2021 Air Quality
Annual Status Report (ASR)

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

December 2021

Portsmouth City Council

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Executive Summary: Air Quality in Portsmouth

Air Quality in Portsmouth

Whilst complete this 2020 Annual Status report (ASR) published by Portsmouth City Council (PCC) does not seek to provide comprehensive detail on all Local Air Quality Management (LAQM) related activities in Portsmouth during 2020 and beyond.

The primary purpose of this document is to report upon the levels of pollution from monitoring data obtained during 2020 and provide a comparison with data sets from previous years.

As a result of impacts from COVID-19 and the associated restrictions on activity / mobility during 2020 this document follows the Department for Environment and Rural Affairs (DEFRA) guidance published in April 2021[1] with respect to LAQM duties, as described in Part IV of the Environment Act 1995, for the 2021 reporting year.

DEFRA recognise that air pollutant concentrations will have been impacted by the change in activity observed across the United Kingdom (UK) as a result of COVID-19 and the Government's associated measures to combat community transmission of this virus since March 2020. This is highly likely to have led to changes in compliance with Air Quality Strategy Objectives (NAQO) in Air Quality Management Areas (AQMAs) in 2020.

When considering the data provided within this ASR PCC would therefore recommend exercising caution in interpreting the efficacy of improvement measures on pollution concentrations as it is likely that restrictions on activities will have had a notable impact on measured concentrations following the Government's lockdown measures, restrictions and advice.

Impacts of AQ upon Public Health

In March 2019 Public Health England (PHE) published a review of evidence on how to improve AQ in the UK[2]. Within this document PHE state that air pollution has a significant effect on public health, and that poor air quality (AQ) is the largest environmental risk to public health in the UK. PCC continues to recognise the serious

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[1] Covid-19-Supplementary-Guidance-for-Local-Air-Quality-Management-Reporting-in-2021-v1.pdf (defra.gov.uk)
[2] Review of interventions to improve outdoor air quality and public health (publishing.service.gov.uk)

consequences of these harmful impacts and acknowledges that the costs to UK society are estimated at more than 20 billion pounds every year.

PHE confirm that epidemiological studies have shown that long-term exposure to air pollution (over several years) reduces life expectancy, mainly due to cardiovascular and respiratory causes and from lung cancer. The annual mortality burden of human-made air pollution in the UK is roughly equivalent to between 28,000 and 36,000 deaths. Short-term exposure (over hours or days) to elevated levels of air pollution can also cause a range of effects including exacerbation of asthma, effects on lung function, increases in respiratory and cardiovascular hospital admissions and mortality.

More recent research is recognising that the systemic effects of pollutants extend beyond the cardiopulmonary system to affect many other organs, increasing the risk of disease that begins from conception and persists across the life course, with studies showing possible effects on dementia, low birth weight, and diabetes.

NAQO and European Directive limit and target values[3] exist for the protection of human health. PHE advise that adverse health effects from air pollutants are observed at progressively lower exposure levels than previously studied and that further action is needed to achieve ambitious, legally binding targets to reduce emissions of 5 of the most damaging air pollutants (fine particulate matter ($PM_{2.5}$), ammonia, nitrogen oxides, sulphur dioxide, non-methane volatile organic compounds), as well as achieving the Government's proposed reduction of public exposure to PM in line with the World Health Organisation's recommendations.

Attributing health outcomes from exposure to individual constituent pollutants in emissions is not simple. This supports the need to tackle emissions in general and not necessarily to focus on individual pollutants. However, with reference to the limit and target values, the main pollutant of concern in Portsmouth is Nitrogen Dioxide (NO_2).

Nitrogen Dioxide Monitoring Data

In 2018 a different assessment regime of the European Union (EU) Directive on AQ led to an obligation on PCC to develop a plan to tackle exceedances where these have been identified by DEFRA. This was in addition to where we have previously identified pollution hotspots and where we have been monitoring pollutant levels for many years. Consequently, since 2018 parts of Portsmouth not previously assessed under the

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[3] Air_Quality_Objectives_Update.pdf (defra.gov.uk)

LAQM regime and where there is an absence of long-term public exposure (pavements alongside busy roads with no nearby relevant exposure as identified in the 2018 Local Air Quality Management Technical Guidance (LAQM.TG(18))[4] became a new focus. The main areas of concern centered around Alfred Road between Hope Street roundabout and the Queen Street / Anglesea Road / Alfred Road intersection and Mile End Road between the southern end of the M275 and Church Street roundabout.

In addition to deploying monitoring devices along the above named roads, since 2018 PCC further increased its number of Nitrogen Dioxide Diffusion Tube (NDDT) monitoring locations around the city. The reason for this is threefold, firstly as a consequence of DEFRAs interest in new geographic areas where exposure to NO_2 is possible, secondly to assess the impact of PCCs activities to reduce NO_2 over the longer-term and thirdly, most recently, to monitor and evaluate the introduction of the Clean Air Zone (CAZ) introduced in November 2021.

This increased level of monitoring has continued to enable a higher resolution picture to be formulated with respect to NO_2 concentrations than that which was available in previous years. Consequently, this has created a materially different narrative with respect to areas of exceedance which exist. Whilst the data sets from the new monitoring locations remain for relatively short term durations all data achieving the minimum level of validation (i.e. 3 months or more) during 2020 are included within this ASR.

PCC has for many years retained 5 Air Quality Management Areas (AQMAs) declared on the grounds of monitored or modelled exceedances of the UK annual mean NO_2 NAQO. It is our intention to keep all these areas under review. We have no intention to revoke AQMAs even where levels have been recorded in compliance with the NAQO. Currently, the primary reason for this are the uncertainties presented in respect to the efficacy of pollution data collected during the COVID-19 pandemic.

Actions to Improve Local Air Quality

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

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[4] [LAQM-TG16-February-18-v1.pdf (defra.gov.uk)](#)

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

In 2018 Governmental Ministerial Directions were issued to 33 Local Authorities (LAs), including Portsmouth, requiring PCC to submit studies to comply with roadside NO_2 limits in the shortest possible timeframe. In October 2018 the government published a supplement to this original plan prescriptively setting out what work we needed to do.

DEFRA is continuing to provide extensive direction, guidance and support to PCC, requiring the development of local plans and to benchmark these against the CAZ Framework principles for England published in 2020[7]. The support provided includes funding to enable PCC to help take the necessary action to improve AQ whilst minimising the impact of these plans on individuals and businesses.

To resolve the UK's failure to comply with the EU Directive, PCC remains in regular discussion with officials of DEFRA to determine the extent of measures necessary to achieve a satisfactory outcome. This has included the Government-mandated charging CAZ launched in Portsmouth on Monday 29 November[8] and the monitoring and evaluation of its impacts which have begun, and which will be included within the ASR reporting process in 2022 in line the Framework principles mentioned above.

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[5] Clean Air Strategy 2019 - GOV.UK (www.gov.uk)
[6] The Road to Zero (publishing.service.gov.uk)
[7] Clean Air Zone Framework (publishing.service.gov.uk)
[8] Portsmouth charging clean air zone launches - Portsmouth City Council

Conclusions and Priorities

- Despite the reduction of NO_2 levels recorded in 2020 air pollution remains a significant concern.

- Mindful of the positive impacts of COVID-19 on levels of air pollution the information contained within this 2020 ASR is not considered to represent a deterioration in local AQ.

- In 2021 / 22 and beyond PCC will continue to increase its knowledge of NO_2 levels and the impact of the CAZ on such by retaining and potentially further increasing our AQ monitoring and evaluation capabilities.

- Delivering compliance with statutory obligations and further reducing harmful levels of pollution remains a key priority of PCC.

- PCC reiterates its commitment to working together with DEFRA and other interested parties to assess the complex AQ needs of all within Portsmouth whilst undertaking this necessary and important work.

Table 1. Summary of Nitrogen Dioxide Monitoring Results

NDDTS = Nitrogen Dioxide Tube Survey. CAQMS = Continuous Air Quality Monitoring Station. DC = Data Capture. LTML = Long Term Monitored Locations. All results are annual averages

NDDTS year	NO_2 DOWNWARD trend recorded at LTML	Improvement?
2016 - 2020	100.00%	Yes
2015 - 2019	92.59%	
NDDTS year	NO_2 annual mean levels decreased at LTML	Improvement?
2020	100%	Yes
2019	100%	
NDDTS year	Locations in excess of NO_2 NAQO at LTML	Improvement?
2020	0.00%	Yes
2019	3.70%	
NDDTS year	No. of sites exceeding NAQO at LTML located outside an AQMA	Improvement?
2020	0	Yes
2019	0	
CAQMS Station	5 year NO_2 trend	Improvement?
London Road	Downward	Yes
Gatcombe Park	Downward (2020 DC < 25%)	Yes
Burrfields Road	Downward	Yes
Mile End Road	Downward	Yes
CAQMS Station	NO_2 2019 compared with 2020	Improvement?
London Road	-20.06%	Yes
Gatcombe Park	-0.57% (2020 DC < 25%)	Yes
Burrfields Road	-14.64%	Yes
Mile End Road	-18.16%	Yes
CAQMS Station	Exceeding NO_2 NAQO	
London Road	No	
Gatcombe Park	No (2020 DC < 25%)	
Burrfields Road	No	
Mile End Road	No	
Anglsea Road	No	

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1. Local Air Quality Management

This report provides an overview of air quality in Portsmouth during 2020. It fulfils the requirements of LAQM as set out in Part IV of the Environment Act (1995) and relevant policy and technical guidance documents.

The LAQM process places an obligation on all LA to regularly review and assess AQ 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 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 ASR is an annual requirement showing the strategies employed by PCC to improve AQ and any progress that has been made.

The statutory air quality objectives applicable to LAQM in England are presented in **Error! Reference source not found.**.

1.2. 2020 NO$_2$ results summary - impact of COVID-19

Our data sets demonstrate a significant reduction in NO$_2$ levels across a number of key hotspot locations and those within the geographical area of the CAZ. In order to communicate clearly on the potential impact of COVID-19 on emission levels due to reduced mobility data, data capture and quality of monitoring data collected during 2020, DEFRA have produced advice on how to contextualise impacts on monitoring data from diffusion tubes and continuous analysers. Following that advice within the publication of this ASR we therefore suggest that readers treat the 2020 data with more caution than usual particularly, for example, where data capture was less than 75% or where diffusion tubes have been exposed outside of the usual time periods, or a combination of both. Further information on the impacts of the COVID-19 pandemic on monitoring data can be found in Appendix F.

2. Action to Improve Air Quality

Under the terms of the Environment Act 1995, the government has issued a Ministerial Direction to relevant authorities of which PCC is one. The initial ministerial direction required PCC to conduct a targeted feasibility study investigating the persistence of long term NO_2 exceedances. Having identified long term exceedances along 2 DEFRA Pollution Climate Modelling (PCM)[9] links, PCC received a direction and funding to retrofit buses operating along these links to the cleaner Euro VI emissions standard.

Following this PCC received another ministerial direction to develop plans for a package of measures that would achieve compliance with NO_2 limits in the shortest possible time. Finally, after identifying a Class B charging CAZ with a package of supporting measures as the plan which would achieve legal limits for NO_2 in the shortest possible time, PCC received ministerial direction to deliver their preferred package.

In the technical report published alongside the UK plan, Government identified charging CAZ[10] as the measure, able to be modelled nationally, which would achieve compliance with NO_2 limits in the shortest possible time.

PCC have therefore been working closely with Government's Joint Air Quality Unit (JAQU)[11] to develop a plan to ensure that levels of NO_2 in Portsmouth are reduced below legal limits in the shortest possible time. This is known as our Local Air Quality Plan (LAQP).

The process that we have to follow to produce our LAQP has been set out by JAQU. There are a number of documents that PCC were required to submit to the Government for review and approval.

On the 21st December 2020 PCC submitted a Full Business Case (FBC) which made the case for the delivery of measures that would be effective in reducing NO_2 emissions from road traffic sources. The plan was informed by detailed transport and

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[9] Air modelling for Defra - Defra, UK
[10] Clean Air Zone Framework PDF
[11] UK Parliamentary business - Joined up action

AQ modelling, which demonstrated that non-charging measures would not be sufficient to achieve the reduction of air pollution needed in the city. Therefore options for a charging CAZ were considered. The final package of measures that were included within the Outline Business Case (OBC) included a Class B CAZ, accompanied by a number of non-charging measures and support packages.

Government ministers confirmed their approval of the FBC on 19th March 2021; the measures approved by government and which have received funding for delivery are:

- Class B CAZ covering a concentrated area in the southwest of Portsea Island (this issues a daily charge to the most polluting buses, coaches, taxis, private hire vehicles and heavy goods vehicles for driving within the zone).

- Changes to Alfred Road traffic signals.

- Tightening of taxi licensing requirements for taxi and private hire vehicles (achieved prior to FBC submission).

- Rapid Electric Vehicle (EV) chargers for taxis and Private Hire Vehicles (PHV).

- Financial support towards upgrade or replacement of non-compliant vehicles (funded through a successful bid to the Government's Clean Air Fund).

Following approval of the FBC, PCC have secured the delivery of the measures listed above. Further details of the progression in delivering these projects can be found in Table 3.

Further to those measures identified in the LAQP a number of measures have been implemented in recent years, are currently being implemented, or are expected to be implemented soon. These have the potential to make a positive contribution to improving air quality in Portsmouth. These are summarised below:

- Bus retrofit programme - Defra funding to retrofit 105 buses to Euro 6 emissions standard.

- Traffic signal improvements - PCC is modernising existing signal infrastructure and improving the overall operation of the traffic signal equipment across the city

to improve traffic throughput, reduce delays and improve the safety of road users and pedestrians.

- Traffic management measures to improve traffic flow – Including Mile End Relining Scheme (early 2019) and Church Street Roundabout improvement (2016).

- Interventions to encourage active travel, including: the East-West Active Travel Corridor (Goldsmith Avenue / Fratton Way Roundabout to The Hard) which will improve cycling and walking connectivity between two public transport hubs; major works to replace coastal and flood defences around the island, which are incorporating additional facilities for walking and cycling; behaviour change initiatives including Pompey Monsters walk to school campaign, 'Bikeability' cycle training for children, Bike Doctor sessions offering low cost bike maintenance and road safety promotion.

- Public transport improvements – Including re-development of The Hard Public Transport Interchange (2017), launch of Park and Ride 2 (PR2) service serving the University and city centre businesses (2018), deployment of real time information at bus stops on key corridors and railway stations, Quick Response (QR) codes at bus stops, interchange information screens at key bus interchanges, and installation of Microprocessor Optimised Vehicle Actuation (MOVA) at 3 key junctions to improve bus priority (Tranche 1, 2019).

- EV Charge points - Funding was secured from the Office for Low Emission Vehicles (OLEV) On-street Residential Charge-point Scheme (ORCS) which saw the installation of 36 charge points in residential areas in March 2019, enabling residents without off-street parking the ability to charge their vehicles at home. Additional funding for a further 63 charging points has been secured, these are expected to be delivered 2021 / 22. PCC have also installed EV charging points in three public pay and display car parks as part of a small trial before considering providing EV charging in more PCC-owned car parks.

- Air Quality Grant Programme (2018 / 19) and promotion of active travel modes - PCC were awarded an Air Quality Grant (AQG) of £450,000 from DEFRA for delivery of targeted improvements in AQ within Portsmouth, including

infrastructure improvements, communications and marketing, initiatives to promote sustainable travel in workplaces and schools, eco-driving, and an anti-idling awareness campaign.

2.1. Progress on DEFRA grant funded projects

Measure	Update on progress
Bus retrofit	Completed - 105 First and Stagecoach buses completed. Further buses and coaches to be retrofitted using Clean Air Fund financial support for buses and coaches. Stickers highlighting the retrofit systems to members of the public have been applied to buses which benefitted from this project.
Class B CAZ	Siemens appointed as the contractor to install the CAZ following a successful design phase. The CAZ went live in November 2021.
Alfred Road signal changes	Final design confirmed. Initial changes were made in spring 2021 including a trial of new Spilt Cycle Offset Optimisation Technique (SCOOT) region timings with further changes to follow. Potential long term opportunities for further improvements have been identified and could be advanced when funding is available.
Targeted communication and marketing	A communication plan developed. Marketing and communication initiated largely in the form of social media posts and updates through emails / newsletters / e-bulletins.

Measure	Update on progress
	Cleaner Air Portsmouth website and information video launched. 2021 included live webinar, radio advertising campaign and out of home advertising.
Financial support to upgrade non-compliant taxis/ PHVs, buses and coaches and HGVs (Clean Air Fund)	Funding applications opened in spring 2021 to Taxi /PHV drivers, further supported by the opening of applications to buses and coaches and Heavy Good Vehicles (HGVs). Uptake of funding was encouraging, whereby the following approvals have been made as of July 2021: • Taxi (standard) - 28% • Taxi Wheelchair Accessible Vehicles (WAV) - 51% • Bus or Coach - 78% • HGV - 72%
Rapid EV Chargers for Taxis / PHVs	Engagement with taxi / PHV trade and the PCC Energy Team establishing a network of suitable charge point locations. Delivery of charge points aligned with the CAZ go-live date.

2.2. Top tips for reducing exposure to air pollution

There are small changes we can make today which will reduce our exposure to air pollution. These include:

- not using your car as often for short journeys

- reducing how much is burnt in homes and gardens

- if choosing to burn, switching to using cleaner fuels like 'Ready to Burn' wood and to more efficient appliances[12]

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[12] Report: Open fires and wood-burning stoves - a practical guide - Defra, UK

- opening windows when cleaning; doing DIY, smoking or undertaking other activities that release pollutants directly into homes

- staying away from traffic if walking or cycling (like walking on the side of the pavement furthest from the road, using the quieter roads and keeping back when waiting to cross the road)

- turning off engines when parking or waiting in traffic

2.2.1. Walking and cycling

For most, the health benefits of walking and cycling far outweigh the risks of roadside exposure to air pollution. Aside from the health benefits of the additional exercise, it has the potential to reduce exposure to air pollution. This is because air quality inside a vehicle can be worse than it is outside.

The Government have committed over £300 million to improve people's access to cycling though schemes like Bikeability and Cycle Ambition Cities. They are also investing £100 million to improve conditions for cyclists and walkers. The Highways England Cycling Strategy[13] shows how this money will be invested to create a cycling network.

2.2.2. Leaving the engine running (vehicle idling)

PCC encourage all drivers to turn off their engine if their vehicle is not moving. Idling vehicles can have a significant localised effect on local AQ, especially around schools, care homes and train crossings. LA can issue fixed penalty notices to drivers who leave their engines running unnecessarily while their vehicles are stationary on a road.

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[13] Highways England Cycling Strategy - GOV.UK (www.gov.uk)

2.3. Key challenges and progression for the year ahead

Portsmouth is a bustling south coast city with unique geography, being surrounded by 49km of coastline on three sides. Its historic, diverse and vibrant waterfront contains the HM Naval Base, Portsmouth International Port, and major tourist attractions (such as Southsea seafront, Gunwharf Quays retail outlet, and the world-renowned Portsmouth Historic Dockyard / Mary Rose Museum). In addition, the University of Portsmouth in the city centre has a population of c. 20,000 students and has ambitious plans for growth.

Portsmouth is one of the most densely populated cities in Europe (with a population density higher than some parts of London), and its population of around 217,000 is expected to grow to 236,000 by 2040.

These factors create unique challenges for Portsmouth in terms of improving its AQ. It is well documented that road traffic is a significant contributor to air pollution and in July 2017 the UK government (DEFRA and the Department for Transport (DfT)) published the UK plan for tackling roadside NO_2 concentrations[14], setting out its commitment to achieving a cleaner and healthier environment, with the aim of benefitting both people and the economy.

Air pollution is the largest environmental risk to public health in the UK and it is known to have disproportionate effects on vulnerable groups. Air quality disproportionately affects the very old, the very young, and those with chronic conditions. It also has greater impact on those who live, work, or go to school in more deprived areas.

With such clear evidence about the impact of air pollution on people's health, PCC has been clear about its plans to improve air quality in the city, as set out in the Air Quality Strategy 2017-2027[15]. This strategy sets out a commitment to "work collaboratively to improve and maintain a healthy local AQ in the city in order to protect health and the environment, enhancing our status as a great waterfront city".

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[14] Air quality plan for nitrogen dioxide (NO2) in UK (2017)

[15] PCC Air Quality Strategy PDF

PCC sets out the following strategic aims to:

- foster closer working relationships between council directorates and external partners

- create a focus on sustainable travel, including the promotion of a modal shift in transport from the car to active travel

- provide high quality information and guidance on local AQ to members of the public

- develop and implement measures to reduce traffic and congestion-related emissions, addressing road network flow and functionality

- support and stimulate sustainable citywide economic growth, including a focus on reducing carbon emissions and

- ensure that as a council we lead by example in supporting sustainable working practices, minimising our own emissions and carbon footprint

The strategic objectives are underpinned by the following core principles: evidenced-based practice, innovation, collaborative working, monitoring and evaluation, ambition, seeking funding, and analysis.

The strategic aims of the strategy and core principles have been applied in the development of Portsmouth's LAQP produced in response to ministerial directions requiring PCC to make improvements to concentrations of NO_2 in the city in the 'shortest possible time'.

Having received ministerial approval on the LAQP FBC from 1st March 2021, PCC was from that date, and remains, fully committed to delivering compliance against legal limits for NO_2 in the shortest possible time. The key measure through which this success will be achieved is through the implementation of a Class B charging CAZ.

2.4. Engagement activity

2.4.1. Decision makers

Decision makers both locally and nationally continue to be engaged in the work to improve AQ across the city. Cabinet Members for Traffic & Transport, Climate Change & the Green Recovery, and Community Safety & Environment sit on the Air Quality Improvement Executive Board, and regular briefings are held for all Councillors to update on the work across the Transport department, including measures to improve AQ.

The Members of Parliament for both the north and the south of the city have received briefings on the work that is being undertaken to address air pollution in Portsmouth, and regular updates on the progress of the city's LAQP are provided to JAQU.

2.4.2. Members of the public

PCC are continuing to engage with a range of stakeholders on the issue of air pollution and the steps being taken to reduce it. In order to facilitate this engagement activity PCC has recruited 4 engagement officers, whose role it is to continue to contact businesses and individuals following the implementation of the charging CAZ and to support them in taking steps to reduce their own emissions, as well as signposting them towards funding to help them do this. The work of the engagement officers compliments the existing engagement activity related to air quality that is undertaken through the Air Quality Steering Group and PCC's Business to Business networking activity.

Building on the public consultation which took place in summer 2020, reaching 93,000 households in the city as well as local businesses, a business advisory group has been setup to engage local businesses with continual CAZ updates. The group acts to ensure businesses who may be impacted by the CAZ are kept updated with progression on elements such as vehicle exemptions, and funding opportunities.

Throughout the COVIC-19 pandemic and resulting national lockdown measures, one of the challenges faced across all engagement activities has been the safety concerns

of holding public events. To overcome this the team have achieved an increased online presence through social media activity, e-updates, and continue to explore new opportunities including live webinar sessions. As the UK potentially progresses out of the COVID-19 pandemic and national restrictions engagement officers will have an increased presence with stakeholders as face-to-face meetings become safe to conduct.

2.4.3. Personal action

Air pollution is a global public health risk; more harmful than passive smoking. Long-term exposure is linked to reduced life expectancy, increased cardiovascular disease, poor lung function and mental health issues.

Travel in Portsmouth is a major contributor to air pollution and the type of transport chosen can help to improve AQ. PCC is making transport improvements to the city including safer cycling routes and facilities to make it easier to choose this way of travelling, improving public transport connectivity with the wider region, funding the upgrade of some of the most polluting vehicles on our roads, and providing electric charging points for residents choosing greener vehicles. PCC are improving the options for travel and together we can choose a greener, cleaner way of travelling for cleaner air in Portsmouth.

Despite the work that has and continues to be undertaken, Portsmouth still faces challenges to reduce the concentrations of harmful pollutants in the air. The CAZ proposals demonstrated one of the key challenges of addressing air pollution as it can be difficult to accept that our own actions are part of the problem and therefore changing behaviours is part of the solution. It is therefore important to consider that we all have a part to play in improving the air quality in the city. Below are some suggestions for changes that individuals and businesses across the city could make to keep the air cleaner:

- Think about whether you need to make the journey in a car. The national lockdown measures introduced in response to the coronavirus pandemic have helped many of us to find the great walking and cycling routes that are available around Portsmouth to get you from A to B.

- If you are unable to make the trip by walking or cycling, consider the use of public transport, or even car-pooling.

- Avoid excessive idling of your car. Switch your engine off when you are stationary for a minute or so.

- When you need to change your vehicle, think about a hybrid or electric car.

If you wish to obtain further information about how your personal action can help tackle air pollution in Portsmouth, or would like to know more details about PCC's plans, use some of the links in the table below to guide you.

Source	Information
PCC website	Key information about air quality in Portsmouth Access to plan documentation
Cleaner Air Portsmouth	Key information about PCC plans for cleaner air Access to news and events
CAZ framework	Detailed information regarding the operation of national clean air zones
Global Action Plan	Key information about air quality Access to free resources for businesses /schools /individuals
Public Health England	Key information on the health impacts of air pollution
DEFRA	Key information about air quality Access to air quality monitoring data

3. Air Quality Management Areas

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

A summary of AQMAs declared by PCC can be found in Table 2. The table presents a description of the 5 that are currently designated within Portsmouth.

Appendix D: Map(s) of Monitoring Locations and AQMAs provides maps of AQMA(s) and also the AQ monitoring locations in relation to the AQMA(s). The NAQO pertinent to the current AQMA designation are as follows:

- NO_2 annual mean

Further information relating to declared or revoked AQMAs, including maps of AQMAs boundaries are available online at https://uk-air.defra.gov.uk/aqma/local-authorities?la_id=198.

The 5 AQMAs currently in place within Portsmouth statutory boundary which were declared due to exceedances in the annual NO_2 NAQO are:

- AQMA6 - which extends north along Fratton Road from Fratton Bridge to Kingston Road, continuing into London Road until the roundabout junction with Stubbington Avenue and Gladys Avenue

- AQMA7 - covering Hampshire Terrace and the St Michael's Road gyratory

- AQMA9 - covering the southernmost section of Eastern Road from Sword Sands Road south into Velder Avenue and its junction with Milton Road

- AQMA11 - which extends from Rudmore Roundabout south to Church Street roundabout; and

- AQMA12 - encompassing the greater part of Queen Street from The Hard to St James's Street.

Additionally because of DEFRA's focus on additional areas of the city through the PCM model, the following 2 road links in Portsmouth have subsequently been modelled and exceed the annual mean NO_2 limit value:

- A3, Alfred Road between Hope Street roundabout and the Queen Street / Anglesea Road / Alfred Road intersection.

- A3, Mile End Road between the southern end of the M275 and Church Street roundabout (located within AQMA 11).

Table 2. 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 (From 2019 to 2020)	Name	Date of Publication
AQMA 6	2005	NO$_2$ Annual Mean	PCC	An area encompassing a large number of residential properties extending north along Fratton Road; from Fratton Bridge into Kingston Road, continuing into London Road until the roundabout junction with Stubbington Road and Gladys Avenue	NO	59.9 µg/m^3	From 40.42 µg/m^3 to 36.51 µg/m^3	PCC's AQAP was set up as a citywide AQAP rather than specifying actions for individual AQMAs. PCC's AQAP in the process of being reviewed	2011
AQMA 7	2005	NO$_2$ Annual Mean	PCC	An area encompassing a number of residential properties along Hampshire Terrace and St Michaels Road gyratory	NO	43.36 µg/m^3	From 36.92 µg/m^3 to 29.67 µg/m^3	PCC's AQAP was set up as a citywide AQAP rather than specifying actions for individual AQMAs. PCC's AQAP in the process of being reviewed	2011

AQMA 9	2005	NO$_2$ Annual Mean	PCC	An area encompassing a number of residential properties near to the southernmost section of Eastern Road from Sword Sands Road south into Velder Avenue and its junction with Milton Road	NO	43.1 µg/m^3	From 33.38µg/m^3 to 28.59µg/m^3	PCC's AQAP was set up as a citywide AQAP rather than specifying actions for individual AQMAs. PCC's AQAP in the process of being reviewed	2011
AQMA 11	2010	NO$_2$ Annual Mean	PCC	This area encompasses a large number of residential properties east of the west transport corridor extending along part of the M275 and Mile End Road stretching from Rudmore roundabout south to Church Street roundabout	NO	46.25 µg/m^3	From 34.29µg/m^3 to 28.20µg/m^3	PCC's AQAP was set up as a citywide AQAP rather than specifying actions for individual AQMAs. PCC's AQAP in the process of being reviewed	2011
AQMA 12	2005	NO$_2$ Annual Mean	PCC	An area encompassing a number of residential properties along Queen Street mainly an area stretching from The Hard to St James's Road	NO	33.11 µg/m^3	From 31.2µg/m^3 to 27.15µg/m^3	PCC's AQAP was set up as a citywide AQAP rather than specifying actions for individual AQMAs. PCC's AQAP in the process of being reviewed	2011

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

4. Progress and Impact of Measures to address Air Quality in Portsmouth

4.1. Air Quality Action Planning

PCC has taken forward a number of new measures during the current reporting year of 2020 in pursuit of improving AQ in the shortest possible timeframe. Details of all the measures are set out in Table 3.. PCC has provided information within the table of when measures are expected to be completed. Additionally, narrative with respect to the progress made in delivering key actions and where reduction of air pollution is possible has been provided. PCC has prioritised actions where funding has already been secured and where the need is greatest.

The problems that PCC are facing are complex. Portsmouth is a densely populated partial island city with 3 primary north south main road links. NO_2 pollution from road traffic is the most significant problem in Portsmouth particularly where high volumes or congested traffic travels through street canyons.

Combinations of the measures contained within Table 3.3 are required to contribute towards compliance. Whilst some narrative has been provided within the relevant text boxes, at this point in time it is not possible to confirm the funding sources of all these schemes or the estimated costs of all measures. This information is being collated and will be published as the situation becomes clearer.

Table 3. 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
APV1	Car Clubs	Alternatives to Private Vehicle Use	Car Clubs	PCC	2020/21	2021	Use of Car Club	<0.1µgm3 Car Club sharing has the potential to reduce the cars per person on the road and therefore reduce emissions.	Funding for Car Clubs was secured with implementation delayed due to COVID-19 to adhere to social distancing measures.	2021	COVID-19 social distancing and further measures must be adhered to before this measure can progress.
APV2	Promoting bus use	Alternatives to private vehicle use	Bus based Park & Ride	Bus Operators	2009	Ongoing	Increase in bus patronage	N/A	Increasing bus vehicle miles and bus patronage is the responsibility of the bus operators. Portsmouth City Council work closely with the operators to encourage usage and increased punctuality and so making public transport more attractive	Ongoing	
APV3	Working with South Western Railway to implement investments through the new Rail Franchise	Alternatives to private vehicle use	Other	PCC/SWR	2019	Ongoing	N/A	N/A	PCC are working with South Western Railway to see improvements to rail stations in Portsmouth. This includes improved and additional electronic signage at stations and improved information on onward connections, by bus and ferry. Meetings continue to be held with the rail operator to work through proposals to improve stations and services	Ongoing	
APV4	Park and Ride decking	Alternatives to private vehicle use	Bus based Park & Ride	PCC funding feasibility study	2017	Ongoing	Initial completion of additional scoping work. Long term - introduction of Park and Ride decking	<0.1µgm3 If this development is successful it would potentially double the parking spaces available at the park and ride, assisting in reducing traffic flow	The feasibility study has been completed for this scheme, and if developed will provide increased parking space availability at the Park and Ride site, allowing for increased usage of the service. At present, the Park and Ride provides 665 parking spaces. If the new decking is	Ongoing	Currently no funding to take this scheme forward to the next stage

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									through into the city through AQMA 11	developed to make the car park a multi-storey, it is proposed that an additional 1000 spaces will be provided, taking the total car parking spaces up to 1650.		
C1	The provision of appropriate cycle parking at key destinations across the city	Promoting Travel Alternatives	Promotion of cycling	PCC	Ongoing	Ongoing	N/A	N/A	Cycle parking is continually introduced and improved as required and as funding is available. Further cycle parking will be provided at various locations through ongoing schemes. Throughout 2020/21 PCC will oversee the provision of new bike 'hangars' which will facilitate the storage of multiple bikes.	Ongoing	The ongoing continuation of this will be dependent upon funding resources.
C2	Local Cycling and Walking Infrastructure Plan (LCWIP)	Promoting Travel Alternatives	Promotion of cycling	Feasibility funded by PCC, technical support provided by DfT	2017	Ongoing	Completion of LCWIP	<0.1µgm3 This measure will support cycling in the city	The production of a Local Cycling and Walking Infrastructure Plan (LCWIP) for Portsmouth is underway, following the production of Government's Local Cycling and Walking Investment Strategy. PCC were successful in securing technical support for the development of the LCWIP, which is now with the Secretary of State for review.	Date to be confirmed for LCWIP to be taken to Traffic & Transport Committee to be adopted - report to be finalised	LCWIP routes caveat that additional land may be required for construction - limited opportunity for land grab and purchase
C3	Bike Hire Scheme	Promoting Travel Alternatives	Promotion of cycling	FTZ Funding available totalling £2.4 million for schemes in Portsmouth & Southampton. Split between Authorities still to be determined.	2021-22	2022/23	Delivery and uptake of Bike Hire scheme	<0.1µgm3 This scheme is likely to provide only a very small reduction in air pollution initially, however, there is the possibility that greater overall reductions could be achieved over time, as uptake of the scheme increases.	Bike hire scheme funding available via the Future Transport Zone (FTZ). Early market testing has been carried out and initial procurement planning is underway. Due to COVID-19 and Brexit the industry supply of bikes and e-bikes is currently limited, which is likely to affect delivery schedule for this project	Launch of the scheme currently planned for Spring 2022.	Promotion and marketing of this scheme will be required to support its launch and delivery
C4	Family Cycle Grants and Family Cycle Training	Promoting Travel Alternatives	Promotion of cycling	PCC, funded through Defra Air Quality Grant	2017	2018/19	Uptake of Family Bike Grant scheme and cycle training	N/A	Successfully delivered in 2016/17, enabling lower income families to access safe cycling and move away from the private car. Also successfully delivered in 2018/19 through the Air Quality Grant. For the family cycle training scheme, 36 families received cycle training, to increase skills and confidence, learn to effectively shepherd children and to journey plan. A further 22 sessions have run cycle maintenance training. Evaluation	Funding due to be awarded in July 2021	Further roll out of this scheme will be dependent upon further funding becoming available

									suggests that both training sessions have been very well received and have been effective in increasing confidence and rates of cycling,and reducing the barriers to cycling. For the family cycle grants, 24 families received a grant towards new bikes and associated safety equipment (helmets, lights, locks and high vis). 36 adult bikes were funded and 33 children's bikes. Feedback suggests that the families in receipt of the bikes and safety equipment are cycling more, using the bikes for leisure, school and work and are cycling more as families. A funding bid for £35,000 has been made in the Capability fund in order to restart the program.		
C5	Community Cycle Hub Continued partnership working to support and generate income through community events and initiatives using Bike Doctor	Promoting Travel Alternatives	Promotion of cycling	PCC	2014	2019	Level of uptake of Cycle Hub services	N/A	Ongoing - support of a cycle hub providing maintenance, training and retail of cycle goods. Cycle hire provision also available. Continuation of the Bike Dr maintenance sessions across the city.	Ongoing	The ongoing continuation of this will be dependent upon funding resources.
C6	Supply of sustainable travel options for staff business travel	Promoting Travel Alternatives.	Promotion of cycling.	PCC	Ongoing	Ongoing	Uptake of pool bikes, electric vehicles for business staff travel	<0.1µgm3	Pool bikes and electric vehicles are available for staff business use. Booking system available to enable online bookings, a cycle maintenance stand to be provided at the PCC Civic Offices	Ongoing	
C7	City-wide Early Release Low Level Cycle Signals	Promoting Travel Alternatives	Promotion of cycling	PCC	2018/19	2019	Installation of early release signals	<0.1µgm3 This measure will support cycling in the city	The installation of low level signals and early release at existing signalised junctions, improving cycle safety.	2020	
C8	Quieter Routes	Promoting Travel Alternatives.	Promotion of cycling.	PCC	2016	2019/20	Upgrading of signage	<0.1µgm3 Supports travel behaviour change,	A number of 'Quieter Routes' have been marked out in the city, with the use of coloured stickers on lampposts. There are currently five routes between the	22/23	The existing network of 20mph roads support the formation of the

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								strengthening the cycle routes in the city, particularly for short local journeys	north and south of the city, and five between the east and west. Signage was upgraded on these routes during 2019/20 with continued investigation of new signage to further improve the routes. The project has been progressing route by route, and after a pause has recently started again with parking revenue reactivated and funding available again. Routes to continue to be audited with increase of team resource from late summer 21, with more signage to be installed.		'Quiet Routes' network
C9	Road Safety and Active Travel Events Programme	Promoting Travel Alternatives.	Promotion of cycling.	PCC	2017	Ongoing	Delivery of cycling events and attendance levels.	N/A Whilst the events themselves won't deliver a significant reduction in pollution levels, the awareness raising achieved will have longer term benefits	Successfully delivered Pedal Portsmouth events, Glow Ride, Changing Places and Be bright be Seen in 2017 and 2018. Pedal Portsmouth Events, Glow Ride. The Capability Funding bid includes £40,000 for such events with funding to be approved in July 21.	Ongoing	COVID-19 social distancing and further measures must be adhered to before this measure can progress. Funding may not be awarded for further events.
C10	Promoting Road Safety & Active Travel initiatives. For example; - educational programmes in schools - Road safety behaviour change with students and commuters -Cycle promotion through community based cycle events to promote quieter routes. - Cycle Hub to support events with the provision of	Promoting Travel Alternatives	Promotion of cycling	PCC,	2010	Ongoing	Delivery of cycling, road safety and active travel initiatives	N/A Promotion of active travel initiatives will support the uptake of sustainable travel modes and contribute to positive travel behaviour change	Walking and cycling map is a popular resource. Planning is underway for an interactive map on the council website. Works in conjunction with stakeholders such as Portsmouth Cycle Forum continue. Educational programmes in schools continue to be delivered, such as the Pompey Monsters Challenge. Stomper application for walking to school is due to be launched in September 2021 School Streets trial for 5 schools taking place Autumn 2021 and Spring 2022 Bike hangars trial Phase 1 trial completed with Phase 2 now planned	Ongoing	A small amount of funding was available for 2019, but further funding will be required to take forward into the future

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	Bike Dr. Stakeholder engagement to support CyclingUK set up Community cycle groups									
O1	Domestic heating emissions (ECHO)	Other	Other	PCC & Agility ECO Various funding sources	Ongoing	Ongoing	Uptake of scheme	Potential for reduction of range of pollutants	PCC have received funding for a boiler replacement scheme. Fuel Cell Micro-CHP Installations were carried out in 2018/19, with monitoring of the performance of the systems being conducted by remotely accessing generation data. 14 repairs or new installations were achieved in 2021 (of a total 66 during 20/21).	2021	Awaiting confirmation of further funding
O2	Domestic heating emissions (ECO)	Other	Other	PCC & Agility ECO Funded by Energy Company Obligation (ECO)	Ongoing	Ongoing	Uptake of scheme	Potential for reduction of range of pollutants	This measure has delivered a range of domestic emissions improvements including: 52 boiler replacements, 256 cavity wall insulations, 54 electric storage heaters, 48 first time central heating, 139 loft insulations, 126 smart thermostats.	2021	
O2	Green Homes Grant	Other	Other	PCC & Agility ECO Funded through central government	2020	Ongoing	Uptake of scheme	Potential for reduction of range of pollutants	36 total installations including air source heat pumps, solid wall insulation & solar PV.	2021	
O4	Bidding for Funding	Other	Other	N/A	Ongoing	Ongoing	Successful applications for additional funding towards Air Quality improvements and initiatives	N/A	We will seek funding opportunities to assist with air quality initiatives wherever possible	Ongoing	
O5	Explore new technology	Other	Other	PCC	2017	Ongoing	Implementation of research into new technology, as	There is the potential for significant reductions in NOX to be achieved	Undertake research and test new transport technologies to reduce levels of NOx and consider their potential use within future strategies.	Ongoing	

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ID	Action	Category	Sub-category	Lead	Start	End	Outcome	Target	Progress	Status	Comments
							opportunities arise	through the introduction of new technologies	Research into other technologies beyond transport based solutions, for example green infrastructure.		
PGDC 1	AQ improvement through the planning process	Policy Guidance and Development Control	Air Quality Planning and Policy Guidance	PCC	Ongoing	Ongoing	N/A	<0.1µgm3	There is an ongoing involvement with Planning Policy on the air quality effects of developments through the Planning Process. Consideration is given to limiting air pollution issues which may arise from new developments both during and after construction	Ongoing	The Planning Department are represented on the Air Quality Board
PGDC 2	Air Quality Board	Policy Guidance and Development Control	Other	PCC	2018	2018 and ongoing	Regular meetings/updates to Air Quality Board	N/A	An Air Quality Board was formed in 2018 and includes wide departmental involvement. The ambition for an over-arching council wide Air Quality board has been acknowledged and will be actioned in the coming months.	Ongoing	Ongoing board restructuring
PGDC 3	Portsmouth International Port Air Quality Action Plan	Policy Guidance and Development Control	Low Emissions Strategy	PCC, PIP, DfT	2019	Ongoing	Delivery of plan to reduce emissions	There is the potential for significant reductions in emissions around the Port.	Action Plan to submitted to DfT	Ongoing	
PGDC 4	Air Quality Local Plan	Policy Guidance and Development Control	Air Quality Planning and Policy Guidance	DEFRA	2019	2020/21	Reduction in NOx to within legal limits	The plan aims to achieve a significant reduction in NO_2 emissions, particularly in areas which current exceed legal limits.	FBC approved March 2021, CAZ to be operational November 2021 with the provision of supporting measures during the course of 2021 before the go-live date including: targeted communications and marketing, rapid EV chargers for taxis, signal changes at key locations, tightening of taxi licensing requirements.	Ongoing	
PI 1	Provision of information regarding air quality, including real time monitoring data and information regarding assessments of air quality to enable public awareness of issues and success of actions implemented	Public Information	Other	PCC	Ongoing	Ongoing	Collection of monthly air quality readings Production of Annual Status Report to inform public of monitored data	N/A	Widespread monitoring of NO_2 is undertaken across the city using diffusion tubes. There are also five continuous monitoring stations, with a sixth to be installed during 2020/21. Data on levels of particulate matter is collected at 3 locations. This data is available through the Annual Status Report. A further continuous monitoring station has been delivered located at St. John's Cathedral and is due to be operational soon.	Ongoing	

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PI 2	Air Quality Communications and Marketing - Clean Air Day 2021	Public Information	Via the internet Via leaflets Via other mechanisms	PCC	2021	17th June 2021	Involvement and participation in Clean Air Day events	Whilst there were not significant reductions in air pollution during this day, it assisted in raising awareness of air pollution, its effects on health, and ways in which people could consider travelling more sustainably	Completed	Completed on 17/06/21, engaging adults and children in a photography competition which included active travel prizes.	
PI 3	Air Quality Steering Group	Public Information	Other	PCC	2018	2018 and ongoing	Attendance at Air Quality Steering Group	N/A	An Air Quality Steering Group was formed in 2018. This group includes representation from local residents groups, businesses and organisations, active travel groups, and relevant officers from PCC. Over the 2020/21 course the steering group will be broken down into more specific groups to target communications and interaction.	Ongoing	
PI 4	Business Advisory Group	Public Information	Via the internet	PCC	2020	2020 and ongoing	Attendance at Business Advisory Group	N/A	A Business Advisory Group was established in 2020, which provides a range of business based stakeholders with updates on the progression of Clean Air Zone plans and beyond.	Ongoing	
PI 5	Sustainable Travel Behaviour Change	Public Information	Other	Some historical schemes funded through DEFRA PCC	2012	Ongoing	Increase in change in travel behaviour away from the private car to more sustainable modes of travel, particularly for short local journeys around the city	<0.1µgm3 Raising awareness of sustainable travel options through various schemes and initiatives, and encourage consideration of uptake	Much good work has been carried out through Local Sustainable Transport Fund, Sustainable Travel Transition Year Grant and Clean Air Grant 2018/19 Further sustainable travel behaviour work will come as part of the Air Quality Local Plan in 2020/2021.	2019/20 and ongoing	The promotion of sustainable travel is an ongoing element of many schemes, and the My Journey programme. Future running of specific behaviour change programmes will be dependent upon securing future funding
PI 6	Personal Journey Planning	Public Information	Via leaflets Via other mechanisms	Various	2018	2018 and ongoing	No. of people engaged within residential and events based activities	<0.1µgm3 Awareness raising with local residents and visitors	Personal Journey Planning (PJP) work was undertaken during 2018 as part of the Air Quality Grant work. An element of this programme focussed on PJP in AQMA 6, involving both residential and event based activities. Previous PJP work has also been carried out with the use of Travel Advisors, through the LSTF and Sustainable Travel Transition Year programmes. Where funding has been available on street travel advisors has been used at various events held across the city. Further recent work has focused on sustainable travel planning alongside key businesses.	Ongoing	

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PI 7	Air Quality Communications and Marketing - Anti Idling Campaign	Public Information	Other	Funded through DEFRA Air Quality Grant	2018	Ongoing	Reduction of idling vehicles in the city Raising awareness and educating drivers about the impact of engine idling.	<0.1µgm3 Whilst not delivering a significant reduction in air pollution, this campaign has raised significant awareness of the need to switch off vehicle engines when stationary for more than a couple of minutes.	Anti-idling campaign complete but lamppost banners still in place, to remain for foreseeable future until there is a need for them to be removed / replaced.	Ongoing	Some anti-idling events have been postponed due to adherence with COVID-19 measures. Further funding required for ongoing activities.
PI8	Traveline	Public Information	Other	PCC	2016	Ongoing	Continued up to date travel and public transport information on Traveline	N/A Although not delivering measurable air pollution reduction targets, public transport information supports uptake of active travel	Traveline consists of a national database for all bus stops and timetables which is updated daily, providing comprehensive information and is used to populate all journey planning engines	Ongoing	
PI9	Public Transport Network Maps	Public Information	Other	PCC	2017	Ongoing	Completion of online mapping system	N/A Supporting public transport use	New Public Transport Network Hub map produced in 2017 An online mapping system using network maps was developed and completed June 2018. Work is ongoing to explore the development of online active travel maps.	Ongoing	Bus route maps are updated on a regular basis
PI10	Public transport information	Public Information	Other	PCC, with TCF element funded by DfT	2012	Ongoing	Provision of public transport information	N/A Although not delivering measurable air pollution reduction targets, public transport information supports uptake of active travel	SMS/ texting / bus timetable downloads; Improved Shelters with 90 real-time passenger information units have been installed in 2017/18. The TCF Tranche 1 has delivered 120 RTI units which have been installed at bus stops across the city, with a further 20 RTI pole only locations and 13 interchange screens with bus destinations and COVID information. On all 210 RTI units bus occupancy details are now displayed.	Ongoing	Journey planning and interactive mapping has been halted until after COVID-19 restrictions which will be reviewed at the end of July.

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PLE T1	Electric Vehicle Charge Point scheme - off street	Promoting Low Emission Transport	Other	Charge points funded by City EV Bay marking and electricity funded by PCC	2018	2020	Installation of charge points and level of usage	<0.1µgm3 This measure will initially only achieve a very low level of NO_2 reduction. There is potential for greater reductions to be achieved over time as EV usage increases across the city	Off street charge points have been installed at 3 car parks in the city: Isambard Brunel Multi storey, Esplanade car park and Clarence Pier car park. Clarence Pier car park is currently not accessible due to seafront works.	2021/22	The trial will be completed in Jan 2021. An off- street charging feasibility study is planned to begin in 2021 to understand the kinds of charge points are needed in PCC owned car parks. Staffing resource has caused delays in beginning this process.
PLE T2	Electric Vehicle Residential Charge point schemes - phase 1	Promoting Low Emission Transport	Other	Office for Low Emission Vehicles (ORCS) Grant	2018	2019	Installation of charge points and level of usage	<0.1µgm3 This measure will initially only achieve a very low level of NO_2 reduction. There is potential for greater reductions to be achieved over time as EV usage increases across the city	36 on-street charge points have been installed through the ORCS scheme, at various locations in the city, where requested by residents. All charge points have been installed at locations where the resident does not have off street parking.	May 2019	Information is being gathered on further residents interested in a residential on-street charge point, to further develop the network when funding becomes available
PLE T3	Electric Vehicle Residential Charge Point scheme - phase 2	Promoting Low Emission Transport	Other	Office for Low Emission Vehicles (ORCS) Grant	2019	2021	Installation of further charge points and level of usage	<0.1µgm3	Funding for the second phase has been secured, where 63 on-street charging points will be delivered.	2021/22	
PLE T4	Review of PCC fleet and moving away from diesel vehicles	Promoting Low Emission Transport	Company vehicle procurement	PCC	Ongoing	Ongoing	Reduced emissions from Council vehicles	N/A	Future consideration to be given to PCC fleet procurement, with a view to moving away from Diesel vehicles, and increasing the number of electric vehicles in the fleet.	Ongoing	Further work is necessary to progress this further, however it is a clear aspiration of PCC.
PLE T5	Electric Vehicle Promotion	Promoting Low Emission Transport	Other	Funded through Defra Clean Air Grant	2018	2019 and ongoing	Uptake of electric vehicles/ULEV	N/A	Promotion of electric vehicle charge points available through OLEV's ORCS scheme, encouraging further uptake of electric and hybrid vehicles in the city. An off street EV charge point trial also taking place at three city car parks	Completed	35 charge points have been installed through the ORCS scheme, and all three off street EV charge points are now fully operational which have had good usage. Funding for 63 more chargers has been secured

										for the second phase of the project.
PLE T6	Electric Vehicle Rapid Chargers for Taxi/PHVs	Promoting Low Emission Transport	Other	DEFRA	2019	2021	Uptake of EVs in taxi/PHV licensed fleet, usage of chargers	<0.1µgm3 This measure will initially only achieve a very low level of NO$_2$ reduction. There is potential for greater reductions to be achieved over time as EV usage increases across the city	Installation of chargers before the go-live date of the Clean Air Zone is currently on target, shortly to enter into procurement phase.	2021	
PLE T7	Clean Air Fund	Promoting Low Emission Transport	Other	Defra	2019	2021	Uptake of funding	This measure will help to support CAZ affected vehicles upgrade/retrofit to compliant emissions standard. In doing so a small reduction in NOx as well as other pollutants will be achieved.	Initial rounds of Clean Air Fund grants for Taxis/PHVs, Buses and Coaches, and Heavy Goods Vehicles are currently live.	2021/22	Long lead times for specialist vehicles purchased under the grant.
PTA1	'Play Streets' Development	Promoting Travel Alternatives	Other	No funding currently available	2019	2020	Delivery of Play Streets	<0.1µgm3 There is the potential for reductions in NO$_2$ to be achieved in the play street locations	The first Play Street Pilot was successfully delivered along Francis Avenue. Further Play Streets have been confirmed since for Whitwell Road and Francis Avenue, with Chetwynd Road and Lindley Avenue also looking likely.	Ongoing	Work is ongoing so that neighbourhoods can arrange their own committees so they are able to organise play street events themselves.
PTA2	Safer Routes to School Minor Remedial Works	Promoting Travel Alternatives	School Travel Plans	PCC	2014	2030	Completion of schemes, and uptake by parents/pupils	<0.1µgm3 Safer routes to school schemes tend to be small scale, supporting sustainable travel to school through increasing safety and supporting walking to school	This work is on-going and will be completed year on year.	Ongoing	
PTA3	Pompey Monster Walk to School Challenge - school behaviour change	Promoting Travel Alternatives	Promotion of walking	PCC, further work funded through Defra Clean Air Grant	2016	Ongoing	Uptake of scheme by schools	<0.1µgm3 Supporting sustainable travel to school	The Pompey Monsters Scheme was introduced in 2016/17, and a trial of the scheme was carried out at three schools in the city, as part of the STTY scheme. This successful initiative is popular with the children and encouraged an increase in walking to school. This scheme was	Ongoing	6 schools have benefitted from the Pompey Monster Walk to School Challenge through the Clean Air Grant. Half term events in

									delivered to 4 further schools within or close to AQMA's in 2018/19, through the DEFRA Air Quality Grant. The scheme now supports 6 schools to encourage travel behaviour change.		libraries encouraged children to walk with their families. Evaluation is underway to assess modal shift. A new air quality Pompey Monster was developed, Breezy, and air quality messages promoted in the school via assemblies, and also the Pompey Monster packs.
PTA4	School travel plans	Promoting Travel Alternatives	School Travel Plans	PCC, with funding from Air Quality Grant to deliver further schemes in 2018/19	2014	Ongoing	Delivery of school travel plan schemes, and effect on school travel modes	<0.1µgm3 Supporting sustainable travel to school	In 2018/19, 14 schools in AQMA areas took part in gathering parent pledges to travel to school sustainably to improve air quality. Park and Stride maps were created and distributed to 2 schools and 15 schools have received Scootability training. Evaluation suggests that the training was well received and take-up has increased following the training.	Ongoing	Further development of school travel plan schemes dependent on funding and resource
PTA5	Workplace travel plans (WPTP)	Promoting Travel Alternatives	Workplace Travel Planning	PCC, and DEFRA Air Quality Grant	2014	Ongoing	Number of travel plans implemented, or engagement with WPTP activities	<0.1µgm3 Workplace travel plans can support increases in sustainable travel	Further to previously completed workplace travel planning opportunities, engagement through STTY and WSTF will help to establish a greater base of workplaces to work alongside and develop travel plans.	Ongoing	The work delivered through the Clean Air Grant 2018/19 provided various engagement materials to the 4 businesses involved, including, Clean Air Initiative flyers, travel information flyers, printed and online pledge cards. Clean Air Initiative flyers were also distributed to SME's along the AQMA 6 corridor. Through "lunch and Learn" sessions, eco driving, bike doctor and engagement, 94 people have pledged to travel to work more sustainably. Follow up emails will be sent to all those that have pledged to see if there has been any modal shift.

										Further Workplace Travel Planning activities are dependent upon further funding becoming available
PTA6	Workplace Sustainable Travel Fund (WSTF)	Promoting Travel Alternatives	Workplace Travel Planning	PCC, DEFRA	2016/2017	Ongoing	Delivery of WSTF to businesses located close to or within an AQMA	<0.1µgm3 Whilst this fund would only make a very small impact on local air pollution levels, it is a useful measure in raising awareness of and supporting sustainable travel for local work related journeys	In 2020/21 19 business benefitted from up to £5,000 grant funding packages. Funding has been secured for a 21/22 round of support to further encourage more businesses to install sustainable travel initiatives.	Ongoing
PTA7	Emergency Active Travel Fund	Promoting Travel Alternatives	Other	DfT	2020	2020	Shift to active travel modes	There is potential for NOx emissions to be improved on some links in the city where active travel measures are introduced, if modal shift is achieved.	PCC were successful in securing funding from the DfT Emergency Travel Fund. This funding was used to deliver a range of active travel schemes in the city in adherence to COVID-19 guidelines.	Ongoing
TM1	LTP Programme	Traffic Management	Strategic highway improvement, re-prioritising road space away from cars, including Access management, Selective vehicle priority, bus priority, high vehicle occupancy lane.	PCC	Ongoing	Ongoing	Implementation of LTP schemes	<0.1µgm3 Pollution reductions achieved by individual LTP schemes will be low, however the combination of these measures would likely have an overall positive impact on assisting with reducing levels of NO_2	Ongoing schemes being developed through the LTP will provide improvements to local air quality.	Ongoing

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TM2	Speed Reduction Schemes	Traffic Management	Other	PCC	2018	2020	Implementation of schemes	<0.1µgm3 Speed reduction measures can help in increasing uptake of walking and cycling through improved safety	Various speed reduction schemes have recently been completed to improve safety and encourage uptake of walking and cycling. Measures included additional speed cushions and coloured surfacing. Further speed reduction schemes have been implemented throughout 2020/21 across the city to improve road safety.	Ongoing	
TM3	Signs and Lines	Traffic Management	Other	PCC	2018	2020	Implementation of schemes	N/A Whilst these measures will not deliver measurable air pollution targets, they will assist in improving traffic flow	Various small city wide improvements to existing road signage and markings were carried out in 2020/21.	Ongoing	
TM4	Variable message signs	Traffic Management	Other	PCC	2009	Ongoing	Installation of VMS	<0.1µgm^3	Several VMS signs are already in place in the city. In late 2017 five new signs displaying live car park occupancy information were installed. These signs incorporated the 'Cough Cough Engine Off' anti-idling campaign messages between January and April 2019. All Cough Cough messages cleared from display early 2020. A new Swarco multi-text sign has now been installed inbound on Commercial rd between the Hope St and Marketway Rbts. Additionally we are currently waiting for live car park data to be supplied & displayed from the Historic Dockyard Potentially a further 2 signs to be installed in the Portsbridge and Cosham Wards	2021 and ongoing	Some CIL money is to be requested from all ward Cllrs to fund signs although PCC may be able to allocate some funding
TM5	Traffic Signal Reconfiguration	Traffic Management	Other	PCC	2014	Ongoing	Completion of signalised junction and crossing review	<0.1µgm3 Will provide improved journey times and less congestion in specific areas	TSOP was delivered at eleven junctions in the city in 2017, with MOVA technology being introduced. These schemes delivered more efficient traffic flow Some minor junction improvements such as timing or improvements to cycle safety are continually analysed and updated across the city. A number of signalised junctions and crossings will be reviewed to ensure correct and efficient operation.	Ongoing	

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TM6	Junction improvements	Traffic Management	Strategic highway improvements	PCC	2013	Ongoing	Completion of city wide junction review	<0.1µgm3 Will provide improved journey times and less congestion in specific areas	On-going improvements to junctions. Recently completed 3 junction upgrades as part of an award from Tranche 1 of the Transforming Cities Fund. These included more efficient vehicle detection and low-level cycle signals. 2 junction upgrades on two of the city's busiest junctions to improve pedestrian facilities including the first example of an "X" crossing in Portsmouth were also completed during 2019/20. A further 5 junction schemes are committed for implementation as funded through the Transforming Cities Fund which will help to deliver improved bus priority and journey times as well as improved pedestrian and cycle facilities.	Ongoing	
TM7	Smart Motorways M27 Jct. 11	Traffic Management	Strategic highway Improvements Re-prioritising road space away from cars, including Access management, Selective vehicle priority, bus priority, high vehicle occupancy lane	Other	2017	2019	Completion of works	Unknown	Upgrade and improvements from M27 Junction 4 - junction 11 to the A27/A3 (M) junction to include: Smart Motorways, ALR, and off-HE network investment in connecting junctions including Farlington and Portsbridge roundabouts.	2020/21	Programme to junction 11 is underway
TM8	Wightlink increased vehicle stacking capacity and reduced queuing	Traffic Management	Other	Wightlink	2017	2018	Reduced queuing of vehicles entering the ferry port following completion of planned works	<0.1µgm3 Significant congestion can occur at this location. The introduction of ANPR will go some way in addressing this issue and reducing local NO_2 levels	Wightlink undertook work to facilitate increased capacity, improved loading and vehicle waiting facilities in 2017. Further work was completed in 2018 to implement Automatic Number Plate Recognition (ANPR), which allows for faster check in times and reduce ferry related congestion. Electric vehicle charge points were installed at the Wightlink terminal in 2018.	ANPR - Completed Vehicle Stacking - ongoing	Wightlink have reported reduced queuing times since the scheme was completed. Development of vehicle stacking infrastructure is ongoing.
TM9	Eastern Corridor	Traffic Management	Other	PCC	2017	Ongoing	Completion of all schemes of works	Milton Common cycle path design/planning permission/ Milton Common Restoration and Management Framework possible	A comprehensive study of the Eastern Road corridor was conducted, which will deliver identifiable solutions for this key corridor into the city. The study identified	Ongoing	Milton Common Cycle Path falls within a site of importance for Nature Conservation (SINC) and is close to sites

	Phase 2 Works						update to allow the cycle path is underway. Phase 2 feasibility study regarding carriageway widening and one left slip lane onto A27 is underway.	problems of current uses and identified future uses and solutions. Further development of the plan is on hold to ensure shared interests with the Coastal Defence strategy are met.		that are important for Brent Goose feeding. Planning permission or permitted development is required. Development alongside Coastal Defence works.
TM10	A27 Safer Roads Funds	Traffic Management	Strategic highway improvement, re-prioritising road space away from cars, including Access management, Selective vehicle priority, bus priority, high vehicle occupancy lane	DfT, PCC	2017	2020	Delivery of traffic safety measures	<0.1µgm3	Traffic safety measures including improved facilities for active travel modes, high friction surfacing, signage, and modifications to the shared footway. A further intervention Is to be made in FY21/22 to add a controlled pedestrian/cycle crossing at a busy junction	March 2022	
TPI1	Access for people with disabilities	Transport Planning and Infrastructure	Other	PCC	2016	Ongoing	Delivery of measures to support access for people with disabilities	N/A Whilst not delivering high levels of direct pollution reduction, these measures will support mobility	To provide low cost measures citywide in Portsmouth where improvements to the kerb lines, signing and street furniture will aid mobility for the disabled and parents with young children in prams and pushchairs. Encouraging active travel modes. Further small scale schemes will be delivered in 2020/21	Ongoing	
TPI2	South East Hampshire Rapid Transit (SEHRT)	Transport Planning and Infrastructure	Bus Route Improvements	DfT, with PCC/ Hampshire and IOW funding development bid	Ongoing	Ongoing	Delivery of schemes.	<0.1µgm3 This scheme would deliver significant benefits to the city in terms of public transport provision	Funding secured through TCF re-bid with schemes to be delivered 2020-2023.	Ongoing	The Portsmouth & South East Hampshire City Region Transforming Cities Bid was 1 of 12 cities shortlisted into the co-design phase with the DfT. Funding has now been secured after a re-bid for the TCF fund.

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TPI3	Transforming Cities Fund	Transport Planning and Infrastructure	Other	DfT	Ongoing	Ongoing	Completion of works	This scheme would deliver significant benefits to the city in terms of public transport provision and promoting active travel alternatives.	For £56m, the revised package will deliver 23 schemes agreed across the partnership of Hampshire County Council (10, £19.6m), Portsmouth City Council (9, £26.7m) and the Isle of Wight Council (4, £10m).	2023	Bid awarded with match funding provided by each of the bidding authorities and their partners First Bus, Stagecoach, and the borough councils.
TPI4	Central Corridor Scheme	Transport Planning and Infrastructure	Cycle Network	Funded through DEFRA Air Quality Grant	2018	2019	Completion of scheme and improvements to cycle safety along route	<0.1µgm3 This measure will support cycling in the city	Construction of raised tables at various sites along the A2047 and improvements to the cycle lane have now been completed.	2019	
TPI5	Holbrook Road/ Arundel Street Roundabout	Transport Planning and Infrastructure	Other	PCC	2019	2019/20	Completion of works	<0.1µgm3 Will increase safety for cyclists and encourage cycling	Improve signage and lane discipline which will reduce the risks to cyclists at this roundabout, cycling on this route will be more attractive and therefore may increase the number of people choosing to cycle.	2020/21	
TPI6	Northern Parade-Gladys Avenue junction improvement.	Transport Planning and Infrastructure	Other	PCC	2019	2019/20	Completion of works	<0.1µgm3 Will increase safety for cyclists and pedestrians to encourage active travel	A junction improvement that will make safety improvements for both pedestrians and cyclists, through larger pedestrian islands and a surface treatment to increase driver awareness of cyclists.	Completed	
TPI7	Zebrite	Transport Planning and Infrastructure	Other	PCC	2018/19	Ongoing	Successful implementation of beacons.	N/A	Roll out of enhanced LED belisha beacons which provide greater increased visibility of zebra crossings and are especially effective at crossings that experience vehicles not stopping for pedestrians. The Zebrite beacons draw attention to the crossing thus making it more likely that a pedestrian waiting to cross will be seen and therefore road safety is improved.	2020/21	
TPI8	Fratton to the Hard Interchange Active Travel Corridor	Transport Planning and Infrastructure	Cycle Network	PCC	2019	2019/20	Implementation of cycle route and usage of route by cyclists	<0.1µgm3 Will increase safety for cyclists and encourage cycling	As part of the Fratton to The Hard Interchange Active Travel Corridor to provide a segregated cycle lane, where feasible between the junction with Haslemere Road/ Goldsmith Avenue and the eastern approach to the Fratton Roundabout. Significant infrastructure. This scheme is currently waiting to be consulted on before any further progress can be made.	2020/21	

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TPI9	Re-development of Hard Interchange	Transport Planning and Infrastructure	Public transport Improvements interchanges stations and services	PCC	2014	New Interchange opened in 2017, but benefits to supporting sustainable travel are ongoing	Increase in bus patronage at The Hard Interchange	<0.1µgm3	The new Interchange opened in May 2017, and provides improved links to rail and ferry services and improved pedestrian and cycle links to Gunwharf Quays and tourist attractions, helping to make public transport easier and more attractive to use. The interchange provides a modern, state of the art gateway to the city, with a secure environment for customers	Completed	Bus and coach operators have reported an increase in bus patronage boarding at The Hard, and increased passenger satisfaction.
TPI10	Milton Road/ Priory Crescent Junction/crossing improvement	Transport Planning and Infrastructure	Other	PCC	2019	2019/20	Completion of works	<0.1µgm3 Will increase safety for cyclists and pedestrians to encourage active travel	Proposed improvements to an existing junction to increase visibility and build cycle lanes to improve pedestrian and cycle safety has been incorporated into wider Locksway Road roundabout scheme.	Dependent on wider Locksway Road roundabout scheme	
TPI11	New Road Copnor-Junction Treatment	Transport Planning and Infrastructure	Other	PCC	2019	2019/20	Completion of Scheme	<0.1µgm3 Will provide improved journey times and less congestion in specific areas	To improve an existing junction, to make safety improvements at the junction and its approaches. This will provide improved pedestrian facilities as well as increased cycle safety.	Completed	
VFE1	Bus Retrofit Programme	Vehicle Fleet Efficiency	Promoting Low Emission Public Transport	DEFRA	2018	2019/20	Upgrading buses travelling along specific route to Euro 6 standard	Buses upgraded to Euro 6 standard can result in significant reductions in levels of local air pollution. Compliance with legal NO$_2$ limits along Mile End Road.	The bus retrofit programme is for Stagecoach and First buses running along routes 48196 and 18114, it has enabled pre-Euro VI buses running along these routes to be upgraded to the higher emission standard of Euro VI. 105 buses were retrofitted by the end of the programme, and stickers to promote their upgrade are being applied.	2020/21	Completed
VFE2	Eco Driver Training	Vehicle Fleet Efficiency	Driver training and ECO driving aids	PCC, Further work funded through Defra Air Quality Grant	2013	2018/19	Delivery of Eco Driver training to businesses located within or close to AQMA	<0.1µgm3 Whilst this training would only make a very small impact on local air pollution levels, it is a useful measure in raising awareness of and promoting eco driving techniques	Eco Driver Training was delivered as part of the STTY project, with the training being offered to local businesses. Through funding received from Defra's Clean Air Fund, 104 drivers from 6 companies received eco driving training from the Blue Lamp Trust. Businesses within or close to an AQMA area were selected. Evaluation from these sessions showed an average fuel consumption decrease of 15%.	Completed	Further provision of this scheme will be dependent upon further funding becoming available

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W1	Rights of Way / Way finding and signage rationalisation Routes4U Piloted programme (City-centre) to detail accessible routes for the elderly, visually and physically impaired. Reactive response to rights of way requests. Sustainable way finding signage and repair of damage	Promoting Travel Alternatives.	Promotion of walking.	PCC	2012	Ongoing	Delivery of access improvements for pedestrians	N/A	Rights of Way Improvement Plan review completed by 2019. PCC currently working on a contract for Routes4U, to bring about access improvements for pedestrians. This contract has been signed until the end of 2022	Ongoing	
W2	Promote walking Road Safety & Active Travel initiatives set and prioritised around improving road safety for pedestrians and behaviour change. Educational programmes in schools such as, pedestrian training, Junior Road Safety Officers and Pompey Monster Walk to School Challenge, along with	Promoting Travel Alternatives.	Promotion of walking.	PCC	2010	2030	Development of new walking and cycling strategy, uptake of initiatives such as Pompey Monsters Walk to School Challenge	N/A Whilst not providing a direct pollution reduction target, promoting active travel initiatives will support the uptake of sustainable travel modes and contribute to positive travel behaviour change	Walking and cycling map is a popular resource. Planning is underway for an interactive map on the council website. Works in conjunction with stakeholders such as Portsmouth Cycle Forum continues. Education programmes in schools such as Bikeability and Pompey Monsters continue to be delivered. Junior Road Safety Officers are recruited annually and Portsmouth Smart Steps awards scheme has been developed in line with this.	Ongoing	Further funding will be required to take forward into the future

	supporting measures such as Park and Stride. Partnership work with Routes4U and local action groups to support local walking initiatives									

Key

_____	**Funding available / In an Air Quality Management Area**
_____	**No funding currently available, but likely**
_____	**No funding currently available**
_____	**Completed**

5. PM$_{2.5}$ – Local Authority Approach to Reducing Emissions and/or Concentrations

Particulate Matter (PM) is everything in the air that is not gas. This includes natural sources like pollen, sea spray and desert dust. It also includes human made sources like smoke and dust from exhausts, brakes and tyres. PM can travel large distances with up to 33% of PM$_{2.5}$ originating from non-UK sources and around 15% from natural sources. PM is classified according to size. PM$_{2.5}$ is less than 2.5um (micrometers) across, and is the main type of PM which is regulated.

As detailed in 2016 Local Air Quality Management Policy Guidance (LAQM.PG) Local Authorities are expected to work towards reducing emissions and / or concentrations of PM$_{2.5}$. There is clear evidence that PM$_{2.5}$ has a significant impact on human health, including premature mortality, allergic reactions, and cardiovascular diseases. PM can get into the lungs and blood and be transported around the body, lodging in the heart, brain and other organs.

PM emissions have reduced significantly in recent decades, but have recently stabilised. This is partly due to an increase in wood burning in homes.

The UK meets the 2020 concentration limit of 20ug/m3. The Government have made legally binding commitments to further reduce the amount of PM$_{2.5}$ that the county emits into our air by 2020 and 2030.

5.1. Sources of PM

Particulate emissions in the UK[16] come from:

- 38% from burning wood and coal in domestic open fires and solid fuel stoves
- 12% from road transport
- 13% from solvent use and industrial processes
- 16% from industrial combustion (non-domestic burning)

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[16] Air quality: explaining air pollution – at a glance - GOV.UK (www.gov.uk)

Around 2.5 million homes in the UK use solid fuel fire or stoves. Wood burning releases harmful pollutants straight into the home as well as into the air outside. Domestic burning is the UK's largest source of particulate matter air pollution. Reducing how much is burnt improves AQ. If you use a wood burning stove, you can reduce emissions by:

- using Ecodesign ready and DEFRA exempt stoves

- using the right fuel (use dry wood which contains 20% or less moisture, or look for the "Ready to Burn symbol")

- having the stove installed properly

- regularly maintaining the stove and chimney

- using the stove correctly

Smoke control areas are areas where it's illegal to allow smoke emissions from chimneys. In these areas, the public can only burn authorised fuels in approved appliances (exempted stoves). Individuals can be fined up to £1,000 if they break the rules. The south west corner of Portsmouth is a smoke control area[17], which limits fuel usage to smokeless fuels in the area[18] - except where approved combustion equipment is used. Chimneys for larger industrial sites across the city may need to be approved by the PCC pollution control team.

Given that a significant contribution to particulate pollution remains road traffic related, additionally dealing with the automotive related pollutants of PM_{10} and NO_2 will inherently reduce levels of $PM_{2.5}$.

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[17] Pollution control - Portsmouth City Council
[18] Smoke control areas: the rules - GOV.UK (www.gov.uk)

6. Air Quality Monitoring Data and Comparison with Air Quality Objectives and National Compliance

6.1. Summary of Monitoring Undertaken

This section sets out what monitoring has taken place by PCC.

PCC's NO_2, $PM_{2.5}$ and PM_{10} monitoring programmes are annually assessed to ensure that the local AQ monitoring requirements of the review and assessment processes are met. This includes the additional Ambient Air Quality Directive (AAQD) measurement requirements.

According to AAQD measurements must meet certain siting requirements. These requirements must be met for measurements collected by either method (automatic chemiluminescence analysers or Nitrogen Dioxide Diffusion Tubes (NDDT)). A summary of the NDDT siting requirements outlines that siting requirements for NO_2 measurements at roadside / urban traffic sites must be carried out at locations which meet specific siting requirements. For example:

- Measurements should not be sited within 25m of a major junction

- Measurements should be made within 10m from the kerbside (NB. given the uncertainties in assessing access using aerial photography, roads with no clear access within 15m may be excluded from the PCM modelling)

- The inlet sampling point should be within 1.5-4m above the ground

- Measurements should be representative of air quality for a street segment no less than 100m in length.

Local AQ monitoring program has been subject to the following changes since the publication of the 2017 ASR:

- In accordance with monitoring requirements, there has been significant change to PCC's AQ monitoring program within the period 2018-2019 as the number of the newly added NDDT sites increased by 39.09% (an addition of 43 sites) to reach 153 sites. This substantial increase in NO_2 monitoring using NDDT is to meet both PCC requirement under LAQM regime and stipulated monitoring requirements. Some of the added monitoring locations are within the 2

exceedance road links as identified by PCM model for Portsmouth. This local AQ monitoring is to be used instead of the corresponding PCM modelled concentrations for the purposes of determining compliance or non-compliance with the 40 μg/m^3 limit value. Other added monitoring locations across the city were identified as having similar criteria to those identified in the 2 road-links by the PCM model.

- PCC expanded the NDDT network further in the course of 2020 with an additional 16 locations to reach 162 locations (excluding co-locations), an increase of 10.96% in monitoring.

- The NDDT network is likely to expand further in 2021 / 2022 to allow for an effective assessment of the introduction of the CAZ from November 29th 2021.

- In addition, to the above, in 2021 PCC acquired and located a new continuous monitoring station that is sited within Alfred Road for reviewing and assessing the impact of the CAZ.

PCC currently monitor local AQ and in doing so meet the following 2 requirements. According to LAQM.TG, emphasis has been placed, for the annual mean NAQO, on monitoring and assessing non-occupational above or below ground level outdoor locations, where members of the public might be regularly exposed. These include:

- Building facades of residential properties

- Schools, hospitals, care homes, library facades etc.

6.2. Automatic Monitoring Sites

PCC continued undertaking automatic (continuous) monitoring at the four PCC owned CAQMS during 2020. In addition, local AQ monitoring data, from the DEFRA CAQMS in Anglesea Road, is included in this report in the third year in a row.

Details of all CAQMS sites are shown in Appendix A.

Maps showing the location of individual CAQMSs and their proximity to AQMAs are also provided in Appendix D as follows:

- Map 1 shows the CAQMS locations across the city.

- Map 2, Map 3, Map 4, Map 5 and Map 6 show individual locations of PCC's and DEFRA's owned CAQMSs: London Road, Gatcombe Park, Burrfield Road, Mile End Road and Anglesea Road.

NO_2, $PM_{2.5}$ and PM_{10} continue to be continuously monitored as outlined below in accordance with the QA / QC protocols documented in Appendix C:

- CAQMS C2 (Map3, Appendix D): This station is located in a relatively narrow busy roadside shopping area where large numbers of pedestrians are present (with pavements in places approximately only 2 metres). This station is located within AQMA6. It is originally a fixed kerbside station set up to monitor NO_2, PM_{10} and $PM_{2.5}$ generated by the road traffic along London Road before the pavement was enlarged. Buildings in the immediate vicinity are predominantly commercial. However, residential units are located further north and south of the site typically at first floor level above retail outlet units. This shopping location has some of the characteristics of a street canyon-like siting with slow moving road traffic often causing congestion.

- CAQMS C4 (Map2, Appendix D): An Automatic Urban and Rural Network (AURN) station located in an urban background location at Gatcombe Park Primary School, Curtis Mead. This station was fully refurbished in 2021. The pollutants monitored at are NO_2, PM_{10} and $PM_{2.5}$.

- CAQMS C6 (Map 4, Appendix D): This is a fixed roadside station established since 2007 to monitor NO_2 and PM_{10} generated by the road traffic along Burrfields Road. This station is located at a junction with large numbers of pedestrians and residential properties. Buildings in the immediate vicinity are a mixture of both commercial and residential. This station was mainly set up to monitor road traffic related pollution generated from the adjacent Burrfields Road / Copnor Road junction within the revoked AQMA3. A PM_{10} analyser was installed within this station in 2021 during our refurbishment programme.

- CAQMS C7 (Map 5, Appendix D): This station is located within AQMA11 approximately 6.5 metres from Mile End Road kerbside in a residential area. Buildings in the immediate vicinity are all residential. It is a fixed Roadside

station established since 2007 to monitor road related NO_2 PM_{10} and $PM_{2.5}$ along Mile End Road and the southern end of the M275 into the City.

- CAQMS C8 (Map 6, Appendix D): In accordance with Ambient Air Quality Directive 2008/50/EC, Bureau Veritas identified Anglesea Road (A3) as a road link of main interest in respect of compliance in May the 5th 2016 to enhance the UK coverage of sites in order to better understand the nature of the compliance challenges. As a result, the required site type in the Portsmouth Urban Area was identified as an urban traffic site, which namely requires the site to be located close to a main road. Specifically, the site is required to be within 10m of a road where high level of traffic pollution (NO_2 and PM_{10}) are either modelled, or are already measured. The site must not be located within 25m of a junction and the location must be representative of 100m of road length. Bureau Veritas installed a fixed roadside CAQMS (C8) as outlined above approximately 2.5 metres from Anglesea Road kerbside in a non-residential urban area. The nearest buildings are some distance and are either Portsmouth University buildings or HM Naval administrative buildings. This station was established since the beginning of 2018 to monitor road related NO_2 and PM_{10}.

6.3. Non-Automatic Monitoring Sites

PCC revised its non-automatic (passive) monitoring of NO_2 network, NDDT network, to expand it to reach 151 sites up to 2019 including co-locations sites.

This monitoring network expansion was initiated as result of DEFRA's commentary on PCC's 2017 ASR and was expanded even further by 16 locations in 2020.

Appendix A shows the details of the sites:

- **Yellow highlighted sites**: Ongoing monitoring sites for many years (**27 sites excluding co-locations**).

- **Blue highlighted sites**: The additional monitoring sites in the period 2017-2018 (**77 sites**).

- **Green highlighted sites**: The additional monitoring sites since the beginning of year 2019 as results of DEFRA's commentary on PCC 2017 ASR report (**42 sites**).

- **Red highlighted sites**: Additional monitoring sites during the ear 2020 (**16 sites**). *Not included within the maps - to be updated in 2022*

Maps showing the NDDT locations of the monitoring sites and their proximity to AQMAs are provided in Appendix D.

Due to the large number of monitoring locations and their respective spread across the city maps showing PCC's NDDT monitoring network has been subdivided into various maps covering various zones in the city. These are numbered from individually to allow clear identification of the site locations:

- Map 7: Portsmouth map showing the 10 Zones for NDDT monitoring site locations.

- Maps 8 to Map 18: individual "zoomed in" area maps.

Whilst not reported within this ASR it is worth noting that the above network of monitoring sites has been further expanded in 2021 primarily to assess the impact of the CAZ. The total number of NNDT tubes across Portsmouth now exceeds 500. The results of these monitoring locations will be published within the 2022 ASR.

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.

6.4. Individual Pollutants

The AQ monitoring results presented in these sections were subjected to various corrections depending on the monitored pollutant, monitoring methodology, and monitored duration in line with the COVID-19 2021 Supplementary Guidance. AQ monitoring results presented in this section were, where relevant, adjusted for bias (only NDDT), annualised and distance correction. Further details on adjustments are provided in Appendix C.

The CAQMS's NO_2 data for 2016 / 2020 period is presented on last 5 rows of Table A.3, Appendix A.

6.4.1. Nitrogen Dioxide (NO_2)

The NO_2 continuous monitoring program is supplemented by a non-automatic passive monitoring survey using an extensive NDDT network. These sites are located mainly

near busy junctions at kerbside and roadside locations at relevant exposure locations as defined in Box 1.1 of the LAQM.TG guidance. Additional monitoring locations were needed to cover the ministerial direction for the road links to validate compliance in respect of the AAQD 2008/50/EC[19].

This monitoring program is no longer focusing on declared / revoked AQMAs but expanded as outlined above to include locations within the 2 exceedance road links as identified by PCM model for Portsmouth and monitoring sites in road links of similar criteria across Portsmouth.

The NDDT survey locations and monitoring site characteristics are summarised in Table A2, Appendix A and illustrated in Maps 7-18, Appendix D.

NDDT survey has been conducted in accordance with the QA / QC outlined in Appendix C.

The NDDT network covered 167 locations in 2020. 5 of these locations are dedicated to co-location studies.

The 2016, 2017, 2018, 2019 and 2020 NDDT survey data was subjected up to 3 stage adjustments to be directly compared to the NO_2 annual mean NAQO.

6.4.1.1. Data annualisation:

According to Box 7.10 of LAQM.TG, data generated from NDDT survey was firstly annualised where monitoring had been carried out for a period greater or equal to 3 months and fewer than 9 months. As a result, this assessment covers 112 out of 162 NDDT monitoring locations (69.14% of total NDDT monitoring locations, excluding co-locations).

6.4.1.2. Bias correction

All NDDT data has been subjected to bias correction using locally generated bias correction factor from local co-location study involving the exposure of a triplicate NDDTs at each of the 5 CAQMSs.

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[19] EUR-Lex - 32008L0050 - EN - EUR-Lex (europa.eu)

Bias correction factors were generated following the approach prescribed within LAQM.TG, using DEFRAs calculating precision and accuracy spreadsheet.

For 2020 the NDDT co-location study generated the following bias correction factors:

- Tubes exposed at Burrfields Road, and Mile End Road stations (both roadside stations) generated 0.84 and 0.89 respectively as the bias correction factors

- Tubes exposed at DEFRA's station (roadside station) generated 0.75 as the bias correction factor

The above bias correction factors were averaged using the methodology prescribed in the LAQM.TG. The 2020 NDDT survey results have consequently been bias adjusted using 0.822 as the average of the above-mentioned correction factors.

6.4.1.3. Distance correction to the nearest relevant exposure

Where a NNDT is located at some distance from the receptor a distance correction is deployed to predict the level of the pollutant at the façade of the sensitive premises. This has been carried out using the calculator made available via 'Air Quality Consultants'. This tool is provided to LA to predict the annual mean NO_2 concentration for a receptor location that is close to a monitoring site, but nearer or further to the kerb than the monitor.

2 NDDT locations were however subjected to a further adjustment as the monitoring points at these locations are distant from the façade of the nearest relevant exposure.

The two locations are:

- 106 Victoria Road North

- Anchorage Road

6.5. NDDT data sets (2016-2020)

Appendix A compares the ratified and adjusted monitored NO_2 annual mean concentrations for the past 5 years with the NAQO of $40\mu g/m^3$ a summary of which is presented below.

6.5.1. 2016 NDDT

The 2016 NDDT survey data concluded that NO_2 annual mean levels were in excess of the annual mean NAQO at the following 6 locations:

- Lord Montgomery Way, AQMA7

- Northern Road

- Albert Road

- London Road CAQMS (C2), AQMA6

- 117 Kingston Road, AQMA6

- The Tap Public House London Road, AQMA6

6.5.2. 2017 NDDT

The 2017 NDDT survey data concluded that NO_2 annual mean levels were in excess of the annual mean NAQO at the following 3 locations:

- The Tap Public House on London Road, AQMA6

- London Road CAQMS (C2), AQMA6

- 117 Kingston Road, AQMA6

A closer examination of the NDDT survey data for the period 2013 to 2017 revealed that:

- a downward trend emerged at 34.37% monitored locations in the last 5 years since 2013 compared to 40.6% monitored locations for the 5 years commencing year 2012 to 2017 NDDT annual mean levels decreased at 64.28% of the

monitored locations compared to 2016. However, the 2016 NO$_2$ annual mean levels decreased at 10.71% of the monitored locations compared to 2015

- 7.14% of the monitored locations were in excess of the NAQO in 2017 compared to 17.86% in 2016

In 2017, despite the seemingly contradicting statements above PCC concluded that AQ was moving towards compliance with the NAQO.

6.5.3. 2018 NDDT

The 2019 ASR results compared the ratified and adjusted monitored NO$_2$ annual mean concentrations for the past 5 years with the NAQO of 40µg/m^3.

The 2018 NDDT survey data concluded that NO$_2$ annual mean levels were in excess of the annual mean NAQO at 13 monitoring locations mostly in / very close to declared / revoked AQMAs while others were located within the 2 exceedance road links as identified by PCM model for Portsmouth. These were as follows:

- The long-term monitoring locations registered 2 exceedances:

  - Lord Montgomery Way 42.92µg/m^3 AQMA7

    - The NO$_2$ annual average remained above the NAQO in the previous 5 years with the exception of 2017.

    - The NO$_2$ annual average exhibited a downward trend in the previous 5 years demonstrating an AQ improvement in the long-term similar to the previously reported 5 year trend.

  - The Tap Public House, London Road 46.02µg/m^3 AQMA6

    - The NO$_2$ annual average remained above the NAQO for the previous 5 years.

    - The NO$_2$ annual average exhibited an upward trend in the previous 5 years demonstrating a continued AQ deterioration

in the long-term, similar to the previously reported 5 year trend.

- The newly established monitoring locations since the beginning of 2018 registered 11 exceedances:

  - 2-3 Selbourne Terrace 40.33µg/m^3

  - 47 Queen Street 40.37µg/m^3 AQMA12

  - 98/100 Albert Road 40.41µg/m^3 west of revoked AQMA2

  - 4 Market Way 40.41µg/m^3 west of AQMA11

  - Opposite 6 Market Way 41.97µg/m^3

  - 145 Albert Road 42.82µg/m^3 north of the revoked AQMA2

  - 137 London Road 44.18µg/m^3 north AQMA6

  - Mile End Road, Column 5 44.51µg/m^3 AQMA11

  - Alfred Road 47.51µg/m^3 southwest of AQMA11

  - Alfred Road 50.38µg/m^3 southwest of AQMA11

  - Alfred Road 50.42µg/m^3 southwest of AQMA11

A closer examination at the NDDT survey data for the period 2014 to 2018 at the 28 long-term monitoring locations revealed that:

- In the long-term a downward trend emerged at 60.716% (17 locations) monitored locations in the previous 5 years since 2014 compared to 34.37% monitored locations for the 5 years commencing year 2013. Therefore, AQ was considered to be improving in this year.

- In the short term NDDT monitoring revealed that:

o The 2018 NDDT annual mean levels decreased at 53.57% of the monitored locations compared to 2017. This level of AQ improvement was lower than that registered in 2017 where the NDDT annual mean levels decreased at 64.28% of the monitored locations compared to 2016. This represented an AQ improvement in 2018 at a number of monitored locations less than that of 2017 which was considered to be an AQ deterioration.

o The 2018 NDDT annual mean levels exceeded the NO_2 NAQO at 7.14% of the monitored locations (2 locations). This percentage of difference was similar to the one registered in 2017 but with the following differences:

   1. Lord Montgomery Way AQMA7:

      ▪ The NO_2 annual average has remained above the NAQO in the previous 5 years with the exception of 2017.

      ▪ The NO_2 annual average at this roadside monitoring location increased by 4.12µg/m^3 (an increase of 10.29%) between 2017 and 2018 which exceeded the NAQO in 2018 (42.9µg/m^3) representing an AQ deterioration in the short-term.

      ▪ The 2017-2018 NO_2 annual average change was described as being substantially adverse.

      ▪ The NO_2 annual average represented a downward trend in the previous 5 years demonstrating an AQ improvement in the long-term similar to the previously reported 5 year trend.

   2. The Tap Public House, London Road AQMA6:

      ▪ The NO_2 annual average remained above the NAQO for the last 5 years.

- The NO_2 annual average at this kerbside monitoring location increased by 2.93µg/m^3 (an increase of 7.33%) between 2017 and 2018 and remained above the NAQO in 2018 (46µg/m^3) representing an AQ deterioration in the short-term.

- The 2017-2018 NO_2 annual average change was described as being substantially adverse.

- The NO_2 annual average represented an upward trend in the previous 5 years demonstrating a continued AQ deterioration in the long-term similar to the previously reported 5 year trend.

3. 117 Kingston Road AQMA6:

- The NO_2 annual average fell below the NAQO for the first time in the last 5 years.

- The NO_2 annual average at this roadside monitoring location decreased by 6.07µg/m^3 (a decrease of 15.17%) between 2017 and 2018 and remained below the NAQO in 2018 (38.2µg/m^3) representing an AQ improvement in the short-term.

- The 2017-2018 NO_2 annual average change was described as being substantially beneficial.

- The NO_2 annual average represented a downward trend in the previous 5 years demonstrating AQ improvement in the long-term contrary to the previously reported five year trend.

Monitoring at all added locations since the beginning of 2018 continued.

6.5.4. 2019 NDDT

The 2020 ASR concluded that for the same monitored locations to those of 2018 the 2019 NO_2 annual mean levels were in excess of the annual mean NAQO at 4 locations compared to 13 monitoring locations in 2018 (1 exceedance at AQMA6 The Tap Public House) and 3 locations along the road links as identified by PCM model for Portsmouth.

A closer examination of the NDDT survey data for the period 2015 to 2019 at the 27 long-term monitoring revealed that:

- The 2019 NDDT annual mean levels decreased resulting in a beneficial change at all of the 27 long-term monitored locations (100%). This level of AQ improvement was higher than that registered in 2018 where the NDDT annual mean levels decreased at 53.57% of the monitored locations compared to 2017. AQ improved in 2019 in a number of monitored locations that was greater than that of 2018 and therefore represented an AQ improvement.

- The above beneficial change in AQ can be apportioned as follows:

    - Negligibly beneficial at 5 out of 27 locations (18.52%)

    - Slightly beneficial at 8 out of 27 locations (29.63%)

    - Moderately beneficial at 11 out of 27 locations (40.74%)

    - Substantially beneficial at 3 out of 27 locations (11.11%)

- The 2019 NDDT annual mean levels exceeded the NO_2 NAQO at 1 of 27 locations.

- In the long-term a downward trend emerged at 92.59% (25 out of 27 monitored locations) in the 5 years since 2015 compared to 60.72% of the monitored locations for the 5 year period commencing in year 2014. Therefore, AQ was considered to be improving.

- A closer examination of the dataset of the 77 NDDT locations added during the period 2018 to 2019 revealed that:

- o Exceedance of the annual mean levels NO_2 NAQO occurred at 3 locations along the road links as identified by PCM model for the second consecutive year.

- o Alfred Road, Column 9 south / west of AQMA11 48µg/m^3

- o Alfred Road, Column 12 south / west of AQMA11 52.52µg/m^3

- o Alfred Road, opposite St Agaths's bus stop south / west of AQMA11 46.90 µg/m^3

- o The change in AQ was beneficial at 72 out of 77 locations (93.51%).

- In summary, for 104 monitored locations in 2018 the 2019 change in NO_2 annual mean levels exhibited a beneficial change at 99 locations (95.19%):

  - o Negligibly beneficial at 13 out of 104 locations (12.50%)

  - o Slightly beneficial at 26 out of 104 locations (25.00%)

  - o Moderately beneficial at 41 out of 104 locations (39.42%)

  - o Substantially beneficial at 19 out of 104 locations (18.27%)

- As for the newly established 42 monitoring locations established in the year 2019 8 monitored locations exhibited exceedances of the NO_2 annual mean NAQO in 2019. These were as follows:

  - o 8 Old London Road, 40.81 µg/m^3

  - o Hope Street by Sainsburys, 43.91 µg/m^3

  - o Southampton Road, 41.97 µg/m^3

  - o Southampton Road, 43.04 µg/m^3

  - o Eastern Road, 40.92 µg/m^3

- o   Eastern Road, 45.25 µg/m^3

- o   Commercial Road, 41.50 µg/m^3

- o   Fratton Road, 41.88 µg/m^3

Monitoring at all added locations since the beginning of 2019 continues.

6.5.5. 2020 NDDT

According to 2020 NDDT survey dataset, for the same monitored locations to those of 2019, the 2020 NO_2 annual mean levels were in excess of the annual mean NAQO at 2 locations compared to 12 monitoring locations in 2019 (both locations are along the road links as identified by PCM model for Portsmouth). A closer examination of the NDDT survey data for the period 2016 to 2020 at the 27 long-term monitoring locations revealed that:

- The 2020 NDDT annual mean levels decreased at all the 27 long-term monitored locations (100%). This level of AQ improvement is similar to that registered in 2019.

- The beneficial change in AQ at all 27 long-term monitoring locations can be apportioned as follows:

  - Negligibly beneficial at 6 out of 27 locations (27%)

  - Slightly beneficial at 9 out of 27 locations (33%)

  - Moderately beneficial at 12 out of 27 locations (44%)

  - Substantially beneficial at none out of 27 locations (0%)

- The 2020 NDDT annual mean levels did not exceed the NO_2 annual mean NAQO at any of the long term monitoring locations compared with 1 exceedance in 2019.

- In the long-term a downward trend emerged at all long term (27) monitored locations in the last 5 years since 2016 compared to 92.59% of the monitored locations for the 5-year period commencing in 2016.

- A closer examination of the added 119 NDDT location dataset for the period 2018-2019 revealed that exceedance of the annual mean levels NO_2 NAQO occurred at 2 locations outside of AQMA11 along the road links as identified by PCM model for the second year in a row:

  - Alfred Road, south / west of AQMA11:

    - The NO_2 annual average at this roadside monitoring location decreased by 6.96µg/m^3 (a decrease of 14.50%) between 2019 and 2020 but remained above the NAQO in 2020 (41.04µg/m^3) for the second consecutive year. This represented an AQ improvement in the short-term.

    - The 2018-2019 NO_2 annual average decrease is described as substantially beneficial.

  - Hope Street south / west of AQMA11:

    - The NO_2 annual average at this roadside monitoring location decreased by 10.32µg/m^3 (a decrease of 19.15%) between 2019 and 2020 but remained above the NAQO in 2020 (52.52µg/m^3) for the second consecutive year. This represented an AQ improvement in the short-term.

    - The 2019-2020 NO_2 annual average decrease is described as substantially beneficial.

- The change in LAQ was beneficial at 112 out of 119 of the added monitored locations between 2018 and 2019 (94.12%). The beneficial change in AQ was apportioned as follows:

  - Negligibly beneficial at 17 out of 112 locations (15.18%) and of the total 119 locations (14.29%)

- o Slightly beneficial at 22 out of 112 locations (19.64%) and of the total 119 locations (18.49%)

- o Moderately beneficial at 70 out of 112 locations (62.5%) and of the total 119 locations (58.82%)

- o Substantially beneficial at 3 out of 112 locations (2.68%) and of the total 119 locations (2.52%)

- The remaining 7 monitored locations (5.88%) exhibited an adverse change in AQ. This change was apportioned as follows:

  - o Negligibly adverse at 6 out of the 7 monitored locations (85.71%) and of the total 119 locations (5.04%)

  - o Substantially adverse at 1 out of 7 monitored locations (14.29%) and of the total 77 locations (0.84%)

- A closer examination of the newly added 16 NDDT monitored locations revealed that:

  - o The NO_2 annual mean NAQO was not registered as breached at any of these added monitoring locations

- In summary, for the same 146 monitored locations to those of 2019, the 2020 change in NO_2 annual mean levels exhibited the following characteristics:

  - o 139 locations exhibited beneficial change in LAQ (95.20%)

  - o Negligibly beneficial at 23 out of 139 locations (16.55%) and of the total 146 locations (15.75%)

  - o Slightly beneficial at 31 out of 139 locations (22.30%) and of the total 146 locations (21.23%)

  - o Moderately beneficial at 82 out of 139 locations (58.99%) and of the total 146 locations (56.16%)

- o Substantially beneficial at 3 out of 139 locations (2.16%) and of the total 146 locations (2.05%)

- o 7 locations exhibited adverse change in AQ (4.79%)

- o Negligibly adverse at 6 out of 7 locations (85.71%) and of the total 146 locations (4.11%)

- o Slightly adverse at 1 out of 7 locations (14.29%) and of the total 146 locations (0.68%)

Monitoring at all added locations since the beginning of 2020 continues.

6.6. Continuous Air Quality Monitoring Station Data 2016 - 2020

6.6.1. CAQMS NO_2

Appendix A compares the ratified and adjusted monitored NO_2 annual mean concentrations for the past 5 years with the NAQO ($40\mu g/m^3$).

The NO_2 continuous monitoring programme for the period 2016 to 2020 concluded that:

- The 2016 NO_2 annual mean levels recorded at the 4 CAQMS compared to that of 2015 were at levels below the NAQO at all stations apart from London Road. The maximum recorded concentration at London Road was $41.21\mu g/m^3$. This level breached the NO_2 annual mean NAQO.

- The 2017 NO_2 annual mean level increased cross 50% of CAQMSs compared to that of 2016. Levels met the NO_2 annual mean NAQO at all but the London Road CAQMS. The maximum-recorded concentration was at London Road kerbside CAQMS $44.6\mu g/m^3$. This level breached the NO_2 annual mean NAQO. The largest increase in 2017 NO_2 annual mean was registered at the London Road increasing by $3.39\mu g/m^3$ compared to the level recorded in 2016.

- The 2018 NO_2 annual mean level increased slightly (from 33.54 µg/m^3 to 33.95µg/m^3) at 1 CAQMS (Mile End Road) compared to 2017 but met the NO_2 annual mean NAQO at all but the London Road CAQMSs. The maximum recorded concentration was at London Road CAQMS 40.57µg/m^3. This level constituted a breach of the NO_2 annual mean NAQO.

- The 2019 NO_2 annual mean level decreased cross the 5 CAQMS compared to that of 2018 but met the NO_2 annual mean NAQO at all but London Road CAQMS. These changes are considered as beneficial across the 5 stations with variable degrees (moderately beneficial 40%, slightly beneficial 20%, negligibly beneficial 40%). The maximum-recorded concentration was at London Road CAQMS (40.46µg/m^3) which remained a continued breach of the NO_2 annual mean NAQO. The 5-year trend was downward at 2 CAQMS:

  - London Road CAQMS "upward"

  - Gatcombe Park CAQMS "downward"

  - Burrfields Road CAQMS "downward"

  - Mile End Road CAQMS "upward"

The NO_2 hourly mean did not exced 200µg/m^3 in 2019 at any of the CAQMS. The NO_2 hourly mean NAQO was not breached in 2019.

- The 2020 NO_2 annual mean level decreased cross the 5 CAQMSs compared to that of 2019 and met the NO_2 annual mean NAQO at all CAQMSs. These changes are considered as beneficial cross the five stations with variable degrees (moderately beneficial 80% and negligibly beneficial 20%) representing an overall improvement in AQ. The maximum-recorded concentration was at London Road CAQMS (32.66µg/m^3) meeting the NAQO at this location for the first time in many years. The 5-year trend was downward at all PCC's owned CAQMSs:

  - London Road CAQMS:

- The NO_2 annual average decreased below the NAQO for the first time in the last five years.

- The NO_2 annual average decreased by 7.8µg/m^3 (a decrease of 19.27%) between 2019 and 2020 to drop below the NAQO in 2020 (32.66µg/m^3) and representing an AQ improvement in the short-term.

- The 2019-2020 NO_2 annual average decrease is described as moderately beneficial.

- The NO_2 annual average downward trend in the last 5 years exhibits an AQ improvement in the long-term contrary to the previously reported 5-year trend that showed an upward trend and represents an AQ improvement.

o Burrfields Road CAQMS:

- The NO_2 annual average decreased further below the NAQO.

- The NO_2 annual average decreased by 4.42µg/m^3 (a decrease of 14.19%) between 2019 and 2020 (26.56µg/m^3) representing a continued AQ improvement in the short-term.

- The 2019-2020 NO_2 annual average decrease is described as moderately beneficial.

- The NO_2 annual average downward trend in the last 5 years represents an AQ improvement in the long-term that is consistent with the previously reported 5-year trend.

o Mile End Road CAQMS:

- The NO$_2$ annual average decreased further below the NAQO.

- The NO$_2$ annual average decreased by 5.86µg/m^3 (a decrease of 14.65%) between 2019 and 2020 to 26.55µg/m^3 representing an AQ improvement in the short-term.

- The 2019-2020 NO$_2$ annual average decrease is described as moderately beneficial

- The NO$_2$ annual average downward trend in the last 5 years exhibits an AQ improvement in the long-term.

o DEFRA's Anglesea Road CAQMS:

- The NO$_2$ annual average remained below the NAQO for the third monitored consecutive year.

- The NO$_2$ annual average at this roadside monitoring location decreased by 6.51µg/m^3 (a decrease of 23.41%) between 2019 and 2020 and remained below the NAQO in 2020 (21.29µg/m^3) representing an AQ improvement in the short-term.

- The 2019-2020 NO$_2$ annual average decrease is described as moderately beneficial.

6.6.1.1. CAQMS NO2 summary

- Appendix A compares the ratified continuous monitoring NO$_2$ hourly mean concentrations for the past 5 years with the NAQO of 200µg/m^3 (not to be exceeded more than 18 times per year).

- Data collected at PCC CAQMSs did not register any exceedance of the NO$_2$ hourly mean NAQO.

- In addition, none of CAQMS NO_2 annual mean exceeded 60µg/m^3 which indicates that an exceedance of the 1-hour mean NAQO is unlikely.

6.6.2. CAQMS Particulate Matter (PM$_{10}$) Annual Mean

Appendix A compares the ratified and adjusted monitored PM$_{10}$ annual mean concentrations for the past 5 years with the NAQO (40µg/m^3).

There has been no exceedance of the PM$_{10}$ annual mean NAQO since 2016 at any of Portsmouth based CAQMSs. The highest registered annual mean since then was recorded in 2016 at London Road kerbside CAQMS (20.04µg/m^3).

The highest PM$_{10}$ annual mean recorded in 2020 was 18.25µg/m^3 at DEFRA's CAQMS located at Anglesea Road.

The 2020 PM$_{10}$ monitoring concluded:

- London Road CAQMS:

  - The PM$_{10}$ annual mean remained considerably below the NAQO in the last 5 years.

  - The PM$_{10}$ annual mean decreased by 2.93µg/m^3 (a decrease of 16.47%) between 2019 and 2020 remaining below the NAQO in 2020 (14.86µg/m^3) representing an AQ improvement in the short-term.

  - The 2019-2020 PM$_{10}$ annual mean change is described as being slightly beneficial.

  - The PM$_{10}$ annual mean exhibits a downward trend in the last 5 years demonstrating an AQ improvement in the long-term in line with the previously reported 5-year trend.

- Gatcombe Park CAQMS:

  - The PM$_{10}$ annual mean has remained considerably below the NAQO in the last 5 years.

  - The PM$_{10}$ annual mean at this urban-background monitoring location increased by 1.54µg/m^3 (an increase of 10.21%) between 2019 and 2020

and remains below the NAQO in 2020 (16.62µg/m^3). This small increase however represents an AQ deterioration in the short-term for the third consecutive year.

- o The 2018-2019 PM$_{10}$ annual mean change is described as being negligibly adverse.

- o The PM$_{10}$ annual mean exhibits a downward trend in the last 5 years representing an AQ improvement in the long-term in line with the previously reported 5-year trend.

- Mile End Road CAQMS:

    - o The PM$_{10}$ annual mean has remained considerably below the NAQO in the last 5 years.

    - o The PM$_{10}$ annual mean at this roadside monitoring location decreased by 0.16µg/m^3 (a decrease of 1.09%) between 2019 and 2020 and remained below the NAQO in 2020 (14.9µg/m^3) representing an AQ improvement in the short-term.

    - o The 2018-2019 PM$_{10}$ annual mean change is described as being negligibly adverse.

    - o The PM$_{10}$ annual mean exhibits an upward trend in the last 5 years, demonstrating an AQ deterioration in the long-term contrary to the previously reported 5-year trend.

- DEFRA's Anglesea Road CAQMS:

    - o The PM$_{10}$ annual mean has remained considerably below the NAQO in the last 5 years.

    - o The PM$_{10}$ annual mean at this roadside monitoring location decreased by 1.24µg/m^3 (a decrease of 3.10%) between 2019 and 2020 and remained below the NAQO in 2019 (18.25µg/m^3) representing an AQ improvement in the short-term.

> o The 2019-2020 PM_{10} annual mean change is described as being negligibly beneficial.

> o The PM_{10} annual average represents a downward trend in the last 3 years, demonstrating an AQ improvement in the long-term.

6.6.2.1. CAQMS Particulate Matter (PM_{10}) Annual Mean Summary

The 2020 PM_{10} annual mean remains below the NAQO at all CAQMSs with the highest annual mean level (19.49 µg/m^3) being recorded at DEFRA's Anglesea Road CAQMS.

PM_{10} levels are in decline across all PCC and DEFRA's owned CAQMSs in the long-term with the exception of Mile End Road CAQMS. PM_{10} levels decreased cross all Portsmouth based CAQMS in the short term with the exception of Portsmouth AURN when the annual mean increased by 1.54 µg/m^3.

6.6.3. CAQMS Particulate matter (PM_{10}) Daily Mean

Appendix A compares the ratified continuous monitored PM_{10} 24 hour mean concentrations for the past 5 years with the daily NAQO (50µg/m^3) not to be exceeded more than 35 times per year. A closer examination of the data reveals:

- London Road CAQMS 24 hour mean PM_{10}

  > o In 2020 the number of 24 hour mean levels in excess 50µg/m^3 remained well below 35 occurrences permitted per annum representing no exceedance of the NAQO.

  > o The number of the 24 hour mean levels in excess 50µg/m^3 remained considerably below the NAQO in the last 5 years.

  > o The number of 24 hour mean levels in excess 50µg/m^3 increased by 1 occurrence between 2019 and 2020 representing an AQ deterioration in the short term.

  > o The number of the 24 hour mean levels in excess 50µg/m^3 exhibits a downward trend in the last 5 years representing an AQ improvement in the long-term.

- Gatcombe Park CAQMS 24 hour mean PM_{10}

- o In 2020 the number of 24 hour mean of PM_{10} levels in excess $50\mu g/m^3$ remained well below 35 occurrences per annum representing no exceedance of the NAQO.

- o The number of the 24 hour mean levels in excess $50\mu g/m^3$ remained considerably below the NAQO in the last 5 years.

- o The number of 24 hour mean levels in excess $50\mu g/m^3$ decreased by one occurrence between 2019 and 2020 representing an AQ improvement in the short term.

- o The number of the 24 hour mean levels in excess $50\mu g/m^3$ represents a downward trend in the last 5 years representing an AQ improvement in the long-term.

- Mile End Road CAQMS 24 hour mean PM_{10}

  - o In 2020 the number of 24 hour mean levels in excess $50\mu g/m^3$ remained well below 35 occurrences per annum representing no exceedance of the NAQO.

  - o The number of the 24-Hour mean of PM_{10} levels in excess $50\mu g/m^3$ remained considerably below the NAQO in the last 5 years.

  - o The number of 24-Hour mean of PM_{10} levels in excess $50\mu g/m^3$ increased by 1 occurrence between 2019 and 2020 representing an AQ deterioration in the short term.

  - o The number of the 24-Hour mean of PM_{10} levels in excess $50\mu g/m^3$ exhibits an upward trend in the last 5 years representing an AQ deterioration in the long-term.

- DEFRA Anglesea Road CAQMS PM_{10}:

  - o In 2020 the number of 24 hour mean levels in excess $50\mu g/m^3$ remain well below 35 occurrences per annum representing no exceedance of the NAQO.

  - o The number of the 24 hour mean levels in excess $50\mu g/m^3$ remains considerably below the NAQO in the last 3 years.

- o The number of 24 hour mean levels in excess 50µg/m^3 remained the same at two occurrences in 2020 exhibiting AQ stability in the short term.

- o The number of the 24 hour mean levels in excess 50µg/m^3 represented an upward trend in the last 3 years representing an AQ deterioration in the long-term.

In 2020 the highest number of daily means in excess of 50 µg/m^3 was recorded twice at DEFRA's CAQMSs. This does not amount to an exceedance of the daily NAQO.

6.6.4. CAQMS Particulate Matter (PM2.5) Annual Mean

PCC monitors PM$_{2.5}$ at the AURN CAQMS Gatcombe Park and commenced monitoring PM$_{2.5}$ from January 2017 at CAQMS London Road and CAQMS Mile End Road.

Appendix A presents the ratified and adjusted monitored PM$_{2.5}$ annual mean concentrations for the past 5 years.

In 2020 PM$_{2.5}$ annual mean remains below the NAQO at all three CAQMSs with the highest annual mean level (9.45 µg/m^3) being recorded at Gatcombe Park.

With the excetion of the CAQMS London Road the 2020 PM$_{2.5}$ annual mean decreased at 2 out of the 3 CAQMS representing an AQ improvement.

Historically, the highest PM$_{2.5}$ annual mean recorded in Portsmouth was 14.26µg/m^3 in 2014 at the AURN CAQMS. This level dropped in 2018 to 12.32µg/m^3, reducing in 2019 to 8.9µg/m^3 and increasing in 2020 to 9.45µg/m^3.

- Gatcombe Park CAQMS PM$_{2.5}$:

  - o The PM$_{2.5}$ annual mean has remained considerably below the NAQO in the last 5 years.

  - o In 2020 the PM$_{2.5}$ annual mean increased by 0.55µg/m^3 (an increase of 6.14%) between 2019 and 2020 remaining below the NAQO (9.45µg/m^3) representing an AQ deterioration in the short-term.

  - o The 2019-2020 PM$_{2.5}$ annual mean change is described as being negligibly adverse.

- o The PM$_{2.5}$ annual mean represents a downward trend in the last 5 years and an AQ improvement in the long-term for the third consecutive 5-year trend.

- London Road CAQMS PM$_{2.5}$:

  - o The PM$_{2.5}$ annual mean has remained considerably below the NAQO for the third consecutive year.

  - o The PM$_{2.5}$ annual average decreased by 1.84µg/m^3 (a decrease of 16.44%) between 2019 and 2020 and remained below the NAQO in 2020 (9.34µg/m^3) representing an AQ improvement in the short-term.

  - o The 2019-2020 PM$_{2.5}$ annual mean change is described as being negligibly beneficial.

  - o The PM$_{2.5}$ annual average exhibits a downward trend in the last 4 years, demonstrating an AQ improvement in the long-term.

- Mile End Road CAQMS PM$_{2.5}$:

  - o The PM$_{2.5}$ annual mean has remained considerably below the NAQO for the third consecutive year.

  - o The PM$_{2.5}$ annual mean decreased this year by 0.39µg/m^3 (a decrease of 3.98%) between 2019 and 2020 and remains below the NAQO in 2020 (9.4µg/m^3) representing an AQ improvement in the short-term.

  - o The 2019-2020 PM$_{2.5}$ annual mean change is described as being negligibly beneficial.

  - o The PM$_{2.5}$ annual mean represents a downward trend in the last 4 years demonstrating an AQ improvement in the long-term.

6.6.5. Sulphur Dioxide (SO$_2$)

PCC does not monitor for sulphur dioxide as it is not an AQ concern in Portsmouth.

6.7. Monitoring Conclusions

6.7.1. NDDT Monitoring

For the same monitored locations NO_2 annual mean levels were in excess of the annual mean NAQO at 2 locations in 2020 compared with 11 monitoring locations in 2019.

Of 146 monitored locations in 2019 and 2020 change in NO_2 annual mean levels exhibited the following characteristics:

- o 139 locations exhibited beneficial change in LAQ (95.20%):

- o Negligibly beneficial at 23 out of 139 locations (16.55%) and of the total 146 locations (15.75%)

- o Slightly beneficial at 31 out of 139 locations (22.30%) and of the total 146 locations (21.23%)

- o Moderately beneficial at 82 out of 139 locations (58.99%) and of the total 146 locations (56.16%)

- o Substantially beneficial at 3 out of 139 locations (2.16%) and of the total 146 locations (2.05%)

- o 7 locations exhibited adverse change in LAQ (4.79%)

- o Negligibly adverse at 6 out of 7 locations (85.71%) and of the total 146 locations (4.11%)

- o Slightly adverse at 1 out of 7 locations (14.29%) and of the total 146 locations (0.68%)

As for the newly established 16 monitoring locations in year 2020, no breaches of the NO_2 NAQO were registered.

6.7.2. Nitrogen Dioxide Continuous Monitoring

The 2020 NO_2 annual mean level decreased cross the 5 CAQMSs compared to that of 2019 and met the NO_2 annual mean NAQO at all CAQMSs.

These changes are considered as beneficial cross the 5 stations with variable degrees (moderately beneficial 80%, and negligibly beneficial 20%) respecting an overall improvement in AQ.

The maximum-recorded concentration was at London Road kerbside CAQMS. The NO_2 annual mean meets the NAQO for the first time in many years. The 5-year trend was downward at all PCC's owned CAQMSs.

None of CAQMS NO_2 annual mean exceeded 60µg/m^3 which indicates that an exceedance of the 1-hour mean NAQO is unlikely.

6.7.3. Particulate Matter (PM_{10})

There has been no exceedance of the PM_{10} annual mean NAQO since 2016 at any of Portsmouth based CAQMSs. The highest registered annual mean since then was recorded in 2016 at London Road kerbside CAQMS (20.04µg/m^3).

The 2020 PM_{10} annual mean remains below the NAQO at all CAQMSs with the highest annual mean level (18.25 µg/m^3) being recorded at DEFRA's Anglesea Road CAQMS (C8).

The 2020 PM_{10} monitoring concluded that PM_{10} annual average decreased at London Road and Anglesea Road but increased at Mile End Road CAQMS where the adverse change was negligible. A downward trend for the last 5 years was exhibited at London Road and Anglesea Road representing an AQ improvement. A slight upward trend was exhibited at Mile End Road CAQMS.

6.7.4. Particulate Matter ($PM_{2.5}$)

The 2020 $PM_{2.5}$ annual mean remains below the NAQO at all 3 CAQMSs, with the highest annual mean level (9.4 µg/m^3) being recorded at Mile End Road CAQMS (C7).

The 2020 $PM_{2.5}$ annual mean decreased at both London Road and Mile End Road CAQMSs representing an AQ improvement.

It is not always possible to categorically state why the NO_2, $PM_{2.5}$ and PM_{10} levels decreased in several areas across the city in 2020 given that a multitude of factors influence pollutant generation and their subsequent dispersion. Such influences are wide ranging and complex but are highly likely to include the impact of COVID-19 as referenced earlier within this ASR.

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 major road (m) [2]	Inlet Height (m)
C2	London Road	Kerbside	464925	102129	NO_2 $PM_{2.5}$ PM_{10}	Y	Chemiluminescent, HORIBA's APDA- 372	1.8m of the kerbside further to the south of the station	1m	1.8m
C4	Gatcombe Park Primary School (AURN)	Urban Background	465403	103952	NO_2 PM_{10} $PM_{2.5}$ O_3	N	Chemiluminescent, FDMS	0m Within the school peremiter	119 m	2.5m
C6	Burrfields Road	Roadside	466004	102348	NO_2	N	Chemiluminescent	0.5m	4.5m of Burrfields Road & 5.5m of Copnor Road	1.8m
C7	Mile End Road	Roadside	464397	101270	NO_2 $PM_{2.5}$ PM_{10}	Y	Chemiluminescent, HORIBA's APDA- 372	2m	6.5m	1.8m
C8	Anglesea Road (DEFRA)	Roadside	463835	100259	NO_2 PM_{10}	Y	Chemiluminescent, FDMS	5m	2.5m	1.8m

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.

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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) [3]
1	Lord Montgomery Way (LMW-FST)	Roadside	463872	99874	NO2	Close	0	3.7m	No	2m
2	12 Chadderton Gardens (CG-12)	Urban background	463705	99371	NO2	N	0	N/A	No	2m
3	High Street (HS-121A)	Roadside	463408	99460	NO2	N	0	3.1m	No	2m
4	Queen Street (QS-Col 30)	Roadside	463190	100390	NO2	Y	N/A	3m	No	2m
5	119 Whale Island Way (WIW-119)	Roadside	464230	102194	NO2	Close	0	16.23m	No	2m
6	88 Stanley Road (SR-88)	Roadside	464331	102197	NO2	Close	0	9.88m	No	2m
7	138 Lower Derby Road (LDR-138)	Urban background	464291	102279	NO2	N	0	37.57m	No	2m
8	492 Hawthorn Crescent (HC-492)	Urban background	466690	104355	NO2	N	0	34m	No	2m
9	6 Northern Road (NR-6)	Roadside	465621	105528	NO2	N	0	5.43m	No	2m
10	20 Stroudley Avenue (SA-20)	Urban background	467107	104850	NO2	N	0	N/A	No	2m
11	Anchorage Road (AR-Col6)	Roadside	466869	103457	NO2	N	11.76M	6.56m	No	2m
14	4 Merlyn Drive (MD-4)	Roadside	466109	103736	NO2	N		11.26m	No	2m
15	29 Milton Road (MR-29)	Roadside	466120	101324	NO2	N	0	7.04m	No	2m
16	Parade Court, London Road (LR-PC)	Roadside	465474	104205	NO2	N	5.32m	5.15m	No	2m
18	4 Milton Road (MR-4)	Roadside	466097	101332	NO2	N	0	6.13m	No	2m
19	7 Velder Avenue (VA-7)	Roadside	466392	100226	NO2	Y	0	4.44m	No	2m
20	136 Eastney Rd (ER-136)	Roadside	466712	99415	NO2	N	0	6.23m	No	2m
21	118 Albert Road (AR-116)	Roadside	465209	98964	NO2	N	0	2.36m	No	2m
22	2 Victoria Road North (VRN-2)	Roadside	464778	99306	NO2	N	0	5.53m	No	2m
23	106 Victoria Road North (VRN-106)	Roadside	464974	99766	NO2	N	2.37m	2.42m	No	2m

24	221 Fratton Road (FR-221)	Roadside	465111	100737	NO2	Y	0	4.21m	No	2m
25	117 Kingston Rd (KR-117)	Roadside	465036	101547	NO2	Y	0	2.46m	No	2m
26	The Tap London Road (LR-Tap)	Kerbside	464900	101976	NO2	Y	0	1.91m	No	2m
30	Market Tavern (Mile End Rd) (MER-MT)	Roadside	464478	101457	NO2	Y	0	12.73m	No	2.12m
34	Sovereign Gate, Commercial Rd (CR-UF)	Roadside	464425	100893	NO2	Y	0	4.40m	No	2m
35	Hampshire Terrace (HT-AM)	Roadside	463837	99759	NO2	Close	0	4.9m to 10.74m	No	2m
36	Elm Grove (EG-103)	Roadside	464501	99329	NO2	N	0	2.26m	No	2m
42	Kingston Crescent-Admiral Drake PH-(KC-ADPH)	Roadside	464552	101940	NO2	N	0		No	2m
43	Kingston Crescent-Vanguard House (KC-VH)	Urban background	464774	101922	NO2	N	0		No	2m
44	Opp. 4 Market Way (OppMW-4)	Roadside	464336	100833	NO2	Close	0		No	2m
45	5 Market Way (MW-4)	Roadside	464344	100808	NO2	Close	0		No	2m
46	Mile End Road-Col5(MW-Col5)	Roadside	464339	101273	NO2	Y	0	3.35m	No	2.3m
47	1 Stamshaw Road West (SR-W1)	Roadside	464586	102125	NO2	N	0		No	2m
48	28 Stamshaw Road East (SR-E28)	Urban background	464597	102119	NO2	N	0		No	2m
49	Half Moon Street-The Ship and Castle(PH) (HMS-S&CPH)	Urban background	463042	100315	NO2	Y	0		No	2m
50	47 Queen Street (QS-47)	Roadside	463388	100398	NO2	Y	0		No	2m
51	57 Queen Street (QS-57)	Urban background	463333	100395	NO2	Y	0		No	2m
52	Column 29 Queen Street (QS-Col29)	Roadside	463235	100412	NO2	Y	11.76M		No	2m
55	Gunwharf Road, Column 12 (GWR-Col12)	Roadside	463224	99590	NO2	N		1.5 m	No	2m
56	Gunwharf Road, Column 4 (GWR-Col4)	Roadside	463261	99782	NO2	N		1.5 m	No	2m
58	St Georges Street-9 (St GS-9)	Roadside	463487	99659	NO2	N	N/0A	6	No	2m
59	Milton Road, Column 41 (MR-Col41)	Roadside	466263	100334	NO2	N		1.5 m	No	2m
60	Column 42 Milton Road (MR-Col42)	Roadside	466201	100478	NO2	N	5.32m		No	2m
61	1/10 Southwick House Milton Road on the fence (MR- SH)	Roadside	466136	100610	NO2	N	0		No	2m
62	12 Hambrook House Milton Road (MR-HH)	Roadside	466165	100573	NO2	N			No	2m
63	209 Milton Road (SR-209)	Roadside	466354	100172	NO2	Y	0		No	2m

64	Summerson Lodge Milton Road (MR-SL)	Roadside	466326	100165	NO2	Y	0		No	2m
65	Moorings Way-12 (MW-12)	Roadside	466681	100373	NO2	Close	0	1.5 m	No	2m
66	1 Velder Avenue (VA-1)	Roadside	466267	100216	NO2	Y	0		No	2m
67	23 Velder Avenue (VA-23)	Roadside	466457	100253	NO2	Y	2.37m		No	2m
68	36 Velder Avenue (VA-36)	Roadside	466501	100277	NO2	Y	0		No	2m
69	Column 4 Velder Avenue (VA-Col4)	Roadside	466396	100248	NO2	Y			No	2m
70	Milton Primary School (ER-DS)	Roadside	466667	99546	NO2	N	0		No	2m
71	19 Havant Road (HR-19)	Kerbside	465711	105624	NO2	N	0		No	2m
72	60 Northern Road (NR-60)	Roadside	465657	105577	NO2	N	0		No	2m
73	52 Northern Road (NR-52)	Roadside	465653	105544	NO2	N	0		No	2m
74	Column 38 Northern Road (NR-Col38)	Roadside	465610	105383	NO2	N			No	2m
75	1-6 Chipstead House Southampton Road (SR-CH)	Roadside	465618	105619	NO2	N	0		No	2m
76	142 Copnor Road (CR-142)	Roadside	466002	102053	NO2	N	0		No	2m
77	Copnor School Playground Copnor Road (CR-School)	Roadside	466008	102097	NO2	N			No	2m
78	3 Goldsmith Avenue (GA-3)	Roadside	466523	99599	NO2	N			No	2m
79	Column 1 Goldsmith Avenue (GA-Col1)	Kerbside	466555	99598	NO2	N	1.8 m		No	2m
80	147 Albert Road (AR-147)	Urban background	465204	98978	NO2	N			No	2m
81	Column 22 Albert Road (AR-Col22)	Roadside	465278	98968	NO2	N	0.5 M		No	2m
82	106-108 Albert Road (On Waverley Road) (AR-WR)	Roadside	465178	98945	NO2	N	2m		No	2m
83	141 Albert Road (AR-141)	Roadside	465166	98982	NO2	N			No	2m
84	145 Albert Road (On Lawrence Road) (AR-145)	Roadside	465198	98996	NO2	N			No	2m
85	98-100 Albert Road (AR-98/100)	Urban background	465150	98968	NO2	N	5		No	2m
86	91 Fawcett Road (FR-91)	Roadside	465201	99734	NO2	N	N/A		No	2m
87	Priory School Fawcett Road (FR-PSc)	Roadside	465183	99904	NO2	N			No	2m
88	1-8 Brandon House Lawrence Road (LR-BH)	Urban background	465186	98996	NO2	N			No	2m
89	114 Waverley Road (WR-114)	Urban background	465190	98946	NO2	N			No	2m

90	18 Baffins Road (BR-18)	Urban background	466095	100813	NO2	N			No	2m
91	3 Baffins Road (BR-3)	Urban background	466070	100819	NO2	N			No	2m
92	Locksway Road-13 (LR-13)	Roadside	466525	99736	NO2	N		2.5 m,	No	2m
93	40 Victoria Road North (Back of nursery) (VRN-40)	Roadside	464826	99500	NO2	N			No	2m
95	189 Collins Place Fratton (CP-189)	Roadside	465109	100005	NO2	Close			No	2m
96	Mary Rose Centre Albert Road (AR-MR)	Urban background	465465	98937	NO2	N			No	2m
97	29 Rowan Court, Goldsmith Avenue (GA-29)	Roadside	465896	99852	NO2	N	5.32m		No	2m
98	13-29 Eastern Road (ER-13/29)	Roadside	466700	100591	NO2	Close			No	2m
99	64-80 Eastern Road (ER-64/80)	Roadside	466727	100572	NO2	Close			No	2m
100	340 Havant Road (HR-340)	Roadside	467783	105677	NO2	N			No	2m
101	Column 52 Havant Road (HR-Col52)	Roadside	467693	105687	NO2	N			No	2m
102	Hillside & Wymering Centre Service Road (SR-HWC)	Roadside	464585	105714	NO2	N			No	2m
103	UTC Portsmouth	Roadside	465556	103968	NO2	N	2.37m		No	2m
108	137 London Road (LR-137)	Roadside	464951	102418	NO2	Close			No	2m
109	122/124 London Road (LR-122/124)	Roadside	464961	102383	NO2	Close			No	2m
110	2a/2b Gladys Avenue (GA-2a/2b)	Roadside	464913	102419	NO2	Close			No	2m
111	Column 3 Gladys Avenue (GA-Col3)	Roadside	464898	102414	NO2	Close			No	2m
117	Alfred Road Column 9 (AR-Col 9)	Roadside	463901	100508	NO2	Close			No	2m
118	Alfred Road Column 12 (AR-Col 12)	Roadside	463951	100531	NO2	Close			No	2m
119	Market Way-left of St Agatha's bus shelter (MW-StABS)	Kerbside	464098	100748	NO2	Close			No	2m
120	Market Way Opposite MW-StABS (MW-OppStABS)	Roadside	464086	100765	NO2	Close			No	2m
121	46 London Road (LR-46)	Roadside	464930	102071	NO2	Y			No	2m
122	47 London Road (LR-47)	Roadside	464918	102090	NO2	Y			No	2m
124	Hillsley Road Column 23 (HR-Col23)	Roadside	462491	106553	NO2	N			No	2m
125	7 Tudor Crescent (TC-7)	Roadside	465624	104626	NO2	N			No	2m
126	Column 32 Port Way (PW-Col32)	Roadside	463756	105253	NO2	N			No	2m

127	133 Southampton Road (SR-133)	Roadside	463536	105652	NO2	N			No	2m
128	47 Derby Road (DR-47)	Roadside	464710	102222	NO2	Close			No	2m
129	50 Derby Road (DR-50)	Roadside	464711	102239	NO2	Close			No	2m
130	120 London Road (On Stubbington Avenue Bus Stop) (SA-BS)	Kerbside	464986	102344	NO2	Close			No	2m
131	16 London Road on Chichester Road (CR-PP0	Roadside	464925	101969	NO2	Close			No	2m
132	Column 50 Milton Road (MR-Col50)	Roadside	466344	100139	NO2	Close			No	2m
141	Column 7 St Jude School (StJS-Col7)	Roadside	463504	99362	NO2	N			No	2m
133	Labour Party Club Holbrook Road (HR-LPC)	Roadside	464882	100475	NO2	N			No	2m
134	Labour Party Club Coburg Street (CS-LPC)	Roadside	464919	100464	NO2	N			No	2m
135	Southampton Road - North (SR-N)	Kerbside	464526	105665	NO2	N			No	2m
136	Southampton Road - South (SR-S)	Roadside	464512	105641	NO2	N			No	2m
137	Column 96 Southampton Road (SR-Col96)	Roadside	464082	105658	NO2	N			No	2m
138	Column 97 Southampton Road (SR-Col97)	Kerbside	464067	105633	NO2	N			No	2m
139	Column79 Southampton Road (SR-Col79)	Roadside	463938	105638	NO2	N			No	2m
140	69 Hillsley Road (HR-69)	Urban background	462813	106442	NO2	N			No	2m
142	23 St Nicholas Street (StNS-23)	Roadside	463476	99345	NO2	N			No	2m
143	8 Old London Road (OLR-8)	Roadside	465686	103868	NO2	N			No	2m
144	Column 3 Old London Road (OLR-Col3)	Kerbside	465668	103832	NO2	N			No	2m
145	Opposite Sainsbury Hope Street- Col4)	Kerbside	464259	100965	NO2	Close			No	2m
146	Column 1 Sevenoaks Road (SOR-Col1)	Roadside	465265	105807	NO2	N			No	2m
147	Column 4 Sevenoaks Road (SOR-Col4)	Roadside	465303	105817	NO2	N			No	2m
148	Column 146 Southampton Road (SR-Col146)	Roadside	464670	105713	NO2	N			No	2m
149	Column 147 Southampton Road (SR-Col147)	Roadside	464665	105737	NO2	N			No	2m
150	Column 154 Southampton Road (SR-Col154)	Roadside	464791	105775	NO2	N			No	2m

151	Column 155 Southampton Road (SR-Col155)	Roadside	464806	105751	NO2	N			No	2m
152	Column 171 Southampton Road (SR-Col171)	Roadside	465169	105763	NO2	N			No	2m
153	Column 172 Southampton Road (SR-Col172)	Kerbside	465173	105784	NO2	N			No	2m
154	Column 177 Southampton Road (SR-Col177)	Roadside	465337	105726	NO2	N			No	2m
155	Column 178 Southampton Road (SR-Col178)	Roadside	465350	105748	NO2	N			No	2m
156	Column 78 Southampton Road (SR-Col78)	Roadside	463936	105617	NO2	N			No	2m
157	Opposite Column2 Church Street (Cs-OCol2)	Kerbside	464471	101099	NO2	Close			No	2m
158	106 Eastern Road (ER-106)	Roadside	467322	103333	NO2	N			No	2m
159	107 Eastern Road (ER-107)	Roadside	467357	103337	NO2	N			No	2m
160	116 Eastern Road (ER-116)	Roadside	467378	103247	NO2	N			No	2m
161	117 Eastern Road (ER-117)	Roadside	467343	103240	NO2	N			No	2m
162	51 Eastern Road (ER-51)	Roadside	467441	104208	NO2	N			No	2m
163	52 Eastern Road (ER-52)	Roadside	467423	104211	NO2	N			No	2m
164	Column 2 Allaway Avenue (AA-Col2)	Kerbside	464707	105787	NO2	N			No	2m
165	Column 3 Allaway Avenue (AA-Col3)	Roadside	464716	105817	NO2	N			No	2m
166	Column 2 Anchorage Road (AR-Col2)	Roadside	467269	103292	NO2	N			No	2m
167	Column 11 Church Street (CS-Col11)	Roadside	464589	100962	NO2	N			No	2m
168	Column 15 Copnor Road (CR-Col15)	Kerbside	465798	103856	NO2	N			No	2m
169	Column 16 Copnor Road (CR-Col16)	Kerbside	465809	103870	NO2	N			No	2m
170	Column 3 Commercial Road (ComR-Col3)	Roadside	464454	101044	NO2	Y			No	2m
171	Column 4 Commercial Road (ComR-Col4)	Roadside	464423	101047	NO2	Y			No	2m
172	Column 11 Hope Street (HS-Col11)	Roadside	464365	101038	NO2	N			No	2m
173	Column 5 Fratton Road (FR-Col5)	Roadside	465161	100081	NO2	Y			No	2m
174	Column 12 Church Street (CS-Col12)	Roadside	464606	100961	NO2	N			No	2m
175	Column 2 Church Street (CS-Col2)	Roadside	464478	101110	NO2	Close			No	2m
176	Column 3 Anchorage Road (AR-Col3)	Roadside	467269	103275	NO2	N			No	2m

178	Copnor Road- Column3 Opposite Walbrant Building (CR- Col3(OPWB)	Kerbside	465679	103987	NO2	N			No	2m
179	Building on Eastside of Junction Southampton Road/ Alloway Avenue Junction (AAOB)	Roadside	464735	105784	NO2	N			No	2m
180	Hope Street South Flat House Road (HS-Col Not Numbered)	Kerbside	464261	100967	NO2	Close			No	2m
181	Trafalgar Gate Column 3 (TG-Col3)	Kerbside	464299	101324	NO2	Y			No	2m
182	Trafalgar Gate Column 4 (TG-Col4)	Kerbside	464289	101338	NO2	Y			No	2m
183	Flathouse Road Column2 (FR-Col2)	Kerbside	464222	101346	NO2	Close			No	2m
184	Flathouse Road Opposite Column2 (FR-OCol2)	Roadside	464211	101346	NO2	Close			No	2m
185	42 Tudor Csecent (TC-42)	Roadside	465976	104576	NO2	Close			No	2m
188	Kettering Terrace- Normasn House Column5 (KT-NHCol5)	Kerbside	464390	101510	NO2	N			No	2m
189	Kettering Terrace- Normasn House Column10 (KT-NHCol10)	Kerbside	464386	101532	NO2	Close			No	2m
190	Prospect Road Column2 (PR-Col2)	Roadside	464292	101382	NO2	Close			No	2m
191	Prospect Road Column3 (PR-Col3)	Roadside	464267	101401	NO2	Close			No	2m
192	58 Kingston Road Shirin Kebab (KR-SK)	Roadside	465114	101370	NO2	Y	0		No	2m
193	Goldsmith Avenue- Front Garden (GA-FR)	Roadside	465297	100005	NO2	N			No	2m
194	48 New Road (NR-48)	Roadside	465138	101343	NO2	Close	0		No	2m
213	Kingston Roard Column 4 (KR-Col4)	Kerbside	465104	101319	NO2	Y			No	2m

Yellow highlighted sites: Ongoing monitoring sites for many years (**27 sites including co-locations**).

Blue highlighted sites: The additional monitoring sites in year 2018 (**78 sites**).

Green highlighted sites: The additional monitoring sites in year 2019 (**43 sites**).

Red highlighted sites: The additional monitoring sites in year 2020 (**16 sites**).

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.

(3) 2m is the minimum height above ground level.

Table A.3 – Annual Mean NO₂ Monitoring Results

Site ID	Site Type	Monitoring Type	Valid Data Capture for Monitoring Period (%) [1]	Valid Data Capture 2020 (%) [2]	NO₂ Annual Mean Concentration (µg/m³) [3]				
					2016	2017	2018	2019	2020
1	Roadside	Diffusion Tube		91.67%	**43.52**	38.8	**42.92**	36.92	29.67
2	Urban background	Diffusion Tube		83.33%	17.4	16.38	17.09	14.96	12.95
3	Roadside	Diffusion Tube		58.33%	25.75	23.7	24.13	21.02	18.29
4	Roadside	Diffusion Tube		86.11%	34.7	34.2	34.04	31.2	27.15
5	Roadside	Diffusion Tube		83.33%	29.52	24.38	28.08	24.86	22.28
6	Roadside	Diffusion Tube		66.67%	36.08	32.08	30.86	30.18	21.85
7	Urban background	Diffusion Tube		66.67%	28.09	27.32	27.74	23.29	22.73
8	Urban background	Diffusion Tube		66.67%	29.94	26.75	25.97	23.18	21.74
9	Roadside	Diffusion Tube		83.33%	**40.86**	37.06	36.7	33.6	29.72
10	Urban background	Diffusion Tube		83.33%	19.54	17.58	17.17	15.08	14.39
11	Roadside	Diffusion Tube		75.00%	28.1	23.5	22.9	20.7	18.80
14	Roadside	Diffusion Tube		83.33%	22.2	21.28	21.66	19.54	17.00
15	Roadside	Diffusion Tube		83.33%	28.97	28.95	27.64	24.91	21.16
16	Roadside	Diffusion Tube		83.33%	36.45	35.44	29.59	25.44	20.94
18	Roadside	Diffusion Tube		83.33%	29.3	29.62	26.01	24.32	22.77
19	Roadside	Diffusion Tube		88.89%	39.61	34.72	37.68	33.38	28.59
20	Roadside	Diffusion Tube		91.67%	29.12	29.73	28.42	24.01	21.79
21	Roadside	Diffusion Tube		91.67%	**40.05**	38.37	36.5	33.41	28.44
22	Roadside	Diffusion Tube		91.67%	31.23	26.48	29.28	24.49	21.96

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23	Roadside	Diffusion Tube		91.67%	37	34	34.6	32.2	27.30
24	Roadside	Diffusion Tube		91.67%	37.74	38.3	36.76	31.3	28.70
25	Roadside	Diffusion Tube		75.00%	**43.65**	**44.28**	38.21	37.63	30.62
26	Kerbside	Diffusion Tube		91.67%	**49.16**	**43.09**	**46.02**	**40.42**	36.51
30	Roadside	Diffusion Tube		77.78%	39.34	38.48	39.17	34.29	28.20
34	Roadside	Diffusion Tube		75.00%	36.06	36.17	33.34	31.01	25.26
35	Roadside	Diffusion Tube		66.67%	30.68	30.13	30.08	26.92	21.36
36	Roadside	Diffusion Tube		83.33%	33.32	29.74	31.47	27.01	20.88
42	Roadside	Diffusion Tube		83.33%			38.05	32.46	28.41
43	Roadside	Diffusion Tube		58.33%			32.5	30.3	27.70
44	Roadside	Diffusion Tube		91.67%			**40.41**	32.35	27.49
45	Roadside	Diffusion Tube		83.33%			**41.97**	31.84	27.61
46	Roadside	Diffusion Tube		91.67%			**44.51**	33.87	28.86
47	Roadside	Diffusion Tube		50.00%			36.77	31.07	27.87
48	Roadside	Diffusion Tube		25.00%			30.54	25.32	29.29
49	Roadside	Diffusion Tube		66.67%			34.64	29.05	22.17
50	Roadside	Diffusion Tube		58.33%			**40.37**	34.07	24.70
51	Roadside	Diffusion Tube		50.00%			33.18	28.92	23.12
52	Roadside	Diffusion Tube		58.33%			32.29	27.77	23.50
55	Roadside	Diffusion Tube		58.33%		30.4	25.38	26.17	19.57
56	Roadside	Diffusion Tube		58.33%		36.17	35.09	30.44	24.78
58	Roadside	Diffusion Tube		58.33%		33.8	29.32	26.93	20.74
59	Roadside	Diffusion Tube		91.67%			38.23	37.11	31.53
60	Roadside	Diffusion Tube		83.33%			29.77	25.16	23.81
61	Roadside	Diffusion Tube		58.33%			33.67	30.28	23.76
62	Roadside	Diffusion Tube		58.33%			22.04	17.56	16.78

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63	Roadside	Diffusion Tube		58.33%			34.17	29.43	23.83
64	Roadside	Diffusion Tube		58.33%			37.88	30.33	26.43
65	Roadside	Diffusion Tube		58.33%		27.62	28.24	24.35	20.79
66	Roadside	Diffusion Tube		58.33%			31.9	27.6	23.33
67	Roadside	Diffusion Tube		50.00%			36.73	31.44	25.54
68	Roadside	Diffusion Tube		58.33%			36.86	29.25	24.71
69	Roadside	Diffusion Tube		58.33%			31.14	24.95	23.68
70	Roadside	Diffusion Tube		75.00%		23.69	25.14	21.58	19.59
71	Kerbside	Diffusion Tube		58.33%			27.78	25.19	21.97
72	Roadside	Diffusion Tube		58.33%			26.49	23.33	19.33
73	Roadside	Diffusion Tube		58.33%			27.4	23.78	20.24
74	Roadside	Diffusion Tube		16.67%			37.27	30.25	30.72
75	Roadside	Diffusion Tube		58.33%			25.71	21.25	20.19
76	Roadside	Diffusion Tube		58.33%			31.25	28.87	23.55
77	Roadside	Diffusion Tube		58.33%			21.23	18.51	19.01
78	Roadside	Diffusion Tube		58.33%			25.04	19.91	17.88
80	Roadside	Diffusion Tube		58.33%			38.35	32.36	23.99
81	Roadside	Diffusion Tube		58.33%			35.22	30.66	22.31
82	Roadside	Diffusion Tube		41.67%			30.79	26.61	22.15
83	Roadside	Diffusion Tube		58.33%			32.43	28.5	21.13
84	Roadside	Diffusion Tube		58.33%			42.82	30.4	23.81
85	Roadside	Diffusion Tube		58.33%			**40.41**	31.52	25.06
86	Roadside	Diffusion Tube		83.33%			28.89	24	24.33
87	Roadside	Diffusion Tube		50.00%			27.3	24.8	20.23
88	Roadside	Diffusion Tube		58.33%			35.35	28.43	27.25
89	Roadside	Diffusion Tube		58.33%			30.85	25.97	20.54

90	Roadside	Diffusion Tube		58.33%			23.98	22.13	18.23
91	Roadside	Diffusion Tube		58.33%			26.69	23.84	21.54
92	Roadside	Diffusion Tube		58.33%		28.69	27.27	25.7	19.26
93	Roadside	Diffusion Tube		83.33%			35.04	34.81	30.46
95	Roadside	Diffusion Tube		50.00%			29.31	26.06	22.57
96	Roadside	Diffusion Tube		50.00%			23.47	21.48	18.90
97	Roadside	Diffusion Tube		58.33%			25.84	22.64	17.86
98	Roadside	Diffusion Tube		75.00%			22.51	18.19	17.10
99	Roadside	Diffusion Tube		75.00%			23.57	20.29	18.98
100	Roadside	Diffusion Tube		58.33%			22.14	19.94	15.19
101	Roadside	Diffusion Tube		58.33%			28.17	25	22.21
102	Roadside	Diffusion Tube		50.00%			28.72	23.71	21.86
103	Roadside	Diffusion Tube		58.33%			24.73	23.04	18.16
108	Roadside	Diffusion Tube		58.33%			44.18	32.46	31.38
109	Roadside	Diffusion Tube		58.33%			35.76	30.11	26.00
110	Roadside	Diffusion Tube		58.33%			27.72	22.15	22.35
111	Roadside	Diffusion Tube		41.67%			28.73	24.6	21.53
117	Roadside	Diffusion Tube		86.11%			50.42	48	**41.04**
118	Roadside	Diffusion Tube		77.78%			**50.38**	**52.52**	38.76
119	Kerbside	Diffusion Tube		86.11%			31.97	30.67	24.69
120	Roadside	Diffusion Tube		86.11%			**47.51**	**46.9**	36.30
121	Roadside	Diffusion Tube		50.00%			37.32	38.55	32.49
122	Roadside	Diffusion Tube		41.67%			37.68	36.76	30.77
124	Roadside	Diffusion Tube		58.33%			28.56	26.07	23.83
125	Roadside	Diffusion Tube		55.56%			39.58	27.88	30.05
126	Roadside	Diffusion Tube		83.33%			37.53	38.66	27.03

127	Roadside	Diffusion Tube		58.33%			36.1	28.44	23.96
128	Roadside	Diffusion Tube		58.33%				23.39	21.54
129	Roadside	Diffusion Tube		58.33%				23.18	21.11
130	Kerbside	Diffusion Tube		66.67%				35.8	36.15
131	Roadside	Diffusion Tube		41.67%			39.61	33.16	27.28
132	*Roadside*	*Diffusion Tube*		58.33%			36.85	39.36	31.62
133	*Roadside*	*Diffusion Tube*		83.33%			**43.07**	35.73	30.65
134	*Roadside*	*Diffusion Tube*		25.00%			25.41	24.96	19.51
135	*Kerbside*	*Diffusion Tube*		58.33%				25.73	23.62
136	*Roadside*	*Diffusion Tube*		58.33%			42	26.67	25.35
137	Roadside	Diffusion Tube		58.33%				35.42	30.67
138	Kerbside	Diffusion Tube		33.33%				38.31	25.68
139	Roadside	Diffusion Tube		50.00%				33.74	26.20
140	Urban background	Diffusion Tube		22.22%				24.64	22.74
142	Roadside	Diffusion Tube		58.33%				17.67	12.11
143	Roadside	Diffusion Tube		58.33%				33.35	22.92
144	Kerbside	Diffusion Tube		58.33%				40.81	29.88
145	Roadside	Diffusion Tube		91.67%				**53.91**	**43.59**
146	Roadside	Diffusion Tube		58.33%				26.69	19.73
147	Roadside	Diffusion Tube		58.33%				26.17	22.51
148	Roadside	Diffusion Tube		50.00%				24.19	21.25
149	Roadside	Diffusion Tube		50.00%				33.93	27.93
150	Roadside	Diffusion Tube		58.33%				37.46	30.57
151	Roadside	Diffusion Tube		58.33%				31.83	24.81
152	Roadside	Diffusion Tube		25.00%				**41.97**	35.79
153	Kerbside	Diffusion Tube		58.33%				36.31	27.23

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154	Roadside	Diffusion Tube		50.00%				**43.04**	32.10
155	Roadside	Diffusion Tube		50.00%				35.76	27.42
156	Roadside	Diffusion Tube		58.33%				35.8	25.50
157	Kerbside	Diffusion Tube		83.33%				37.33	28.03
158	Roadside	Diffusion Tube		58.33%				33.96	27.80
159	Roadside	Diffusion Tube		58.33%				39.16	34.23
160	Roadside	Diffusion Tube		58.33%				**40.92**	31.69
161	Roadside	Diffusion Tube		50.00%				28.49	25.09
162	Roadside	Diffusion Tube		50.00%				**45.25**	32.68
163	Roadside	Diffusion Tube		58.33%				**38.56**	30.45
164	Kerbside	Diffusion Tube		58.33%				34.57	26.70
165	Roadside	Diffusion Tube		50.00%				30.25	26.97
166	Roadside	Diffusion Tube		50.00%				34.71	29.47
167	Roadside	Diffusion Tube		91.67%				29.01	27.63
168	Kerbside	Diffusion Tube		41.67%				27.62	22.53
169	Kerbside	Diffusion Tube		58.33%				32.66	32.35
170	Roadside	Diffusion Tube		83.33%				**41.5**	30.72
171	Roadside	Diffusion Tube		83.33%				31.33	23.07
172	Roadside	Diffusion Tube		83.33%				38.77	27.90
173	Roadside	Diffusion Tube		75.00%				**41.88**	33.17
174	Roadside	Diffusion Tube		75.00%				31.3	25.71
175	Roadside	Diffusion Tube		91.67%				37.55	32.42
176	Roadside	Diffusion Tube		50.00%				29.41	25.50
178	Kerbside	Diffusion Tube		58.33%					29.98
179	Roadside	Diffusion Tube		50.00%					24.21
180	Kerbside	Diffusion Tube		58.33%					37.55

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ID	Site Type	Method		Data Capture (1)					
181	Kerbside	Diffusion Tube		66.67%					24.33
182	Kerbside	Diffusion Tube		66.67%					30.04
183	Kerbside	Diffusion Tube		83.33%					26.44
184	Roadside	Diffusion Tube		58.33%					24.23
185	Roadside	Diffusion Tube		58.33%					20.92
188	Kerbside	Diffusion Tube		58.33%					27.40
189	Kerbside	Diffusion Tube		75.00%					28.49
190	Roadside	Diffusion Tube		50.00%					27.73
191	Roadside	Diffusion Tube		58.33%					27.23
192	Roadside	Diffusion Tube		33.33%					27.61
193	Roadside	Diffusion Tube		41.67%					25.18
194	Roadside	Diffusion Tube		25.00%					26.66
213	Kerbside	Diffusion Tube		33.33%					34.09
37	Kerbside	Automatic		99.00%	**41.21**	**44.6**	**40.57**	**40.46**	32.34
38	Urban background	Automatic		14.74%	20.05	19.41	18.68	17.47	17.37
39	Roadside	Automatic		99.46%	34.34	35.22	34	31.12	26.56
40	Roadside	Automatic		99.79%	35.48	33.54	33.95	32.44	26.55
53	Roadside	Automatic		98.91%			30.52	27.8	21.29

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

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

Notes:

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

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

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

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

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

7. Significance of local air quality change

The assessment and description of change in nitrogen dioxide annual average has been carried out according to guidance on land use planning and development control AQ impact descriptors for annual mean pollutant concentrations.

The air quality change from year on year can be considered significant if it leads to significant impacts at existing sensitive receptors. In this assessment similar approaches have been adopted as presented in guidance on land-use planning and development control. This guidance suggests that a two-stage approach should be adopted to determine whether or not a change in air quality is considered as a significant.

The methodology followed is:

- Firstly, qualitative descriptions are applied to the latest air quality monitoring data at individual receptors.

- Secondly, professional judgement is applied to judge whether the accumulation of the identified impacts constitute a significant impact overall.

In order to assess the potential change in local air quality, a description of the change is given based on the magnitude of change as a percentage of a relevant Air Quality Assessment Level. Account must also be taken of latest monitoring pollutant concentrations and their relationship to the NAQO for the pollutants of concern.

A summary of the impact descriptors for annual mean pollutant concentrations is tabulated in Section 7.1. The impact descriptors may be adverse or beneficial depending upon whether monitored concentrations increase or decrease.

7.1. Air quality Impact descriptors for annual mean pollutant concentrations:

Annual mean concentration at receptor in assessment year (as % of AQAL)	PM_{10} Annual mean concentration (µg/m^3) [3]				
	0	**1**	**2 – 5**	**6 – 10**	**>10**
≤75%	Negligible	Negligible	Negligible	Slight	Moderate
76% - 94%	Negligible	Negligible	Slight	Moderate	Moderate
95% - 102%	Negligible	Slight	Moderate	Moderate	Substantial
103% - 109%	Negligible	Moderate	Moderate	Substantial	Substantial
≥110%	Negligible	Moderate	Substantial	Substantial	Substantial

Figure A.1. Trends in Annual Mean NO₂ Concentrations

In this section the trends in annual mean NO₂ concentrations are illustrated for long term NDDT data from Figure F1 to F27 and CAQMS data from Figure F28 to F31.
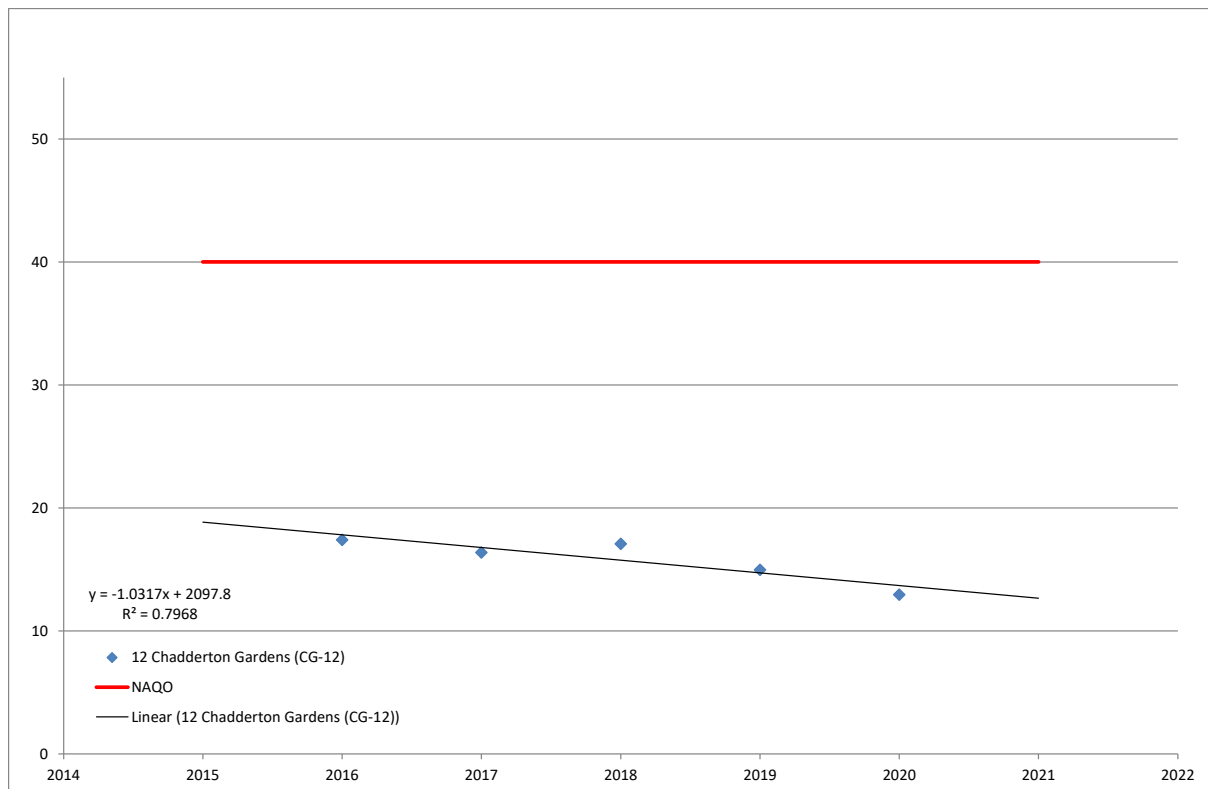
Figure F.1: Lord Montgomery Way (LMW-FST)
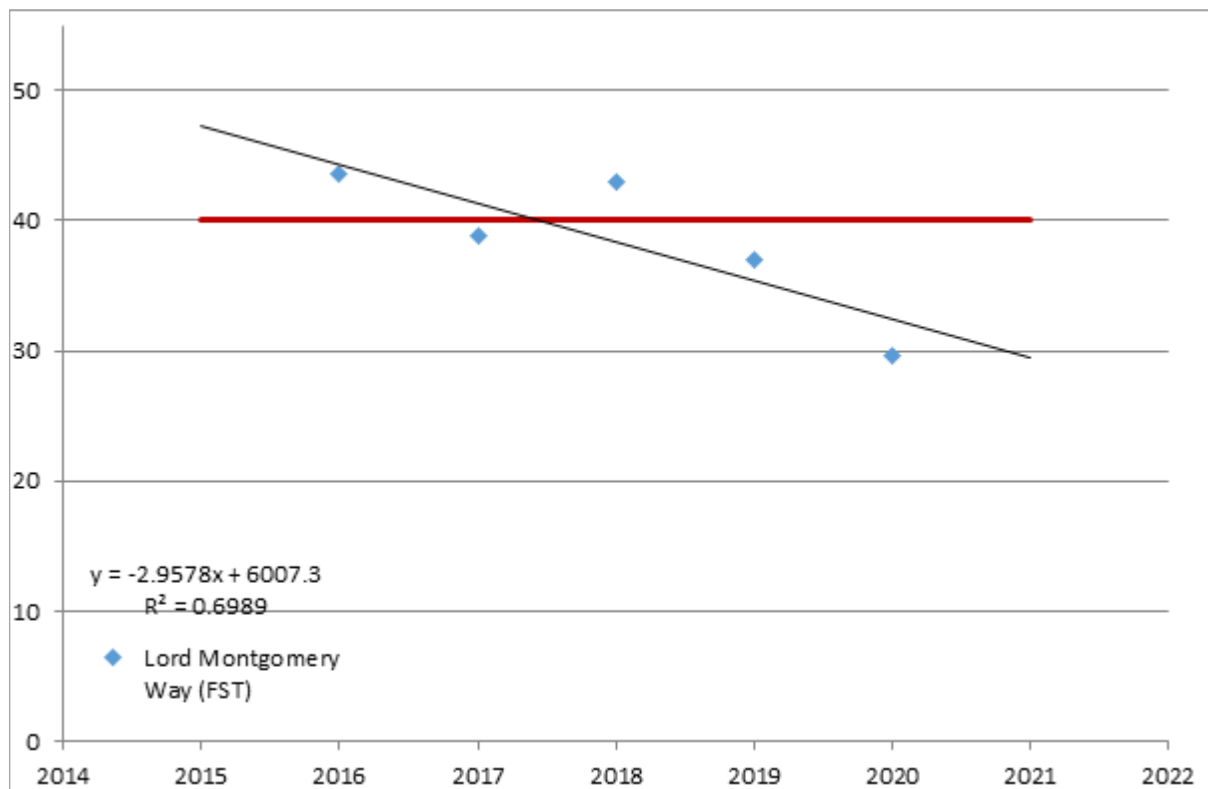
$y = -2.9578x + 6007.3$
$R^2 = 0.6989$

◆ Lord Montgomery Way (FST)

Summary

No exceedance, short-term moderately beneficial, long-term downwards

1. The NO_2 annual mean decreased further below the NAQO for the second time in the last 5 years.

2. The NO_2 annual mean at this roadside monitoring location decreased by 7.25µg/m^3 (a decrease of 19.64%) between 2019 and 2020 to remain below the NAQO in 2020 (29.67µg/m^3) representing a continued AQ improvement in the short-term.

3. The 2019-2020 NO_2 annual mean decrease is described as moderately beneficial.

4. The NO_2 annual mean downward trend in the last 5 years exhibits an AQ improvement in the long-term that is consistent with the previously reported 5-year trend.

Figure F.2: 12 Chadderton Gardens (CG-12)

$$y = -1.0317x + 2097.8$$
$$R^2 = 0.7968$$

Legend:
- 12 Chadderton Gardens (CG-12)
- NAQO
- Linear (12 Chadderton Gardens (CG-12))

Summary

No exceedance, short-term negligibly beneficial, long-term downwards

1. The NO_2 annual mean decreased further below the NAQO.

2. The NO_2 annual mean at this urban background monitoring location decreased by $2.01\mu g/m^3$ (a decrease of 13.41%) between 2019 and 2020 to remain below the NAQO in 2020 ($12.95\mu g/m^3$) representing a continued AQ improvement in the short-term.

3. The 2019-2020 NO_2 annual mean decrease is described as negligibly beneficial.

4. The NO_2 annual average downward trend in the last 5 years represents an AQ improvement in the long-term that is consistent with the previously reported 5-year trend.

Figure F.3: 121A High Street (HS-121A)
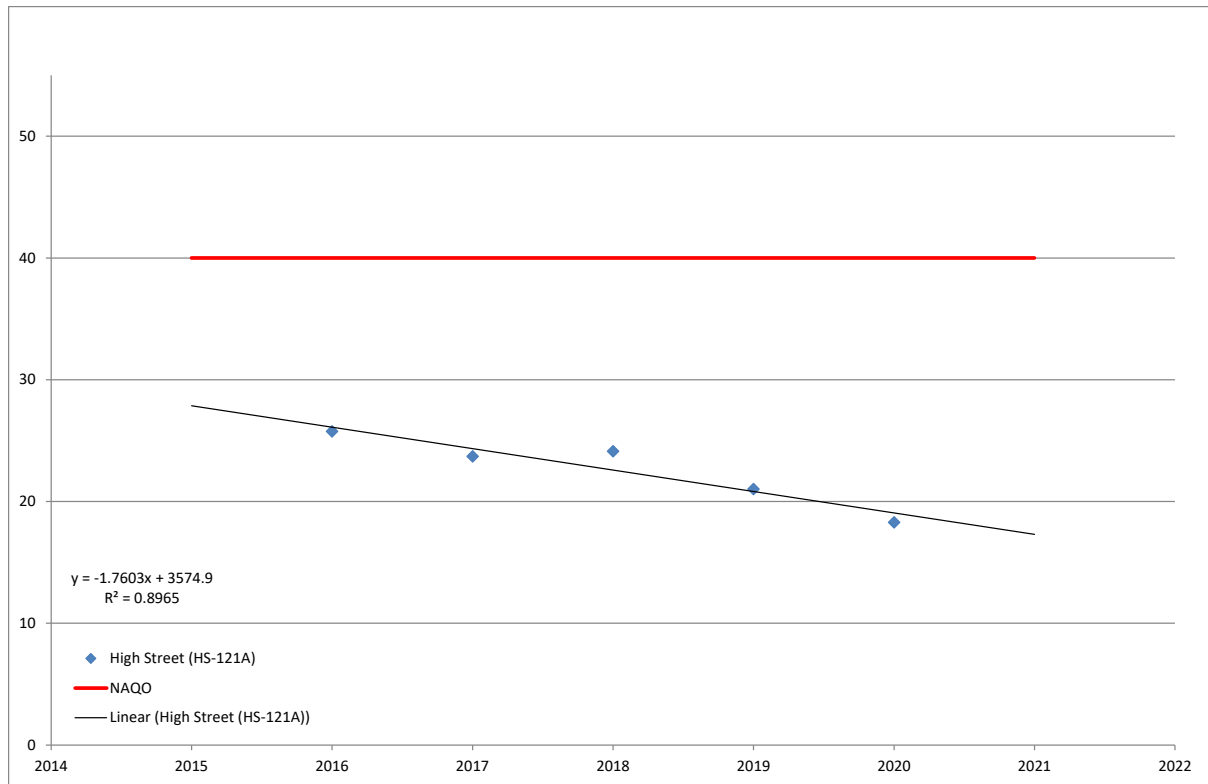
$y = -1.7603x + 3574.9$
$R^2 = 0.8965$

Summary

No exceedance, short-term slightly beneficial, long-term downwards

1. The NO_2 annual mean decreased further below the NAQO.

2. The NO_2 annual mean at this roadside monitoring location decreased by 2.73µg/m³ (a decrease of 12.99%) between 2019 and 2020 to remain below the NAQO in 2020 (18.29µg/m³) representing a continued AQ improvement in the short-term.

3. The 2019-2020 NO_2 annual mean decrease is described as "slightly beneficial".

4. The NO_2 annual mean downward trend in the last 5 years represents an AQ improvement in the long-term that is consistent with the previously reported 5-year trend.

Figure F.4: Queen Street, Column 30 (QS-Col30)

$y = -1.8091x + 3683.1$
$R^2 = 0.8165$

- ◆ Queen Street (QS-Col 30)
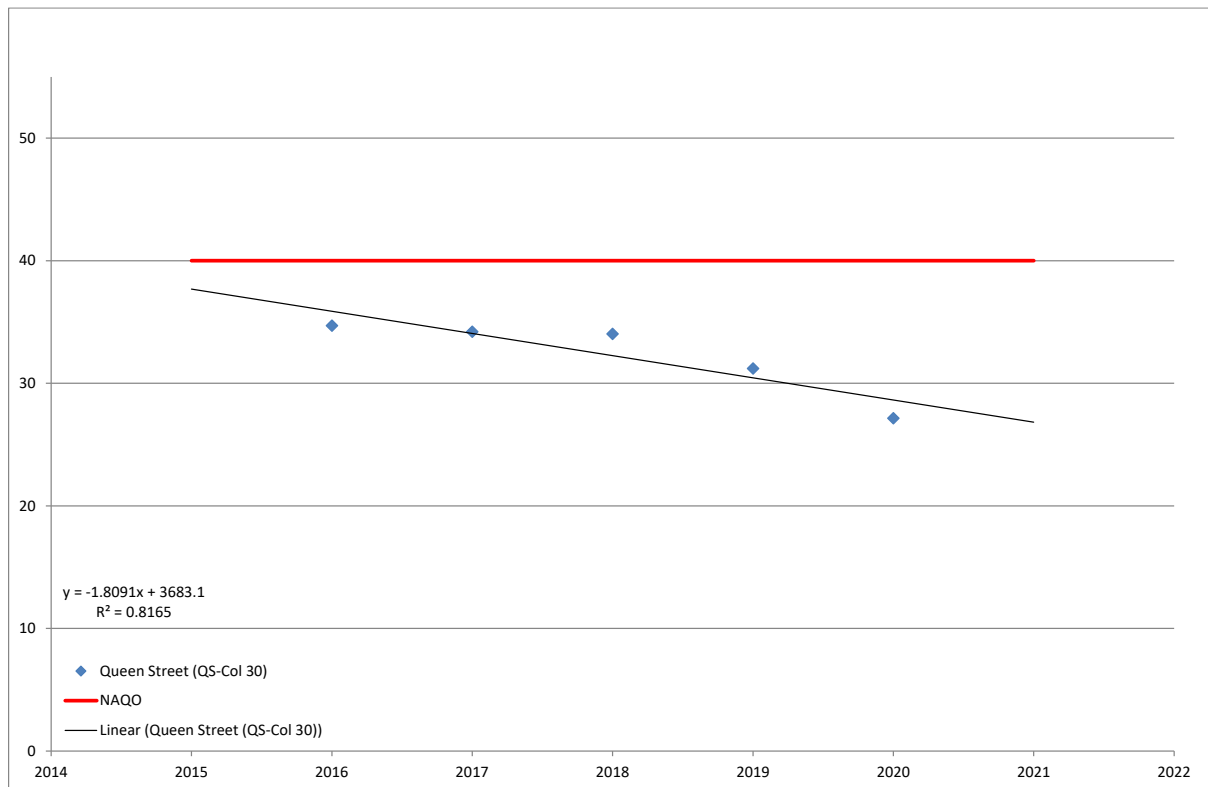- — NAQO
- — Linear (Queen Street (QS-Col 30))

Summary

No exceedance, short-term slightly beneficial, long-term downwards

1. The NO_2 annual mean decreased further below the NAQO.

2. The NO_2 annual mean at this roadside monitoring location decreased by 4.05µg/m^3 (a decrease of 12.98%) between 2019 and 2020 to remain below the NAQO in 2020 (27.15µg/m^3) representing a continued AQ improvement in the short-term.

3. The 2019-2020 NO_2 annual mean decrease is described as slightly beneficial.

4. The NO_2 annual mean downward trend in the last 5 years represents an AQ improvement in the long-term that is consistent with the previously reported 5-year trend.
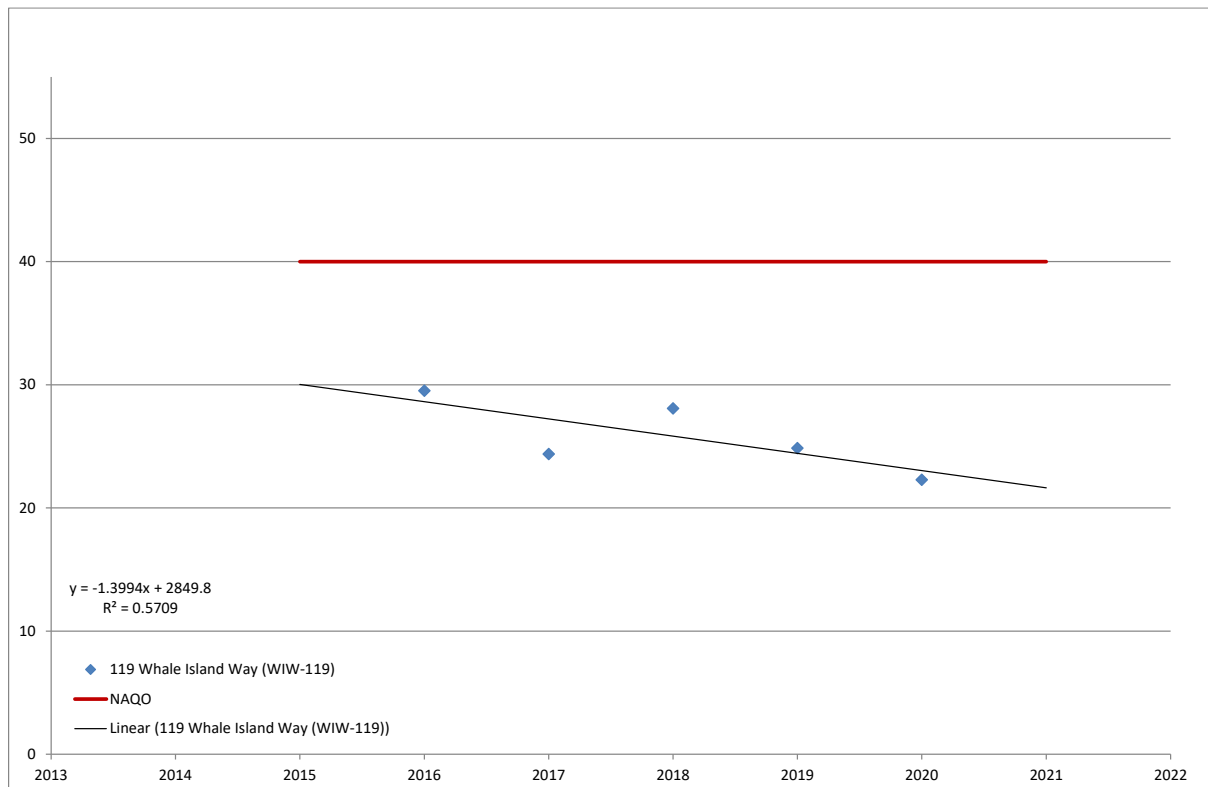
Figure F.5: 119 Whale Island Way (WIW-119)

Summary

No exceedance, short-term slightly beneficial, long-term downwards

1. The NO_2 annual mean decreased further below the NAQO.

2. The NO_2 annual mean at this roadside monitoring location decreased by 2.58µg/m^3 (a decrease of 10.37%) between 2019 and 2020 to remain below the NAQO in 2020 (22.28µg/m^3) representing a continued AQ improvement in the short-term.

3. The 2019-2020 NO_2 annual mean decrease is described as slightly beneficial.

4. The NO_2 annual mean downward trend in the last 5 years represents an AQ improvement in the long-term that is consistent with the previously reported 5-year trend.
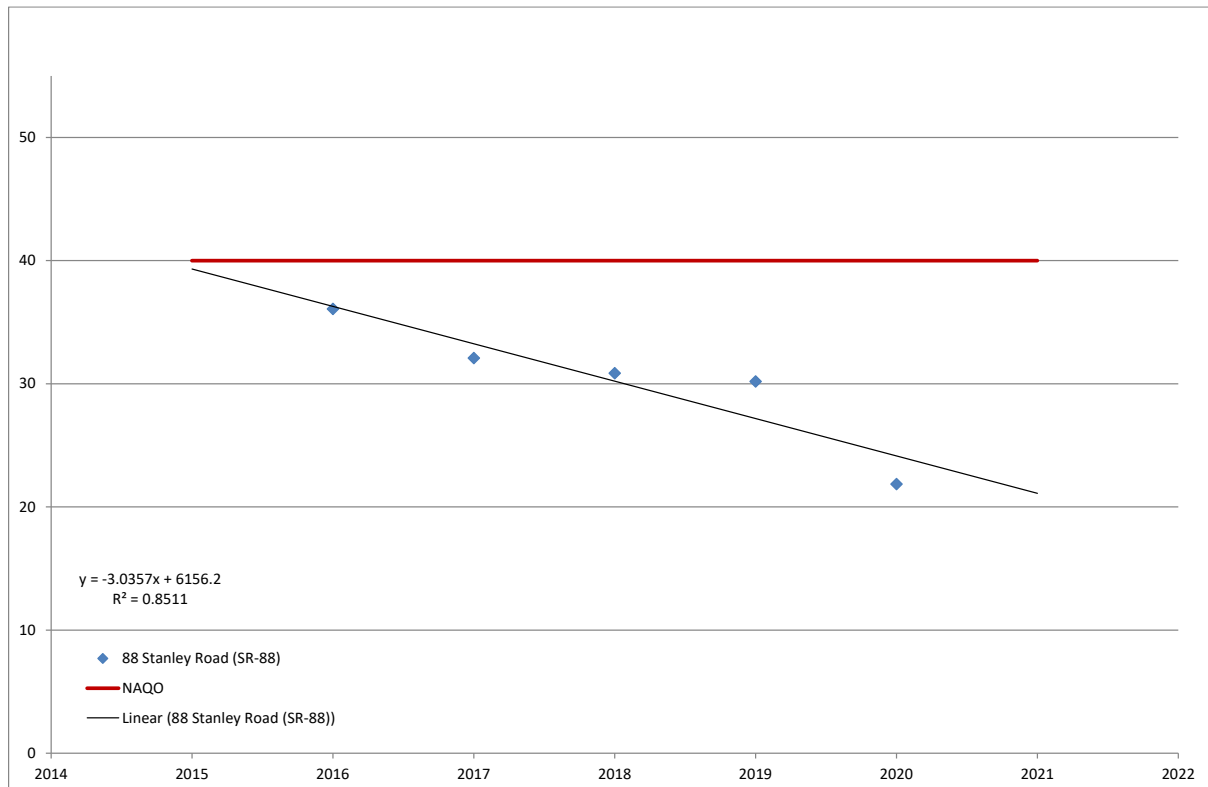
Figure F.6: 88 Stanley Road (SR-88)

Summary

No exceedance, short-term moderately beneficial, long-term downwards

1. The NO_2 annual mean decreased further below the NAQO.

2. The NO_2 annual mean at this roadside monitoring location decreased by 8.33µg/m^3 (a decrease of 27.61%) between 2019 and 2020 to remain below the NAQO in 2020 (21.85µg/m^3) representing a continued AQ improvement in the short-term.

3. The 2019-2020 NO_2 annual mean decrease is described as moderately beneficial.

4. The NO_2 annual mean downward trend in the last 5 years represents an AQ improvement in the long-term that is consistent with the previously reported 5-year trend.

Figure F.7: 138 Lower Derby Road (LDR-138)

$y = -1.4767x + 3005.7$
$R^2 = 0.8046$

◆ 138 Lower Derby Road (LDR-138)
— NAQO
— Linear (138 Lower Derby Road (LDR-138))

Summary

No exceedance, short-term negligibly beneficial, long-term downwards

1. The NO_2 annual mean decreased further below the NAQO.

2. The NO_2 annual mean at this urban background monitoring location decreased by 0.56µg/m^3 (a decrease of 2.42%) between 2019 and 2020 to remain below the NAQO in 2020 (7.27µg/m^3) representing a continued AQ improvement in the short-term.

3. The 2019-2020 NO_2 annual mean decrease is described as negligibly beneficial.

4. The NO_2 annual mean downward trend in the last 5 years represents an AQ improvement in the long-term that is consistent with the previously reported 5-year trend.

Figure F.8: 492 Hawthorn Crescent (HC-492)
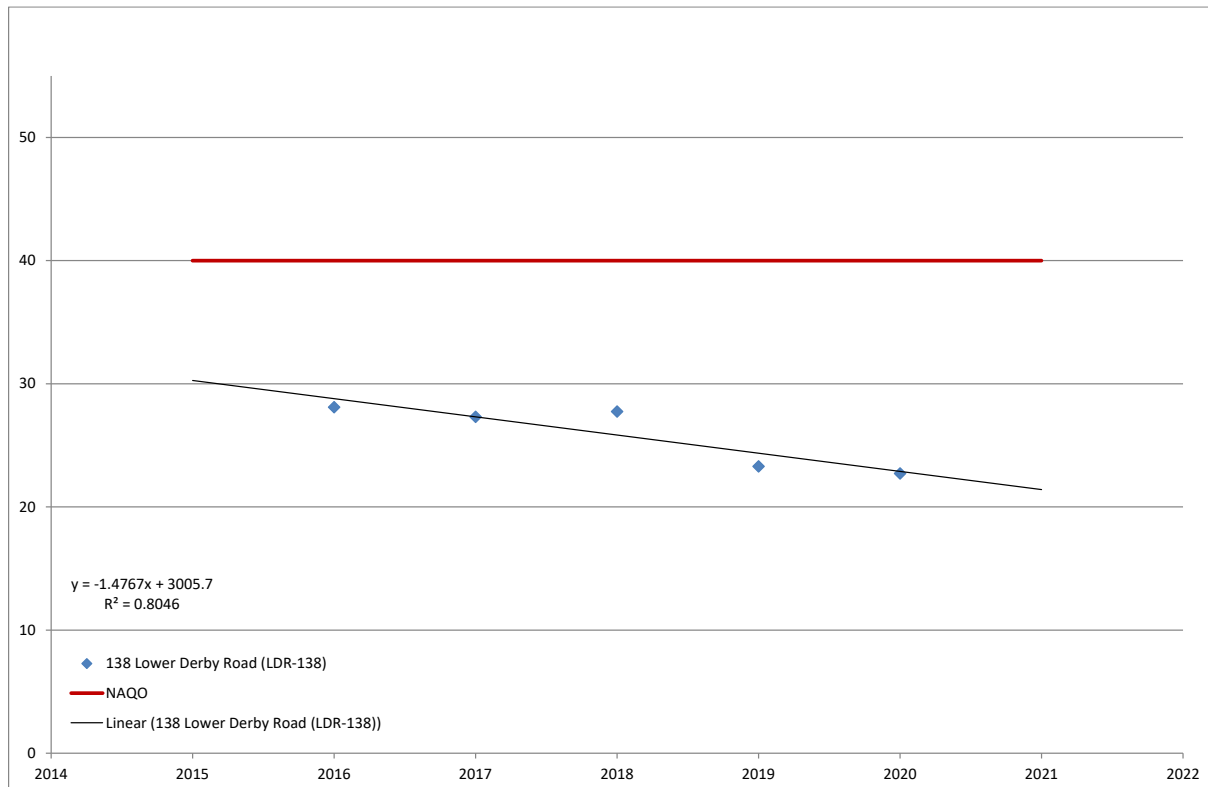

Summary plot for 492 Hawthorn Crescent (HC-492) showing NO₂ annual mean against year. Trend line equation y = -1.9957x + 4052.9, R² = 0.9724.
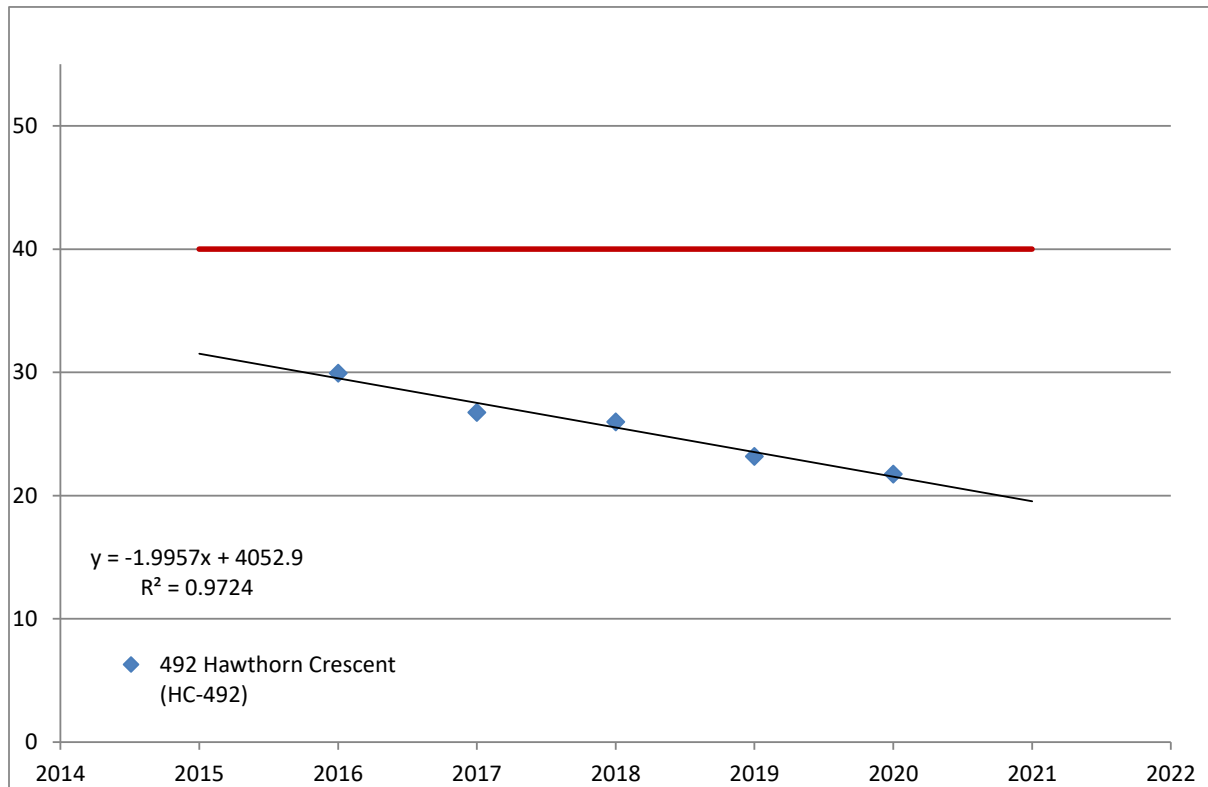
Summary

No exceedance, short-term negligibly beneficial, long-term downwards

1. The NO$_2$ annual mean decreased further below the NAQO.

2. The NO$_2$ annual mean at this urban background monitoring location decreased by 1.44µg/m^3 (a decrease of 6.21%) between 2019 and 2020 to remain below the NAQO in 2020 (21.74µg/m^3) representing a continued AQ improvement in the short-term.

3. The 2019-2020 NO$_2$ annual mean decrease is described as negligibly beneficial.

4. The NO$_2$ annual mean downward trend in the last 5 years represents an AQ improvement in the long-term that is consistent with the previously reported 5-year trend**.**

Figure F.9: 6 Northern Road (NR-6)

$$y = -2.5731x + 5228.1$$
$$R^2 = 0.9523$$

◆ 6 Northern Road (NR-6)

Summary

No exceedance, short-term slightly beneficial, long-term downwards

1. The NO_2 annual mean decreased further below the NAQO for the fourth time in the last 5 years.

2. The NO_2 annual mean at this roadside monitoring location decreased by 3.88µg/m^3 (a decrease of 11.54%) between 2019 and 2020 to remain below the NAQO in 2020 (29.72µg/m^3) representing a continued AQ improvement in the short-term.

3. The 2019-2020 NO_2 annual mean decrease is described as slightly beneficial.

4. The NO_2 annual mean downward trend in the last 5 years represents an AQ improvement in the long-term that is consistent with the previously reported 5-year trend.

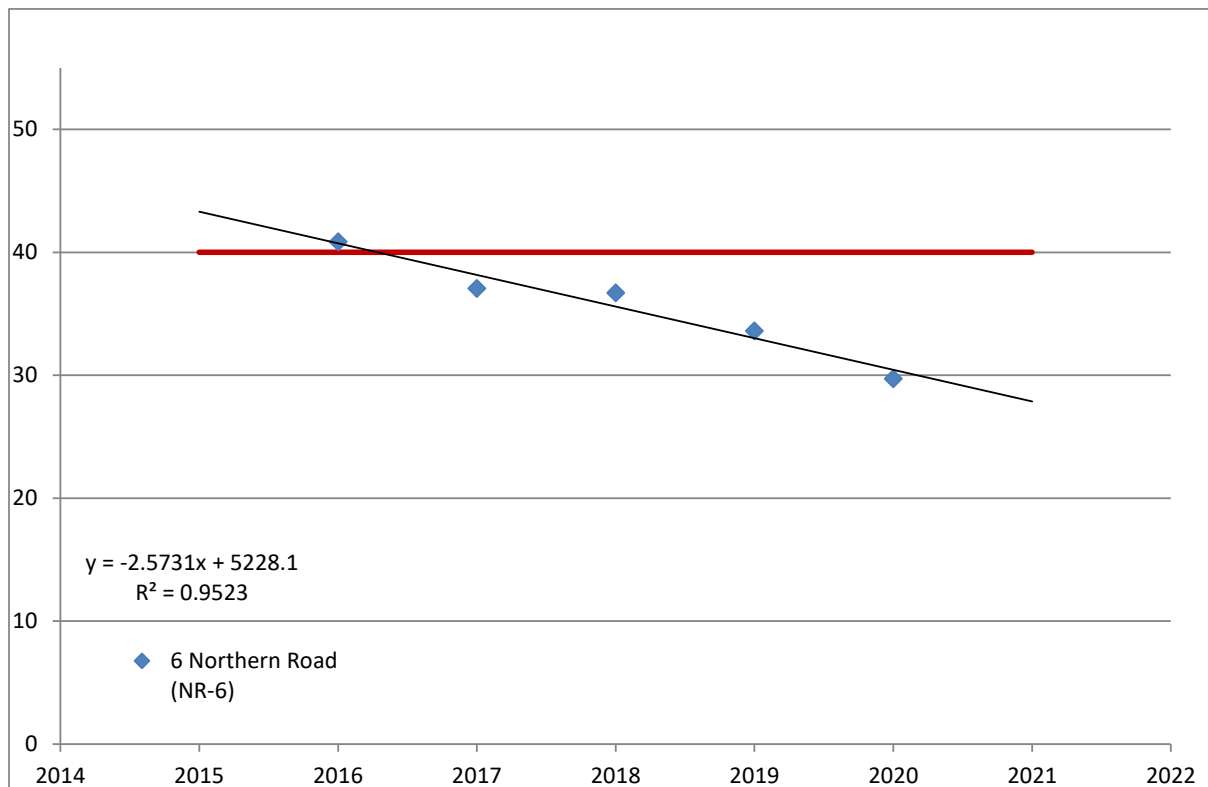**Figure F.10: 20 Stroudley Avenue (SA-20)**
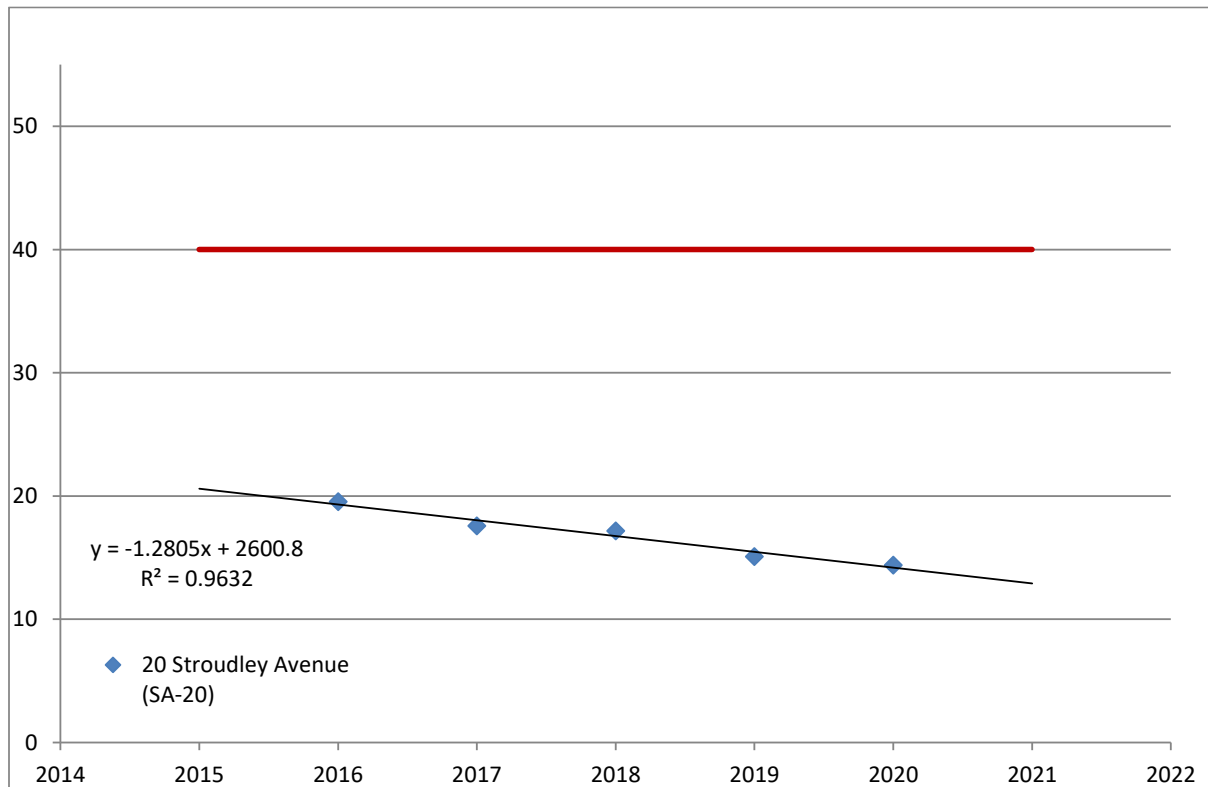
Summary

No exceedance, short-term negligibly beneficial, long-term downwards

1. The NO_2 annual mean decreased further below the NAQO.

2. The NO_2 annual mean at this urban background monitoring location decreased by $0.69\mu g/m^3$ (a decrease of 4.56%) between 2019 and 2020 to remain below the NAQO in 2020 ($14.39\mu g/m^3$) representing a continued AQ improvement in the short-term.

3. The 2019-2020 NO_2 annual mean decrease is described as negligibly beneficial.

4. The NO_2 annual mean downward trend in the last 5 years represents an AQ improvement in the long-term that is consistent with the previously reported 5-year trend**.**

Figure F.11: Anchorage Road, Column 6 (AR-Col6)

y = -2.14x + 4341.3
R² = 0.9346

Anchorage Road (AR-Col6)

Summary

No exceedance, short-term negligibly beneficial, long-term downwards

1. The NO$_2$ annual mean decreased further below the NAQO.

2. The NO$_2$ annual mean at this roadside monitoring location decreased by 1.9µg/m^3 (a decrease of 9.18%) between 2019 and 2020 to remain below the NAQO in 2020 (18.80µg/m^3) representing a continued AQ improvement in the short-term.

3. The 2019-2020 NO$_2$ annual average decrease is described as negligibly beneficial

4. The NO$_2$ annual mean downward trend in the last 5 years representing an AQ improvement in the long-term that is consistent with the previously reported 5-year trend.

Figure F.12: 4 Merlyn Drive (MD-4)
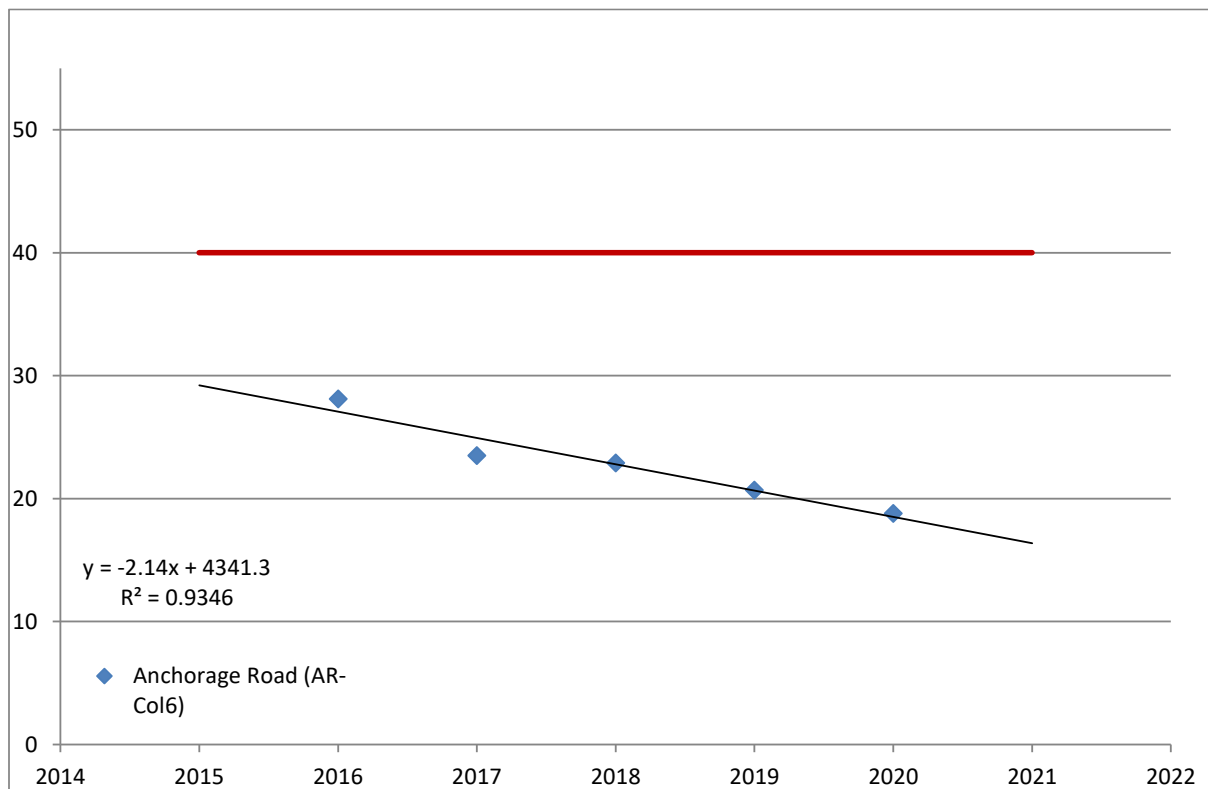

Summary section below is labelled "Summary"

Summary

No exceedance, short-term slightly beneficial, long-term downwards

1. The NO_2 annual mean decreased further below the NAQO.

2. The NO_2 annual mean at this roadside monitoring location decreased by 2.54µg/m^3 (a decrease of 13.01%) between 2019 and 2020 to remain below the NAQO in 2020 (17.00µg/m^3) representing a continued AQ improvement in the short-term.

3. The 2019-2020 NO_2 mean decrease is described as slightly beneficial.

4. The NO_2 annual mean downward trend in the last 5 years represents an AQ improvement in the long-term that is consistent with the previously reported 5-year trend.

Figure F.13: 29 Milton Road (MR-29)
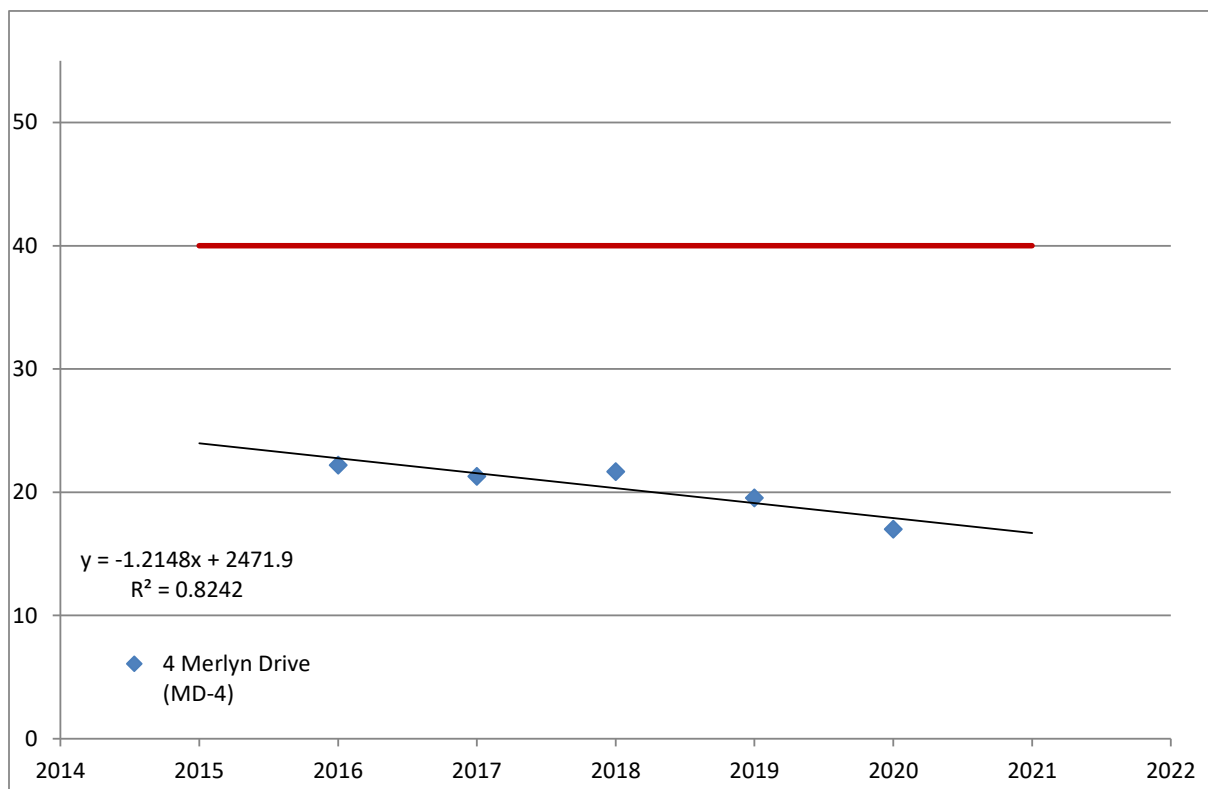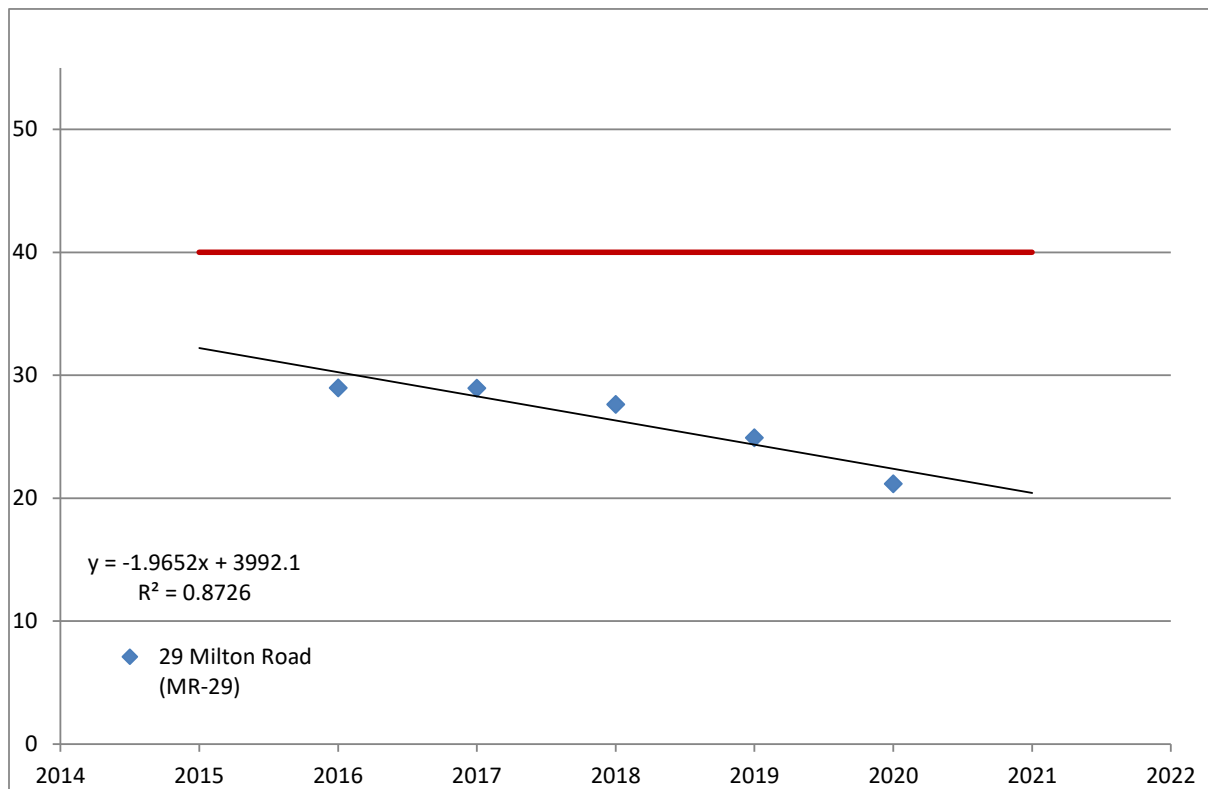

$y = -1.9652x + 3992.1$
$R^2 = 0.8726$

Summary

No exceedance, short-term slightly beneficial, long-term downwards

1. The NO_2 annual mean decreased further below the NAQO.

2. The NO_2 annual mean at this roadside monitoring location decreased by 3.75µg/m^3 (a decrease of 15.04%) between 2019 and 2020 to remain below the NAQO in 2020 (21.16µg/m^3) representing a continued AQ improvement in the short-term.

3. The 2019-2020 NO_2 annual mean decrease is described as slightly beneficial.

4. The NO_2 annual mean downward trend in the last 5 years represents an AQ improvement in the long-term that is consistent with the previously reported 5-year trend.

Figure F.14: 4 Milton Road (MR-4)
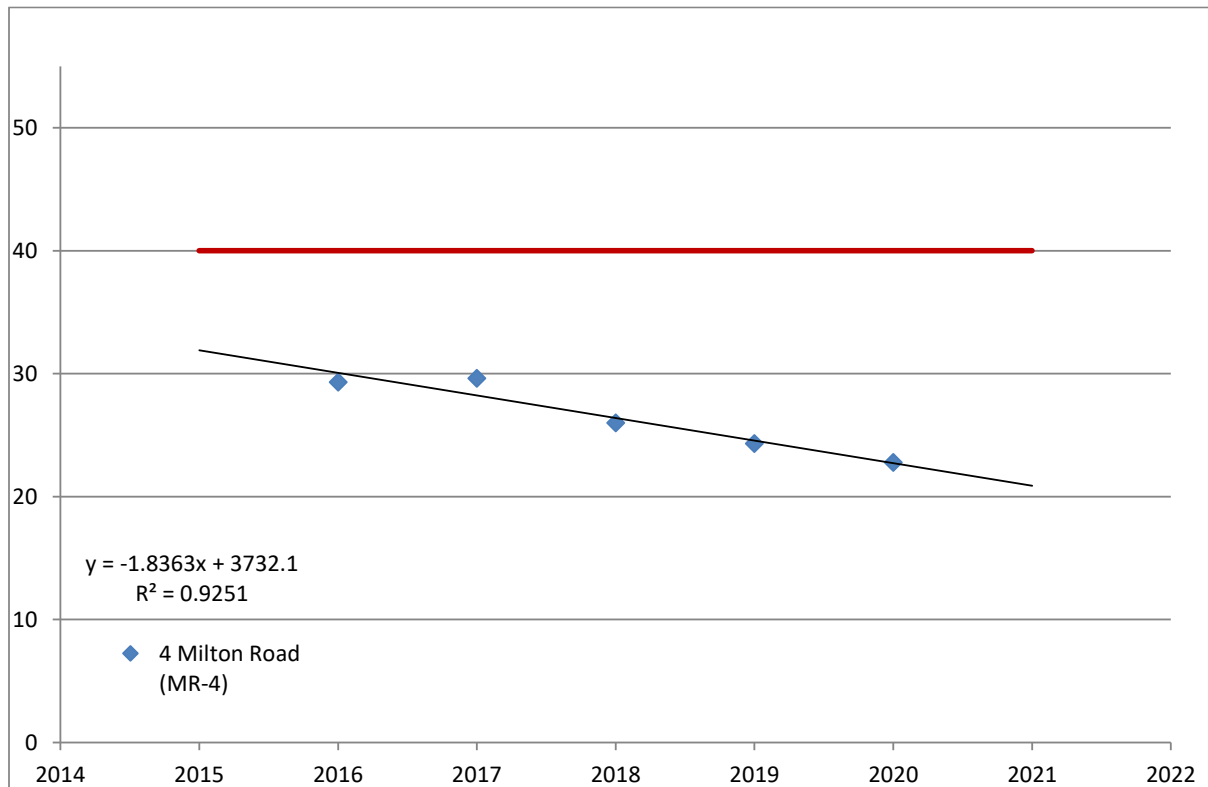
$y = -1.8363x + 3732.1$
$R^2 = 0.9251$

◆ 4 Milton Road (MR-4)

Summary

No exceedance, short-term negligibly beneficial, long-term downwards

1. The NO_2 annual mean decreased further below the NAQO.

2. The NO_2 annual mean at this roadside monitoring location decreased by 1.55µg/m^3 (a decrease of 6.38%) between 2019 and 2020 to remain below the NAQO in 2020 (22.77µg/m^3) representing a continued AQ improvement in the short-term.

3. The 2019-2020 NO_2 annual mean decrease is described as negligibly beneficial.

4. The NO_2 annual mean downward trend in the last 5 years represents an AQ improvement in the long-term that is consistent with the previously reported 5-year trend.

Figure F.15: The Tap Public House London Road (LR-TAP(PH))

$y = -2.7964x + 5686.1$
$R^2 = 0.8161$

◆ The Tap London Road (Tap)

Summary

No exceedance, short-term moderately beneficial, long-term downwards

1. The NO_2 annual mean decreased further below the NAQO for the first time in the last 5 years.

2. The NO_2 annual mean at this kerbside monitoring location decreased by 3.91µg/m^3 (a decrease of 9.66%) between 2019 and 2020 to remain below the NAQO in 2020 (36.51µg/m^3) representing a continued AQ improvement in the short-term.

3. The 2019-2020 NO_2 mean decrease is described as moderately beneficial.

4. The NO_2 annual mean downward trend in the last 5 years represents an AQ improvement in the long-term that is consistent with the previously reported 5-year trend.

Figure F.16: 221 Fratton Road (FR-221)

y = -2.5071x + 5093.9
R² = 0.851

◆ 221 Fratton Road (FR-221)

Summary

No exceedance, short-term slightly beneficial, long-term downwards

1. The NO_2 annual mean decreased further below the NAQO.

2. The NO_2 annual mean at this roadside monitoring location decreased by 2.6µg/m^3 (a decrease of 8.30%) between 2019 and 2020 to remain below the NAQO in 2020 (28.7µg/m^3) representing a continued AQ improvement in the short-term.

3. The 2019-2020 NO_2 annual mean decrease is described as slightly beneficial.

4. The NO_2 annual mean downward trend in the last 5 years represents an AQ improvement in the long-term that is consistent with the previously reported 5-year trend.
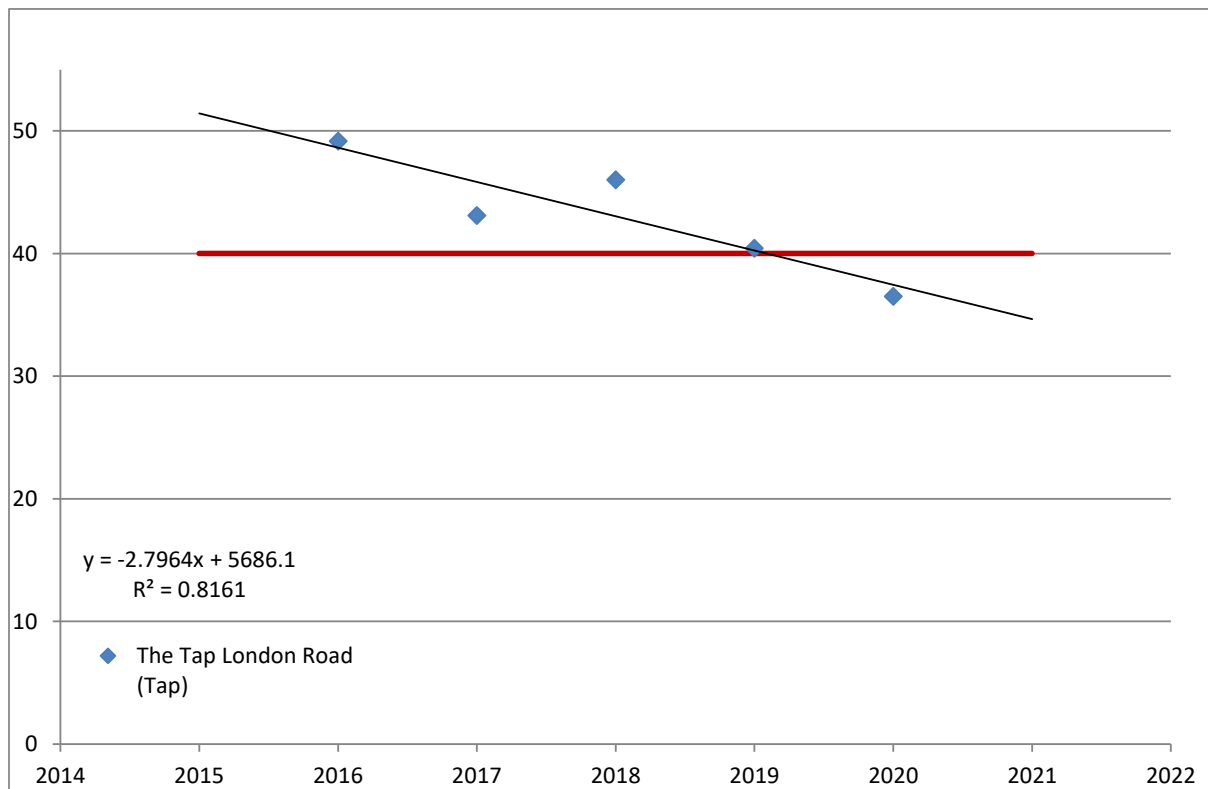
Figure F.17: 117 Kingston Road (KR-117)

Summary

No exceedance, short-term moderately beneficial, long-term downwards

1. The NO_2 annual mean decreased further below the NAQO for the third consecutive year.

2. The NO_2 annual mean at this roadside monitoring location decreased by 7.01µg/m^3 (a decrease of 18.63%) between 2019 and 2020 to remain below the NAQO in 2020 (30.62µg/m^3) representing a continued AQ improvement in the short-term.

3. The 2019-2020 NO_2 annual mean decrease is described as moderately beneficial.

4. The NO_2 annual mean downward trend in the last 5 years represents an AQ improvement in the long-term that is consistent with to the previously reported 5-year trend.

Figure F.18: Market Tavern Public House, Mile End Road (MER-MT)

The chart shows NO2 annual mean with equation:

$$y = -2.6464x + 5376.3$$
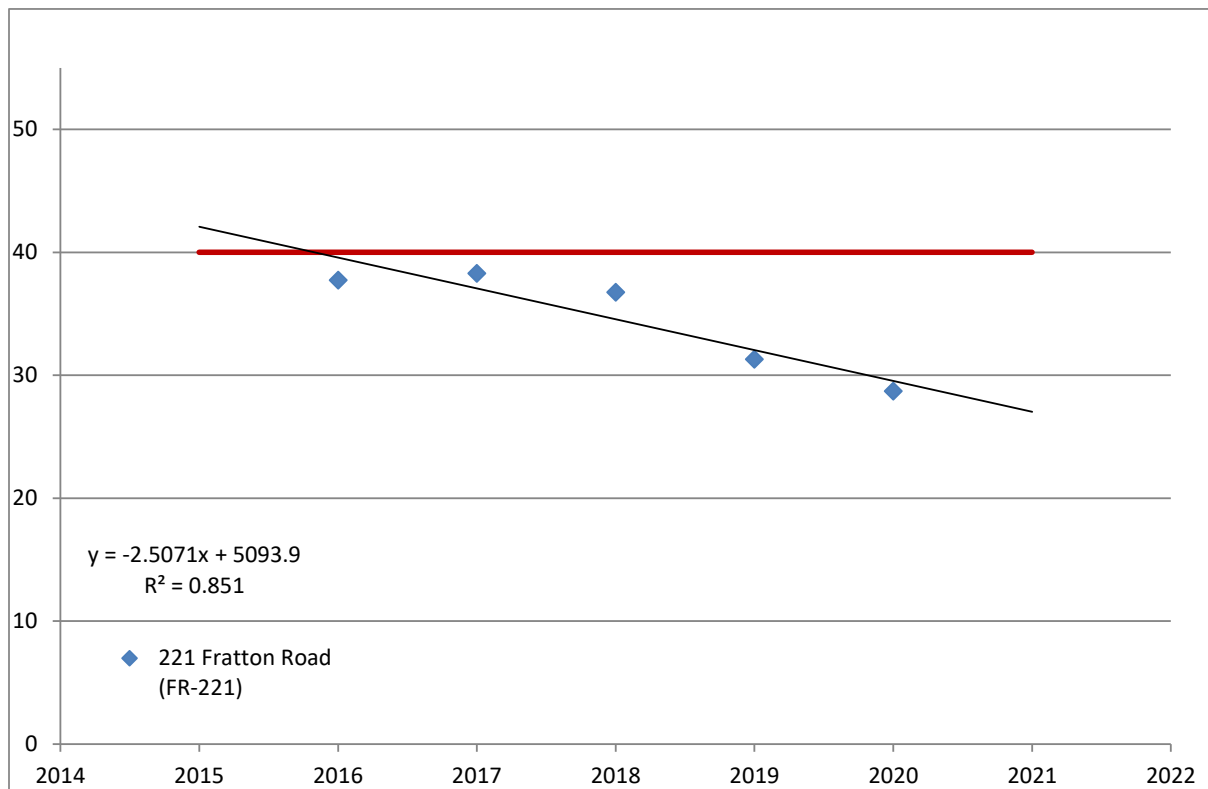$$R^2 = 0.769$$

Legend: ◆ Market Tavern (Mile End Rd) (MT)

Summary

No exceedance, short-term moderately beneficial, long-term downwards

1. The NO$_2$ annual mean decreased further below the NAQO.

2. The NO$_2$ annual mean at this roadside monitoring location decreased by 6.09µg/m^3 (a decrease of 17.76%) between 2019 and 2020 to remain below the NAQO in 2020 (28.2µg/m^3) representing a continued AQ improvement in the short-term.

3. The 2019-2020 NO$_2$ annual mean decrease is described as moderately beneficial.

4. The NO$_2$ annual mean downward trend in the last 5 years represents an AQ improvement in the long-term that is consistent with the previously reported 5-year trend.
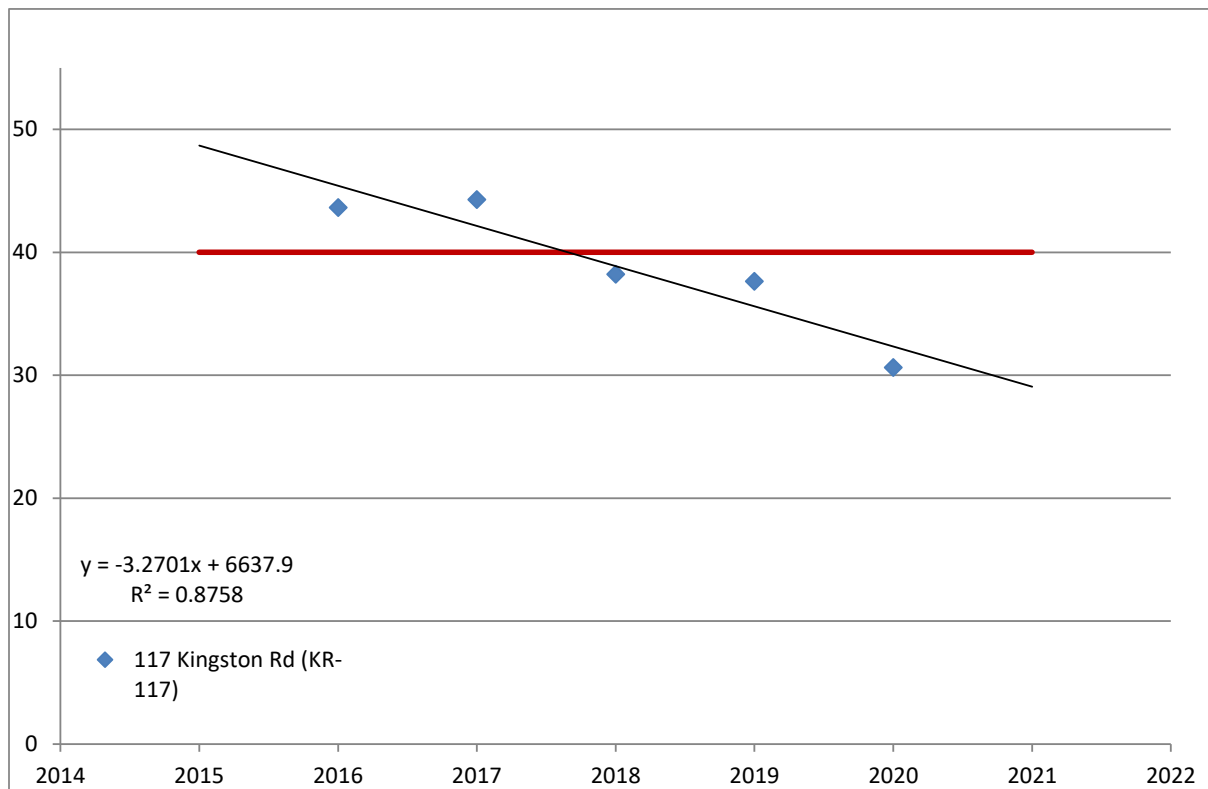
Figure F.19: 103 Elm Grove (EG-103)

Summary

No exceedance, short-term moderately beneficial, long-term downwards

1. The NO_2 annual mean decreased further below the NAQO.

2. The NO_2 annual mean at this roadside monitoring location decreased by 6.13µg/m³ (a decrease of 22.71%) between 2019 and 2020 to remain below the NAQO in 2020 (20.88µg/m³) representing a continued AQ improvement in the short-term.

3. The 2019-2020 NO_2 annual mean decrease is described as moderately beneficial.

4. The NO_2 annual mean downward trend in the last 5 years represents an AQ improvement in the long-term that is consistent with the previously reported 5-year trend.

Figure F.20: 106 Victoria Road North (VRN-106)

$y = -2.12x + 4311.2$
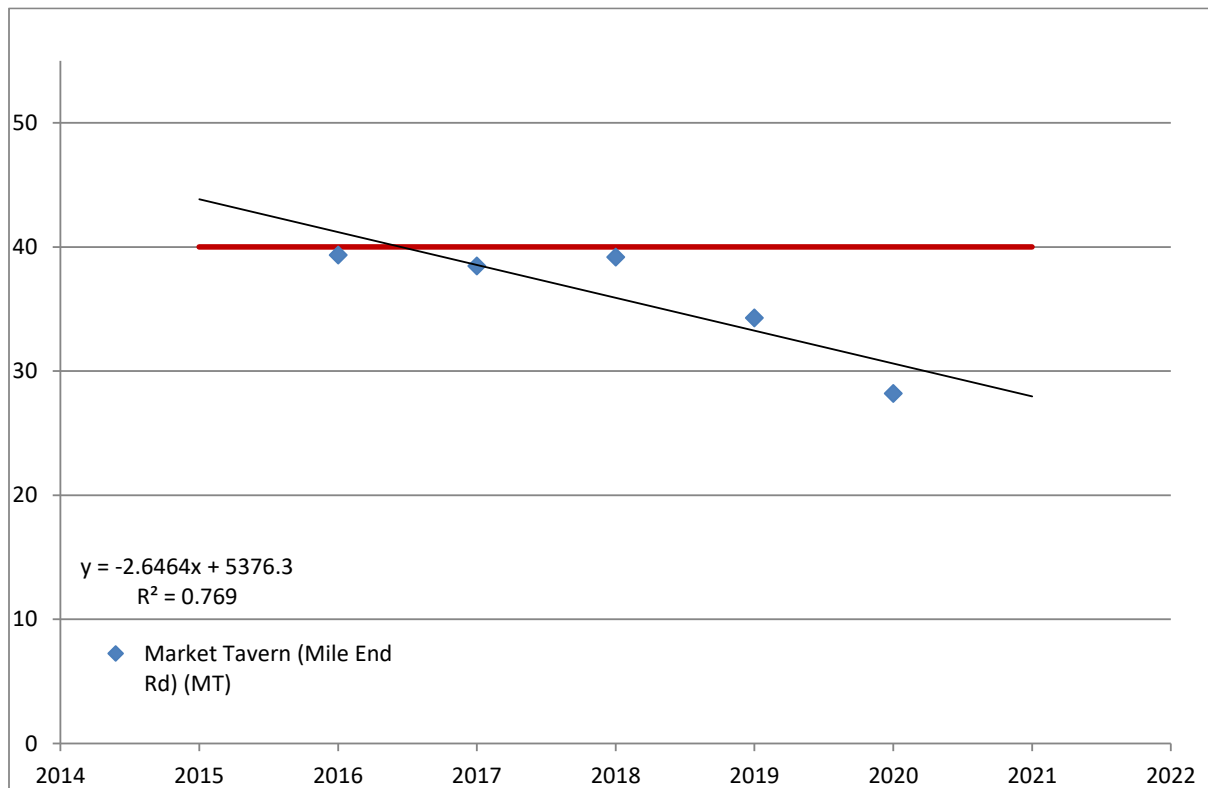$R^2 = 0.853$

106 Victoria Road North
(VRN-106)

Summary

No exceedance, short-term moderately beneficial, long-term downwards

1. The NO_2 annual mean decreased further below the NAQO.

2. The NO_2 annual mean at this roadside monitoring location decreased by 4.9µg/m^3 (a decrease of 15.22%) between 2019 and 2020 to remain below the NAQO in 2020 (27.30µg/m^3) representing a continued AQ improvement in the short-term.

3. The 2019-2020 NO_2 annual mean decrease is described as moderately beneficial.

4. The NO_2 annual mean downward trend in the last 5 years exhibits an AQ improvement in the long-term that is consistent with the previously reported 5-year trend.

Figure F.21: 116 Albert Road (AR-116)

Summary line inside chart:

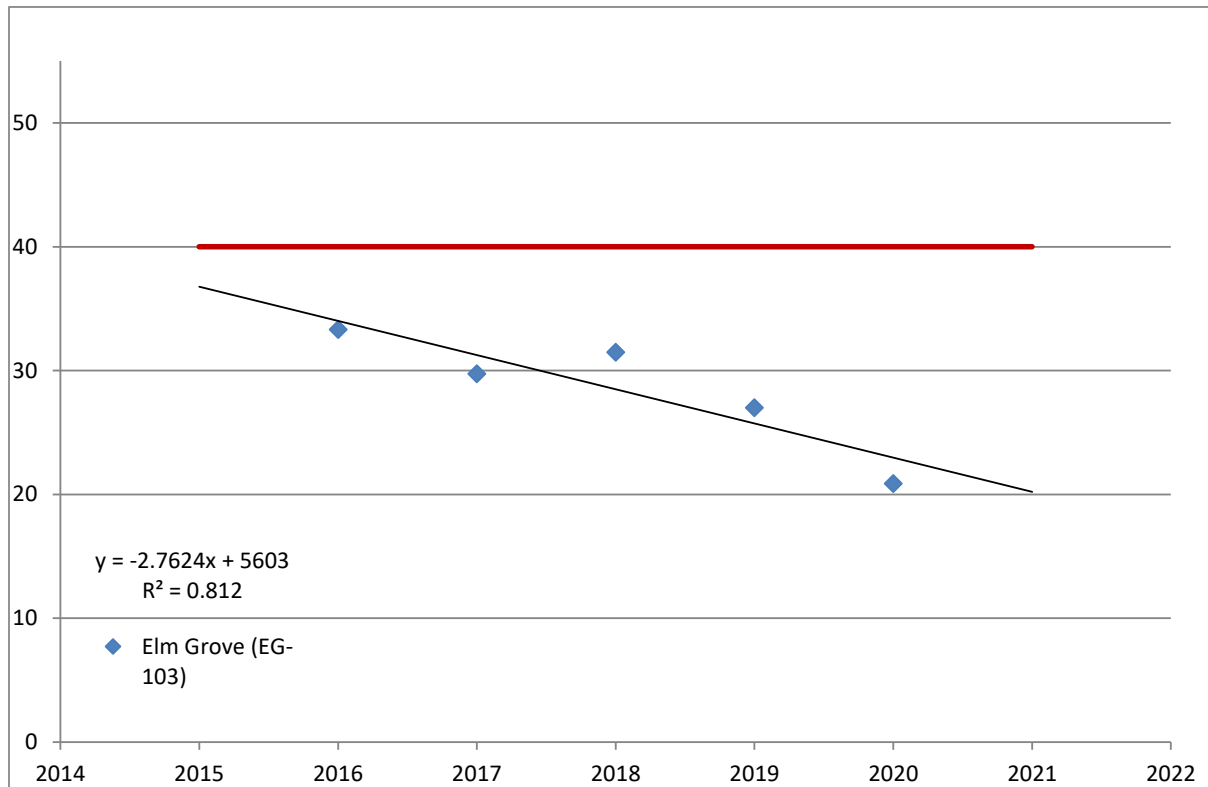y = -2.8167x + 5719.5
R² = 0.9447

◆ 118 Albert Road (AR-116)

Summary

No exceedance, short-term moderately beneficial, long-term downwards

1. The NO$_2$ annual mean decreased further below the NAQO for the fourth consecutive year.

2. The NO$_2$ annual mean at this roadside monitoring location decreased by 4.97µg/m^3 (a decrease of 14.87%) between 2019 and 2020 to remain below the NAQO in 2020 (28.44µg/m^3) representing a continued AQ improvement in the short-term.

3. The 2019-2020 NO$_2$ annual mean decrease is described as moderately beneficial.

4. The NO$_2$ annual mean downward trend in the last 5 years exhibits an AQ improvement in the long-term that is consistent with the previously reported 5-year trend.

Figure F.22: 2 Victoria Road North (VRN-2)

Summary plot with trend line:
- y-axis from 0 to 50+
- x-axis years 2014 to 2022
- Red horizontal line at 40
- Data points for 2 Victoria Road North (VRN-2)
- y = -2.0516x + 4166.8
- $R^2 = 0.7724$

Summary

No exceedance, short-term slightly beneficial, long-term downwards

1. The NO_2 annual mean decreased further below the NAQO for the fourth consecutive year.

2. The NO_2 annual mean at this roadside monitoring location decreased by 2.53µg/m^3 (a decrease of 10.32%) between 2019 and 2020 to remain below the NAQO in 2020 (21.96µg/m^3) representing a continued AQ improvement in the short-term.

3. The 2019-2020 NO_2 annual mean decrease is described as slightly beneficial.

4. The NO_2 annual mean downward trend in the last 5 years exhibits an AQ improvement in the long-term that is consistent with the previously reported 5-year trend.

Figure F.23: 7 Velder Avenue (VA-7)

Chart showing NO₂ annual mean for 7 Velder Avenue (VA-7) from 2014 to 2022 with trend line equation $y = -2.3372x + 4751.3$ and $R^2 = 0.7588$.
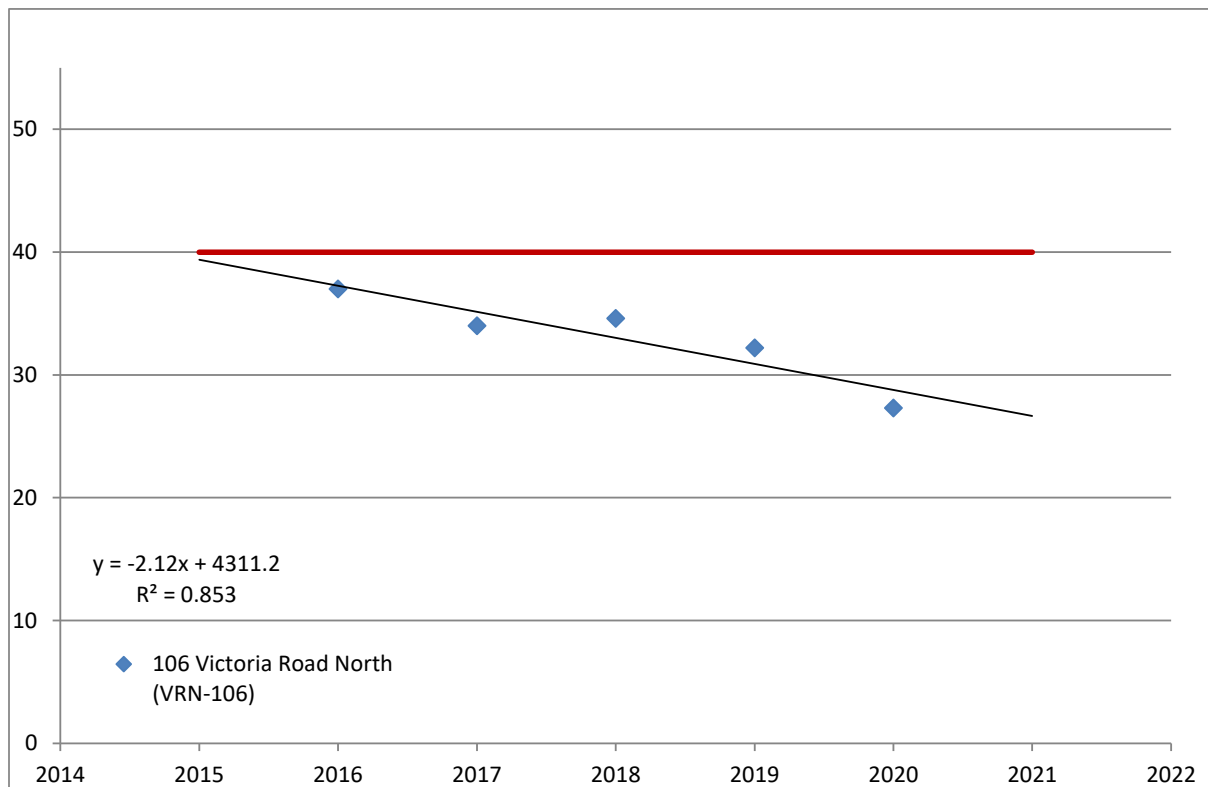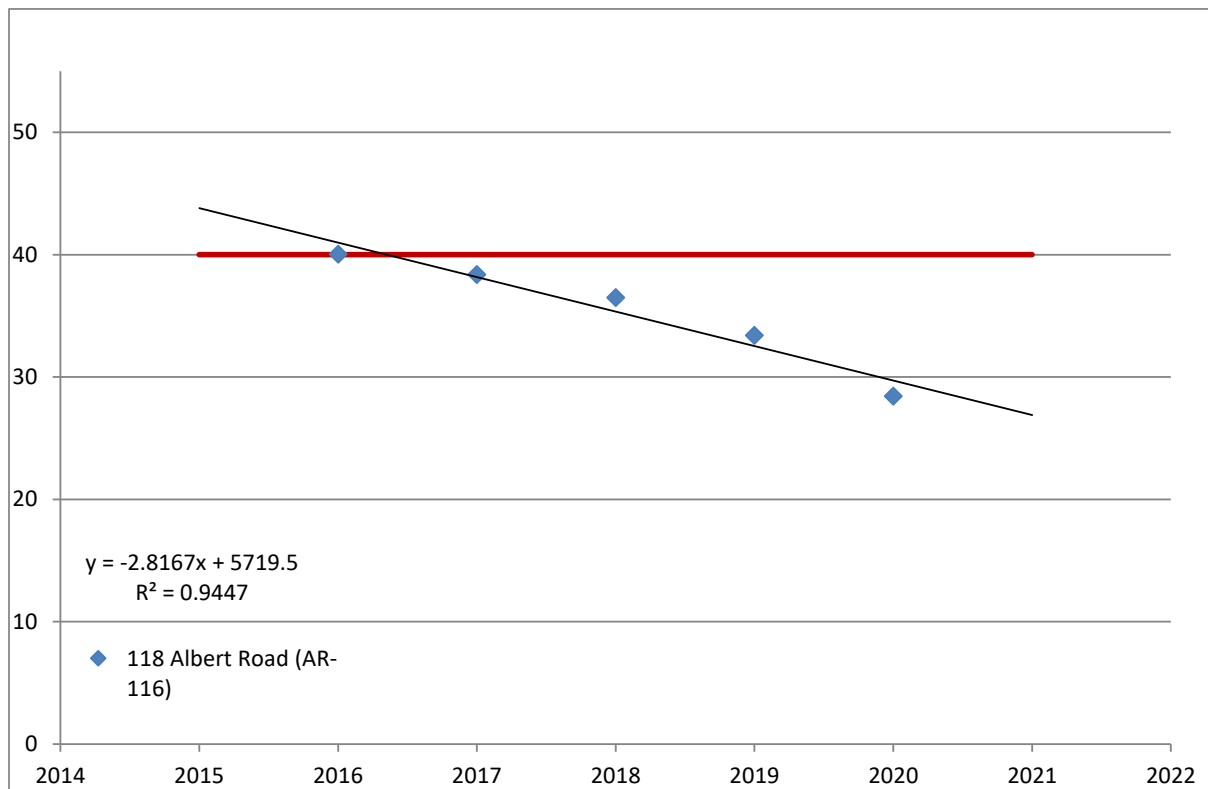
Summary

No exceedance, short-term moderately beneficial, long-term downwards

1. The NO_2 annual mean decreased further below the NAQO for the fourth consecutive year.

2. The NO_2 annual mean at this roadside monitoring location decreased by 4.79µg/m^3 (a decrease of 14.34%) between 2019 and 2020 to remain below the NAQO in 2020 (28.59µg/m^3) representing a continued AQ improvement in the short-term.

3. The 2019-2020 NO_2 annual mean decrease is described as moderately beneficial.

4. The NO_2 annual mean downward trend in the last 5 years represents an AQ improvement in the long-term that is consistent with the previously reported 5-year trend.

Figure F.24: 136 Eastney Road (ER-136)

Summary

No exceedance, short-term slightly beneficial, long-term downwards

1. The NO_2 annual mean decreased further below the NAQO.

2. The NO_2 annual mean at this roadside monitoring location decreased by 2.22µg/m³ (a decrease of 9.26%) between 2019 and 2020 to remain below the NAQO in 2020 (21.79µg/m³) representing a continued AQ improvement in the short-term.

3. The 2019-2020 NO_2 annual mean decrease is described as slightly beneficial.

4. The NO_2 annual mean downward trend in the last 5 years representing an AQ improvement in the long-term that is consistent with the previously reported 5-year trend.

Figure F.25: Sovereign Gate, Commercial Road (CR- UF)

Figure plotting NO2 annual mean with trend line equation $y = -2.6773x + 5435.2$ and $R^2 = 0.8799$. Legend: Sovereign Gate, Commercial Rd (UF)
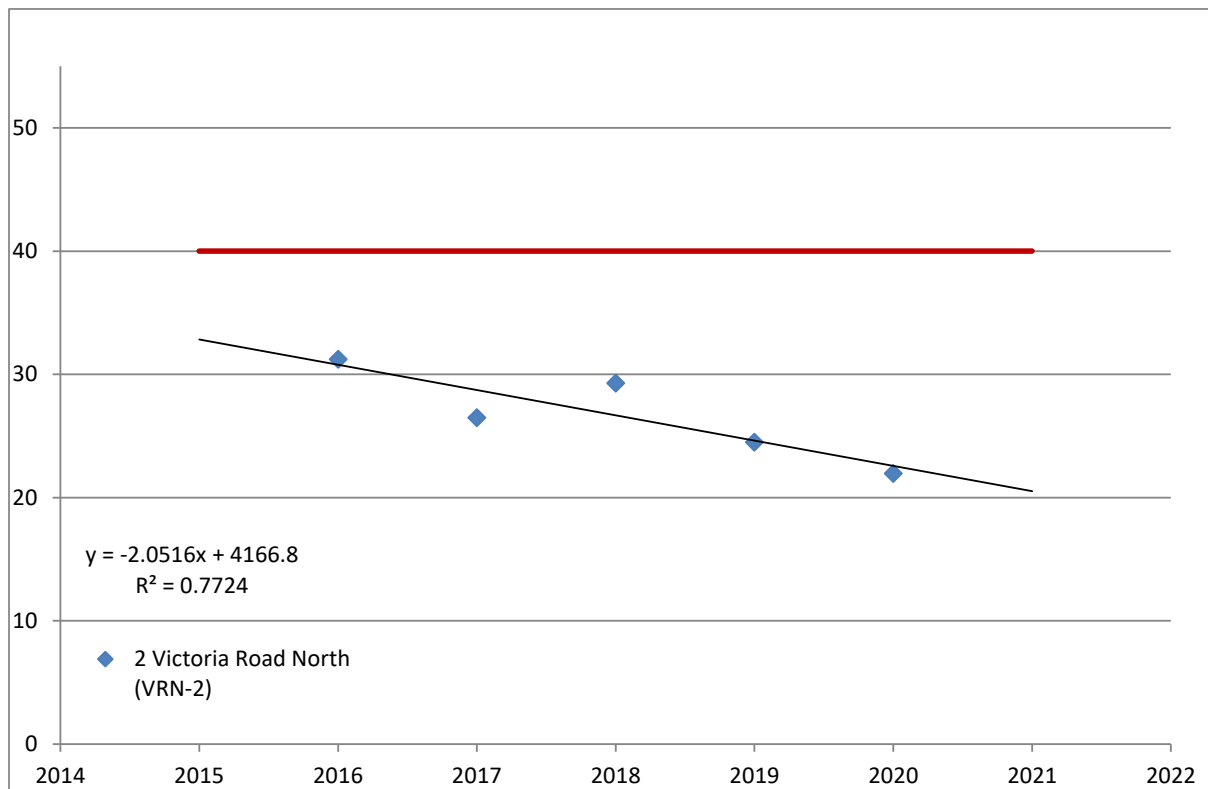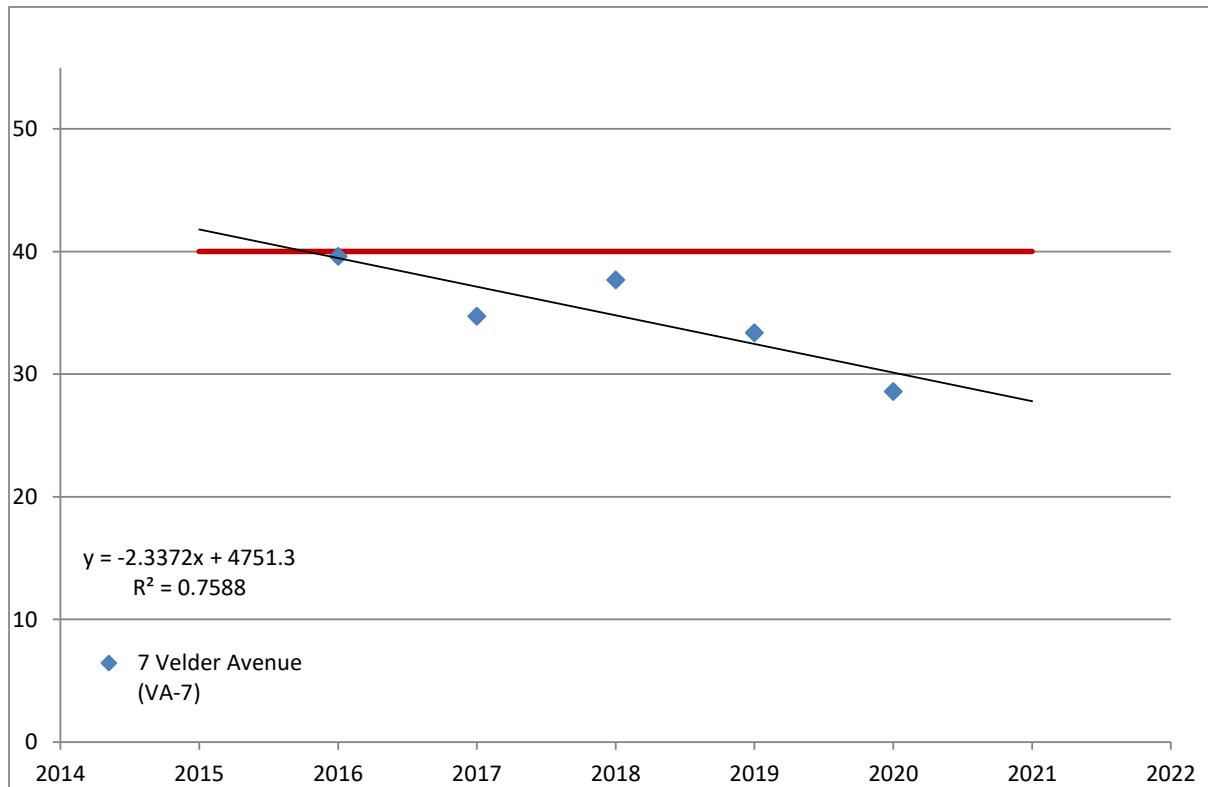
Summary

No exceedance, short-term moderately beneficial, long-term downwards

1. The NO_2 annual mean decreased further below the NAQO.

2. The NO_2 annual mean at this roadside monitoring location decreased by 5.75µg/m^3 (a decrease of 18.55%) between 2019 and 2020 to remain below the NAQO in 2020 (25.26µg/m^3) representing a continued AQ improvement in the short-term.

3. The 2019-2020 NO_2 annual mean decrease is described as moderately beneficial.

4. The NO_2 annual mean downward trend in the last 5 years represents an AQ improvement in the long-term that is consistent with the previously reported 5-year trend.

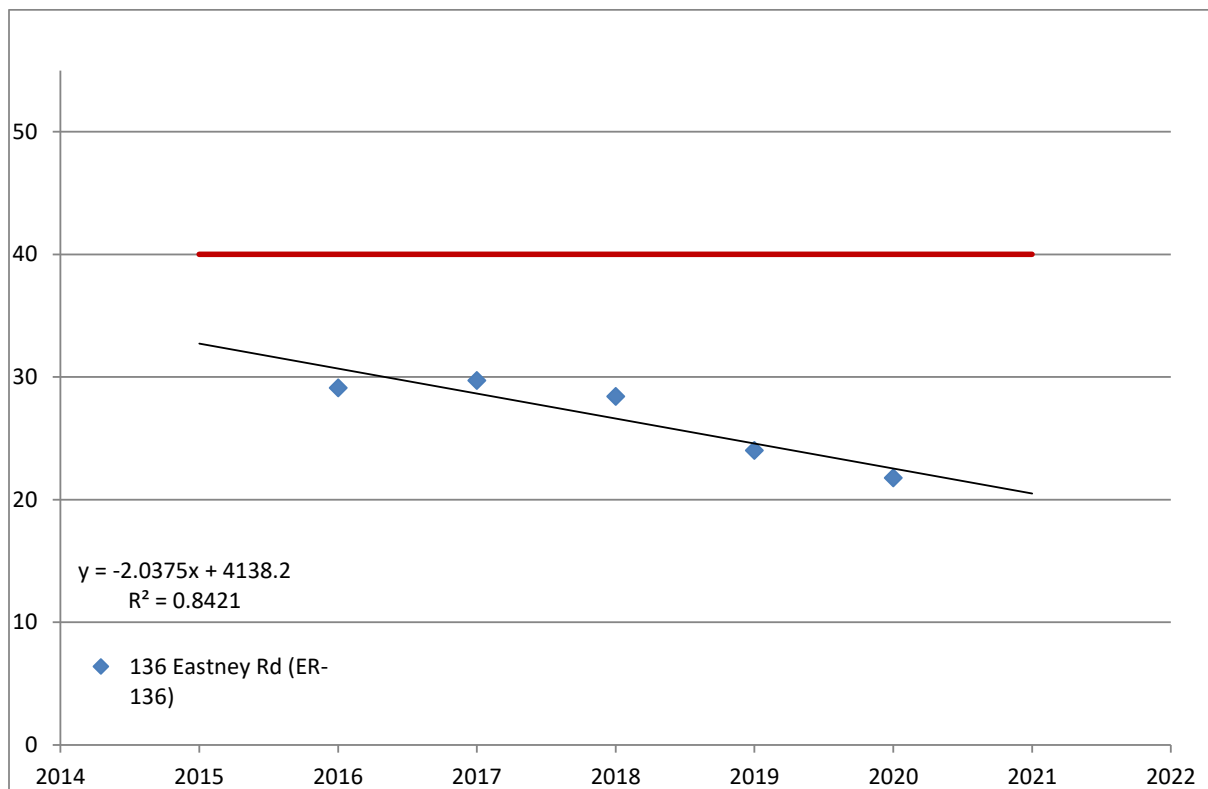**Figure F.26: 11/12 Hampshire Terrace (HT-AM)**

Summary

No exceedance, short-term moderately beneficial, long-term downwards

1. The NO_2 annual mean decreased further below the NAQO.

2. The NO_2 annual mean at this roadside monitoring location decreased by 5.56µg/m^3 (a decrease of 20.65%) between 2019 and 2020 to remain below the NAQO in 2020 (21.36µg/m^3) representing a continued AQ improvement in the short-term.

3. The 2019-2020 NO_2 annual mean decrease is described as moderately beneficial.

4. The NO_2 annual mean downward trend in the last 5 years represents an AQ improvement in the long-term that is consistent with the previously reported 5-year trend.

Figure F.27: Parade Court, London Road (LR-PC)

Summary

No exceedance, short-term moderately beneficial, long-term downwards

1. The NO_2 annual mean decreased further below the NAQO.

2. The NO_2 annual mean at this roadside monitoring location decreased by 4.50µg/m^3 (a decrease of 17.7%) between 2019 and 2020 to remain below the NAQO in 2020 (20.94µg/m^3) representing a continued AQ improvement in the short-term.

3. The 2019-2020 NO_2 annual mean decrease is described as moderately beneficial.

4. The NO_2 annual average downward trend in the last 5 years represents an AQ improvement in the long-term that is consistent with the previously reported 5-year trend.
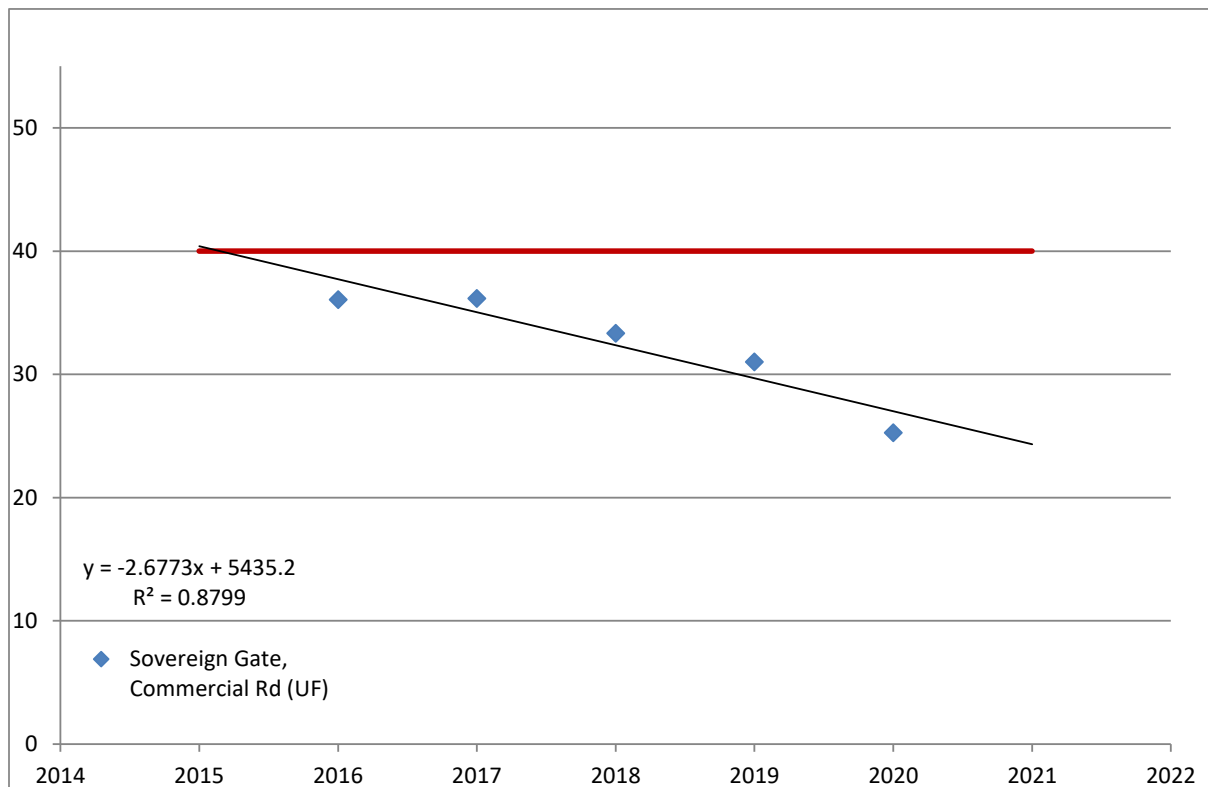
Figure F.28: London Road CAQMS (LR-C2)

$$y = -2.1232x + 4324.5$$
$$R^2 = 0.586$$

Summary

No exceedance, short-term moderately beneficial, long-term downwards

1. The NO_2 annual mean decreased below the NAQO for the first time in the last five years.

2. The NO_2 annual mean at this kerbside monitoring location decreased by 8.12µg/m^3 (a decrease of 20.06%) between 2019 and 2020 to drop below the NAQO in 2020 (32.34µg/m^3) representing a AQ improvement in the short-term.

3. The 2019-2020 NO_2 annual mean decrease is described as moderately beneficial.

4. The NO_2 annual mean downward trend in the last 5 years represents an AQ improvement in the long-term that is not consistent with the previously reported 5-year trend.

Figure F.29: Burrfields Road, CAQMS (BR-C6)
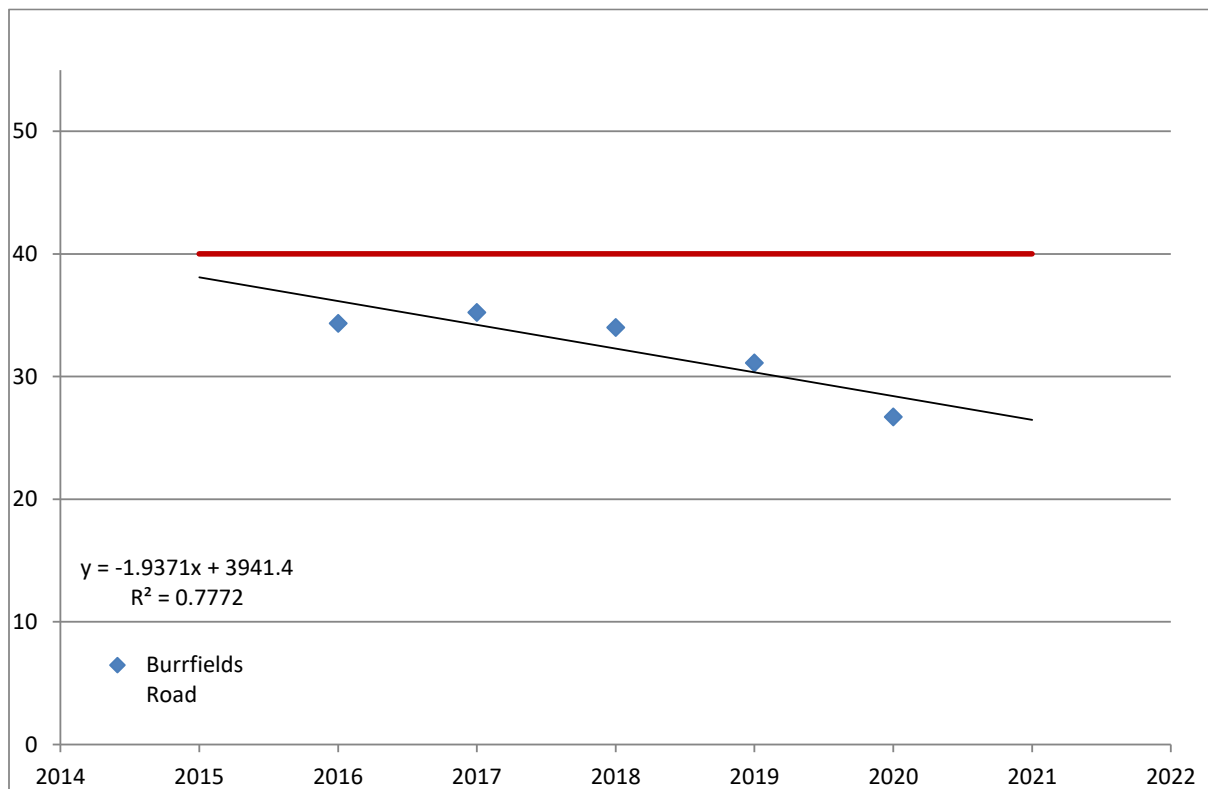
$$y = -1.9371x + 3941.4$$
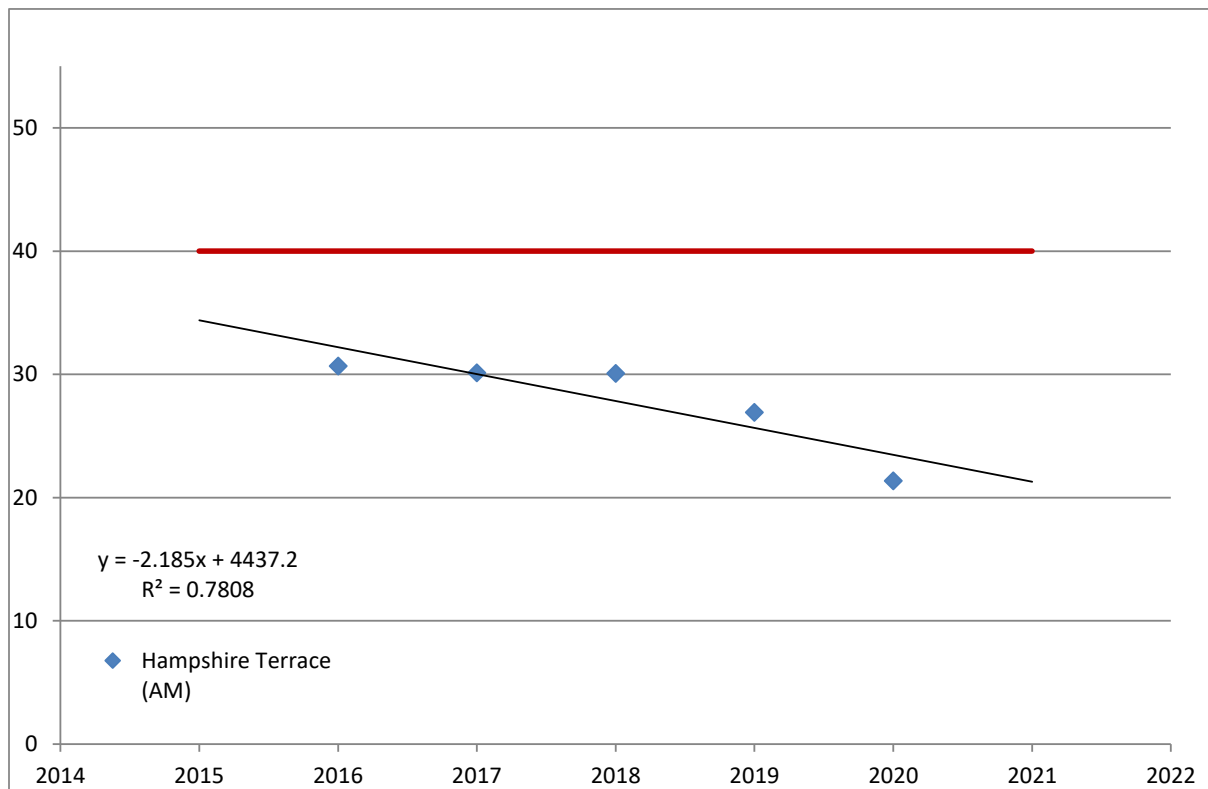$$R^2 = 0.7772$$

◆ Burrfields Road

Summary

No exceedance, short-term moderately beneficial, long-term downwards

1. The NO_2 annual mean decreased further below the NAQO.

2. The NO_2 annual mean at this kerbside monitoring location decreased by 4.56µg/m^3 (a decrease of 14.64%) between 2019 and 2020 to remain below the NAQO in 2020 (26.56µg/m^3) representing a continued AQ improvement in the short-term.

3. The 2019-2020 NO_2 annual mean decrease is described as moderately beneficial.

4. The NO_2 annual mean downward trend in the last 5 years represents an AQ improvement in the long-term that is consistent with the previously reported 5-year trend.

Figure F.30: Mile End Road, CAQMS (MER-C7)
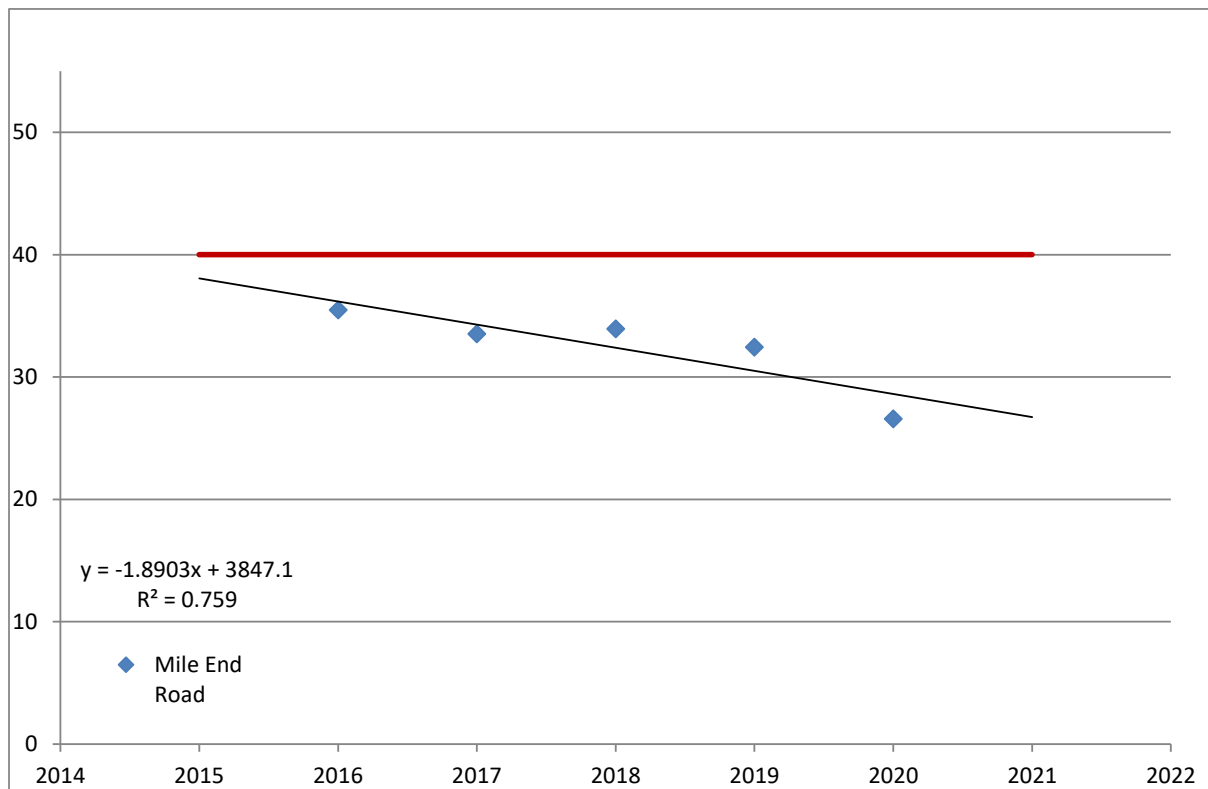
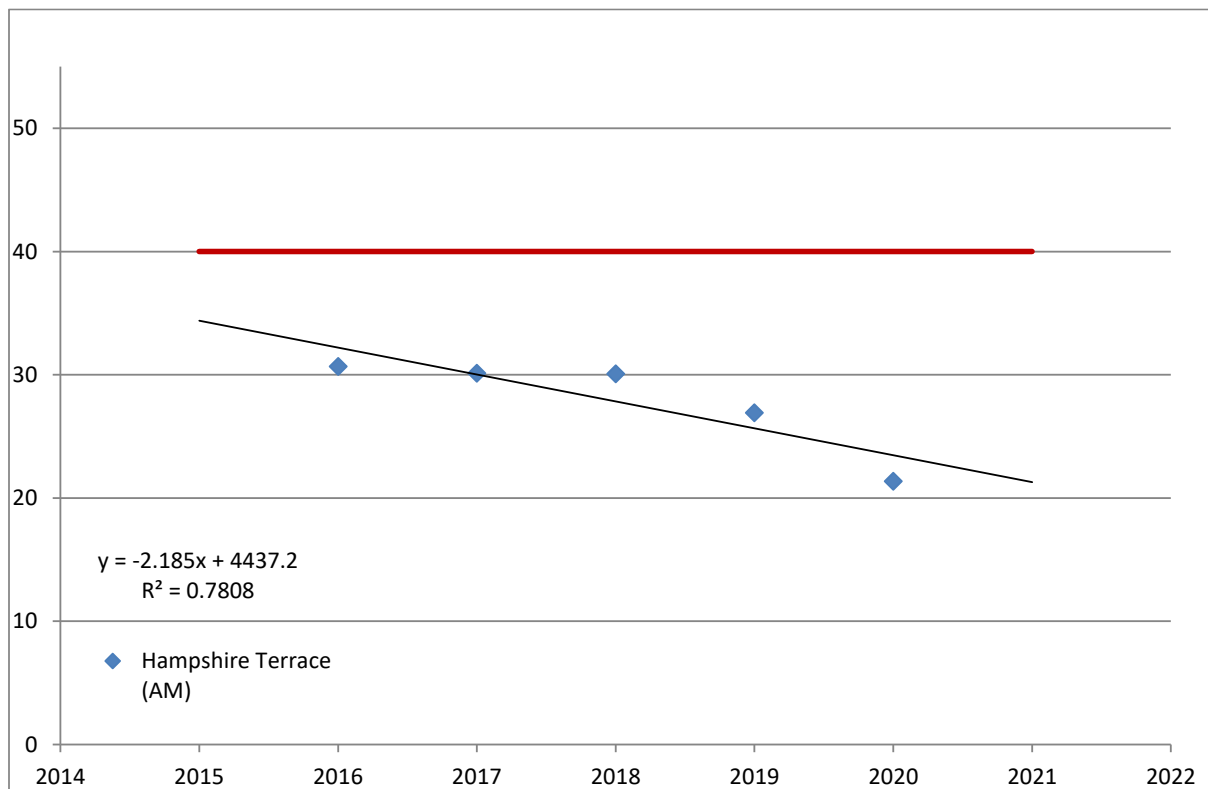$$y = -1.8903x + 3847.1$$
$$R^2 = 0.759$$

Summary

No exceedance, short-term moderately beneficial, long-term downwards

1. The NO_2 annual mean decreased further below the NAQO.

2. The NO_2 annual mean at this kerbside monitoring location decreased by 5.89µg/m^3 (a decrease of 14.64%) between 2019 and 2020 to remain below the NAQO in 2020 (26.55µg/m^3) representing a continued AQ improvement in the short-term.

3. The 2019-2020 NO_2 annual mean decrease is described as moderately beneficial.

4. The NO_2 annual mean downward trend in the last 5 years represents an AQ improvement in the long-term that is consistent with to the previously reported 5-year trend.

Figure F.31: DEFRA's Anglesea Road CAQMS (DEFRA-C8)
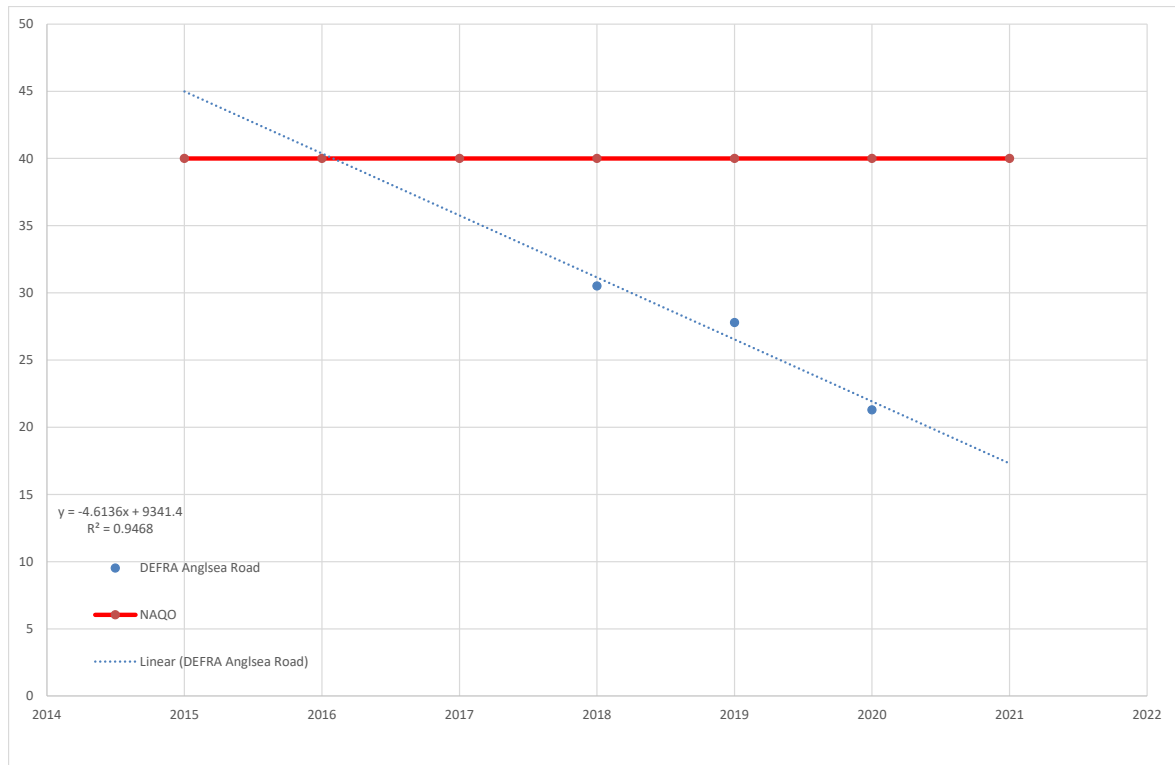
$y = -4.6136x + 9341.4$
$R^2 = 0.9468$

● DEFRA Anglsea Road

━━━ NAQO

⋯⋯⋯ Linear (DEFRA Anglsea Road)

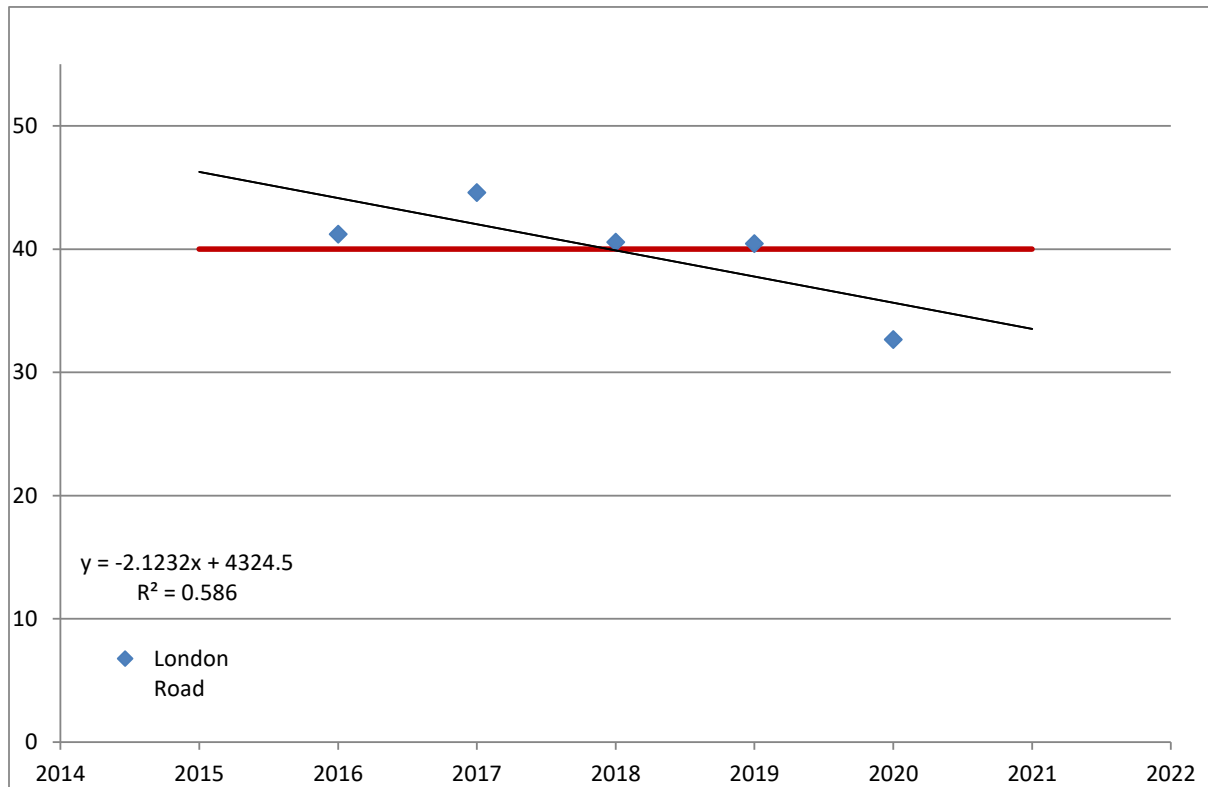*Summary*

No exceedance, short-term moderately beneficial, long-term downwards

1. The NO$_2$ annual mean remained below the NAQO for the third monitored consecutive year.

2. The NO$_2$ annual mean at this roadside monitoring location decreased further by 6.51µg/m^3 (a decrease of 23.41%) between 2019 and 2020 and remained below the NAQO in 2020 (21.29µg/m^3) representing an AQ improvement in the short-term.

3. The 2019-2020 NO$_2$ annual mean decrease is described as moderately beneficial.

4. The NO$_2$ annual mean downward trend in the last 3 years represents an AQ improvement in the long-term.

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 2020 (%) [2]	NO₂ 1-Hour Means > 200µg/m³ [3]				
					2016	2017	2018	2019	2020
C2	Kerbside	Automatic		99	0	0	0	0	0
C4	Urban background	Automatic		14.75	0	0	0	0	
C6	Roadside	Automatic		99.46	0	0	0	0	0
C7	Roadside	Automatic		99.78	0	0	0	0	1
C8	Roadside	Automatic		98.91			1	0	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 NO$_2$ 1-Hour Means > 200μg/m^3

There has been no NO$_2$ hourly mean level in excess of 200μg/m^3 at any of PCC owned CAQMSs since 2015 through to 2020 with the exception of DEFRA's CAQMS that registered one incident as illustrated above.

Figure A.2 – Trends in Number of NO$_2$ 1-Hour Means > 200μg/m^3

Portsmouth City Council

Table A.5 – Annual Mean PM$_{10}$ Monitoring Results

Site ID	Site Type	Valid Data Capture for Monitoring Period (%) [1]	Valid Data Capture 2020 (%) [2]	PM$_{10}$ Annual Mean Concentration (μg/m^3) [3]				
				2016	2017	2018	2019	2020
C2	Kerbside		82.45	20.04	19.71	17.72	17.79	14.86
C4	Urban background		15.35	18.15	14.65	14.67	15.08	16.62
C6	Roadside			19.75	19.96	21.69		
C7	Roadside		78.93	11.88	16.11	16.78	14.74	14.9
C8	Roadside		90.96			19.3	19.49	18.25

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

Data highlighted in red was not analysed given that the data capture was below 25%.

Notes:

Exceedances of the PM$_{10}$ annual mean objective of 40μg/m^3 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) 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.

Figure A.3 – Trends in Annual Mean PM$_{10}$ Concentrations

In this section, the trends in annual mean PM$_{10}$ concentrations for the individual long term CAQMs are illustrated in Figures F32 to F35.

Figure F.32: London Road CAQMS (LR-C2)

$$y = -1.228x + 2496.1$$
$$R^2 = 0.8837$$

- C2 London Road (Kerbside)
- NAQO
- Linear (C2 London Road (Kerbside))

Summary

No exceedance, short-term slightly beneficial, long-term downwards

1. The PM_{10} annual mean remained considerably below the NAQO in the last 5 years.

2. The PM_{10} annual mean at this kerbside monitoring location decreased by $2.93\mu g/m^3$ (a decrease of 16.47%) between 2019 and 2020 and remains below the NAQO in 2020 ($14.86\mu g/m^3$) representing an AQ improvement in the short-term.

3. The 2019-2020 PM_{10} annual mean change is described as being slightly beneficial.

4. The PM_{10} annual mean represents a downward trend in the last 5 years demonstrating an AQ improvement in the long-term in line with the previously reported 5-year trend.

Figure F.33: Gatcombe Park CAQMS (AURN-C4)

$y = -0.263x + 546.57$
$R^2 = 0.0743$

◆ C4 Gatcombe Park (Urban background)

━━━ NAQO

──── Linear (C4 Gatcombe Park (Urban background))

Summary

No exceedance, short-term negligibly adverse, long-term downwards

1. The PM_{10} annual mean has remained considerably below the NAQO in the last 5 years.

2. The PM_{10} annual mean at this urban-background monitoring location increased by $1.54\mu g/m^3$ (an increase of 10.21%) between 2019 and 2020 and remains below the NAQO in 2020 ($16.62\mu g/m^3$) representing an AQ deterioration in the short-term for the third consecutive year.

3. The 2018-2019 PM_{10} annual mean change is described as being negligibly adverse.

4. The PM_{10} annual mean exhibits a downward trend in the last 5 years demonstrating an AQ improvement in the long-term in line with the previously reported 5-year trend.

Figure F.34: Mile End Road CAQMS (MER-C7)

The chart shows data with the equation $y = 0.467x - 927.52$ and $R^2 = 0.1542$.

Legend:
- C7 Mile End Road (Roadside)
- NAQO
- Linear (C7 Mile End Road (Roadside))

Summary

No exceedance, short-term negligibly adverse, long-term upwards

1. The PM_{10} annual mean has remained considerably below the NAQO in the last 5 years.

2. The PM_{10} annual mean at this roadside monitoring location decreased by $0.16\mu g/m^3$ (a decrease of 1.09%) between 2019 and 2020 and remains below the NAQO in 2020 ($14.9\mu g/m^3$) representing an AQ improvement in the short-term.

3. The 2018-2019 PM_{10} annual mean change is described as being negligibly adverse.

4. The PM_{10} annual mean represents an upward trend in the last 5 years demonstrating an AQ deterioration in the long-term contrary to the previously reported 5-year trend.

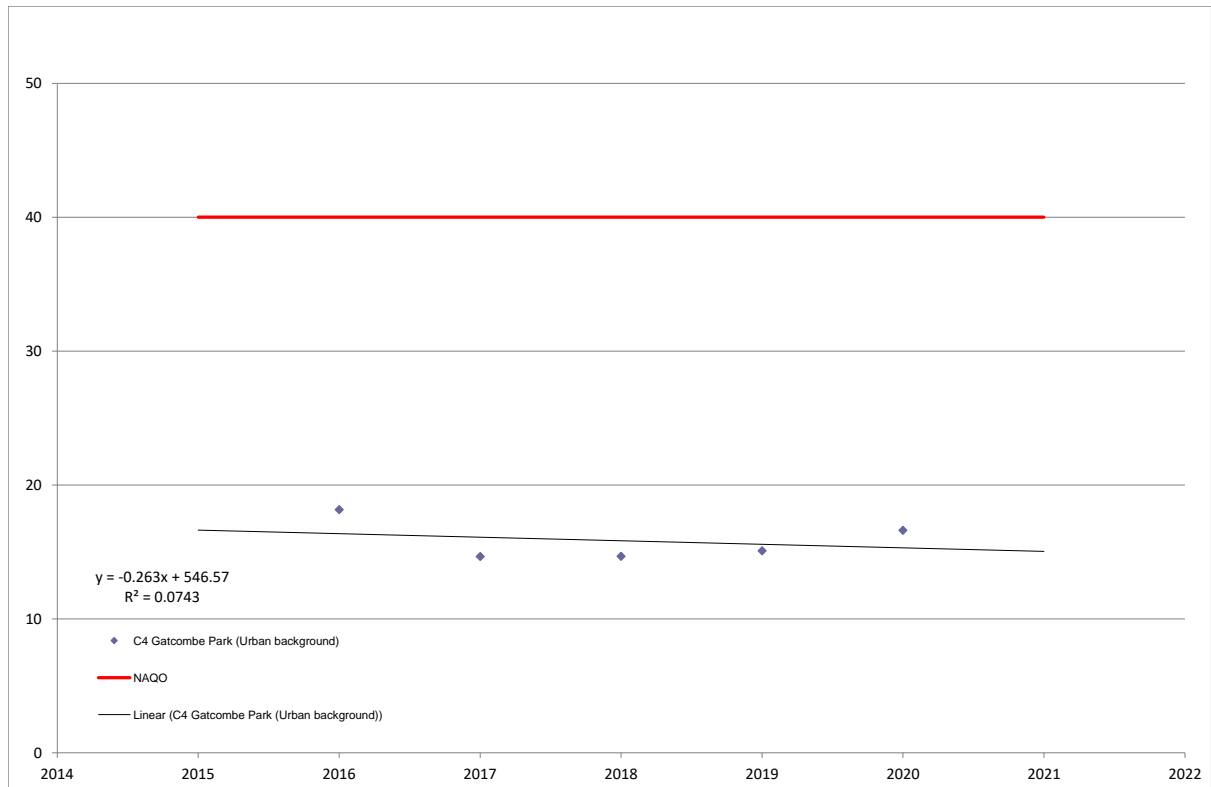**Figure F.35: DEFRA's Anglesea Road CAQMS (DEFRA/AR-C8)**

Summary

No exceedance, short-term negligibly beneficial, long-term downwards

1. The PM_{10} annual mean has remained considerably below the NAQO in the last 5 years.

2. The PM_{10} annual mean at this roadside monitoring location decreased by 1.24µg/m^3 (a decrease of 3.10%) between 2019 and 2020 and remains below the NAQO in 2019 (18.25µg/m^3) representing an AQ improvement in the short-term.

3. The 2019-2020 PM_{10} annual mean change is described as being negligibly beneficial.

4. The PM_{10} annual mean represents a downward trend in the last 3 years, demonstrating an AQ improvement in the long-term.

Table A.6 – 24-Hour Mean PM$_{10}$ Monitoring Results

Site ID	Site Type	Valid Data Capture for Monitoring Period (%) [1]	Valid Data Capture 2020 (%) [2]	PM$_{10}$ 24-Hour Means > 50µg/m^3 [3]				
				2016	2017	2018	2019	2020
C2	Kerbside		82.45	1	4	5	0	1
C4	Urban background		15.35	2	0	0	1	0
C6	Roadside			1	1	3		
C7	Roadside		78.93	0	1	5	0	1
C7	Roadside		90.96			1	2	2

Data highlighted in red was not annualised given that the data capture was below 25%

Notes:

Exceedances of the PM$_{10}$ 24-hour mean objective (50µg/m^3 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.4 – Trends in Number of 24-Hour Mean PM$_{10}$ Results >50µg/m^3

In this section, the trends in the number of the 24-Hour (Daily) Mean PM$_{10}$ concentrations in excess of 50µg/m^3 cross all four long term CAQMs as illustrated in Figure F36 to F40.

Figure A.4 – Trends in Number of 24-Hour Mean PM$_{10}$ Results >50µg/m^3

Figure F.36: Trends in the number of the 24-Hour (Daily) Mean PM$_{10}$ concentrations in excess of 50μg/m^3 cross all four long term CAQMs
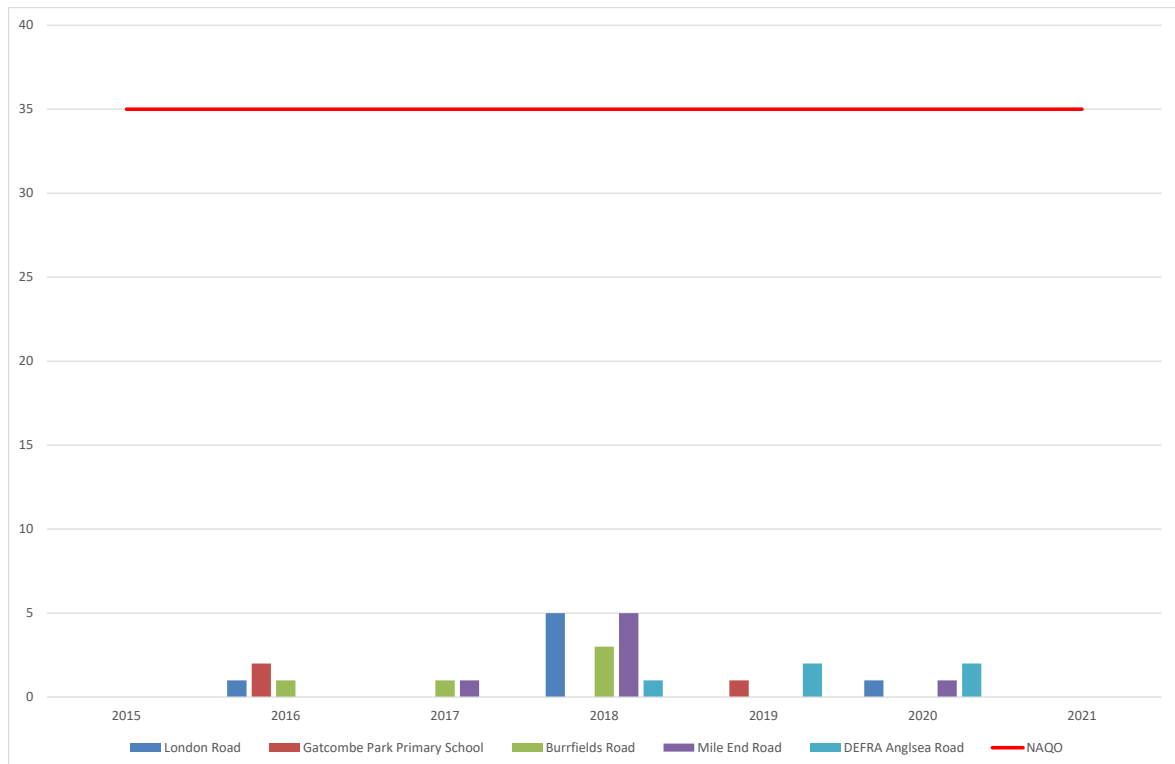
Figure F.37: London Road 24-hour PM$_{10}$ CAQMS (LR-C2)
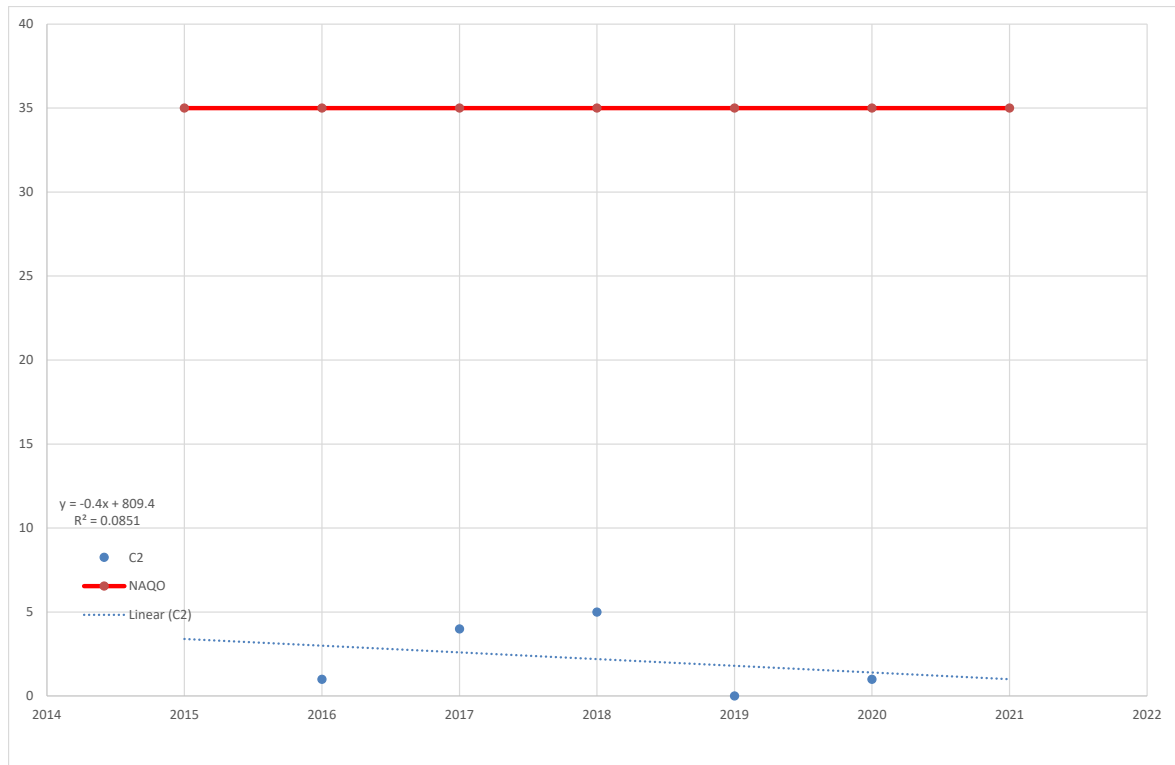
Summary

No exceedance, short-term adverse, long-term downwards

1. The number of 24 hour mean of PM$_{10}$ levels in excess 50µg/m^3 remain well below 35 occurrences per annum. Representing no exceedance of the NAQO in 2020.

2. The number of the 24 hour mean of PM$_{10}$ levels in excess 50µg/m^3 remains considerably below the NAQO in the last 5 years.

3. The number of 24 hour mean of PM$_{10}$ levels in excess 50µg/m^3 increased by 1 occurrence between 2019 and 2020 representing an AQ deterioration in the short term.

4. The number of the 24 hour mean of PM$_{10}$ levels in excess 50µg/m^3 represent a downward trend in the last 5 years representing an AQ improvement in the long-term.

Figure F.38: Gatcombe Park PM$_{10}$ CAQMS (AURN-C4)
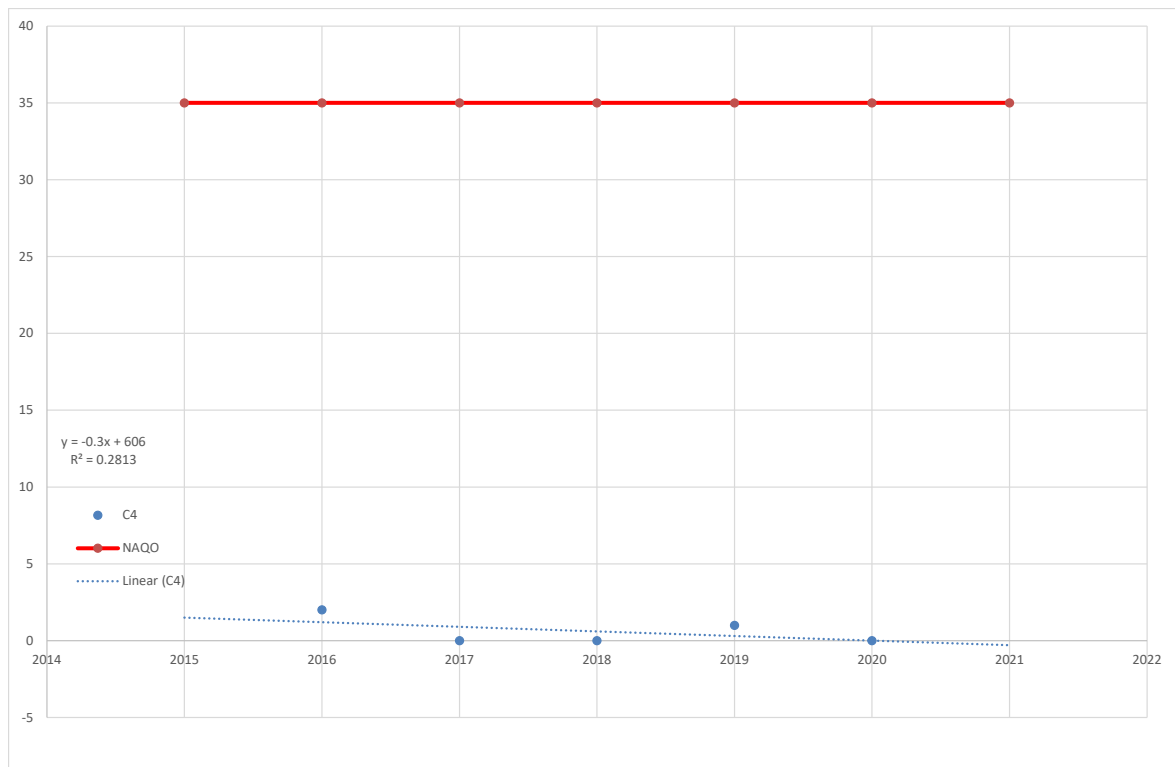
Summary

No exceedance, short-term beneficial, long-term downwards

1. The number of 24 hour mean PM$_{10}$ levels in excess 50µg/m^3 remain well below 35 occurrences per annum. Representing no exceedance of the NAQO in 2020.

2. The number of the 24 hour mean PM$_{10}$ levels in excess 50µg/m^3 remains considerably below the NAQO in the last 5 years.

3. The number of 24 hour mean PM$_{10}$ levels in excess 50µg/m^3 decreased by one occurrence between 2019 and 2020 representing an AQ improvement in the short term.

4. The number of the 24 hour mean PM$_{10}$ levels in excess 50µg/m^3 represents a downward trend in the last 5 years, demonstrating an AQ improvement in the long-term.

Figure F.39: Mile End Road PM$_{10}$ CAQMS (MER-C7)

Summary

No exceedance, short-term adverse, long-term upwards

1. The number of 24 hour mean of PM$_{10}$ levels in excess 50µg/m^3 remains well below 35 occurrences per annum representing no exceedance of the NAQO in 2020.

2. The number of the 24 hour mean PM$_{10}$ levels in excess 50µg/m^3 remains considerably below the NAQO in the last 5 years.

3. The number of 24 hour mean PM$_{10}$ levels in excess 50µg/m^3 increased by 1 occurrence between 2019 and 2020 representing an AQ deterioration in the short term.

4. The number of the 24 hour mean PM$_{10}$ levels in excess 50µg/m^3 represents an upward trend in the last 5 years, demonstrating an AQ deterioration in the long-term.

Figure F.40: DEFRA Anglesea Road PM$_{10}$ CAQMS (DEFRA-C8)
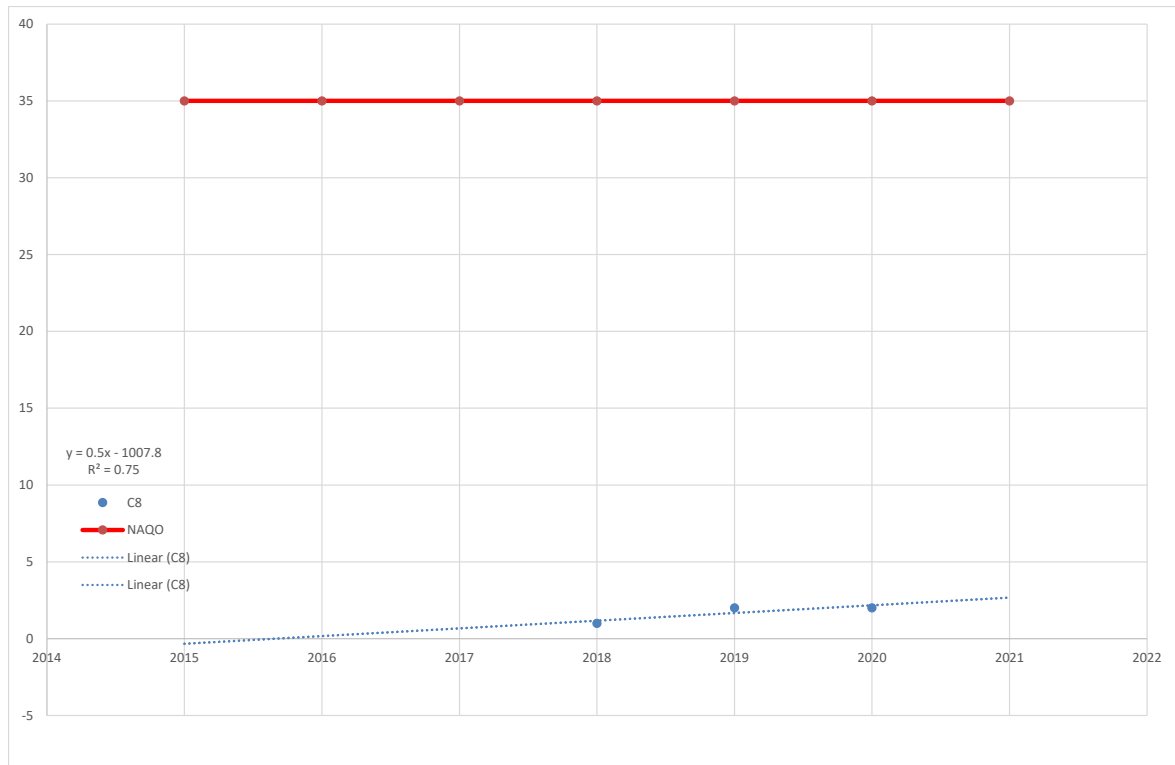
Summary

No exceedance, short-term adverse, long-term upwards

1. The number of 24 hour mean PM$_{10}$ levels in excess 50µg/m^3 remains well below 35 occurrences per annum representing no exceedance of the NAQO in 2020.

2. The number of the 24 hour mean PM$_{10}$ levels in excess 50µg/m^3 remains considerably below the NAQO in the last 5 years.

3. The number of 24 hour mean PM$_{10}$ levels in excess 50µg/m^3 remained the same between 2019 and 2020 representing no change in AQ in the short term.

4. The number of the 24 hour mean PM$_{10}$ levels in excess 50µg/m^3 represents an upward trend in the last 3 years, demonstrating an AQ deterioration in the long-term.

Table A.7 – PM_{2.5} Monitoring Results

Site ID	Site Type	Valid Data Capture for Monitoring Period (%) [1]	Valid Data Capture 2020 (%) [2]	PM$_{2.5}$ Annual Mean Concentration (µg/m³) [3]				
				2016	2017	2018	2019	2020
C2	Kerbside		100%		12.28	11.28	11.19	9.35
C4	Urban background		15.3%	11.63	11.17	12.32	8.90	9.45
C7	Roadside		82.45%		10.54	10.81	9.79	9.40

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

Data highlighted in red was not annualised given that the data capture was below 25%.

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.

Figure A.5 – Trends in Annual Mean PM$_{2.5}$ Concentrations

In this section, the trends in annual mean PM$_{2.5}$ concentrations for the long term 3 CAQMS are illustrated Figure F41 to F43.

Figure F.41: Gatcombe Park PM$_{2.5}$ CAQMS (AURN-C4)
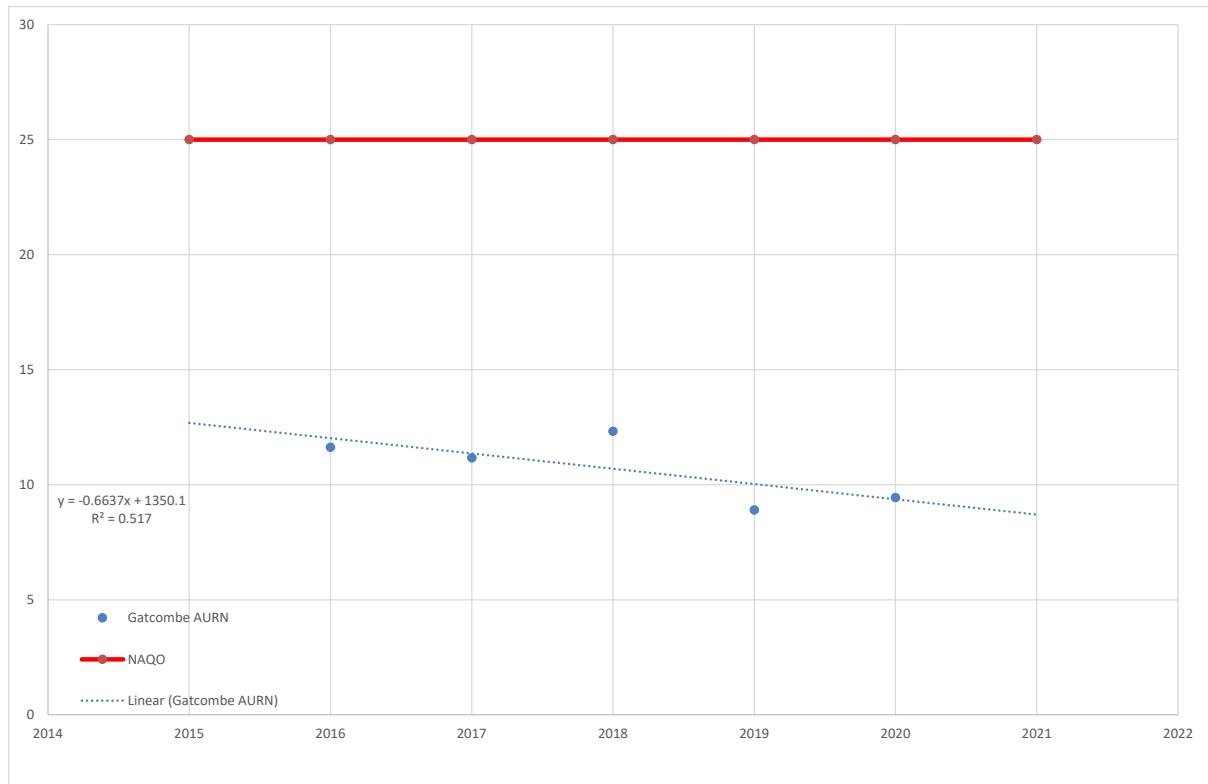
$y = -0.6637x + 1350.1$
$R^2 = 0.517$

- Gatcombe AURN
- NAQO
- Linear (Gatcombe AURN)

Summary

No exceedance, short-term negligibly adverse, long-term downwards

1. The PM$_{2.5}$ annual mean has remained considerably below the NAQO in the last 5 years.

2. The PM$_{2.5}$ annual mean at this urban-background monitoring location increased by 0.55µg/m^3 (an increase of 6.14%) between 2019 and 2020 and remains below the NAQO in 2020 (9.45µg/m^3) representing an AQ deterioration in the short-term.

3. The 2019-2020 PM$_{2.5}$ annual mean change is described as being negligibly adverse.

4. The PM$_{2.5}$ annual mean represents a downward trend in the last 5 years, demonstrating an AQ improvement in the long-term for the third consecutive 5-year trend.

Figure F.42: London Road PM₂.₅ CAQMS (R1-C2)

$$y = -0.888x + 1803.5$$
$$R^2 = 0.8815$$

- London Road
- NAQO
- Linear (London Road)

Summary

No exceedance, short-term negligibly beneficial, long-term downwards

1. The PM$_{2.5}$ annual mean has remained considerably below the NAQO for the third consecutive year.

2. The PM$_{2.5}$ annual mean at this kerbside monitoring location decreased this year again by 1.84µg/m^3 (a decrease of 16.44%) between 2019 and 2020 and remained below the NAQO in 2020 (9.34µg/m^3) representing an AQ improvement in the short-term.

3. The 2019-2020 PM$_{2.5}$ annual mean change is described as being negligibly beneficial.

4. The PM$_{2.5}$ annual mean represents a downward trend in the last 4 years demonstrating an AQ improvement in the long-term.

Figure F.43: Mile End Road PM$_{2.5}$ CAQMS (R5-C7)
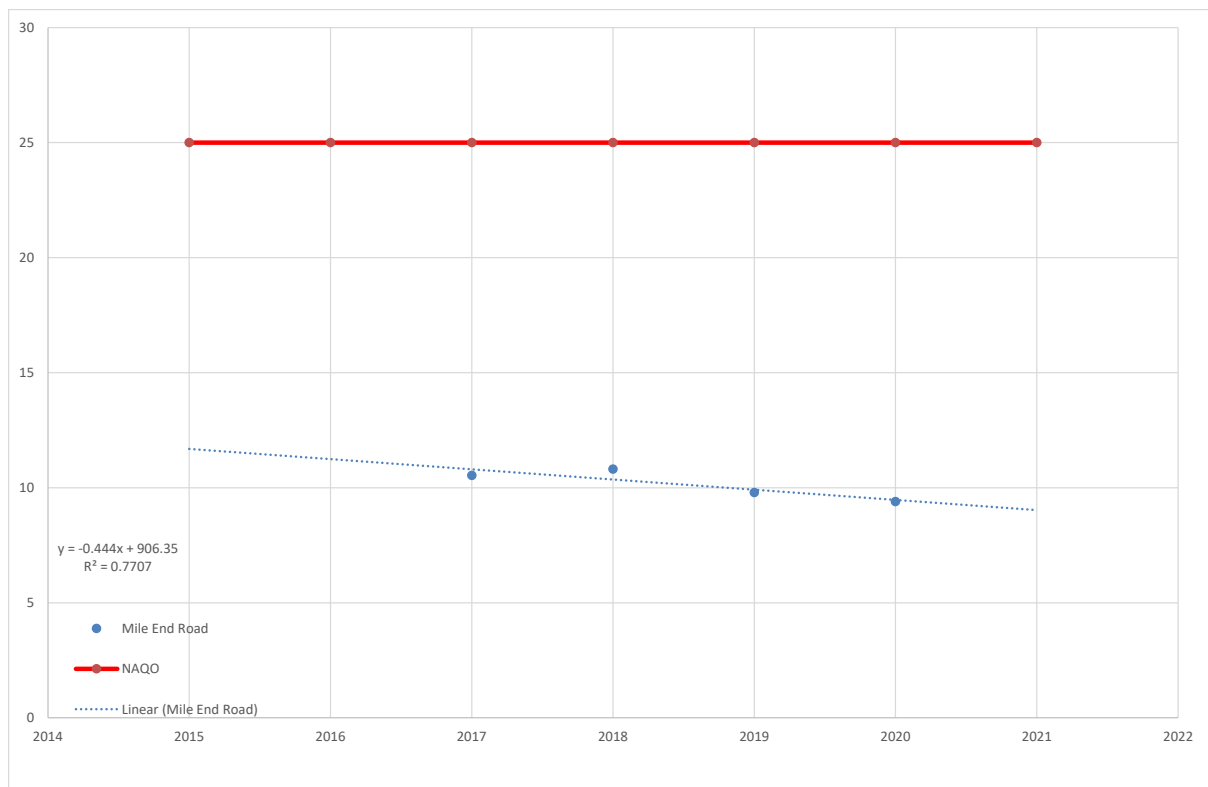
$y = -0.444x + 906.35$
$R^2 = 0.7707$

Summary

No exceedance, short-term negligibly beneficial, long-term downwards

1. The PM$_{2.5}$ annual mean has remained considerably below the NAQO for the third consecutive year.

2. The PM$_{2.5}$ annual mean at this roadside monitoring location decreased this year by 0.39µg/m^3 (a decrease of 3.98%) between 2019 and 2020 and remains below the NAQO in 2020 (9.4µg/m^3) representing an AQ improvement in the short-term.

3. The 2019-2020 PM$_{2.5}$ annual mean change is described as being negligibly beneficial.

4. The PM$_{2.5}$ annual average represents a downward trend in the last 4 years demonstrating an AQ improvement in the long-term.

Appendix B: Full Monthly Diffusion Tube Results

Table B.1 – 2020 NO₂ Monthly Diffusion Tube Results

Site ID	NO₂ Mean Concentrations (µg/m³)														
													Annual Mean		
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Raw Data	Bias Adjusted (0.822) and Annualised [1]	Distance Corrected to Nearest Exposure [2]
1	47.10	33.40	30.09	30.95	36.17	29.86		44.45	39.43	33.11	38.89	33.58	36.09	29.67	
2	19.88	14.00	13.11		15.07	10.36		17.36	16.43	13.12	20.49	17.77	15.76	12.95	
3	28.67	20.35	16.89		19.86	14.17		24.18	20.89				20.72	18.29	
4	44.51	32.78	28.64	26.54	33.66	24.23		34.87	36.54	31.28	37.78	32.50	33.03	27.15	
5	38.96	28.95	23.64		16.98	22.60		28.60	23.18	25.34	32.32	30.51	27.11	22.28	
6			26.08		27.58	23.72		29.80	27.77	31.79	28.15	23.75	27.33	21.85	
7	39.90	31.42	23.47			22.70			23.54	29.43	30.97	31.43	29.11	22.73	
8	35.40	28.13	18.57		22.44			28.08	24.53	26.28		29.29	26.59	21.74	
9	47.18	45.08	29.88	25.77	37.87	28.33		31.92	37.86	37.87	40.61	35.39	36.16	29.72	
10	25.50	16.87	12.40		12.22	12.68		15.35	13.39	17.14	22.26	27.27	17.51	14.39	
11	33.98		18.39		21.57	16.33		24.92	24.39	25.16	31.01	30.44	25.13	19.56	18.8
14	26.13	19.36	19.35		14.75	11.82		20.08	21.12	18.23	25.96	29.99	20.68	17.00	
15	34.05	25.59	22.71		19.92	23.93		25.31	25.55	23.42	32.78	24.20	25.75	21.16	
16	32.69	25.81	22.39		19.63	18.94		27.45	25.54	23.79	28.72	29.75	25.47	20.94	
18	35.07	30.51	24.91		22.64	18.79		31.33	27.08	26.55	29.83	30.30	27.70	22.77	

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19	41.15	34.65	28.40	29.93	35.00	34.53		40.77	36.54	32.12	38.14	31.42	34.79	28.59	
20	28.83	22.16	20.77	41.42	24.75	24.88		28.04	26.20	21.10	28.38	25.03	26.51	21.79	
21	44.23	35.62	29.81	28.84	38.26	23.39		40.93	35.84	34.10	37.17	32.40	34.60	28.44	
22	31.64	22.10	21.50	27.83	22.44	25.34		30.99	28.89	25.03	29.99	28.15	26.72	21.96	
23	47.74	30.38	27.82	34.03	28.15	24.00		41.43	40.64	37.02	45.29	33.36	35.44	29.13	27.3
24	42.11	34.99	27.60	28.06	35.50	31.45		39.96	36.48	33.37	35.75	38.82	34.92	28.70	
25	48.51	42.77	31.65	31.68	39.08	29.06			37.99	38.43		36.11	37.25	30.62	
26	55.86	47.95	38.18	36.08	43.80	34.77		48.31	45.12	44.13	49.64	44.81	44.42	36.51	
30		45.28	30.48	28.38	33.44	19.86		36.76	37.85	36.94	38.52	35.56	34.31	28.20	
34	38.32	31.65	23.67	28.24	26.22			33.54		25.68	33.76	35.46	30.73	25.26	
35	32.60		20.51		24.12	21.26		29.84	25.81	21.76		31.01	25.86	21.36	
36	30.74	22.46	26.14		25.96	18.21		31.03	32.08	3.23	33.95	30.17	25.40	20.88	
42	44.85	45.33	32.12	28.51	31.16	24.00			34.48	33.41	37.35	34.41	34.56	28.41	
43	44.19	44.18	31.19						33.89	34.52	37.74	34.92	37.23	27.70	
44	43.13	38.26	24.89	26.14	30.20	25.09		38.22	32.64	30.80	34.85	43.63	33.44	27.49	
45	42.76	36.59	26.18	26.45	38.66	25.24		35.15	38.41		37.90	28.52	33.59	27.61	
46	43.17	32.27	28.86	35.29		30.41		43.82	36.08	31.13	35.36	34.64	35.10	28.86	
47	51.94	39.64	28.13						32.19	37.38		21.68	35.16	27.87	
48		35.47	31.14									42.58	36.40	29.29	
49	39.19	22.18	26.40		22.44				29.34	29.73	31.65	29.52	28.81	22.17	
50	44.64	32.53	24.85						35.59	26.04	35.80	32.53	33.14	24.70	
51		28.87	27.63						30.79	31.99	31.93	28.79	30.00	23.12	
52	39.11	30.76	24.83						33.85	28.08	33.14	30.94	31.53	23.50	
55	29.17	23.22	20.54						28.74	27.50	29.58	25.14	26.27	19.57	
56	36.26	28.93	24.78						36.94	31.73	40.57	33.65	33.26	24.78	
58	32.43	27.36	24.87						28.24	25.11	29.70	27.25	27.85	20.74	
59	47.89	42.27	32.29	31.85	37.05	33.80		45.61	43.25	37.25	49.33	21.40	38.36	31.53	

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60	31.01	27.76	21.81		27.08	20.49		28.76	30.01	24.57	28.01	50.15	28.96	23.81	
61	36.70	30.98	26.61						34.10	28.01	34.71	32.19	31.90	23.76	
62	25.13	20.00	15.74						19.81	16.78	24.20	36.02	22.53	16.78	
63	30.80	28.01	26.91						33.51	30.19	32.83	41.69	31.99	23.83	
64	41.10	41.66	29.37						37.57	35.79	31.85	31.06	35.48	26.43	
65	32.61	26.59	23.57						27.74	26.88	32.39	25.61	27.91	20.79	
66	35.83	31.57	26.27						33.08	27.91	33.10	31.48	31.32	23.33	
67	41.09	36.37	27.87							32.78	39.71	34.60	35.40	25.54	
68	40.22	28.91	29.13						34.20	29.27	37.80	32.69	33.17	24.71	
69	37.91	29.83	30.26						29.02	28.05	33.80	33.68	31.79	23.68	
70		19.22	18.48	20.42	36.54			25.49	24.57	18.02	26.99	24.72	23.83	19.59	
71	35.48	29.50	18.24						27.64	27.17	35.64	32.77	29.49	21.97	
72	32.75	24.70	18.34						22.63	22.91	30.06	30.32	25.96	19.33	
73	33.31	27.05	19.09						26.14	26.15	28.28	30.25	27.18	20.24	
74	46.10	30.48											38.29	30.72	
75	32.66	25.02	19.67						22.34	24.56	35.28	30.23	27.11	20.19	
76	37.89	31.92	24.72						29.43	28.04	34.26	27.87	30.59	23.55	
77	32.21	23.60	18.88						21.49	22.32	25.25	29.37	24.73	19.01	
78	29.40	21.84	17.81						24.26	20.89	28.27	25.67	24.02	17.88	
80	41.31	33.88	24.65						28.12	29.37	33.78	34.67	32.25	23.99	
81	38.45	31.39	27.94						29.76	29.63	33.13	19.63	29.99	22.31	
82	33.52								33.10	29.26	31.77	32.18	31.96	22.15	
83	35.44	25.53	24.28						29.70	25.32	28.13	30.49	28.41	21.13	
84	35.97	30.09	28.47						33.12	29.56	38.34	28.52	32.01	23.81	
85	39.54	37.31	28.32						29.72	30.79	39.97	30.20	33.69	25.06	
86	31.51	23.45	22.16	28.06	35.50	31.45			26.17	24.95	31.43	41.29	29.60	24.33	
87	34.73	26.98	20.43						26.16	24.13	24.70		26.19	20.23	

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88	43.44	41.92	29.84					34.91	32.46	39.65	34.25		36.64	27.25	
89	30.36	20.82	26.08					27.63	24.48	31.71	32.21		27.61	20.54	
90	22.39	21.74	17.78					27.22	18.12	27.68	30.86		23.68	18.23	
91	36.39	29.87	21.38					22.69	27.65	32.39	25.53		27.98	21.54	
92	32.03	25.23	20.46					26.90	24.76	28.59	23.07		25.86	19.26	
93	39.07	30.73	27.11	28.88	79.53			38.44	35.33	33.24	37.01	21.19	37.05	30.46	
95	32.66	27.89	24.57						24.05	36.02	34.27		29.91	22.57	
96	24.74	24.63		37.99					20.93	24.28	27.89		26.74	18.90	
97	25.66	22.85	20.41					25.06	19.10	28.80	25.92		23.97	17.86	
98	22.57	18.23	16.34		25.96	18.21		21.87	17.05	24.01			20.53	17.10	
99	27.56	22.53	19.44		25.96	18.21		24.56	20.85	26.67	22.04		23.09	18.98	
100	24.26	18.66	16.38					21.05	19.67	24.58	18.33		20.42	15.19	
101	39.99	27.46	24.68					28.45	29.88	34.81	23.68		29.85	22.21	
102	37.84	30.42						24.28	22.07	33.12	29.98		29.62	21.86	
103	32.26	24.55	21.66					19.16	20.47	27.80	24.74		24.38	18.16	
108	51.25	38.37	33.10					39.04	40.38	42.78	49.86		42.11	31.38	
109	39.75	31.92	29.82					31.53	32.13	37.71	41.41		34.90	26.00	
110	37.41	29.57	24.40					24.04	26.28	33.41	34.84		29.99	22.35	
111		32.19						25.12	27.66	30.62	26.41		28.40	21.53	
117	62.09	54.66	43.23	31.35	55.66	36.17		57.97	56.53	53.82	52.85	44.88	49.93	**41.04**	
118	57.67	43.73	42.89	39.14	41.72	40.10		63.20	52.41	41.85	52.72	43.21	47.15	38.76	
119	40.79	35.28	20.53	21.33	30.95	21.76		35.89	34.21	27.92	32.53	29.21	30.04	24.69	
120	58.14	46.27	32.76	30.65	47.04	34.90		53.52	46.59	44.35	46.75	44.80	44.16	36.30	
121	54.01	47.16	29.89					41.56	42.81	47.27	42.52		43.60	32.49	
122	42.09	48.14	35.79						38.06	45.54	46.19		42.64	30.77	
124	36.51	36.97	22.66					30.97	29.28	34.14	33.39		31.99	23.83	

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125	41.85	37.47	23.24					104.22	29.85	27.65	29.39	28.12	40.22	30.05
126	41.06	28.13	28.71	26.24	50.11			33.45	30.18	29.44	35.76	25.73	32.88	27.03
127	39.66	35.77	24.80						29.32	30.89	33.25	31.74	32.20	23.96
128	36.51	33.05	22.96						24.40	28.65	29.28	27.53	28.91	21.54
129	36.30	29.74	21.58						23.95	27.31	32.19	27.31	28.34	21.11
130	52.58	43.09	32.76		91.99				36.66	37.29	39.63	41.99	47.00	36.15
131	49.71		18.88						37.59		47.56	36.08	37.96	27.28
132	50.88	44.38	32.65						47.45	41.65	45.20	35.27	42.50	31.62
133	37.60	31.38	24.93	29.76	54.23			42.68	42.59	42.68	40.73	26.30	37.29	30.65
134	30.12	25.65	21.87										25.88	19.51
135	42.14	33.35	23.72						29.91	29.50	36.86	26.70	31.74	23.62
136	40.95	37.38	26.65						33.10	34.13	35.95	30.35	34.08	25.35
137	52.77	35.95	29.43						43.31	44.08	49.92	33.11	41.22	30.67
138	44.94	38.98	27.11	21.71									33.18	25.68
139		37.59	26.25						36.87	32.32	35.08	37.69	34.30	26.20
140	33.41	32.85	18.76										28.34	22.74
142	20.91	13.13	14.10						18.10	14.42	22.27	6.55	15.64	12.11
143	35.31	35.66	20.85						33.63	29.58	32.98	27.95	30.85	22.92
144	50.42	41.43	29.42						41.75	35.59	43.06	39.80	40.21	29.88
145	70.78	51.15	42.04	36.02	57.56	44.18		63.48	59.53	51.27	55.95	51.34	53.03	**43.59**
146	31.14	25.04	20.98						23.97	23.93	31.98	28.35	26.48	19.73
147	40.19	30.67	23.24						26.42	27.91	32.14	30.96	30.22	22.51
148	39.50	32.02	19.20						29.07	12.85	32.41		27.51	21.25
149	47.68	28.58	29.97						32.45	34.64	43.57		36.15	27.93
150	55.53	39.46	30.81						41.45	40.75	44.45	34.82	41.04	30.57
151	43.28	36.17	25.13						29.73	27.48	34.34	37.00	33.30	24.81

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152	56.45	43.59	34.52										44.85	35.79	
153	42.11	34.94	28.01						36.64	34.05	44.61	35.54	36.56	27.23	
154	53.79	43.48	32.98						42.60	26.39		42.79	40.34	32.10	
155	42.41	41.46	31.85						37.30		41.17	34.75	38.16	27.42	
156	42.40	33.23	23.93						32.79	23.60	40.75	43.17	34.27	25.50	
157	43.40	35.91	23.46		36.24	25.86		33.88	37.40	31.23	37.63	36.07	34.11	28.03	
158	39.39	32.99	34.09						39.08	33.72	38.74	43.22	37.32	27.80	
159	58.73	56.95	33.03						42.29	44.02	45.38	41.28	45.95	34.23	
160	50.61	51.49	36.02						44.83	41.81	41.32	31.69	42.54	31.69	
161	33.49		26.66						31.71	28.57	35.79	56.17	35.40	25.09	
162	67.84		43.28						31.26	52.54	53.40	28.29	46.10	32.68	
163	49.27	37.84	29.23						42.32	34.58	44.25	48.70	40.88	30.45	
164	45.56	34.20	27.44						34.85	34.24	40.76	25.73	34.68	26.70	
165	47.88	37.04	25.51						29.08	32.76		37.91	35.03	26.97	
166	40.77	36.47							36.17	34.37	43.76	36.85	38.06	29.47	
167	47.01	36.76	25.83	27.38	35.91	25.28		33.12	33.82	35.52	36.90	32.27	33.62	27.63	
168	37.10	35.54							19.96	26.91		30.43	29.99	22.53	
169	50.58	51.06	29.15						36.21	41.37	47.06	39.49	42.13	32.35	
170	48.79	44.49	25.26		38.79	28.38		38.22	36.38	36.83	42.09	34.47	37.37	30.72	
171	37.22	29.01	22.55		27.23	20.48		28.28	31.99	28.08	25.20	30.61	28.07	23.07	
172	50.77		30.99	28.51	31.16	24.00		33.79	38.46	32.53	35.65	33.61	33.95	27.90	
173	45.05	34.07		33.86	62.51			39.61	38.39	38.10	44.96	26.67	40.36	33.17	
174	43.25	36.10	24.33		22.82			25.53	32.39	28.78	35.76	32.50	31.27	25.71	
175	50.45	46.89	32.70	25.63	42.43	32.71		36.78	42.92	40.37	44.21	38.69	39.43	32.42	
176	35.18	30.79							36.98	25.40	36.94	32.33	32.94	25.50	
178	47.28	44.77	23.10						39.79	35.43	48.09	34.84	39.04	29.98	
179	39.97	30.63	24.29						31.83		32.47	34.05	32.21	24.21	

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180	**_71.25_**	**49.78**	**40.17**					**53.48**	**53.25**		**50.08**	39.33	**51.05**	37.55	
181	**40.31**	38.05	25.85	30.34					32.65	32.05	34.67	29.11	32.88	24.33	
182	**56.16**	**47.33**	31.57	33.70					39.19	34.46	**43.80**	38.91	**40.64**	30.04	
183	29.78	**42.73**	25.05	28.06	35.50	31.45			32.24	28.40	34.45	34.02	32.17	26.44	
184	**41.73**	37.49	24.27						29.87	27.14	34.74	32.15	32.49	24.23	
185	37.96	31.91	20.55						28.94	24.13	26.44	26.64	28.08	20.92	
188	38.69	39.59	27.53	28.34	**54.78**			29.33				30.27	35.50	27.40	
189	**41.32**	**41.17**	28.38	28.76	**_62.24_**			30.69	32.95	28.32	31.30		36.13	28.49	
190	**43.40**	**49.46**	25.42						31.13	27.28	38.44		35.86	27.73	
191	**45.42**	**48.76**	27.02						32.82	31.41	**40.22**	30.36	36.57	27.23	
192									37.10	33.95	**42.67**	**41.81**	38.88	27.61	
193			23.72						38.29	35.97	38.02	37.31	34.66	25.18	
194									**40.10**		**41.05**	**41.45**	**40.86**	26.66	
213									**54.74**	**45.36**	**46.51**	**45.42**	**48.01**	34.09	

☒ **Local bias adjustment factor used**

☐ **National bias adjustment factor used**

☒ **Annualisation has been conducted where data capture is <75% using data from only one CAQMS (Bournemouth).**

☒ **Where applicable, data has been distance corrected for relevant exposure**

Notes:

Exceedances of the NO$_2$ annual mean objective of 40µg/m^3 are shown in **bold**.

NO$_2$ annual means exceeding 60µg/m^3, indicating a potential exceedance of the NO$_2$ 1-hour mean objective are shown in **bold and underlined.**

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

(2) Distance corrected to nearest relevant public exposure.

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

QA / QC of automatic monitoring

Continuous Air Quality Monitoring, Quality Assurance and Quality Control

PCC manages four air quality-monitoring stations. These are all fully equipped with PCC DEFRA / NETCEN approved real-time automatic continuous monitoring analysers. These are sophisticated automatic monitoring systems housed in purpose built air-conditioned enclosures. These analysers measure and record in real-time a combination of NO_2, PM_{10} and $PM_{2.5}$.

PCC compiled continuous air quality monitoring data for the Further Assessment using Horiba's APNA-370, NO_2 based on the chemiluminescent analysis method.

Routine site operations

PCC employs a dedicated staff member to operate the network of continuous air quality monitoring stations. He is trained in all aspects of the monitoring processes including routine site operations, field calibrations and data ratification. He is also the NETCEN trained Local Site Operator (LSO) for the local affiliated AURN station. This is to ensure that both a high-level of accurate data and an acceptable percentage of data capture are obtained.

All automatic monitoring equipment has both routine remote calibration checks and routine (fortnightly) on-site checks. They also have maintenance visits, which follow documented procedures that stem from equipment manuals, manufacturer instructions and the UK Automatic Network Site Operators Manual.

Routine visits include:

- visual inspection of the station

- regular inlet-filter changes

- regular sampling head-cleaning and airflow

- a two-point calibration of the NO$_2$ analyser using a zero-air scrubber and a Nitric Oxide (NO) gas on-site

- AIR LIQUIDE supplies the NO$_x$ span gas with the concentration certificate. This gas is traceable to national standards

All equipment fitted within each station's enclosure (e.g. sample meteorological sensors, pumps, air conditioning units, modem etc.) is subject to independent routine maintenance and support via a service contract with Horiba. This includes:

- 6-monthly minor service and equipment check visits by the manufacturer for Horiba's analysers and approved engineers covering all non-Horiba equipment following national protocols and traceable QA/QC procedures. Horiba is ISO 9001 accredited and carries out similar or identical support work for a number of AURN network stations across the UK

- 6-monthly major service where a full multi-point calibration is carried out on the NO$_2$ analyser, using zero-air, NO and NO$_2$ span gas (again traceable to national standards) meaning the analyser data slope and offset factors are reset. In addition to multi-point calibration the following checks are carried out:

  - linearity

  - noise

  - response time, leaks and flow

  - converter efficiency

  - stability of the on-site gas calibration cylinder.

The local AURN station is also subject to external audit. Site Inter-calibration checks are carried out by National Environmental Technology Centre Network engineers prior to each of Horiba's major services.

Horiba also carries out non-routine site visits in response to equipment failure to the same standards. Contract arrangements ensure that visits are carried out within two to three days of the notification of call-out in order to minimise data loss.

All routine and non-routine site visits are fully documented and detail all works carried out, including any adjustments, modifications and repairs completed.

Calibration check methods

The calibration procedure for NO_x for sites C2, C4, C6 and C7 is based on a 2 point zero / span calibration check being performed at intervals of two weeks. The calibration procedure for the NO_x analyser of the C4 AURN network was based on three points, the third being span NO_2 to check the NO_2 Converter. However this was changed to two point calibration check. The methodology for the calibration procedure is followed according to the manufacturers' instruction handbooks:

- pre-calibration check - the site condition and status of the analyser is recorded prior to the zero / span check being conducted

- zero check – the response of the analyser to the absence of the gas being monitored. The stations were fitted with an integrated scrubber system incorporating a set of scrubbers, Hopcalite, activated charcoal, Purafil and Drierite, to generate a dried gas with none of the monitored pollutants. All were changed at least every six months but Hopcalite is changed more frequently due to the high levels of humidity in Portsmouth. These were changed to be fitted with synthetic air cylinders supplied by Air Liquide UK Ltd

- span check – the response of the analyser to the presence of the gas of a known concentration. Traceable gases are used for calibration checks supplied as part of the maintenance contract

- post calibration check - the site condition and status of the analyser upon completion of all checks

- all Horiba's APNA-370 analysers have their own built in data storage facility. They are built in a multi-drop set up. The calibration checks are

done directly through the front panel. Each analyser zero / span check is fully documented with records being kept centrally

Automatic data handling

All the stations are remotely accessible from a desktop computer at the civic offices via a telemetry linkage by either landline or GSM system. The telemetry linkage software used is 'Data Communication Server'. It is set on a daily auto-dial collection mode for data retrieval. It is also set to run calibration checks every three days.

Once the connection is established, the 'Data Communication Server' software retrieves the overnight auto-calibration first and stores it in a temporary database and a calibration factor is generated according to the following steps:

- o instrument span, $F = C/(V_s-V_z)$ and

- o pollutant concentration (ppb) = $F_x(V_a-V_z)$ where:

    - C is the set gas value on the gas certificate

    - V_s span value

    - V_z zero span value

    - V_a is the sample value as recorded by the analyser.

Raw measured data retrieved from the station data logger(s) is then subject to the calculated correction factors and stored in the final database as corrected. The latter is then made readily available to be queried via the 'IDAZRW Central Station', database access software.

Instrument status and internal auto-calibration data can be viewed in addition to the corrected collected measured monitoring data.

The air quality data ratification is carried out manually from this station.

Manual data handling

All collected data is screened or validated by visual examination to see if there are any unusual measurements. The affected data is then flagged in the database. Any further remaining suspicious data, such as large spikes, 'flat-lines' and excessive negative data is flagged for more detailed investigation. 'IDAZRW Central Station' is capable to trace back any change made at all times with the administrator's name. An original raw dataset is always kept in the data processing software.

When data ratification has been completed the data is then made available for further statistical and critical examination for reporting purposes.

Air quality monitoring data can be imported manually into a Microsoft Excel spreadsheet. This scaled data (where values are above the lower detectable limit is considered to be valuable data) is then further converted to generate data in the National Air Quality Objective format to enable direct comparison to the standards. A file of raw data is always kept for reference in the database.

QA / QC of diffusion tube monitoring

Monitoring technique

The continuous NO_2 monitoring network is complemented by a secondary network of passive NO_2 tubes that are located in suspected air quality hot spots. In addition, tubes are located at the relevant continuous monitoring sites to enable data adjustment. At a selection of sites three tubes are exposed simultaneously and the data compared. Where the data is consistent, the results are averaged. Where the tubes results show significant differences the data is discounted.

This method provides a cost-effective means of monitoring a wide range of monitoring locations. The accuracy of tubes however is variable depending on the tube handling procedures, the specific tube preparation, adsorbent mixture and the analysing laboratory. These tubes are supplied and analysed by Gradko International Ltd.

PCC's NO_2 diffusion tubes are prepared by the supplier using 50% Triethanolamine (TEA) in acetone. These tubes were exposed for one-month periods in accordance with LAQM.TG (16) guidance [5].

Tube Handling Procedures

Once received by post, NO_2 tubes are stored in cool location within the supplied packaging until use. The tube end caps are not removed until the tube has been placed at the monitoring location at the start of the monitoring period. The exposed tubes are recapped at the end of the monitoring period and returned as quickly as possible to a clean cool storage environment then sent to GIL for analysis.

Laboratory QA / QC

GIL is a UKAS accredited company for the analysis of NO_2. GIL take part in the WASP scheme on a quarterly basis. An inter-comparison of results from other laboratories demonstrates that GIL's performance is good in terms of accuracy and precision.

Data Ratification

Once analysed, the NO_2 diffusion tubes results which, were significantly within the documented limit of detection, were laboratory blank corrected.

The returned results are closely examined on a monthly basis to identify any spurious data (e.g. very high or very low data).

The data is subjected to a further series of corrections for the monitored period under consideration:

- Firstly, PCC use the data from the local co-location study of NO_2 diffusion tubes to calculate the bias following the approach prescribed in Box 6.4 of LAQM TG using the appropriate continuous monitoring data from the local air quality monitoring network for individual NO_2 monitored sites according to the site criteria

- Secondly, the estimation of the NO_2 annual mean is deduced for individual NO_2 diffusion tube monitored locations following the approach prescribed in Box 6.5 of LAQM TG using data from both Portsmouth and Southampton AURN stations

- The corrected results are then reported and used for comparison only, i.e. not for verification processes in the Further Assessment (Review and Assessment process).

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

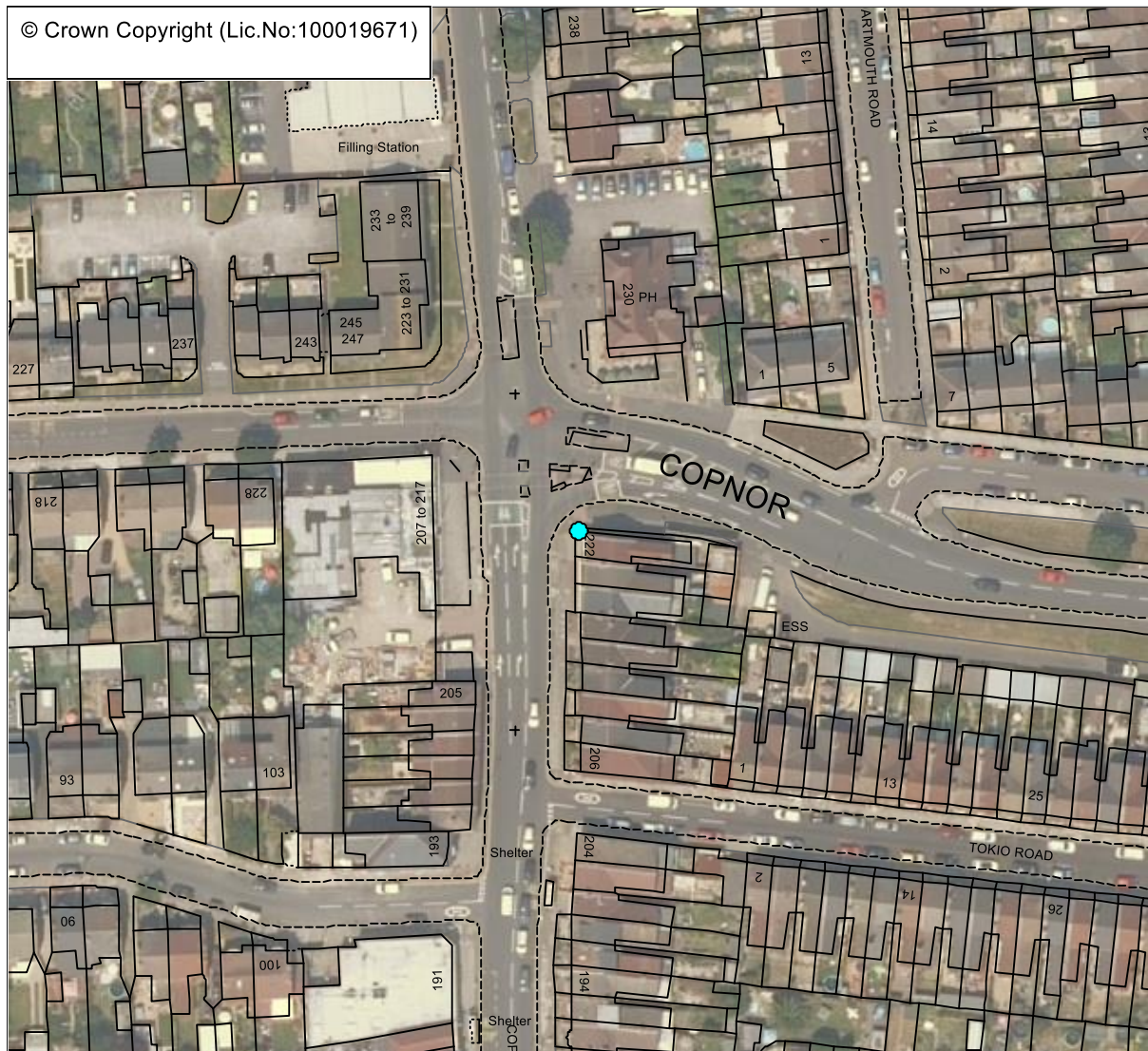## Map 1 – Locations of PCC's (C2, C4, C6, and C7) and DEFRA's (C8) CAQMS
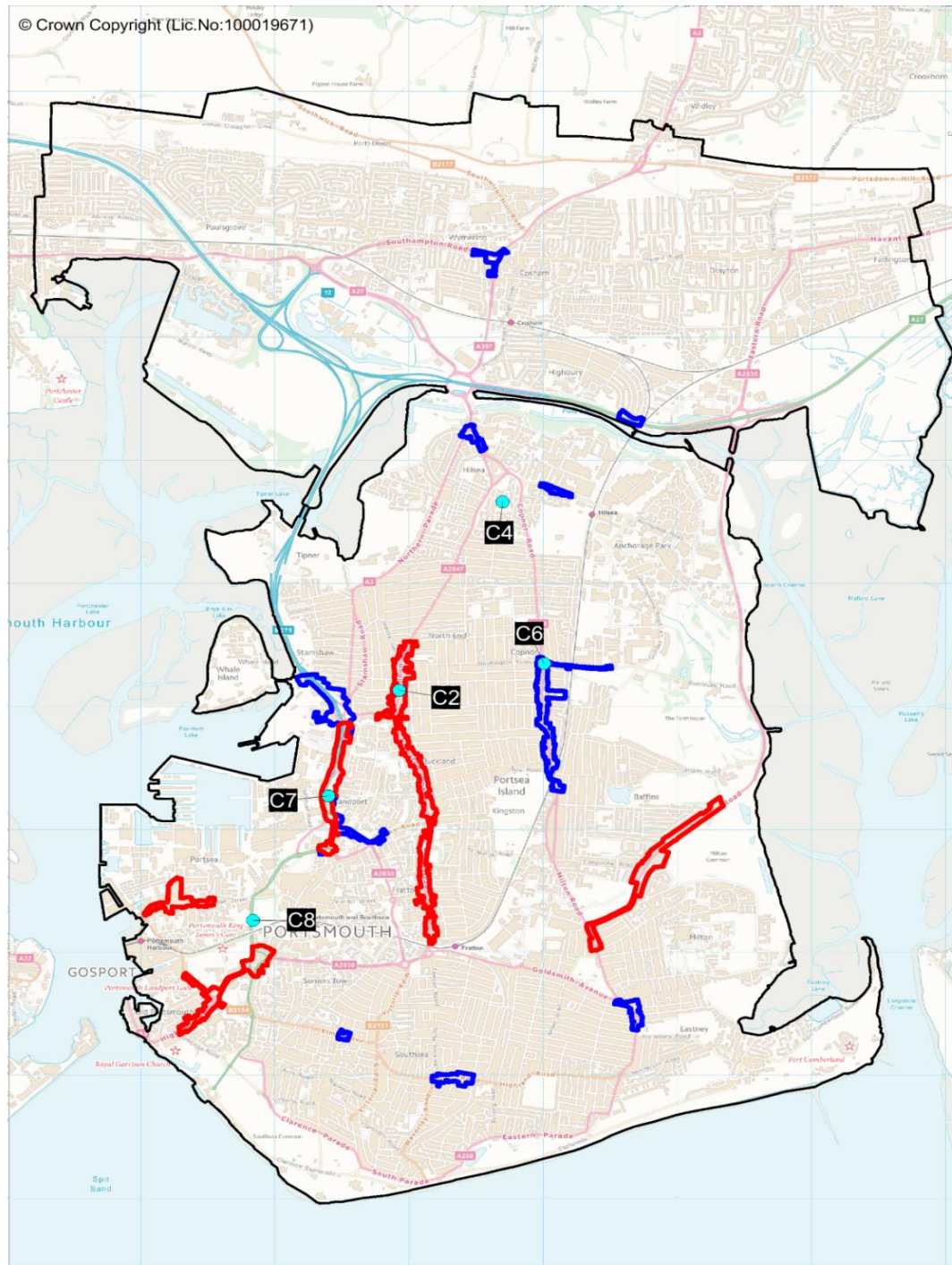
Map 2 – PCC's Kerbside CAQMS: Location (C2) London Road, North End

Map 3 – PCC's AURN CAQMS: Location (C4) Gatcombe Park Primary School, Hilsea

© Crown Copyright (Lic.No:100019671)

Map 4 – PCC's Roadside CAQMS: Location (C6) Burrfields Road, Baffins

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Map 5 – PCC's Roadside CAQMS: Location (C7) Mile End Road, Buckland

Map 6 – DEFRA's Roadside CAQMS: Location (C8) Anglesea Road, Southsea

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Portsea   Island

Tennis Courts

Fn

Pond

ANGLESEA ROAD

El Sub Sta

El Sub Sta

El Sub Sta

Anglesea Building

El Sub Sta

Map 7 – PCC's AQMAs and NDDT Monitoring Location Zones
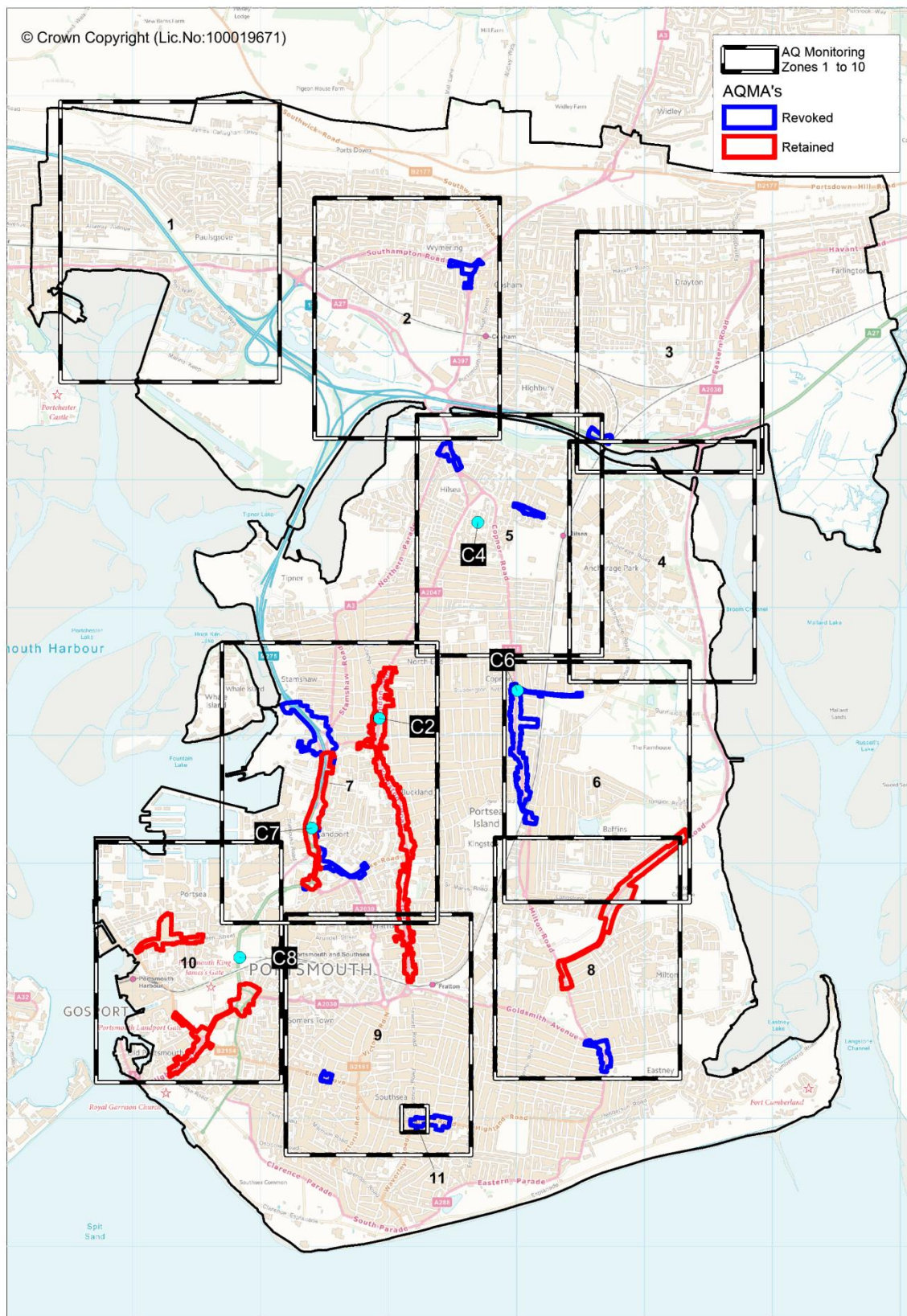
© Crown Copyright (Lic.No:100019671)

Map 8 – PCC's NDDT monitoring locations (Zone 1)

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\#   Ongoing monitoring sites

\#   Additional monitoring site - since 2017

\#   DEFRA's commentary on PCC 2017 ASR report

\#   DEFRA's Targeted Feasibility Studies

▢   Retained AQMA

▢   Revoked AQMA

Map 9 – PCC's NDDT monitoring locations (Zone 2)

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\# Ongoing monitoring sites

\# Additional monitoring site - since 2017

\# DEFRA's commentary on PCC 2017 ASR report

\# DEFRA's Targeted Feasibility Studies

☐ Retained AQMA

☐ Revoked AQMA
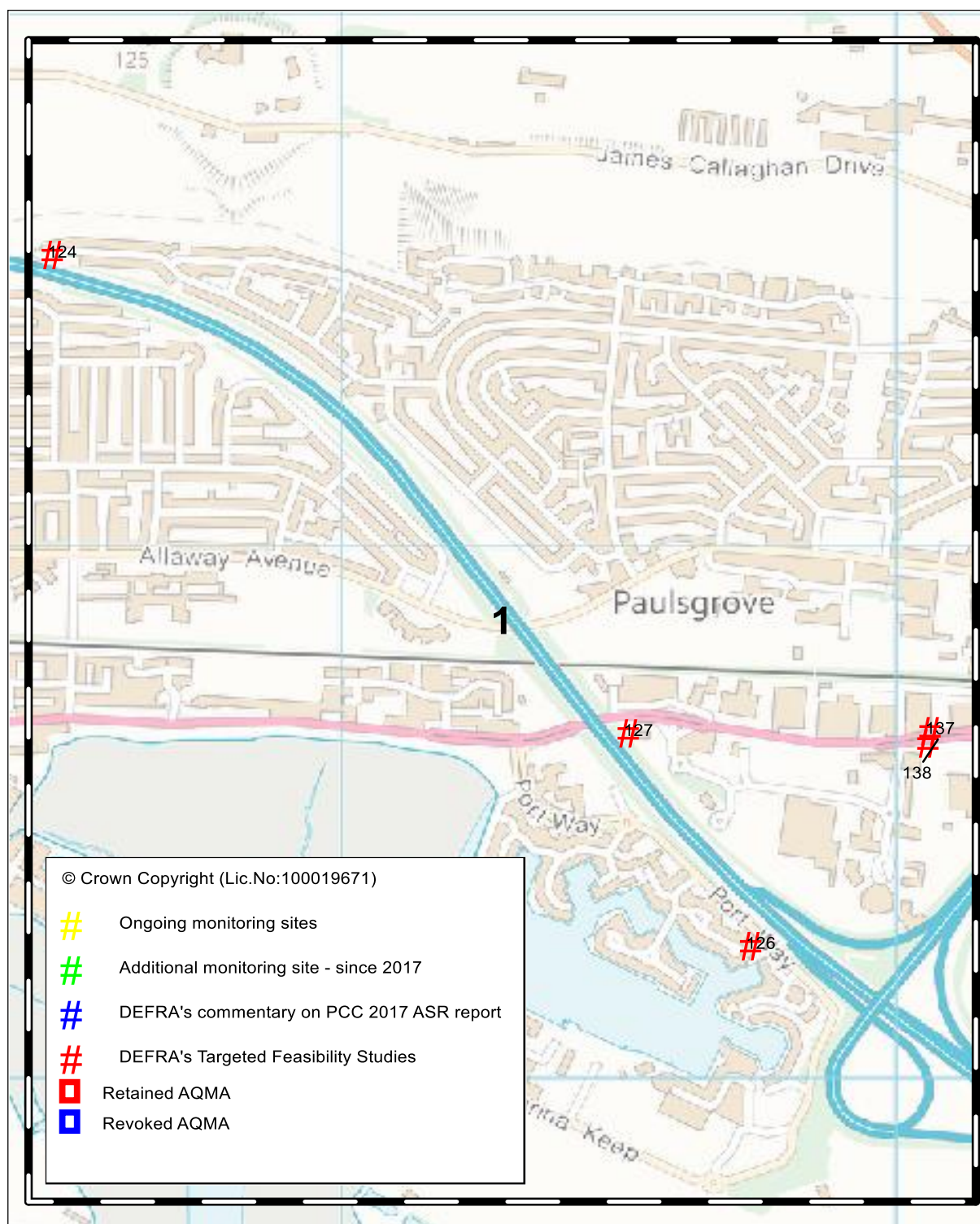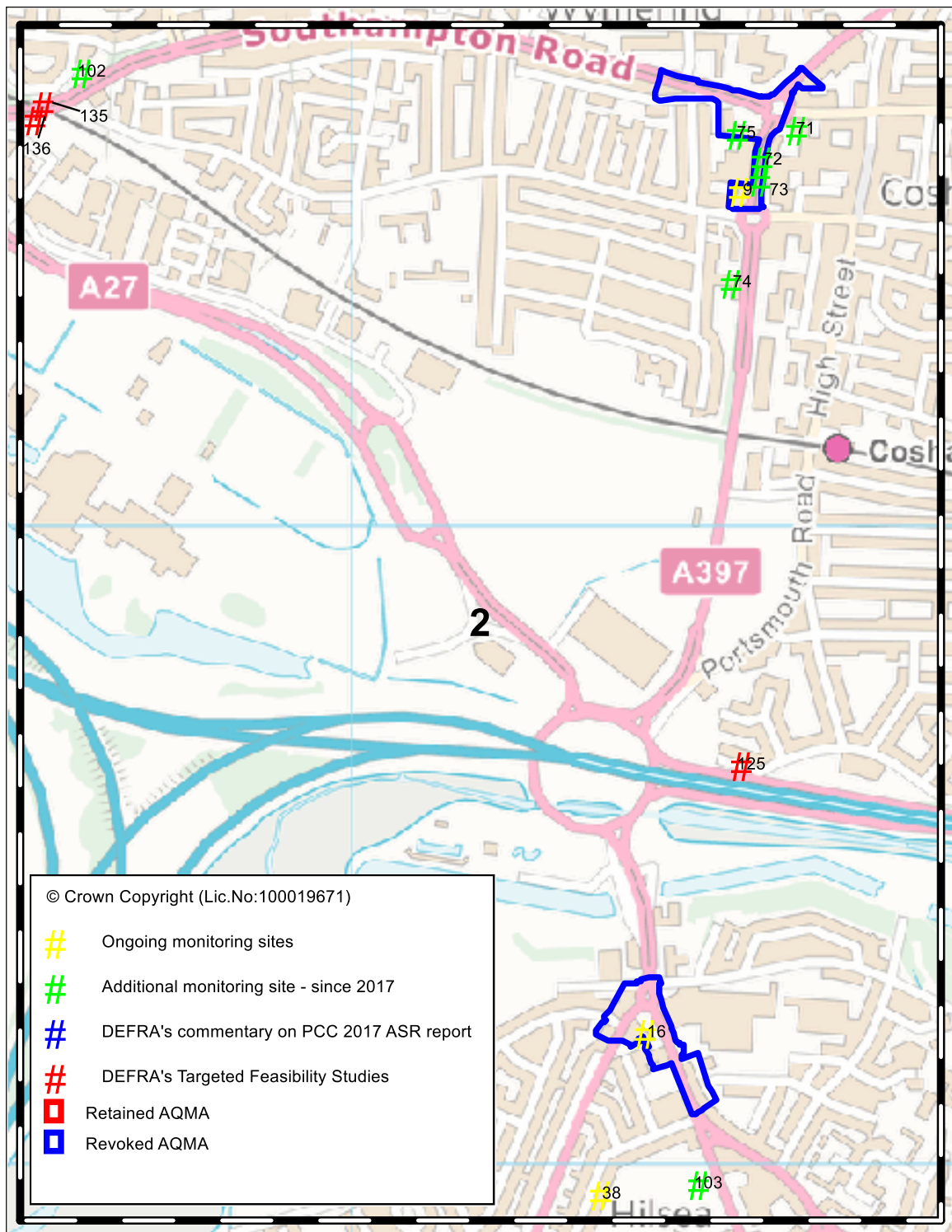
Map 10 – PCC's NDDT monitoring locations (Zone 3)

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\#   Ongoing monitoring sites

\#   Additional monitoring site - since 2017

\#   DEFRA's commentary on PCC 2017 ASR report

\#   DEFRA's Targeted Feasibility Studies

☐   Retained AQMA

☐   Revoked AQMA
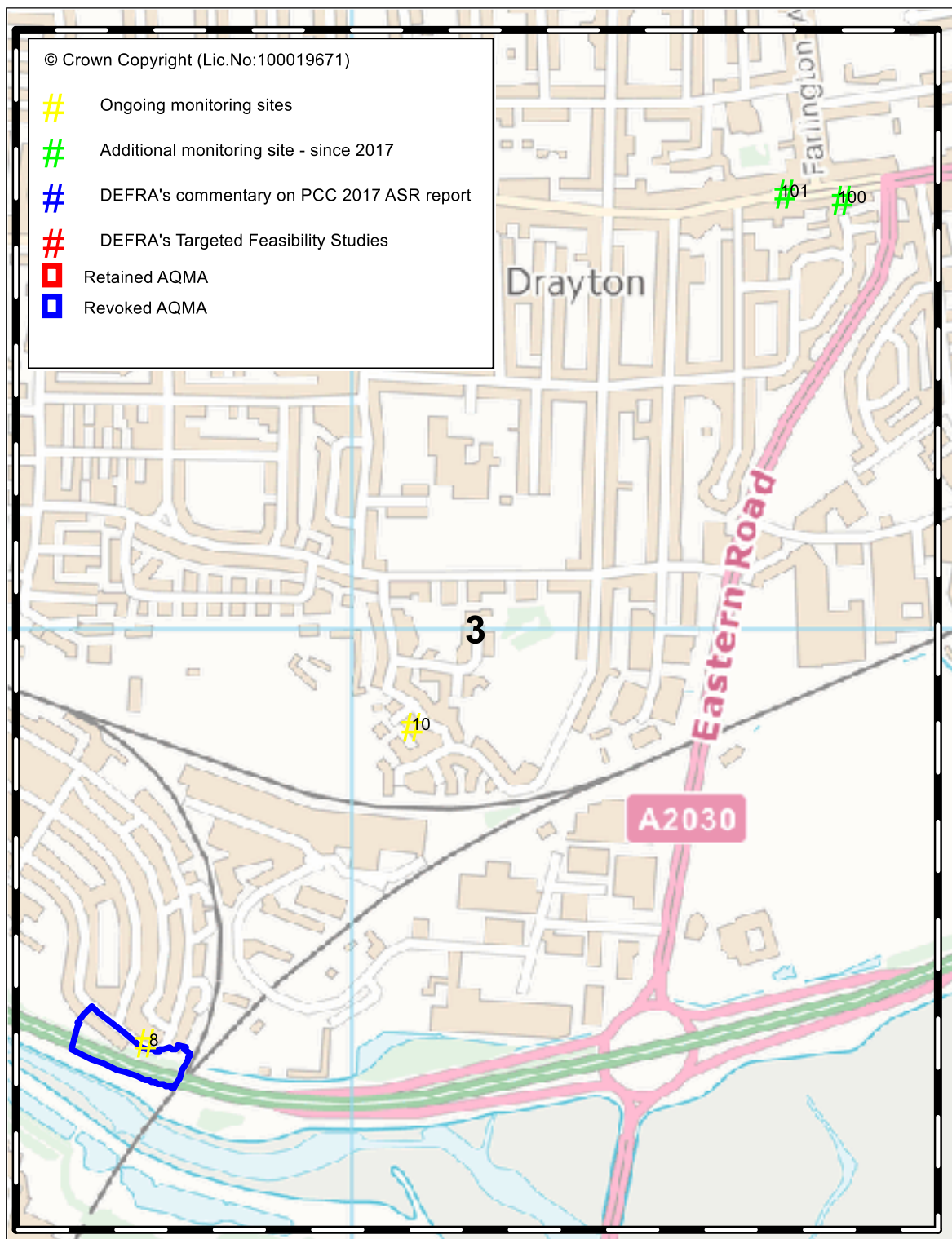
Map 11 – PCC's NDDT monitoring locations (Zone 4)
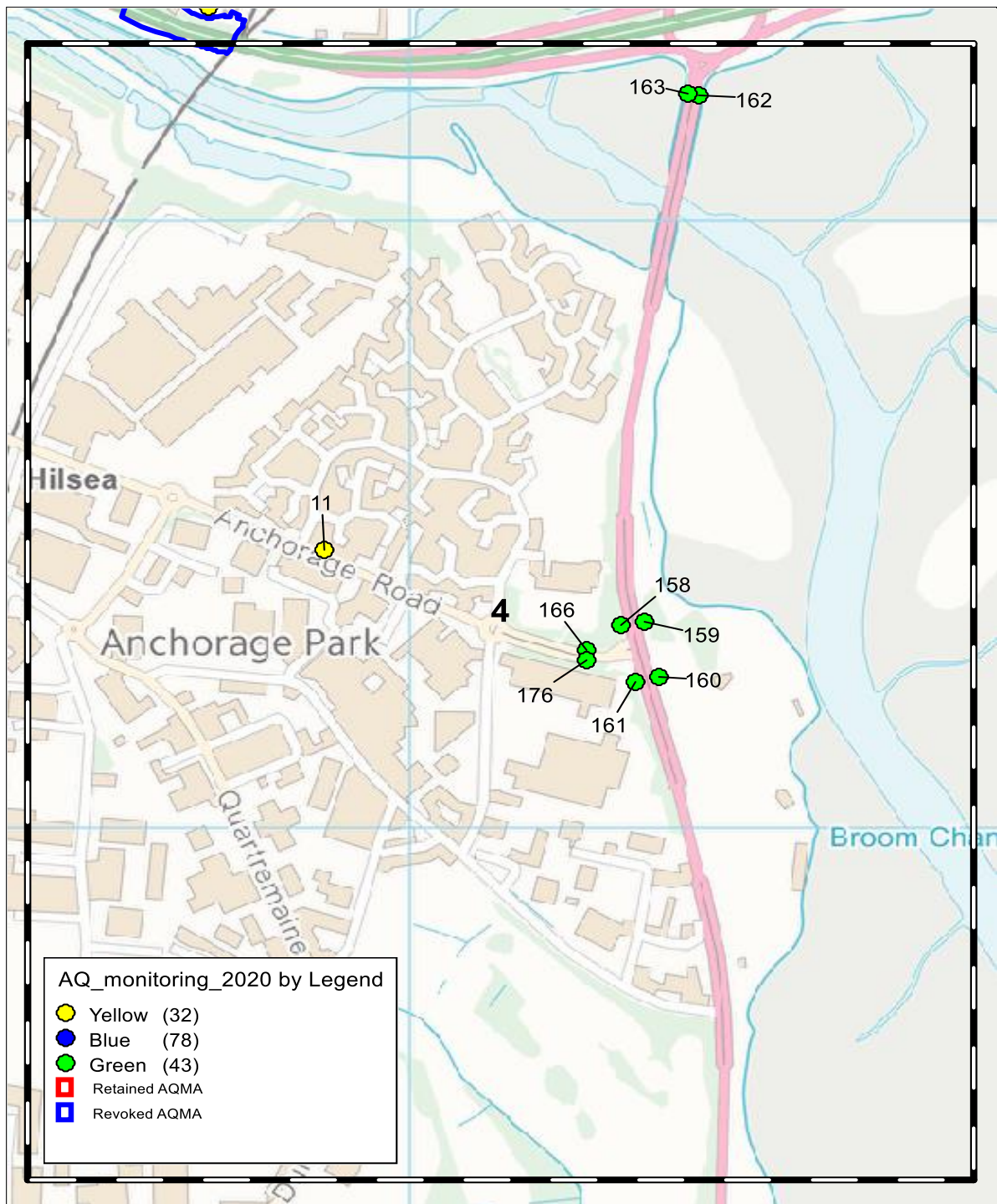
Map 12 – PCC's NDDT monitoring locations (Zone 5)
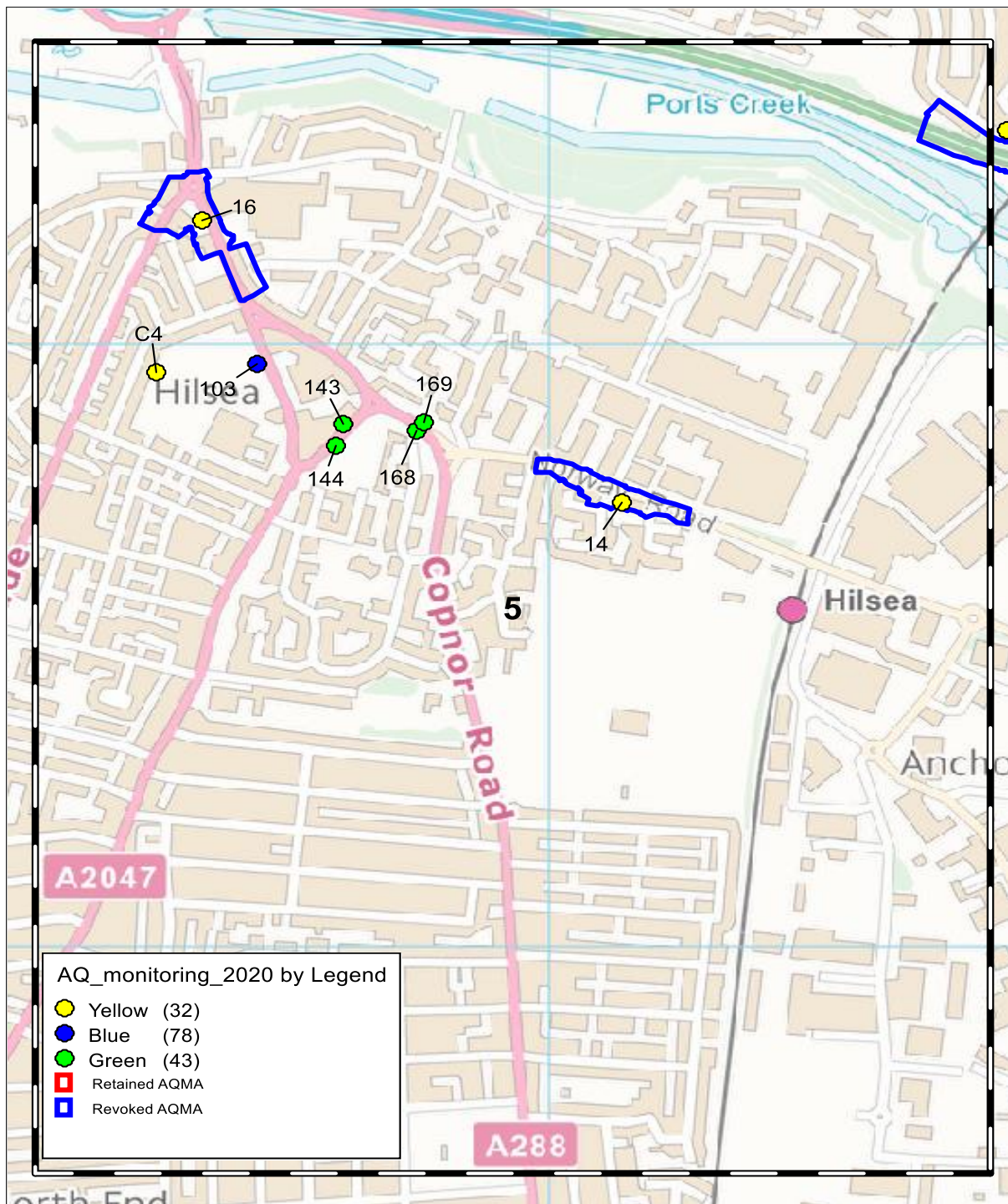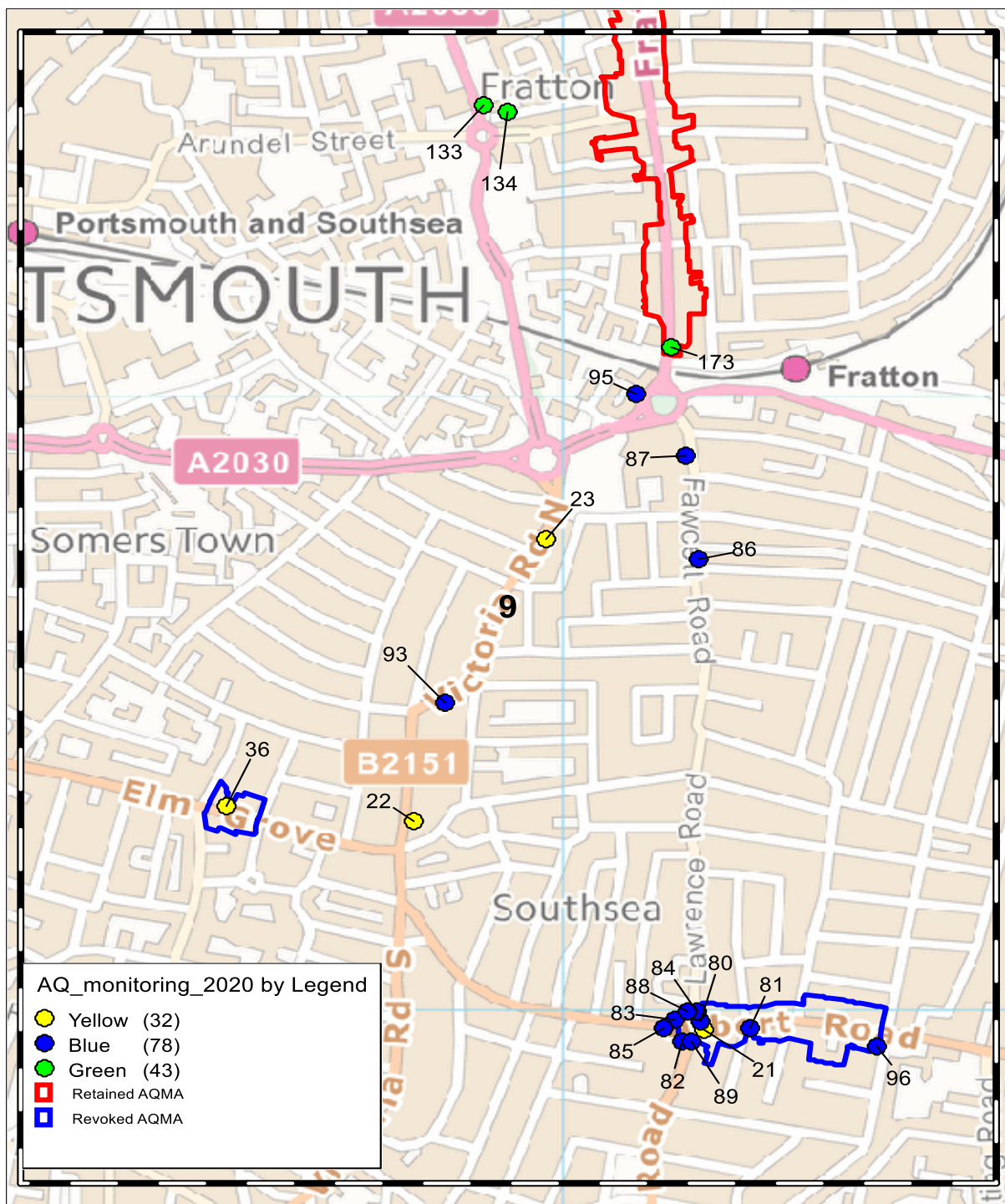
Map 13 – PCC's NDDT monitoring locations (Zone 6)
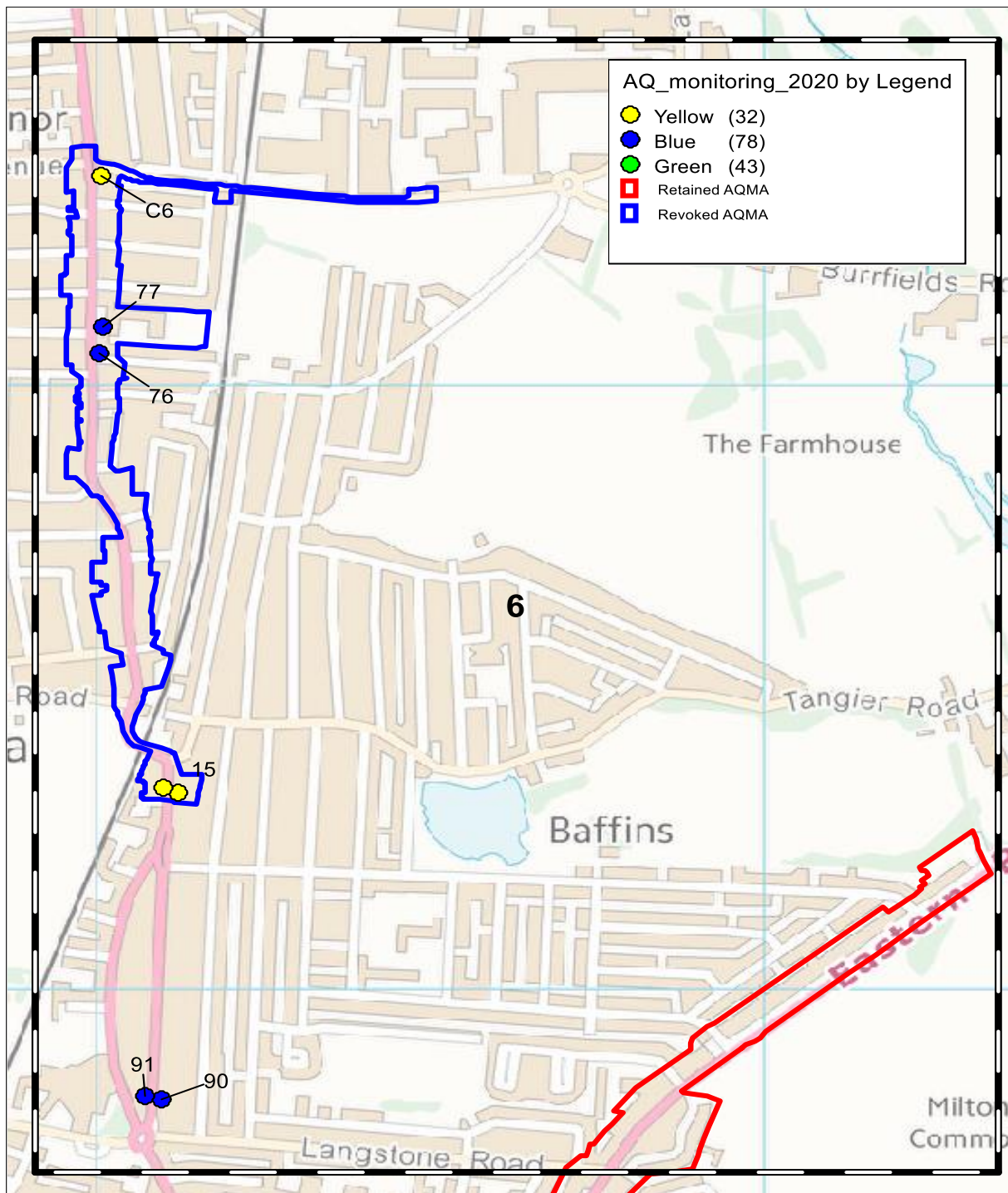
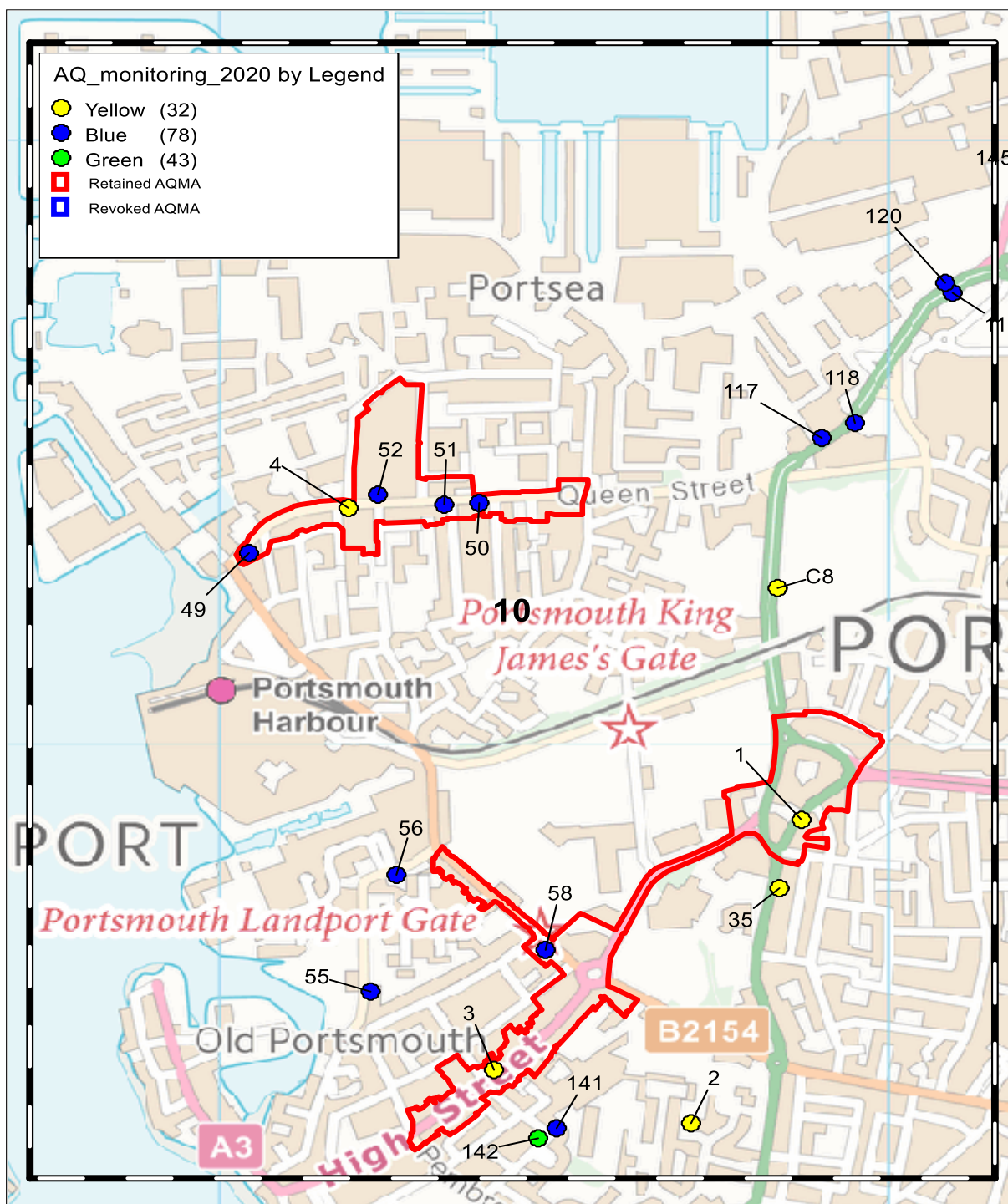## Map 14 – PCC's NDDT monitoring locations (Zone 7)
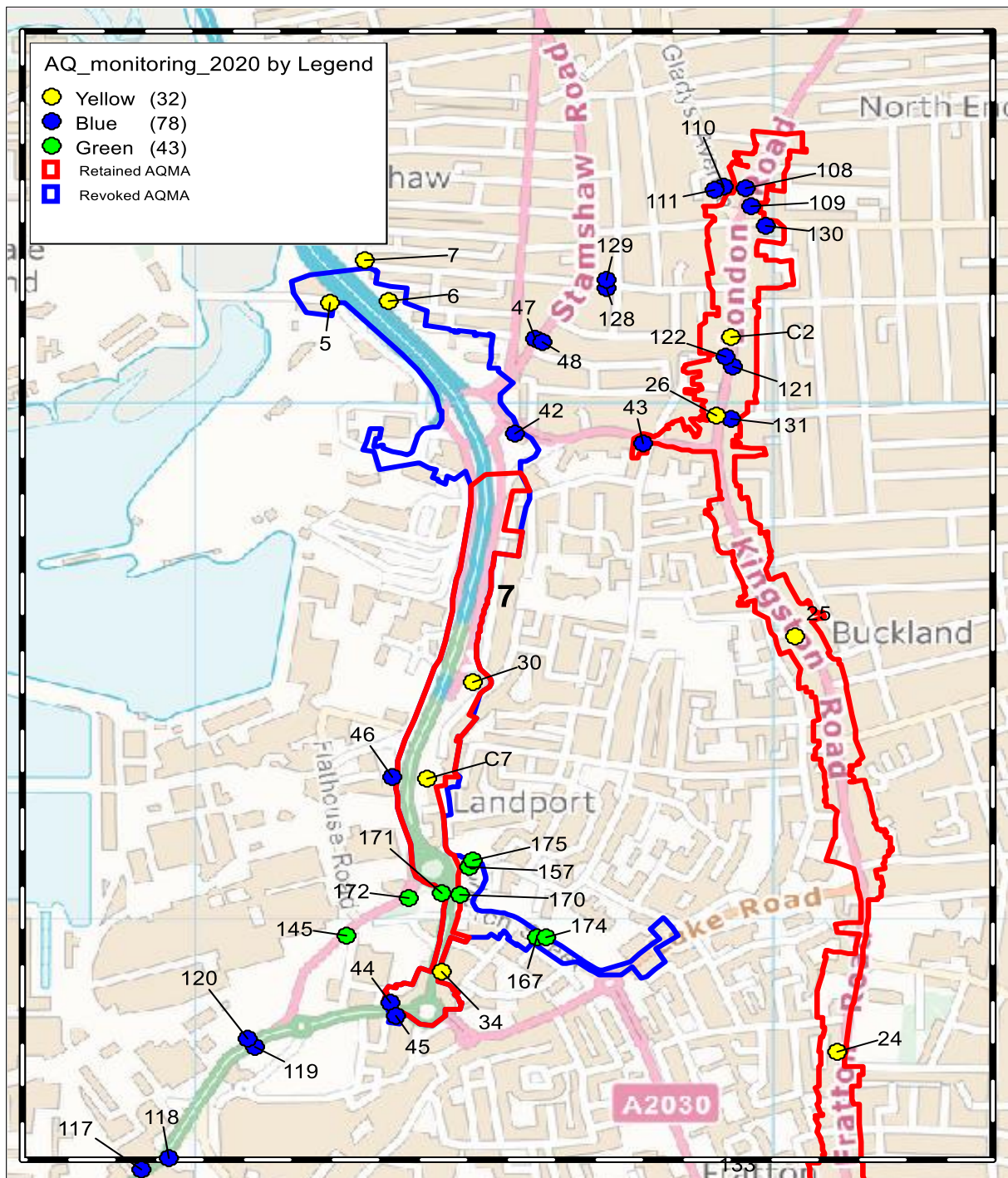
Map 15 – PCC's NDDT monitoring locations (Zone 8)
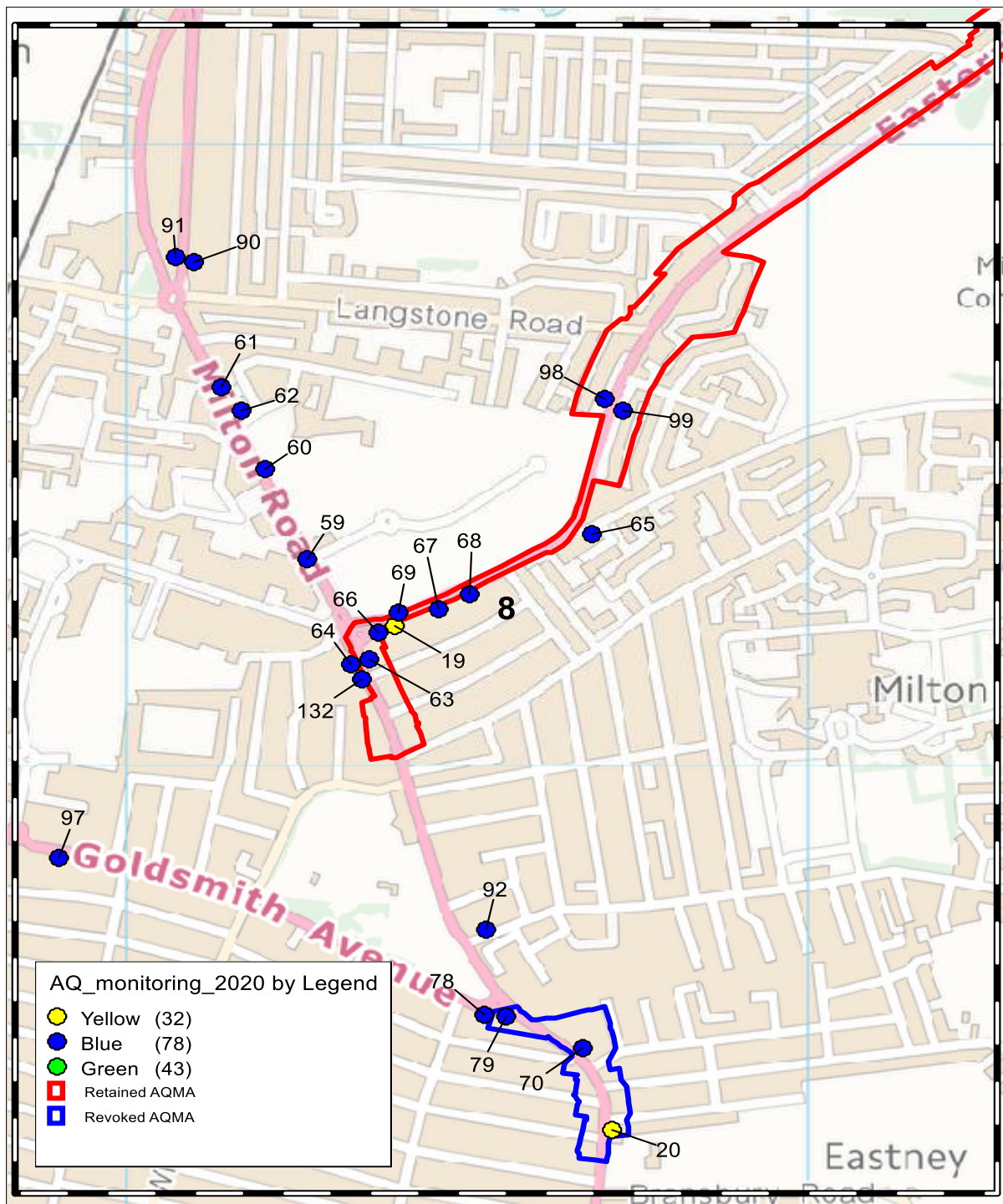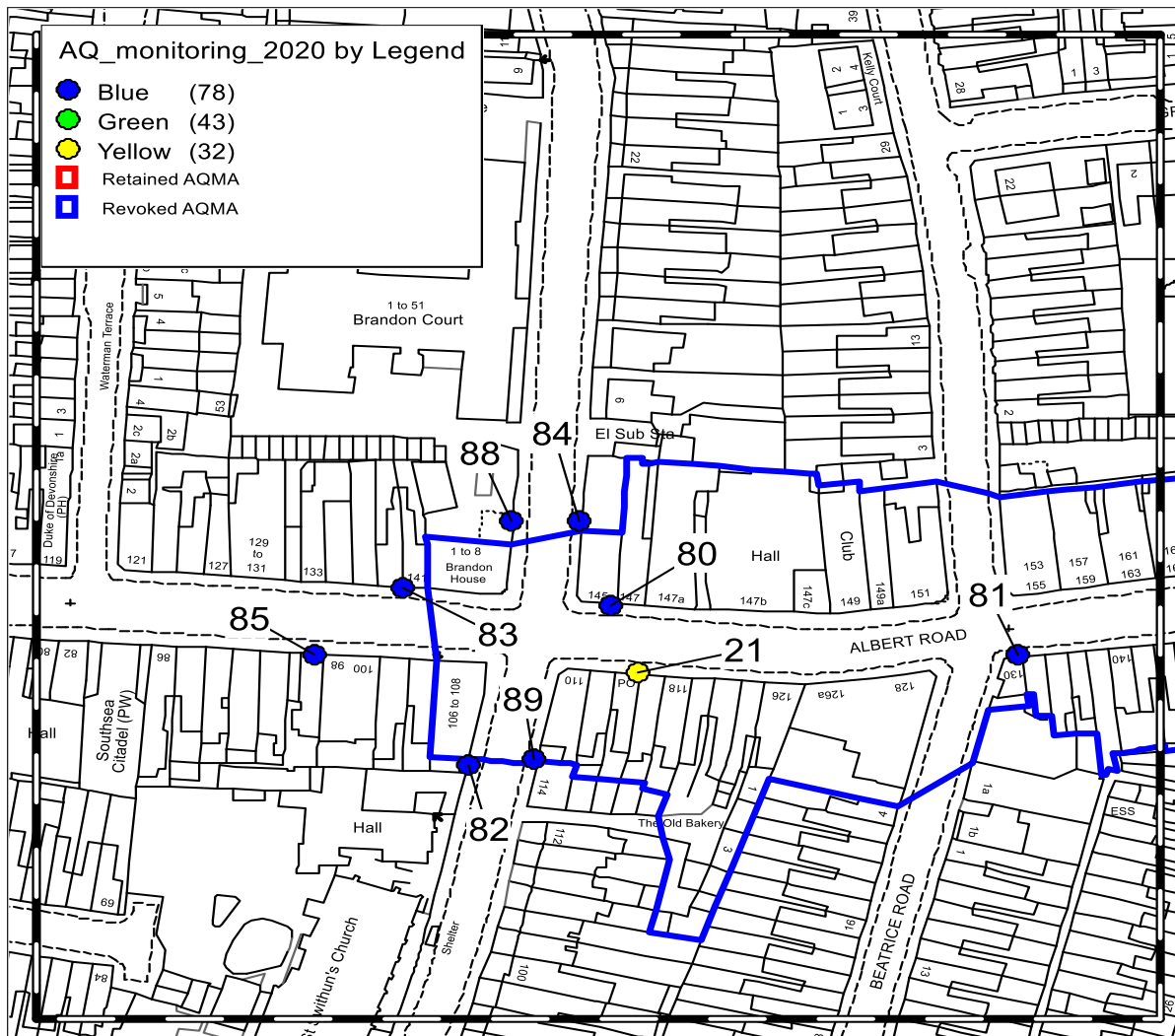
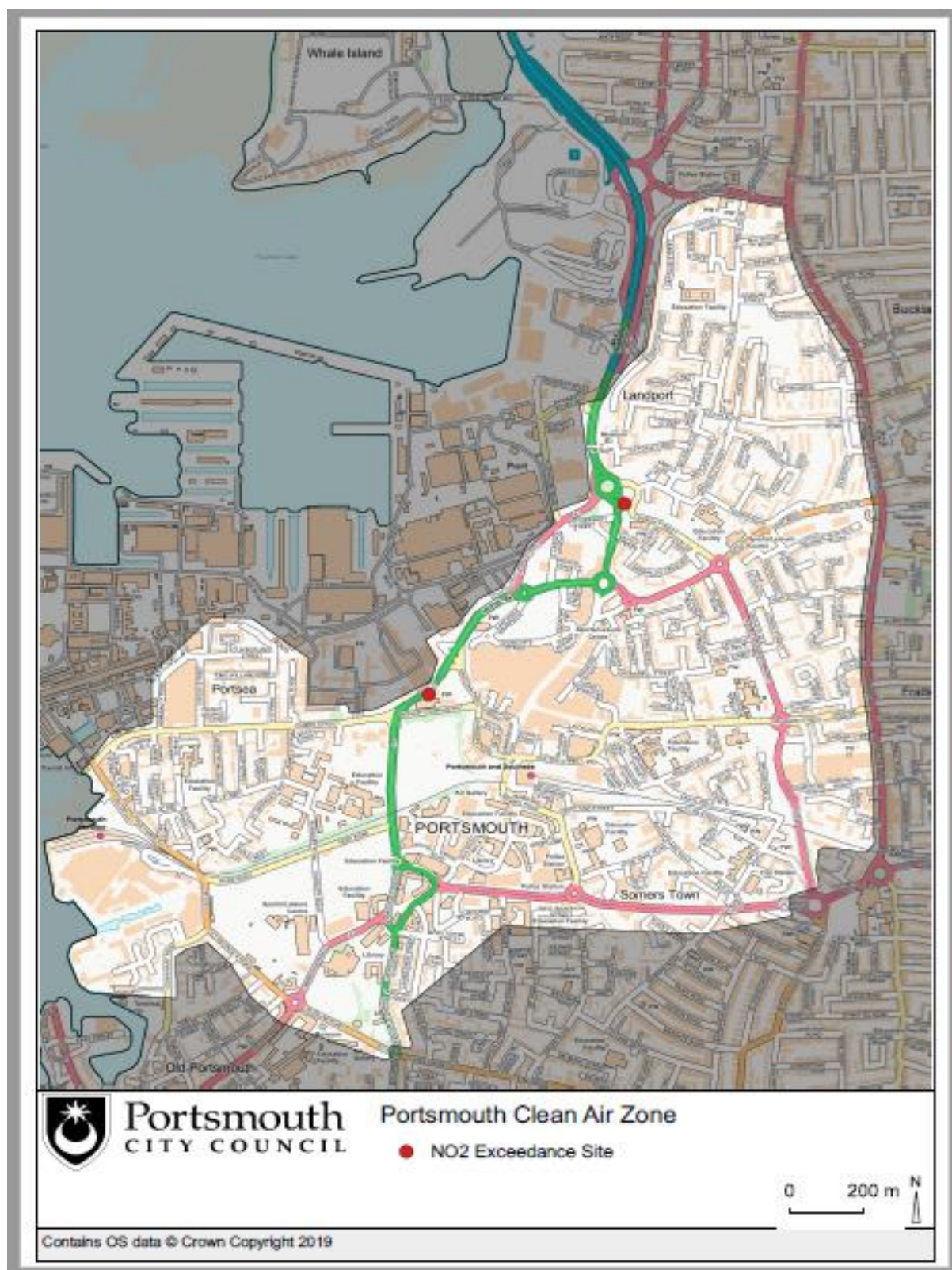## Map 16 – PCC's NDDT monitoring locations (Zone 9)

Map 17 – PCC's NDDT monitoring locations (Zone 10)

Map 18 – PCC's NDDT monitoring locations (Zone 11)

Appendix E: Concentrated CAZ

Appendix F1: Impact of COVID-19 upon LAQM

AF1.1. Introduction

COVID-19 has had a significant impact on society. Inevitably, COVID-19 has also had an impact on the environment, with implications to air quality at local, regional and national scales.

COVID-19 has presented various challenges for LA with respect to undertaking their statutory LAQM duties in the 2021 reporting year. Recognising this, DEFRA provided various advice updates throughout 2020 to English authorities, particularly concerning the potential disruption to air quality monitoring programmes, implementation of AQAPs and LAQM statutory reporting requirements. DEFRA has also issued supplementary guidance for LAQM reporting in 2021 to assist LA in preparing their 2021 ASR. Where applicable, this advice has been followed.

Despite the challenges that the pandemic has given rise to, the events of 2020 have also provided LA with an opportunity to quantify the air quality impacts associated with wide-scale and extreme intervention, most notably in relation to emissions of air pollutants arising from road traffic. The vast majority (>95%) of AQMAs declared within the UK are related to road traffic emissions, where attainment of the annual mean objective for nitrogen dioxide (NO_2) is considered unlikely.

On 23rd March 2020, the UK Government released official guidance advising all members of public to stay at home, with work-related travel only permitted when absolutely necessary. During this initial national lockdown (and to a lesser extent other national and regional lockdowns that followed), marked reductions in vehicle traffic were observed; DfT data[20] suggests reductions in vehicle traffic of up to 70% were experienced across the UK by mid-April, relative to pre COVID-19 levels.

This reduction in travel in turn gave rise to a change of air pollutant emissions associated with road traffic, i.e. nitrous oxides (NO_x), and exhaust and non-exhaust particulates (PM). The Air Quality Expert Group (AQEG)[21] has estimated that during

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[20] Prime Minister's Office, COVID-19 briefing on the 31st of May 2020
[21] Air Quality Expert Group, Estimation of changes in air pollution emissions, concentrations and exposure during the COVID-19 outbreak in the UK, June 2020

the initial lockdown period in 2020, within urbanised areas of the UK reductions in NO_2 annual mean concentrations were between 20 and 30% relative to pre-pandemic levels, which represents an absolute reduction of between 10 to 20μg/m^3 if expressed relative to annual mean averages.

During this period, changes in $PM_{2.5}$ concentrations were less marked than those of NO_2. $PM_{2.5}$ concentrations are affected by both local sources and the transport of pollution from wider regions, often from well beyond the UK. Through analysis of AURN monitoring data for 2018-2020, AQEG have detailed that $PM_{2.5}$ concentrations during the initial lockdown period are of the order 2 to 5μg/m^3 lower relative to those that would be expected under business-as-usual conditions.

As restrictions are gradually lifted, the challenge is to understand how these air quality improvements can benefit the long-term health of the population.

AF1.2. Impacts of COVID-19 on Air Quality - Reduction in NO_2 production

During 2020, as a result of the COVID-19 pandemic, data[22] has been provided showing a reduction in mobility.

This suggests that transport activities, particularly road traffic, rail services and aviation, as well as a reduction in overall energy use is likely to have occurred as a result of the impact of the pandemic. In addition, there is a general consensus that lockdowns / restrictions reduced industrial activities and therefore emissions from construction, commercial heating, combustion processes in manufacturing and power generation may also have fallen.

The situation for shipping appears more complex with decreases in activities for some vessel types (particularly offshore, passenger vessels and fishing) and changes in others depending on cargo type. This is obviously of interest in respect to the contribution of pollution emissions from the Portsmouth International Port.

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[22] Coronavirus (COVID-19) Mobility Report - data.gov.uk

Emissions from commercial premises are expected to have been reduced particularly from commercial heating and commercial cooking. With the move to home working, reductions of emissions in commercial areas (shops and offices) may have been partly compensated by increases from homes, but still potentially resulting in a net decrease in emissions.

Locally it is possible that solid fuel combustion in domestic fires and stoves went up initially after lockdown. However, this initial increase is likely to have subsided with rising ambient temperatures during the summer of 2020 and may also be limited by fuel stocks. Nuisance reports linked to bonfires and burning of garden waste appeared to have risen during the various 2020 lockdowns.

AF1.3. Analysis of NO_2 pollution concentrations during 2020

As stated above, we recognise that air pollutant concentrations may have been impacted by the change in activity observed as a result of COVID-19 and its associated measures. We further recognise that these are highly likely to have led to materially beneficial changes in compliance with our AQ improvement objectives during 2020.

As per DEFRA's national technical guidance current guidance states that it expects us to consider measurements carried out over a period of 3 to 5 consecutive years particularly when deliberating the revocation or amendment of an AQMA, as well as national trends in emissions and measures introduced. As our data demonstrates a reduction in pollution levels during 2020 we have followed DEFRAs advice advising against the revocation of any AQMA based solely upon compliance being achieved in 2020 as this year may not be representative of longer-term trends in pollutant concentrations.

When publishing our data it is therefore important to make clear how monitoring has been impacted by the pandemic and to highlight that the data should be treated with caution. It is additionally important that we acknowledge that data from 2020 may differ significantly when compared with historical trends.

AF1.4. NO$_2$ monitoring data set corrections

In respect to our passive monitoring diffusion tube data, guidance exists where poor data capture has occurred. Where data capture is less than 75% of the year (which has occurred in Portsmouth in a high number of locations) annualisation techniques have been used to estimate an annual mean based on current guidance. We must have a minimum of three months of data available for annualisation, however the ability to annualise data in line with current guidance has also been impacted by COVID-19. We have considered the impacts of amending the criteria for annualisation, however, DEFRA suggests that their current guidance remains valid.

The diffusion tube data processing tool has been used to process diffusion tube data. The tool has been developed to more easily calculate annual mean concentrations for the diffusion tube monthly data, by amalgamating the following individual LAQM processing tools: the annualisation tool; the precision and accuracy tool – calculation of local bias; and NO$_2$ fall off with distance calculator. In respect to diffusion tube bias adjustment it is suggested by DEFRA that diffusion tube bias adjustment studies have been affected by COVID-19.

AF1.5. NO$_2$ data collection complications

During 2020 we experienced problems with the deployment of diffusion tubes, as a result of supply, analytical laboratory support and the availability of resource needed to deploy such. DEFRA anticipated this and confirmed that there is no expectation that we should expose diffusion tubes in line with the 2020 diffusion tube monitoring calendar dates. The diffusion tube data processing tool or LAQM annualisation tool has automatically performed a time-weighted annual mean calculation, as opposed to a simple average calculation, if the required criteria are met.

COVID-19 has given rise to changes in our typical continuous monitoring procedures, service and maintenance regimes, calibration regimes and independent auditing regimes. These monitoring procedures and data collection has also been impacted (in some cases significantly) by the upgrading of our continuous monitoring stations during 2020.

A summary of COVID-19 related impacts on monitored concentrations are contained within Appendix A.

In view of the rather unique geographical constraints of Portsmouth's boundary few additional material LAQM related opportunities arose or were developed during 2020 as a direct consequence of COVID-19.

AF1.6. Summary of Challenges and Constraints / Impacts imposed by COVID-19 upon LAQM

PCC has experienced challenges in relation to LAQM within 2020 that can be attributed to the pandemic. These are summarised below:

- Automatic data capture - During 2020 all of our CAQMS were scheduled for refurbishment (either major or minor) funded through a capital programme. The pandemic led to delays in facilitating these activities. The most impacted site was the ARUN CAQMS at Gatcombe Park where data capture fell significantly due to delays with its refurbishment. Impact Rating: Large.

- Automatic monitoring QA/QC regime - Throughout the pandemic, as a result of the availability of staff resources, the prescriptive calibration regime was not completed in its entirety. Impact Rating: Small.

- Passive monitoring data capture - With reference to Table B1 the number of tubes deployed was significantly reduced during the first 4/6 months of the pandemic (depending on location). PCC concentrated upon the location sites which had been subjected to long term monitoring and in areas identified as close to or exceeding the NAQO. Impact Rating: Medium to Large (dependent upon location).

- Passive monitoring NNDT and adherence to changeover duties - DEFRAs tube exposure calendar was occasionally not maintained dependent upon the location of the tubes' sites. Impact Rating: Small to Medium (dependent upon location).

- Passive Monitoring Storage of NDDT - occasionally NNDT were stored for longer than laboratory guidance dependent upon site and location. Impact Rating: Small.

- 2021 CAZ implementation - operationally difficult, however, unaffected. Impact Rating: None.

- 2021 Installation of new CAQMS Alfred Road - the operational deployment timetable was extended, however, data collection began prior to the operation of the CAZ. Impact Rating: Small.

Appendix F2. COVID-19 Impact Matrix

Category	Impact Rating: None	Impact Rating: Small	Impact Rating: Medium	Impact Rating: Large
Automatic Monitoring – Data Capture (%)	More than 75% data capture	50 to 75% data capture	25 to 50% data capture	Less than 25% data capture
Automatic Monitoring – QA/QC Regime	Adherence to requirements as defined in LAQM.TG16	Routine calibrations taken place frequently but not to normal regime. Audits undertaken alongside service and maintenance programmes	Routine calibrations taken place infrequently and service and maintenance regimes adhered to. No audit achieved	Routine calibrations not undertaken within extended period (e.g. 3 to 4 months). Interruption to service and maintenance regime and no audit achieved
Passive Monitoring – Data Capture (%)	More than 75% data capture	50 to 75% data capture	25 to 50% data capture	Less than 25% data capture
Passive Monitoring – Bias Adjustment Factor	Bias adjustment undertaken as normal	<25% impact on normal number of available bias adjustment colocation studies (2020 vs 2019)	25-50% impact on normal number of available bias adjustment studies (2020 vs 2019)	>50% impact on normal number of available bias adjustment studies (2020 vs 2019) and/or applied bias adjustment factor studies not considered representative of local regime
Passive Monitoring – Adherence to Changeover Dates	Defra diffusion tube exposure calendar adhered to	Tubes left out for two exposure periods	Tubes left out for three exposure periods	Tubes left out for more than three exposure periods
Passive Monitoring – Storage of Tubes	Tubes stored in accordance with laboratory guidance and analysed promptly.	Tubes stored for longer than normal but adhering to laboratory guidance	Tubes unable to be stored according to be laboratory guidance but analysed prior to expiry date	Tubes stored for so long that they were unable to be analysed prior to expiry date. Data unable to be used
AQAP – Measure Implementation	Unaffected	Short delay (<6 months) in development of a new AQAP, but is on-going	Long delay (>6 months) in development of a new AQAP, but is on-going	No progression in development of a new AQAP
AQAP – New AQAP Development	Unaffected	Short delay (<6 months) in development of a new AQAP, but is on-going	Long delay (>6 months) in development of a new AQAP, but is on-going	No progression in development of a new AQAP

Appendix G: Summary of Air Quality Objectives in England

Table C1 – Air Quality Objectives in England

Pollutant	Air Quality Objective[23]	
	Concentration	**Measured as**
Nitrogen Dioxide (NO$_2$)	200µg/m^3 not to be exceeded more than 18 times a year	1-hour mean
	40 µg/m^3	Annual mean
Particulate Matter (PM$_{10}$)	50µg/m^3, not to be exceeded more than 35 times a year	24-hour mean
	40µg/m^3	Annual mean
Particulate Matter (PM$_{2.5}$)	25µg/m^3	Annual mean
Sulphur Dioxide (SO$_2$)	350µg/m^3, not to be exceeded more than 24 times a year	1-hour mean
	125µg/m^3, not to be exceeded more than 3 times a year	24-hour mean
	266µg/m^3, not to be exceeded more than 35 times a year	15-minute mean

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

Glossary of Terms

Abbreviation	Description
AAQD	Ambient Air Quality Directive
AP	Air Pollution
AQ	Air Quality
AQAP	Air Quality Action Plan
AQB	Air quality Board
AQG	Air Quality Grant
AQMA (s)	Air Quality Management Area (a) – An area where air pollutant concentrations exceed / are likely to exceed the relevant air quality objectives. AQMAs are declared for specific pollutants and objectives
AQS	Air Quality Strategy
AQSG	Air quality Steering Group
ASR	Annual Status Report
AURN	Automatic Urban and Rural Network
CAQMS	Continuous Air Quality Monitoring Station
CAZ	Clean Air Zone
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
FA	Further Assessment
FBS	Full Business Case
FDMS	Filter Dynamics Measurement System
JAQU	Joint Air Quality Unit
LA(s)	Local Authority (s)
LAQ	Local Air Quality
LAQAP	Local Authority Air Quality Action Plan
LAQM	Local Air Quality Management
LAQM.PG(16)	Local Air Quality Management. Policy Guidance (16)
LAQM.TG(16)	Local Air Quality Management. Technical Guidance (16)
LAQRA	Local Air Quality Review and Assessment
LAQS	Local Air Quality Strategy
MD	Ministerial Direction
MOVA	Microprocessor Optimised Vehicle Actuation
NAQO	National Air Quality Objective
NDDT	Nitrogen Dioxide Diffusion Tubes
NDDTS	Nitrogen Dioxide Diffusion Tubes Survey
NO_2	Nitrogen Dioxides
NO_x	Nitrogen Oxides
OBC	Outline Business Case
PAQS	Portsmouth Air Quality Strategy
PCAN	Portsmouth Clean Air Network
PCC	Portsmouth City Council

PCM	Pollution Climate Mapping
PHE	Public Health England
PM_{10}	Airborne particulate matter with an aerodynamic diameter of 10µm (micrometres or microns) or less
$PM_{2.5}$	Airborne particulate matter with an aerodynamic diameter of 2.5µm or less
QA / QC	Quality Assurance and Quality Control
OBC	Outline Business Case
RSW	Report Submission Website
SAS	Source Apportionment Study
SOC	Strategic Outline Case
SO_2	Sulphur Dioxide
TFS	Targeted Feasibility Study

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