Portsmouth City Council

2018 Air Quality Annual Status Report (ASR)

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

Portsmouth City Council

June 2018

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Executive Summary: Air Quality in Our Area

This overview is a summary of the state of Portsmouth Local Air Quality (LAQ) and progress on actions that Portsmouth City Council (PCC) is taking to improve LAQ.

This report covers Air Quality (AQ) monitoring data for the period 2013 to 2017.

The principal findings of the 2017 Annual Status Report (ASR) are:

- PCC continues to recognise the impact of pollution upon public health and is committed to the continuous reduction of Air Pollution (AP) levels.
- The monitoring of nitrogen dioxide (NO_2) using continuous monitoring and passive NO_2 Diffusion Tubes (NDDT) during 2017 indicates that levels in only 1 of the 5 remaining Air Quality Management Areas (AQMA) - namely AQMA 6 - exceeds the National Air Quality Objective (NAQO) levels.
- As a result of planned regeneration projects, concerns in respect to AP in sensitive areas (such as by schools) and following DEFRA's appraisal of the PCC's 2016 ASR, a significant number of new NDDT monitoring locations have been set up in areas where road traffic may have an influence on sensitive receptors or where the public may be exposed to automotive related AP.
- PCC recognises that LAQ improvements can only be achieved with buy-in, cooperation and commitment from all and that this is likely to mean that extremely difficult decisions and choices will have to be made in deciding what formal steps are to be adopted to combat the remaining hot-spot areas in Portsmouth in order to reduce AP levels city-wide.
- PCC accepts that although wider AP problems arise from a range of sources, as road transport is the main contributor to non-compliance with NO_2 concentration limits this is likely to mean that new solutions will be necessary within areas of concern and that high regard will need to be given to ensuring that large-scale new development and regeneration projects do not increase AP levels.
- PCC continues to develop a diverse range of measures to tackle AP levels and improve LAQ city wide.

Air Quality in Portsmouth

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

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

The main pollutant of concern in Portsmouth is NO_2.

PCC currently has 5 AQMAs declared on the grounds of monitored or modelled exceedances of the UK annual mean NO_2 NAQO.

In view of our increased monitoring programmes it is our intention to keep all these areas under review. We currently have no intention to revoke AQMAs even where levels have been consistently recorded in compliance with the NAQO.

The 2017 ASR results indicate that NO_2 have exceeded the NAQO at 3 locations within AQMA 6 during 2017. No other exceedances of the NAQO, in any pollutant, have occurred.

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

A summary of the NO_2 monitoring results are presented in the table below:

NDDTS = Nitrogen Dioxide Tube Survey / CAQMS = Continuous Air Quality Monitoring Station / *All results are annual averages

NDDTS year	NO_2 DOWNWARD trend* recorded at monitored locations (long term sites)	Improvement?
2013 - 2017	34.37%	No
2012 - 2016	40.70%	
2017	64.28%	Yes
2016	10.71%	
NDDTS year	Locations in excess of NO_2 NAQO* (long term sites)	Improvement?
2017	7.14%	Yes
2016	17.86%	
NDDTS year	No. of sites exceeding NAQO* located outside an AQMA	Improvement?
2017	0	Yes
2016	2	
CAQMS Station	5 year NO_2 trend*	Improvement?
London Road	Upward	No
Gatcombe Park	Downward	Yes
Burrfields Road	Upward	No
Mile End Road	Downward	Yes
CAQMS Station	NO_2 2016 compared with 2017*	Improvement?
London Road	8% increase	No
Gatcombe Park	3% decrease	Yes
Burrfields Road	3% increase	No
Mile End Road	5% decrease	Yes
CAQMS Station	Exceeding NO_2 NAQO*	
London Road	Yes	
Gatcombe Park	No	
Burrfields Road	No	
Mile End Road	No	

Actions to Improve Air Quality

PCC is committed to working in partnership to improve and maintain healthy AQ in Portsmouth. Despite the challenges faced, progress has again been made to improve LAQ and we will drive forward further improvements in the coming years.

A new Air Quality Action Plan (AQAP) is currently being created. A draft plan will be released for widespread community and stakeholder engagement and to seek the support (or otherwise) of the themes and actions it contains. The details of actions will then be finalised and, as necessary, measures will then be subject to separate consultation. It is not possible to predict the likely AQ impact of measures in more detail until options have been adopted and the modelling AP levels has been undertaken for them (as required).

Conclusions and Priorities

Although NO_2 levels in Portsmouth remain a significant concern the results presented within the 2018 ASR are considered to represent a further improvement in AQ.

In 2018 PCC will increase its knowledge of NO_2 levels by deploying a significantly higher number of monitoring sites to further explore the geographical extent of possible hotspot areas and to seek additional evidence that levels in problematic areas are decreasing / remain compliant.

Delivering compliance with statutory obligations and the formulation of a new AQAP following consultation are key priorities. PCC commits to ensuring that we will work hard to balance the complex needs of the city whilst reducing levels of harmful pollutants.

Local Engagement and How to get Involved

PCC engages with local stakeholders, interest groups and the public on individual schemes and initiatives that are likely to have an impact on LAQ, as appropriate. Close working between the different teams within the PCC (for example transport, environmental health, planning and public health) will ensure consideration is given to the impacts and outcomes of all schemes and developments, in terms of AP and its wider impacts.

An Air Quality Board (AQB) has recently been formed in order to bring together key decision makers within PCC to consider the actions necessary to deliver compliance with governmental legislative requirements and to resolve the key AQ issues of concern within Portsmouth. Additionally, an Air Quality Steering Group (AQSG) is in the process of being formed to bring together a range of local stakeholders to assist with the development of the updated LAQAP.

PCC will be participating in Clean Air Day 2018, with a range of events planned at varied locations in the city to raise awareness of the importance of clean air, and ways that people can to contribute to LAQ improvements. In addition to this, a Portsmouth Clean Air Network (PCAN) is to be formed during 2018 to further engage with local businesses, organisations and the public on possible ways to reduce harmful emissions.

A number of events and initiatives are planned for 2018 / 2019 which will provide further opportunities to raise the profile of AQ and encourage positive changes to support pollution reductions. These will include such things as a city wide anti-idling campaign, personal journey planning, workplace journey planning, school initiatives and electric vehicle promotion.

Information on AQ is provided on the PCC website; this will shortly be provided through the PCAN and supported through a range of communications and marketing events that are to be held in the city. There are currently 4 stakeholder groups in the city who have made known a specific interest in AQ issues: Portsmouth Friends of the Earth, Portsmouth Green Drinks Group, Let Pompey Breathe and The Green Party.

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1 Local Air Quality Management

This report provides an overview of AQ in Portsmouth during 2017. It fulfils the requirements of LAQM as set out in Part IV of the Environment Act (1995) and the relevant Policy and Technical Guidance documents.

The LAQM process places an obligation on all Local Authorities (LA) to regularly review and assess AQ in their areas, and to determine whether or not the NAQOs are likely to be achieved. Where an exceedance is considered likely the LA must declare an AQMA and prepare an AQAP setting out the measures it intends to put in place in pursuit of the objectives.

This ASR, which follows the prescriptive template requirements provided by DEFRA, is an annual requirement showing the strategies employed by PCC to improve LAQ and any progress that has been made in reducing AP.

The statutory NAQO applicable to LAQM in England can be found in Table E.1 in Appendix E.

2 Actions to Improve Air Quality

This section outlines progress on duties and latest current PCC's steps to improve AQ locally.

DEFRA's Appraisal Report on ASR2017

In March 2018 DEFRA published an analysis of the PCC 2017 ASR. The commentary confirmed that the conclusions reached were acceptable for all the sources and pollutants reported upon, however, it recommended that a series of measures be introduced in 2018 and beyond.

The commentary recommended improvements to the monitoring and future reporting of AP and provided additional guidance for the ongoing AQAP process.

Whilst all the comments within the appraisal are equally important several areas are worthy of particular mention. These relate to the need to evidence that improvement measures have targeted emission reductions for AP hotspots, that new areas of exceedance should be reviewed and that new AQMA be declared as required. Two areas of exceedance outside the existing AQMAs were identified in the 2017 ASR, these being busy junctions within Albert Road and Northern Road.

DEFRA's appraisal of the 2017 ASR concluded that the report was well structured, detailed, and provided the information specified in the Guidance.

Below are the individual observations raised by DEFRA, coupled with the subsequent responses provided by PCC (highlighted in green):

DEFRA's Comment (Com) 1: *PCC has updated the action plan measures that were reported in the previous ASR so that completed measures are no longer reported.*

PCC's Response (Res) 1: *Completed actions are no longer reported on Table 2.2 of the 2018 ASR.*

DEFRA's Com 2: *The measures detailed within the action plan are still based upon measures that were derived in 2010. Although the latest source apportionment study confirms the previous assessment, the latest monitoring results suggest that a further review of measures within the action plan is justified.*

PCC's Res 2: *PCC's new AQAP is being drafted and is due to be published by the end of 2018. The new AQAP will review the measures contained within the 2010 AQAP.*

DEFRA's Com 3: *The current AQAP was developed in 2010 and is now 8 years old. The summary of recent monitoring highlights that only AQMA 6 and AQMA 7 are currently exhibiting results above NAQO NO_2 level.*

PCC's Res 3: *The summary of the 2017 monitoring confirms that all exceedances of the NAQO are located within AQMA 6. PCC's AQAP is being drafted to be published by the end of 2018.*

DEFRA's Com 4: *However, there are 2 monitoring sites close to busy junctions at Albert Road, and Northern Road, not currently in AQMAs that exceed the annual mean NAQO for NO_2.*

PCC's Res 4: *Both monitoring sits are within revoked AQMAs:*

- *Albert Road within revoked AQMA 2 (Figure F.21) did not exceed the NO_2 NAQO in 2016 as registered levels were 40.05µg/m^3 which on DEFRA's 2017 advice represented compliance. NO_2 levels at this roadside monitoring location dropped below the NAQO in 2017. It continues exhibiting an upward trend in the last five years (2013 to 2017) showing a deterioration in AQ similar to the previously reported 5 year trend commencing year 2012. However, NO_2 level slightly decreased by 1.68µg/m^3 (a reduction of 4%) between 2016 and 2017 to fall under the NAQO. AQ monitoring has been increased around this monitoring location with 8 additional sites. This site will remain under review.*
- *Northern Road within Rev AQMA 13 (Figure F.9): NO_2 levels at this roadside monitoring location fell below the NAQO in year 2017. It exhibits an upward trend in the last five years (2013 to 2017) showing an AQ deterioration similar to the previously reported trend for 5 years commencing year 2012. Only this time with a higher rate of deterioration as the linear trend is characterised by a stronger slop. However, NO_2 levels decreased by 2.75µg/m^3 (a reduction of 8%) between 2016 and 2017 to fall under the NAQO. AQ monitoring has been stepped up with 5 additional sites around this monitoring site. This site will remain under review.*

DEFRA's Com 5: *The report makes clear that the current monitoring programme has been in place for some time and has not been reviewed in recent years.*

PCC's Res 5: *PCC revised its AQ monitoring strategy in 2017 to include 16 additional sites, with a further additional 59 sites created in 2018 in response to DEFRA's appraisal report of PCC's ASR 2017.*

DEFRA's Com 6: *In light of the current exceedances and the evidence of results at sites showing increases in pollution levels, we recommend that the current monitoring strategy should be reviewed and new AQMAs declared as required.*

PCC's Res 6: *PCC revised its monitoring strategy as per Com 5 and the exceedance sites will be further reviewed and considered for declaration. However, the 2017 registered exceedances are only located within AQMA 6. PCC's 2017 data suggests that there is no justification for new AQMA declarations. However, all monitored locations will remain under review.*

DEFRA's Com 7: *The exceedance sites outside of AQMAs represent a single monitoring site, providing no clear evidence for the extent of the exceedance area. The monitoring programme needs to be able to assist in the determination of pollution hotspots, declaration and continued review of the status of AQMAs, in support of action plan measures.*

PCC's Res 7: *See Com 5 and 6 above.*

DEFRA's Com 8: *New AQMAs need to be considered after further assessment at the Albert Road Junction, and Northern Road junctions, once the extent of exceedance areas have been determined.*

PCC's Res 8: *See Com 5, 6 and 7 above.*

DEFRA's Com 9: *The maps of monitoring sites do not link to maps of AQMAs, thus it is difficult to determine locations of monitoring sites to AQMA boundaries. AQMA 12 has met the AQ objective for at least 5 years, but appears it may be the only monitoring site within AQMA 12. Further assessment may be required as a basis for revoking this AQMA.*

PCC's Res 9: *See Com 5, 6, 7 and 8 above. New maps have been provided to demonstrate new the monitoring locations with reference to the AQMAs (refer to maps 6 to 16).*

DEFRA's Com 10: *Similarly, AQMAs 9 and 11 are now reported as marginally below objective levels. The report does not allow identification of which monitoring sites reside within each AQMA, and future reports should clarify this. If only a single monitoring location represents each AQMA further monitoring should be considered* ***to determine full compliance with the objective.***

PCC's Res 10: *Linked to Com 5, 6, 7, 8 and 9 above. Extension of monitoring sites within and around AQMAs has been instigated:*

- *AQMA 9: An additional 9 sites within the AQMA and 4 within the immediately adjacent area.*
- *AQMA 11: An additional 3 sites within the AQMA and 3 within the immediately adjacent area.*

DEFRA's Com 11: *Not all of the AQMAs are clearly defined on the Defra website, for instance there is no map for many of the AQMAs or a copy of the AQMA order. The Local Authority is requested to update their AQMA records to provide AQMA maps, and a copy of the AQMA order for these AQMAs.*

PCC's Res 11: *New maps have been provided. Defra's website is in the process of being updated.*

DEFRA's Com 12: *We agree that the current action plan requires updating; there is no evidence within the current plan that existing measures have targeted emissions reductions for pollution hotspots. No measures have any estimates for emissions reductions, or indicators to track delivery. It is also not clear within the list of current action plan measures, which measures remain within funded programmes.*

PCC's Res 12: Action planning template (Table 2.2) includes this information. The new AQAP will likewise include this information.

DEFRA's Com 13: *The Council may wish to refer to the latest Technical Guidance issued by Defra in LAQM TG(16) highlighting the preferred process for developing action plan measures to target air pollution hotspots. The Action Plan would benefit from the inclusion of prioritisation criteria highlighting the cost-effectiveness of measures to achieve the required levels of emissions reductions based upon source apportionment for the AQMA's. It will be beneficial to include the level of further*

emissions reductions required to achieve the air quality objectives within specified timescales.

PCC's Res 13: *The new AQAP is being prepared with high regard to LAQM.TG(16) and using the latest template.*

DEFRA's Com 14: *The recent source apportionment study concluded that a do-nothing, business as usual response will deliver the AQ objectives in all AQMA's by 2022, or a 15% reduction of roadside emissions are required in AQMA 6 from 2020.*

PCC's Res 14: *This is a statement of fact and PCC offers no additional comment.*

DEFRA's Com 15: *This suggests that measures to address emissions reductions at sensitive receptor locations along the London Road / Kingston Road / Fratton Road corridor within AQMA 6 should be a priority within a new AQAP, along with measures to address pollution hotspots at potential new AQMA sites.*

PCC's Res 15: *All exceedances of the NAQO for NO_2 in 2017 were recorded along London Road / Kingston Road / Fratton Road corridor within AQMA 6. Therefore, AQMA 6 will be prioritised within the new AQAP.*

DEFRA's Com 16: *Table B1 is incomplete in the report, only 25 results are reported; the remainder of the results table is missing. Table B1 should be completed to show all results. Monitoring sites should be labelled to indicate which AQMA they are located within.*

PCC's Res 16: *The 2017 ASR is available on PCC's website. It is reporting all monitoring data and corrected this omission.*

DEFRA's Com 17: *As new action plan measures are developed, it will be important to consider the relationships between local traffic management and positions of air pollution hotspots. It is likely that there will be a significant relationship between traffic congestion and hotspot locations. The new ASR reporting process expects action plan measures to be updated on an annual basis.*

PCC's Res 17: *PCC carried out a study looking at possibilities to improve AQ through various scenarios for traffic management and concluded that traffic management can have a very insignificant impact on AP hotspots. The project was undertaken under the tittle "Optimisation of Road Traffic Control Management Systems" in 2015.*

DEFRA's 18: *On this basis, the action plan needs to reconsider the prioritisation of measures that can significantly impact on reducing pollution below NAQO levels on a clear understanding of current and future transport management within the city.*

PCC's Res 18: *Comment only - confirming the importance of using the planning process to tackle AP from committed developments in Portsmouth.*

Local Air Quality Strategy (LAQS)

On 17th July 2017[4], PCC adopted a LAQS, recognising the impact that poor AQ has on public health and the need for co-ordinated action to reduce AP. The LAQS will help to drive forward improvements to LAQ, promoting joint working amongst departments and stakeholders.

Within the report, and in line with our statutory duties through the Environment Act 1995, was a commitment to create a new AQAP.

Air Quality Action Plan (AQAP)

The present PCC's AQAP was published in 2010 and is now 8 years old. Therefore it is time not only to update / revise the existing plan but to produce a new AQAP.

The development of a new AQAP is well underway and the process of wide community and partner engagement will now begin using the AQAP template and guidance provided by DEFRA.

The AQAP being produced will include all relevant schemes being considered across the PCC. Whilst the main focus will be on transport schemes, it will also include schemes and initiatives from planning, public health, energy services, and landscape architecture.

Through this process the selection and development of options to identify polluting sources will concentrate where controls might be effective in reducing concentrations and upon those which are likely to make a significant contribution to the success of a particular objective.

[4] http://democracy.portsmouth.gov.uk/documents/s15809/Air%20Quality%20Strategy%20-%20Report.pdf

In addition to the on-going measures, consideration will be given to more targeted measures to address the areas with consistently high levels of AP. Devised actions will focus particular attention on AQMA 6 and the other 4 current AQMAs but will aim to deliver city-wide reductions. These measures will be considered with input from the newly founded AQB and forthcoming AQSG.

The draft AQAP will be released for widespread community engagement and to seek the support (or otherwise) of the public and stakeholders for the broad themes and actions it contains. The details of actions will then be finalised, and as necessary measures will then be subject to separate consultation.

It is not possible to predict the likely AQ impact of measures to be selected in more detail until options have assessed to quantify their possible impact using detailed AP modelling (as required).

PCC is currently working on the new AQAP, with the intention to adopt it formally by the end of 2018.

Strategic Direction

The Portsmouth LAQS aims to drive forward PCC's AQAP, seeking to achieve continual city-wide reductions in AP, particularly within existing AQMAs, to fulfil statutory duties for LAQM and public health.

The strategy recognises that reductions in AP can only be achieved with buy-in, co-ordination and commitment from all stakeholders, including members of the public. The multi-disciplinary AQSG will help to drive forward the clean air agenda and to support the implementation of the AQAP.

6 strategic objectives are included within the strategy:

1. Foster closer working relationships between council directorates and external partners
2. Create a focus on sustainable travel, including the promotion of a modal shift in transport from the car to active travel.
3. Provide high quality information and guidance on LAQ to members of the public

4. Develop and implement measures to reduce traffic and congestion related emissions, addressing road network flow and functionality
5. Support and stimulate sustainable citywide economic growth, including a focus on reducing carbon emissions.
6. Ensure that PCC lead by example in supporting sustainable working practices, minimising our own emissions and carbon footprint.

The below actions are proposed, these are likely to form the basis for the AQAP:

- Set up multi-disciplinary AQSG to drive forward the clean air agenda.
- Seek opportunities for effective partnership working at all levels
- Work with the housing sector to minimise domestic sources of air pollution
- Take opportunities to engage with academic sector and community groups to reinforce shared learning and seek solutions to improve LAQ
- Work with schools to promote active travel and cycling proficiency
- Seek funding opportunities to support the possible introduction of electric buses in Portsmouth
- Investigate the role that green infrastructure can play in Portsmouth in helping to remove contaminants from the air
- Empower businesses and industry to take responsibility for their contribution to LAQ and drive down pollution
- Work with Portsmouth International Port and the freight industry to support measures to reduce AP from shipping and haulage
- Encourage, incentivise and empower residents and commuters in adopting active travel, for example through improvements in the walking and cycling infrastructure
- Maximise the availability of sustainable travel options
- Work towards minimising emissions from PCC's vehicle fleet through the uptake of low-emission engine technology and alternative vehicle fuels
- Raise awareness of air pollution amongst city residents and workers
- Consider ways of disseminating messages about air quality during periods of high AP
- Continue to implement measures to reduce traffic congestion, particularly on strategic routes and within AQMA's

- Reduce emissions related to suboptimal traffic flow, through the upgrade of key road junctions with Microprocessor Optimised Vehicle Actuation (MOVA) technology and the development of a sensor network collecting real-time traffic flow information
- Investigate and trial alternative new technologies to reduce delays across the traffic network.
- Encourage all new commercial, industrial and property developments have a focus on sustainability, and minimise carbon emissions
- Encourage sustainable regeneration and growth, particularly through transport policies
- Ensure that businesses that work/contract with the PCC have green fleet and carbon neutral ambitions
- Ensure future revisions of Portsmouth's strategic plans fully recognise air quality issues and where possible minimise their impacts.

Portsmouth City Council Air Quality Board

PCC has formed recently an AQB whose members are made mainly made up of senior PCC officers:

- Director of Public Health
- Director of Regeneration
- Assistant Director, Transport
- Public Health Consultant
- Assistant Director, Planning
- Port Director
- Transport Planner
- Regulatory Services Manager.

The main purpose of AQB is to:

- consider the actions necessary to deliver compliance with governmental legislative requirements to resolve the key AQ issues of concern within Portsmouth

- provide a strategic oversight of the investment and regeneration programmes underway which impact or are likely to impact upon AP levels in Portsmouth.
- advise on the methodologies in air science and health assessments - including emission estimation, air quality assessment and projection, cost benefit analysis of AQ improvement measures and health impact assessments of all chosen outcomes
- consider the impact on the protected harbours.

The top 6 objectives of the AQB are:

1. Champion improvements in AQ across the city
2. Deliver compliance with the NAQOs as required by law, *in the shortest possible timeframe*
3. Oversee the development of the local AQAP, and the implementation of interventions
4. Foster collaborative working and sharing of information, integrating AQ into all PCC decision making and relevant plans and strategies
5. Identify, assess and implement practical AQ improvement measures, building upon best practise ideas and solutions to resolve areas of concern
6. Review updates on schemes or projects related to LAQ.

Air Quality Steering Group

- A proposed Stakeholder Group has recently been formed, to include representatives from key businesses, transport operators, active travel groups and residents groups
- An initial letter has been sent to the key businesses, transport operators and active travel groups in order to inform them of the work that is being undertaken, and to invite them to be a part of the AQSG
- The first AQSG meeting is to be held in June. A key aim of this AQSG will be to help determine the actions in the AQAP
- Moving ahead it its intended that the AQSG will continue to have a supporting role in the continuing work on air quality taking place in the city.

Portsmouth City Council: Third Wave Status

The UK plan for tackling roadside nitrogen dioxide (published in July) set out how to bring NO_2 pollution within statutory limits in the shortest time possible.

Three 'waves' of authorities were identified:

- Wave 1: required to develop a Clean Air Zone: Southampton, Derby, Birmingham, Leeds and Nottingham
- Wave 2: required to carry out a Targeted Feasibility Study (TFS), with the publication of an AQAP by December 2018 (23 authorities).

Originally, the plan for the 'marginal authorities' or 'third wave' authorities of which Portsmouth is one of 45, was for a proportionate approach, whereby LAs were expected to take steps now to reduce emissions if there are measures they could take to bring forward the point where they meet legal limits.

DEFRA committed to consider further steps to ensure that AQ in these areas improves and to ensure that forecast levels remain compliant. These steps could include preferential access to funding and government support to access and build on best practice.

Portsmouth was identified by DEFRA as achieving compliance with AQ levels by 2021, along with Bournemouth, Bradford, Oldham, Plymouth, Solihull, Stoke-on-Trent, Wakefield, Walsall and Wolverhampton.

To aid in the development of the TFS, PCC was awarded a grant of £50k from DEFRA.

The Ministerial Direction sets out that the TFS must be submitted as soon as possible but at the latest by 31st July 2018, with guidance issued for the development of the targeted feasibility study with inherent interim deadlines.

So far PCC has completed the following:

In May 2018:

- Parts 1 and 2 of the TFS have been submitted
- Telephone conference held with Defra's Joint Air Quality Unit (JAQU) revealed that they:
    - are in agreement and will consider our evidence of monitoring data for 2017 for the 48196 road link (bottom of the M275)
    - may not reconsider the Alfred Road link, until EU Ambient Air Quality Directive (AAQD) compliant data has been assessed
    - are happy to consider the potential impacts upon A2047 (AQMA 6) and the expansion of the TFS.
- Evidence of monitoring data in compliance with the AAQD for A2047 and Mile End Road has been submitted.

In April 2018:

- PCC commissioned an AQ consultant, AECOM, who carried out the PCC Source Apportionment Study 2017, to carry out the TFS work
- An initial meeting was held with AECOM on 28th March to discuss the requirements of the study
- AECOM have produced Tasks 1 and 2 of the AQ TFS. These have been submitted to DEFRA's Joint Air Quality Unit.

Work is now continuing on Parts 3 and 4 of the TFS.

Air Quality Grant (AQG)

On 21st March 2018, PCC were awarded £450,000.00 through the DEFRA AQ Grant (AQG) competition. The delivery programme is split between revenue and capital, with 50% revenue funding for a series of behaviour change initiatives focused on reducing AP and 50% for capital improvements for walking and cycling infrastructure.

The grant fund has been split to fund the projects as tabulated below:

Programme Element	Project name	Description	Location	Total Budget (£k)	Example Cost Breakdown
Communications and Marketing	Communicat-ions and Marketing	Market research would be undertaken in order to determine the most effective communications and marketing package. This could include measures such as an anti-idling campaign, participation in National Clean Air Day, recruitment of Clean Air Champions, formation of a Clean Air Network, events to promote air quality and the introduction of branding to promote good air quality	Citywide targeting AQMAs	58	To be determined following market research
Residents	Personal Journey Planning	Journey planning activity targeted at residents in AQMAs to encourage use of sustainable travel modes and green driving behaviour. This activity will look at demographics to identify how residents will be most receptive and is likely to include face to face, and e-communication, offering a variety of activities from basic advice and information to discounted cycle/ driver training courses	All AQMAs	15	Delivery £14,500 Other costs £500
	Electric vehicle promotion	Promotion of electric vehicle chargepoints available through OLEVs ORCS scheme and encouraging the further uptake of electric and hybrid in the city	Citywide, targeting ORCS locations and AQMAs	2	Delivery £2,000
	Cycle Training	A variety of cycle training courses, targeting both new and beginner cyclists in becoming more confident in cycling through adult and family cycle training courses and also bike maintenance courses to help maintain uptake by existing cyclists	Citywide targeting AQMAs	15	Information booklets £1,750 Advertisement £1,250 Posters/Leaflets £1000 Delivery of training £6,250 Equipment giveaway £1,750 Led bike rides £1,250 Other £1,750
	Family Bike Grant scheme	Offer of discounted purchase or loan of bikes and safety equipment to those residents on low incomes	Citywide targeting AQMAs	12	Advertisement £1500 Posters/Leaflets £1,000 Bike grants £8,500 Equipment £1,000
	Bike Dr.	Bike maintenance sessions for free basic cycle repairs	City centre (AQMA 11) North End (AQMA 6)	15	Delivery £15,000
Schools	Pompey Monsters Walk to School Challenge	Roll out of the successful Pompey Monster Walk to School Challenge to schools with primary age children in and adjacent to AQMAs	Schools in and around AQMAs	15	Pupil packs £1,500 Keyring incentives £5,500 Pedometers £1,500 Flyers/posters £700 School launch £350 Evaluation £150 Other costs £300

	School Travel Planning including pedestrian and scooter training	Working with schools in and around AQMAs to encourage sustainable travel for the journey to school through providing infrastructure such as cycle parking, and resources such as park and stride maps to raise awareness of travel choice. Targeting the parents as decision makers on travel choice. This could potentially include Modeshift STARS. Pedestrian training would teach primary aged children basic road safety to improve safety and encourage walking to school. Scootability training for schools with primary aged children to encourage polite and safe scooting to school	Schools in and around AQMAs	22	Travel planning £2,000 ModeshiftSTARS £10,000 Pedestrian training £500 Scootability training £4,500 Cycle/scooter parking £5,000
Workplaces	Workplace Travel Planning	Travel planning activity including personalised journey planning with employees, targeted at large workplaces in AQMAs, or those with staff who travel through AQMAs for commuting or business travel	Workplaces in AQMAs or with staff who travel through AQMAs	25	Consultant delivery £25,000
	Workplace green fleet/driving	Working with businesses in the city with large fleets, to encourage smarter driving behaviour e.g. eco-driver training, and providing advice on the possibilities of improving the environmental impact of their fleets by converting to vehicles with lower emissions	Businesses in the city with large fleets	8	Delivery £8,000
	Workplace sustainable travel fund	A fund available for businesses to apply for measures to promote sustainable travel to their employees for commuting and business use, prioritising those in AQMAs	Citywide, prioritising those in AQMAs	18	Delivery £18,000
Infrastructure improvements	Improvements to permeability to encourage walking and cycling.	Physical improvements to key travel routes to improve permeability and encourage use of active travel modes, making walking and cycling more attractive forms of travel. To include greening of routes and tree planting and other public realm where possible	East-West Active Travel Corridor, in and adjacent to AQMAs 6, 7 and 12	245	Feasibility £20,000 Design £22,500 Consultation £1,000 Construction £200,000 Monitoring surveys £1,500
			Total	**450**	

2.1 Air Quality Management Areas

AQMAs are declared when there is an exceedance or likely exceedance of the NAQO. After declaration, the LA must prepare an AQAP within 12 to 18 months setting out measures it intends to put in place in pursuit of the objectives.

A summary of AQMAs declared by PCC can be found in Table 2.1.

Alternatively, see Appendix D: Map(s) of Monitoring Locations and AQMAs, which provides for a map of AQ monitoring locations in relation to the AQMAs.

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

Table 2.1 – Declared Air Quality Management Areas

AQMA Name	Date of Declaration	Pollutants and Air Quality Objectives	City / Town	One Line Description	Is air quality in the AQMA influenced by roads controlled by Highways England?	Level of Exceedance (maximum monitored/modelled concentration at a location of relevant exposure)		Action Plan	
						At Declaration	Now (From 2016 to 2017)	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 49.16 µg/m^3 to 43.09 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 43.52 µg/m^3 to 38.8 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 39.61µg/m^3 to 34.72µg/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 39.34 µg/m^3 to 38.48 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 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 34.7µg/m^3 to 34.2µg/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**

2.2 Progress and Impact of Measures to address Air Quality in Portsmouth

PCC has taken forward a number of direct measures during the current reporting year of 2017 in pursuit of improving LAQ. Details of all measures are set out in Table 2.2.

PCC has provided information within the table of when measures are expected to be completed. Additional narrative in respect to the progress made in delivering each action to date and where reduction AP is possible has also been provided. PCC will prioritise 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 and where congested traffic travels through the street canyon of AQMA 6 the greatest problems occur. Achieving a model shift from the car to walking or cycling for local traffic using this link, whilst maintaining its significance as a local shopping area together with managing its service vehicles to it has proven historically to be difficult and remains our greatest challenge.

Whilst the measures in Table 2.2 will help to contribute towards compliance, PCC anticipates that further additional measures not yet prescribed will be required to achieve compliance and enable the revocation of AQMA 6.

Table 2.2 – Progress on Measures to Improve Air Quality

Measure No.	Measure	EU Category	EU Classification	Organisations involved and Funding Source	Planning Phase	Implementation Phase	Key Performance Indicator	Reduction in Pollutant / Emission from Measure	Progress to Date	Estimated / Actual Completion Date	Comments / Barriers to implementation
PI1	Air Quality Information 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	Via the Internet Via leaflets Via other mechanisms	PCC	2017	Ongoing	Level of participation in market research exercise No. of events and campaigns held, and level of participation	<0.1µgm3 Raising awareness of travel behaviours and factors to support a reduction in travel related pollution	Whilst some actions have already been carried out in this area, further work is to be progressed An air quality communications and marketing package is to be delivered, following a market research exercise to determine the most effective measures to be applied. To include campaigns and information targeting AQMA's and citywide	Series of events 2018/19 and ongoing	
PI2	Sustainable Travel Behaviour Change.	Promoting Low Emission Transport	Other	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 and Sustainable Travel Transition Year Grant Further Sustainable Travel Behaviour work will be undertaken through the Clean Air Grant and other initiatives	2018/19 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

PI3	On Street Travel Advisors and Personal Journey Planning.	Public Information	Via other mechanisms	PCC, further funded through Defra Clean Air Grant	2018	201/19	No. of people engaged within residential and events based activities	<0.1µgm3 Awareness raising with local residents, workers and visitors	Travel Advisors played a big role in the Personal Journey Planning (PJP) work 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 Personal Journey Planning will be undertaken during 2018 as part of the Air Quality Fund work. An element of this programme will focus on PJP in AQMA 6, involving both residential and event based activities	2018/19 and ongoing	Future Personal Journey Planning dependent upon further funding
PI4	Idling engines	Traffic Management	Anti-idling enforcement	PCC, further funded through Defra Clean Air Grant	2009	Ongoing	N/A	Whist not delivering a significant reduction in air pollution, this campaign will assist in awareness raising promoting the importance of switching off vehicle engines when stationary for more than a couple of minutes	An awareness campaign was carried out in 2011 to encourage drivers to switch off engines when stationary for more than a minute or two. A new awareness raising campaign will be launched in 2018, focussing particularly on congestion hotspots and around local schools. A focus of the campaign will be on AQMA's.	2018 and ongoing	This campaign will focus predominantly around local schools and key areas of the city which are prone to engine idling
PI5	Clean Air Day	Public Information	Via the Internet Via leaflets Via other mechanisms	PCC, funded through Defra Air Quality Fund	April -June 2018	21-Jun-18	No. of people engaged with	Raising awareness of air pollution and its effects on public health, travel behaviours and factors to support a reduction in travel related pollution	Various activities to be held across the city to coincide with Clean Air Day. Activities to include: Roadshow type event at various locations, free park and ride access on Clean Air Day to people previously signed up, electric vehicle demonstration, Bike Doctor, engagement with local schools including 'design a banner' competition, resources including air quality facts/myths and sustainable travel information	21st June 2018	Ongoing engagement with Clean Air Day is depended upon future funding. It is hoped that engagement in forthcoming years will be possible
PI6	Electric Vehicle Promotion	Promoting Low Emission Transport	Other	PCC, funded through Defra Clean Air Fund	2018	2018 and ongoing	Uptake of plugged in 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. Off street EV charge point trial to take place at three city car parks	Ongoing	

PI6	Clean Air Network	Public Information	Other	PCC	2018	2018 and ongoing	Sign up rate for the Clean Air Network	N/A	A Clean Air Network is to be set up, to engage with local businesses, interest groups, residents and educational institutions, to encourage reduced levels of air pollution in the city through changes in personal and organisational actions	Ongoing	
PI7	Air Quality Steering Group	Public Information	Other	PCC	2018	2018 and ongoing	Attendance on Air Quality Steering Group	N/A	An Air Quality Steering Group is to be formed. Initial contact has been made with local organisations and interest groups inviting their attendance	Ongoing	A role of the Steering Group will be to help to support the development of the air quality action plan. It is hoped that members of this group will also form part of the Clean Air Network
PI8	Air Quality Board	PGDC	Other	PCC	2018	2018 and ongoing	Regular meetings/updates to Air Quality Board	N/A	An Air Quality Board has recently been formed and is now in progress. Includes wide departmental involvement with Transport Planning, Regulatory Services, Planning, Public Health and the Port Authority	Ongoing	

C1	Promote Road Safety & Active Travel initiatives. For example; - educational programmes in schools include Bikeability, Transition years and Pompey Monsters Challenge. -Road safety behaviour change with students and commuters - Be bright, Share the Roads, bike security and businesses using light good vehicles. -Cycle promotion through community based cycle events to promote Quieter routes and 'Glow Ride'. Cycle Hub to support events with the provision of Bike Dr. Stake holder engagement to support CyclingUK set up Community cycle groups	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	An Active Travel Strategy in place for the period 2010 to 2030. This will be refreshed in 2018 in conjunction with other departments, notably Public Health to align with Government's Local Cycling and Walking Investment Strategy, alongside the production of a Local Cycling and Walking Investment Plan (LCWIP) for Portsmouth. PCC were successful in securing technical support for the development of the LCWIP, which is currently underway Walking and cycling map is a popular resource. Further redesign of the map is required and will be taken forward when funding becomes available. 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. Air Quality Grant funding is enabling further roll out of Pompey Monsters and Modestars Shift, with priority being given to schools located within AQMA's	Ongoing	Further funding will be required in order to continue to implement measures identified through the LCWIP
C2	Cycle ParkingThe 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 funding is available. 2016/17 a number of cycle parking stands were provided at a wide range of locations across the city as part of the Sustainable Travel Transition Year scheme. Further cycle parking will be provided at various locations through ongoing schemes	Ongoing	Provision of funding
C3	Community Cycle Hub Continued partnership working to support and generate income through community events and initiatives using Bike Dr.	Promoting Travel Alternatives	Promotion of cycling	PCC	2011	2023	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	

C4	LTP Programme.	Traffic Management	Strategic highway improvements, 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 NO2	On-going schemes being developed through the LTP will provide improvements to local air quality	Ongoing	
C5	East-west cycle route.	Promoting Travel Alternatives	Promotion of cycling	PCC, funded through Defra Clean Air Fund	2017	2018/19	Implementation of cycle route and usage of route by cyclists	<0.1µgm3 This route will form a large part of an East West cycle route, making cycling a safer and more viable option to people accessing jobs and local services in this part of the city	Development of an East West cycle route, improving permeability and encouraging use of active travel modes	2019	Funding has been identified through the Clean Air Fund to move forward with this scheme.
C6	Bike Hire Scheme	Promoting Travel Alternatives	Promotion of cycling	PCC	2017	Ongoing	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.	Implementation of a city wide bike hire scheme. An 18 month pilot scheme is to be delivered, with a proposed start up by the end of summer 2018. There is potential for this scheme to be extended. 150 bikes will be introduced at key sites in the city	2018	Promotion and marketing of this scheme will be required to support its launch and delivery
C7	Healthy School Street	Promoting Travel Alternatives	Promotion of cycling	PCC	2017	2018	Delivery of Healthy Schools Street	<0.1µgm3 There is the potential for reductions in NO2 to be achieved at the school location at key school travel times as a direct result of this scheme	It is proposed to deliver a 'Healthy Schools Street' in Portsmouth in 2018, incorporating road closure at a school in the city at key school times, to discourage travel to school by car and encourage active travel	2018	If this scheme is successful, PCC will look to introducing 'Healthy School Streets' to other locations in the city, if funding is available. Priority would be given to schools within or close to an AQMA

C8	Family Cycle Grants and Family Cycle Training	Promoting Travel Alternatives	Promotion of cycling	PCC, further work funded through Defra Clean Air 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 A further Family Bike Grant scheme and cycle training will be delivered through the Clean Air Grant	Mar-19	Further roll out of this scheme will be dependent upon further funding becoming available
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 2017/18. Pedal Portsmouth Events, Glow Ride, Changing Places and Be Bright Be Seen events will all be run again in 2018	Ongoing	Provision of funding
C10	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 are available for staff business use. This initiative is currently being relaunched with the booking system being updated to enable online bookings, a cycle maintenance stand to be provided at the PCC Civic Offices	Ongoing	The cycle maintenance stand will be available for use by staff using the pool bikes, but also by staff travelling to work by bike, adding a further incentive to staff to consider sustainable travel to work
C11	Quieter Routes	Promoting Travel Alternatives.	Promotion of cycling.	PCC	2016	2017	Installation of physical signage	<0.1µgm3 Supports travel behaviour change, strengthening the cycle routes in the city, particularly for short local journeys	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 north and south of the city, and five between the east and west. Physical signage is to be installed at the majority of the Quiet Route locations over this year. It is proposed that the Quiet Routes map will be updated following the completion of this signage upgrade	18/19	The existing network of 20mph roads support the formation of the 'Quiet Routes' network

W1	Promote walkingRoad 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 supporting measures such as Park and Stride. Partnership work with Routes4U and local action groups to support local walking initiatives	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/AWhilst not providing a direct pollution reduction target, promotion active travel initiatives will support the uptake of sustainable travel modes and contribute to positive travel behaviour change	An Active Travel Strategy in place for the period 2010 to 2030. This will be refreshed in 2018 in conjunction with other departments, notably Public Health to align with Government's Local Cycling and Walking Investment Strategy, alongside the production of a Local Cycling and Walking Investment Plan (LCWIP) for Portsmouth. PCC were successful in securing technical support for the development of the LCWIP, which is currently underway.Walking and cycling map is a popular resource. Further redesign of the map is required and will be taken forward when funding becomes available. Works in conjunction with ramblers and Portsmouth Friends of the Earth continue.A walking event 'Green Space Challenge' is to be run in 2018, with a focus on the green spaces surrounding AQMA 9. The Wayfinding System is being maintained with consideration for new finger posts as needs arise. Very good feedback has been received on the totem style mays and finger posts	2018	
W2	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	Completion of review of Rights of Way Improvement Plan. Finalisation of Routes4U contract	N/A	Currently undertaking review of the Rights of Way Improvement Plan, this will be completed by 18/19 Currently working on a contract for Routes4U, which will bring about access improvements for pedestrians. It is intended to complete this contract by the end of 18/19	2018/19	

W3	Healthy School Street	Promoting Travel Alternatives	Promotion of walking	PCC	2017	2018	Delivery of Healthy Schools Street	<0.1µgm3 There is the potential for reductions in NO2 to be achieved at the school location at key school travel times as a direct result of this scheme	It is proposed to deliver a 'Healthy Schools Street' in Portsmouth in 2018, incorporating road closure at a school in the city at key school times, to discourage travel to school by car and encourage active travel.	2018	
W4	Duisburg Way pedestrian crossing facility	Promoting Travel Alternatives	Promotion of walking	PCC	2016	Completed	Completion of scheme	N/A	A controlled toucan crossing has been implemented at Duisburg Way to link the existing footway and shared use facilities in the area. Also offers a controlled crossing facility to pedestrians and cyclists within the area who wish to attend the Events that are held within the area of Southsea Common	Completed Dec 2017	
W5	Victoria Road North - Bradford Rd junction / pedestrians crossing	Promoting Travel Alternatives	Promotion of walking	PCC	2016	2018/19	Completion of scheme	<0.1µgm3 Potential for significant uptake in cycling along this route, in combination with the east-west segregated cycle corridor	To improve the layout of the existing junction and provide a safe crossing point for both pedestrians and cyclists within the area. This will form part of the East West segregated cycle route	2018/19	
PLET 1	Electric Vehicle Chargepoint schemes	Promoting Low Emission Transport	Other	PCC	2018	2018	Installation of chargepoints and level of usage	<0.1µgm3 This measure will initially only achieve a very low level of NO2 reduction. There is potential for greater reductions to be achieved over time as EV usage increases across the city	Electric vehicle chargepoints for residential areas are to be installed at various city locations. Around 50 chargepoints will be installed at around 30 residential locations. Installation will begin summer 2018 with completion expected Autumn 2018. Alongside this chargepoints will be installed in three PCC owned off-street car parks in Spring/Summer 2018	2018	It is intended that further EV chargepoints be installed at other city locations in the future as demand for EV increases. It will be necessary to identify further funding to support this. Promotion of the EV chargepoint scheme will be undertaken in 2018 through the Clean Air Grant Fund
E1	Domestic heating emissions	Other	Other	PCC	2014	2030	Uptake of scheme	Unknown	Ongoing - control of replacement gas-fired boilers through building control and private sector housing teams - careful consideration of CHP. PCC were recently successful in receiving funding for a new first time boiler scheme	Ongoing	

E2	Energy saving measures	Other	Other	PCC	2014	2030	Monitoring of the performance of the measures	Unknown	Ongoing - Promotion of energy saving measures leading to reductions in combustion emissions across the city. To be conducted through PSAG. Continued implementation of Portsmouth Climate Change Strategy to reduce energy use for both organisations and housing across the city. Energy saving measures include Solar PV Installations and Fuel Cell micro-CHP installations	Ongoing	
S1	Safer Routes to School Minor Remedial Works	Promoting Travel Alternatives	School Travel Plans	PCC	2014	2030	Completion of schemes	<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. A number of schemes were successfully delivered in 2017/18. A series of small scale schemes are planned for 2018/19 at a number of schools	Ongoing	
S2	School travel plans	Promoting Travel Alternatives	School Travel Plans	PCC	2014	Ongoing	Delivery of Modestars Shift schemes	<0.1µgm3 Supporting sustainable travel to school	Ongoing school travel planning as part of the Clean Air Grant programme, Modestars Shift will be delivered to a number of local schools, predominantly focussing on AQMA's	2018/19 and ongoing	Dependant on continued funding beyond 2018/19
S3	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 2016/7, 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 will be rolled out to further schools within or close to AQMA's in 2018/19, through the Air Quality Grant	2018/19	Dependent upon further funding for subsequent years
NM1	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. A further VMS sign on M275 in AQMA 11 will either repaired or replaced in 2018	2018 and ongoing	Ongoing as need and funding arises

NM2	Junction improvements	Transport Planning and Infrastructure	Public transport improvements- interchanges stations and services	PCC	2013	Ongoing	Completion of citywide junction review	<0.1µgm3 Will provide improved journey times and less congestion in specific areas	On-going improvements to junctions. A number of junction improvements were completed in 2017, with further work planned for 2018/19. A review of all junctions is to be undertaken citywide, with five junctions being reviewed in 2018, and a focus being given to junctions within AQMA's. This will increase effectiveness and prevent unnecessary congestion	Ongoing	
NM3	Traffic Signal Reconfiguration	Transport Planning and Infrastructure	Public transport improvements- interchanges stations and services	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 further junction improvements are planned for 2018/19, which will incorporate improvements to cycle safety. A number of signalised junctions and crossings will be reviewed to ensure correct and efficient operation	Ongoing	
NM4	Eastern Corridor Works	Traffic Management	Other	PCC	2017	2018	Completion of all schemes of works	The combination of all of the measures to be introduced will have a positive impact on local air quality, reducing congestion and encouraging greater uptake of sustainable travel along this key corridor in the city	A comprehensive study of the Eastern Road corridor was conducted, which will deliver identifiable solutions for this key corridor into the city. The study will identified problems of current uses and identified future uses and solutions Much of this work has now been completed, with the remaining schemes due for completion in 2018. Schemes have included the introduction of a new cycle path, improvements for cyclists and pedestrians, improvements to public transport facilities and traffic light upgrades	2018	

NM6	Wightlink increased vehicle stacking capacity and reduced queuing	Traffic Management	Other	PCC	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 localNO2 levels	Wightlink undertook work to facilitate increased capacity, improved loading and vehicle waiting facilities in 2017.Further work will be completed in 2018 to implement Auto Number Plate Recognition (ANPR), which will allow for faster check in times and reduce ferry related congestion	2018	
NM7	City Centre Road	Traffic Management	Strategic highway improvements, Re-prioritising road space away from cars, including Access management, Selective vehicle priority, bus priority, high vehicle occupancy lane	PCC	2017	Ongoing	Completion of the City Centre Road scheme	<0.1µgm3	A full application has been made for extensive modifications to the road network around the A3, southwards from the junction with Princess Royal Way to the junction with Unicorn Road, including the construction of a new road link between Flathouse Road and the A3 south of Herbert Street. Creation of a new signalised junction on the A3 Mile End Road, north of Church Street roundabout, would route traffic wishing to travel to destinations in the Gunwharf and Dock Yard areas via a new dual carriageway road, effectively bypassing the section of road link 48196 between Princess Royal Way and the Church Street roundabout. Church Street roundabout, Hope Street roundabout and Marketway roundabout would be upgraded to linked signalised junctions to avoid stop-start traffic. This scheme would increase capacity, prioritising public transport, walking and cycling	Currently unknown	
NM8	A27 Safer Roads Funds	Traffic Management	Strategic highway improvements, Re-prioritising road space away from cars, including Access management, Selective vehicle priority, bus priority, high vehicle occupancy lane	PCC	2017	2018	Delivery of traffic safety measures	<0.1µgm3	Traffic safety measures including improved facilities for active travel modes	2018	

NM9	Smart Motorways M27 Jct. 11to A27/A3M	Traffic Management	Strategic highway improvements, Re-prioritising road space away from cars, including Access management, Selective vehicle priority, bus priority, high vehicle occupancy lane	PCC	2017	Ongoing	Completion of works	Unknown	Request to HE for an upgrade and improvements from M27 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. Upgrade of the A27 between Junction 12 M27 to the A27/A3 (M) junction to motorway standard as part of RIS 2	Ongoing	
NM11	Speed Reduction Schemes 2018/19	Traffic Management	Other	PCC	2018	2019	Implementation of schemes	<0.1µgm3 Speed reduction measures can help in increasing uptake of walking and cycling through improved safety	Various speed reduction schemes were completed in 2017/18 to improve safety and encourage uptake of walking and cycling. Measures included additional speed limit roundels and coloured surfacing. Further speed reduction schemes will be implemented in 2018/19, with a focus on Greetham Street, Locksway Road and St Mary's Road	2018/19 and ongoing	
NM12	Signs and Lines	Traffic Management	Other	PCC	2018	2019	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 2017/18. A number of further small city wide improvements to road signage and markings will be carried out in 2018/19	2018/19 and ongoing	
PT1	Promoting bus use	Alternatives to private vehicle use	Bus based Park & Ride	PCC	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 so making public transport more attractive	Ongoing	

PT2	Upgrade bus fleet	Vehicle Fleet Efficiency	Promoting Low Emission Public Transport	PCC	2009	Ongoing	Upgrading buses to Euro 6 standard	Buses upgraded to Euro 6 standard can result in significant reductions in levels of local air pollution	Strive to upgrade fleet and improve emission technologies by bus operators. An application was made to Defra's Clean Bus Fund in Dec 2017 with Stagecoach Buses, for the upgrade of the remaining Stagecoach fleet to Euro 6 standard. Unfortunately this bid was not successful.Consideration was made for an application to the Clean Bus Fund with the 2 main local bus companies. Unfortunately, this fund only allows for new, alternative fuel vehicles and does not allow retrofit to Euro VI, and neither bus company were in a position to introduce new electric or gas fleets at the present time.Stagecoach introduced 20 Euro V1 buses in 2017.	Unknown	PCC will continue to seek funding to support an upgrade to bus fleet in the city to Euro 6 standard
PT3	Public transport ticketing	Alternatives to private vehicle use	Other	PCC	2011	2017	Increase of bus patronage though ease of payment	N/A	Smart card ticketing has been implemented across the bus network. Contactless payment was introduced in Autumn 2017 Working with bus operators through SHBOA on Solent Go and supporting roll out of m-ticketing, contactless payment Park and Ride smartcard facilities - commuter pass	Ongoing	
PT4	Public transport information	Alternatives to private vehicle use	Other	PCC	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.	Ongoing	
PT7	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	

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PT8	Public Transport Network Maps	Public Information	Other	PCC	2017	2018	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 is being developed, to be completed June 2018	2018	
PT9	Public Transport Hub Maps	Public Information	Other	PCC	2018	2018	Feedback from forthcoming 2019 National Highways and Transport (NHT)survey will give some indication of public satisfaction of public transport information provision	N/ASupporting public transport use	Bespoke Hub Map created for Commercial Road South, International Ferry Port and Q.A. Hospital. These maps were created in 2018	2018	A specific question on public transport information in included in NHT surveys, which provides some indication of levels of satisfaction for this
PT10	Park and Ride decking	Alternatives to private vehicle use	Bus based Park & Ride	PCC	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 through into the city through AQMA 11	This proposal is at the feasibility stage, and if developed will provide increased parking space availability at the Park and Ride site, allowing for increased usage of the service. Additional scoping work is being conducted in 2018 At present, the Park and Ride provides 665 parking spaces. If the new decking is developed, the Park and Ride will provide up to a maximum of 1,200 parking spaces	Ongoing	
PT11	Working with First/MTR to implement investments through the new South Western Rail Franchise	Alternatives to private vehicle use	Other	PCC	2017	Ongoing	N/A	N/A	Ambitions shared by Portsmouth City Council, Network Rail and Gunwharf Quays to further develop and open up the waterfront, are gaining momentum, and plans are being developed to enhance and open up the waterfront connecting the 'Millennium Walkway', and creating a new gateway to the city Meetings have been held with the new rail operator to work through proposals to improve stations and services	Ongoing	

PT12	Re-development of Hard Interchange	Transport Planning and Infrastructure	Public transport improvements- interchanges stations and services	PCC	2014	completed	Increase in bus patronage at The Hard Interchange	<0.1µgm3	Re-development of The Hard Gateway and Portsmouth and Southsea interchange - sub-regional hubs is completed. 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 city centre principle shopping areas, helping to make public transport easier and more attractive to use The interchange is ideally located and now provides a modern, up-to-date gateway to the city, with a secure environment for customers	Ongoing	Bus operators have reported an increase in bus patronage boarding at The Hard Interchange. Ridership is up 3% for First Group
PT13	LTP delivery of improved and integrated network of public transport	Transport Planning and Infrastructure	Public transport improvements- interchanges stations and services	PCC	2016	2017	N/A	N/A	Improvements have taken place in traffic signalling (reducing waiting times for all traffic including buses). Initial scoping and initial concept stage has taken place to give a higher priority to keeping buses on schedule city wide		Current lack of funding to take this forward
PT14	South East Hampshire Bus Rapid Transit (SEHBRT)	Public Transport and Infrastructure	Bus Route Improvements	PCC, in partnership with HCC	Ongoing	Ongoing	Submission of bid	<0.1µgm3 This scheme would deliver significant benefits to the city in terms of public transport provision	A joint bid is to be submitted for a SEHBTR scheme linking Portsmouth to the surrounding BRT network	Currently unknown	Work is underway on the development of a Bus Rapid scheme to cover the Portsmouth travel to work area (Fareham, Portsmouth, Havant and Waterlooville) to develop a step change in public transport provision, delivering modal shift and supporting reductions in air pollution
F1	Freight quality partnership	Freight and Delivery Management	Route Management Plans/ Strategic routing strategy for HGV's	PCC	2008	Ongoing	Feasibility study into potential for a freight quality partnership	There is the potential for significant reduction in NO^2 through the development of this measure	Whilst this area has not yet been developed further at the current time, it is an ongoing aspiration for future consideration. Further work would be required, working closely with freight supplies (particularly local) to ensure the most appropriate routes	Ongoing	Further work required

WP1	Workplace travel plans (WPTP)	Promoting Travel Alternatives	Workplace Travel Planning	PCC	2014	Ongoing	Number of travel plans implemented	<0.1µgm3 Workplace travel plans can support increases in sustainable travel	There are over 40 active WTP in total. More WTPs expected. Easit offers a range of benefits including discounts on peak train travel, cycling, & electric vehicle for employees of member organisation. Many large employers provide discounted bus travel for staff. PCC works with these employers to promote sustainable travel	Ongoing	Availability of funding
WP2	Workplace Sustainable Travel Fund (WSTF)	Promoting Travel Alternatives	Workplace Travel Planning	PCC, further work funded through Defra Clean Air Grant	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	The WSTF was carried out in 2016/17 through STTY, with 8 organisations successfully receiving funding for sustainable travel and a total of 11 organisations receiving a package of supporting measures. The WSTF will be further rolled out to businesses in 2018/19, prioritising those within or close to an AQMA	2018/19	Further provision of this scheme will be dependent upon further funding becoming available
WP3	Eco Driver Training	Vehicle Fleet Efficiency	Driver training and ECO driving aids	PCC, further work funded through Defra Clean Air 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. A further round of Eco Driver training will be delivered in 2018/19, through the Air Quality Grant fund. Focus will be given to businesses within or close to AQMA areas	2018/19	Further provision of this scheme will be dependent upon further funding becoming available
T1	Explore new technology	Other	Other	PCC	2017	Ongoing	Implementation of research into new technology, as opportunities arise	There is the potential for significant reductions in NOX to be achieved through the introduction of new technologies	Undertake research and test new transport technologies to reduce levels of NOx and consider their potential use within future strategies	Ongoing	
A1	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 a high levels of direct pollution reduction, these measures will support mobility	To provide low cost measures Portsmouth citywide 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 2018/19	Ongoing	

P1	AQ improvements 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
O1	Bidding for Funding	Other	Other	PCC	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	
O2	Review of PCC fleet and moving away from diesel vehicles	Vehicle Fleet Efficiency	Fleet efficiency and recognition schemes	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	Ongoing	Further work is necessary to progress this further.

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

As detailed in Policy Guidance LAQM.PG16 (Chapter 7) LAs 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.

Given that the main source of AP in Portsmouth is road traffic related and that the main sources of PM_{10} and NO_2 are the same as that of $PM_{2.5}$ PCC is taking no specific measure(s) to reduce $PM_{2.5}$. Dealing with the automotive related pollutants of PM_{10} and NO_2 will inherently deal with $PM_{2.5}$.

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

3.1 Summary of Monitoring Undertaken

3.1.1 Automatic Monitoring Sites

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

PCC undertook automatic (continuous) monitoring at four Continuous Air Quality Monitoring Sites (CAQMSs) during 2017. In addition DEFRA installed, and control, a CAQMS to expand its network into Portsmouth south.

Table A.1 in Appendix A shows the details of the sites.

Maps showing the location of the CAQMSs are provided in Appendix D:

- Map 1 shows the CAQMS locations across the city
- Map 2, Map 3, Map 4 and Map 5 show individual locations of Gatcombe Park, London Road, Burrfield Road and Mile End Road station locations respectively.

3.1.2 Non-Automatic Monitoring Sites

PCC revised its non-automatic (passive) monitoring of NO_2 network, NO_2 Diffusion Tube (NDDT) network, to expand it to 48 sites during 2017 including co-locations sites.

This network was further expanded as a result of DEFRA's commentary on PCC's 2017 ASR with an additional 59 sites and an additional co-location site. Table A.2 in Appendix A shows the details of the sites:

- **Red highlighted sites**: Ongoing monitoring sites for many years (28 sites)
- **Blue highlighted sites**: The additional monitoring sites in year 2017 (16 sites)
- **Green highlighted sites**: The additional monitoring sites in year 2018 as results of DEFRA's commentary on PCC 2017 ASR report (59 sites).

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 monitoring network has been subdivided into 10 maps covering various zones in the city. These are numbered from 1 to 10 to allow clear identification of the site locations:

- Map 6: Portsmouth map identifying the 10 monitoring site locations
- Maps 7 to 17: individual "zoomed in" area maps.

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

3.2 Individual Pollutants

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

There has been no significant change to PCC's AQ monitoring program within the period 2013 to 2017 with the exception of adding 16 new NDDT sites. However, the following changes were undertaken up to June 2018:

- At the beginning of 2017 both London Road and Mile End Road station were both refurbished with HORIBA APDA-372 $PM_{2.5}$ / PM_{10} analysers, replacing the elderly Eberlines. Data from these analysers is reported in this 2018 ASR

- As result of DEFRA's appraisal of our 2017 ASR PCC revised its NDDT monitoring program and increased monitoring sites by 123%, targeting mainly hotspots and expanding existing monitoring in and around existing AQMAs.

NO_2 and PM_{10} continue to be monitored continuously at four CAQMSs, while $PM_{2.5}$ is being monitored continuously at three CAQMSs. In addition, NO_2 was monitored using NDDT at 47 locations across the city.

Emphasis in Section 1.37 and 1.39; including Box 1.1; in the LAQM.TG (16) has been placed, for the annual mean NAQO, on monitoring and assessing non-occupational above or below ground level outdoor locations, where members the public might be regularly exposed. These include:

- Building facades of residential properties

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

PCC's NO_2, $PM_{2.5}$ and PM_{10} monitoring programmes are annually assessed to ensure that the LAQ monitoring requirements of the R&A process are met.

Continuous monitoring has been carried out in accordance with the QA / QC protocols documented in Appendix C.

Each of the CAQMS is fitted with NO_2 and $PM_{2.5}$ and PM_{10} analysers with the exception of C6 that is not fitted with $PM_{2.5}$. These are located as follows:

- Station C2: This station is located in a 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 a fixed kerbside station set up to monitor NO_2, PM_{10} and $PM_{2.5}$ generated by the road traffic along London Road (Map 3, Appendix D). 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 sitting with slow moving road traffic often causing congestion. It was refurbished in January 2017 with a new HORIBA's APDA-372 $PM_{2.5}$ and PM_{10} analyser; that replaced the elderly Eberline to meet DEFRA's AQ monitoring requirements

- Station C4: An Automatic Urban and Rural Network (AURN) station located in an urban background location at Gatcombe Park Primary School, Curtis Mead (Map 2, Appendix D). The pollutants monitored at are NO_2, PM_{10} and $PM_{2.5}$

- Station C6: This is a fixed roadside station established since 2007 to monitor NO_2 and PM_{10} generated by the road traffic along Burrfield Road (Map 4, Appendix D). 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 Burrfield Road / Copnor Road junction within the revoked AQMA 3

- Station C7: This station is located within AQMA11 approximately 6.5 metres from Mile End 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 (Map 5, Appendix D). It was refurbished in January 2017 with a new HORIBA APDA-372 $PM_{2.5}$ and PM_{10} analyser; that replaced the elderly Eberline to meet DEFRA's AQ monitoring requirements.

The locations and characteristics of all CAQMS sites are summarised in Table A.1, Appendix A. The NO_2 continuous monitoring data for 2013 / 2017 period is presented on last four rows of Table A.3, Appendix A.

The LAQ monitoring results presented in these sections were subjected to various corrections depending on the pollutants, monitoring means and period and locations.

3.2.1 Nitrogen Dioxide (NO_2)

Table A.3 in Appendix A compares the ratified and adjusted monitored NO_2 annual mean concentrations for the past 5 years with the air quality objective of 40µg/m^3.

For NDDT network, the full 2017 dataset of monthly mean values is provided in Appendix B.

Table A.4 in Appendix A compares the ratified continuous monitored NO_2 hourly mean concentrations for the past 5 years with the air quality objective of 200µg/m^3, not to be exceeded more than 18 times per year.

None of the monitoring sites exceeded annual means of greater than 60µg/m^3 which indicates that an exceedance of the 1-hour mean objective is unlikely.

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(16) guidance. This monitoring program is primarily focused on both declared and revoked AQMAs.

The NDDT network covered 48 locations in 2017. Four of these locations are dedicated to collocation studies.

Data generated from NDDT survey was firstly annualised where monitoring had been carried out for less than 12 months, yearly projections as prescribed in Box 7.10 of LAQM.TG(16).

Secondly the data was subjected to bias correction using locally generated bias correction factor from local co-location study. These were generated using DEFRAs spreadsheet based Local Bias Adjustment Factor tool.

In addition, NDDT monitored data at two locations not on the façade of building of sensitive receptors were corrected to the nearest façade of building with relevant exposure.

The NDDT survey locations and monitoring site characteristics are summarised in Table A2, Appendix A and illustrated in Maps 7-17, Appendix D.

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

The NDDT survey data were bias adjusted using the bias correction factor generated from the local co-located study. This involved the exposure of three NDDTs at each of the four CAQMSs.

The bias correction factors was generated following the approach prescribed on Section 7.190 to 7.198 of LAQM.TG (16) using the calculating precision and accuracy spreadsheet (http://laqm.defra.gov.uk/documents/AEA_DifTPAB_v04.xls).

For 2017 as the reporting year the NDDT collocation study generated the following bias correction factors:

- Tubes exposed at the London Road station (kerbside station) generated 1 as the bias correction factor

- Tubes exposed at both Mile End Road and Burrfield Road stations (both roadside stations) generated 0.95 and 0.89 respectively as the bias correction factors

- Tubes exposed at the Gatcombe Park station (urban background station) generated 0.97 as the bias correction factor.

The above bias correction factors were averaged using the methodology prescribed in Section 7.192 of the LAQM.TG(16).

The 2017 NDDT survey results were bias adjusted using 0.95 as the average of all the above mentioned bias correction factors.

The 2013, 2014, 2015, 2016 and 2017 NDDT survey data was subjected up to three stage adjustments to be directly compared to the NO_2 annual mean NAQO:

- Annualised: NDDT locations with less than 8 month data were projected for 12 months first

- Bias Correction: bias corrected using the local co-location bias correction factor

- Distance corrections: To predict the level of the pollutant at the façade of the receptors property should the monitoring location be at some distance from the receptor. This was carried out using the calculator that was made available by 'Air Quality Consultants'. This tool is provided to local authorities 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.

Two 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.

Table A.3 in Appendix A compares the ratified and adjusted monitored NO_2 annual mean concentrations for the past 5 years with the NO_2 annual mean NAQO of 40µg/m^3.

For diffusion tubes, the full 2017 dataset of monthly mean values is provided in Table B1, Appendix B.

The adjusted NDDT survey data as prescribed above for all monitored sites in the city are presented on Table A3 in Appendix A.

3.2.1.1 NO_2 data sets

Nitrogen Dioxide Diffusion Tube monitoring (2013-2017)

The results for 2013, 2014, 2015, 2016 and 2017 adjusted NDDT survey data shows that exceedances are concentrated predominantly in AQMA 6.

2013 NDDT: The 2013 NDDT survey data concluded that NO_2 annual mean NAQO was exceeded at four locations:

- Lord Montgomery Way (AQMA 7.
- 221 Fratton Road (AQMA 6)
- The Tap Public House London Road (AQMA 6)
- Addison Madden Hampshire Terrace (Adjacent to AQMA 7).

2014 NDDT: The 2014 NDDT survey data concluded that NO_2 annual mean levels increased compared with those of 2013 at 65.51% of the monitored locations across the City:

- The highest increase was recorded at the 17 Kingston Road location (AQMA 6) and at the Addison Madden Hampshire Terrace (adjacent to AQMA 7)

- 7 Velder Avenue (AQMA 9), 4 Merlyn Drive, Market Tavern, Mile End Road (AQMA 11), 103 Elm Grove, Larch Court Church Road (Corner) adjacent to AQMA 11), 121A High Street, Anchorage Road, 116 Albert Road and 2 Victoria Road North with an increase of 13.49, 12.46, 7.15, 5.60, 5.30, 4.48, 3.84, 3.57, and 3.00µg/m^3 respectively

- The NDDT survey data of 2014 also concluded that NO_2 annual mean levels were in excess of the NO_2 annual mean NAQO in 2014 at the following seven monitored locations:

    - Lord Montgomery Way (AQMA 7)
    - London Road (AQMA 6) continuous monitoring station
    - 221 Fratton Road (AQMA 6)
    - 117 Kingston Road (AQMA 6)
    - The Market Tavern Mile End Road (AQMA 11)
    - The Tap Public House London Road (AQMA 6)
    - Addison Madden Hampshire Terrace (Adjacent to AQMA 7).

2015 NDDT: The 2015 NDDT survey data concluded that:

- 2015 NO_2 annual mean levels decreased compared with those of 2014 at 72.41% of the monitored locations across the City resulting in an improvement of LAQ

- Most significant improvement was registered at Addison Madden (Hampshire Terrace), 117 Kingston Road, Market Tavern (Mile End Road), 103 Elm Grove, Anchorage Road (Column 6), 221 Fratton Road, Larch Court Church Road (Corner), 2 Victoria Road North, 7 Velder Avenue, 4 Milton Road with a decrease of 12.95, 10.39, 9.81, 5.81, 4.40, 4.18, 3.25, 2.74, 2.16 and 1.99µg/m^3 respectively

- The highest increase was recorded at 88 Stanley Road, in Queen Street, the Tap Public House in London Road, 106 Victoria Road North and Lord Montgomery Way with an increase of 11.21, 2.57, 2.32, 2.20, and 1.76µg/m^3 respectively. However, Data capture at 88 Stanley Road was very poor (two month of readings only) and therefore the increase at this location by 11.21µg/m^3 can be considered as incorrect and not recorded as an exceedance of the NO_2 annual mean NAQO in 2015 at this location

- NO_2 annual mean levels were in excess of the NO_2 annual mean NAQO at:

    - 117 Kingston Road (AQM 6)

    - The Tap Public House London Road (AQMA 6)

    - Lord Montgomery Way (AQMA 7)

    - 88 Stanley Road (AQMA 11) [It is important to note that this location is represented by NDDT survey data for only two months which was subjected to all necessary corrections].

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 monitored locations:

- Lord Montgomery Way (AQMA 7)

- Northern Road

- Albert Road

- London Road (AQMA 6) continuous monitoring station

- 117 Kingston Road (AQM 6)

- The Tap Public House London Road (AQMA 6).

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 monitored locations:

- "The Tap" public house on London Road (AQMA 6)
- London Road (AQMA 6) continuous monitoring station
- 117 Kingston Road (AQMA 6).

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

- a downward trend emerged at 34.37% monitored locations in the last five years since 2013 compared to 40.6% monitored locations for the five year commencing year 2012 (From Figure F1 to Figure F28, Appendix F)
- The 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 only 10.71% of the monitored locations compared to 2015
- Only 7.14% of the monitored locations were in excess of the NAQO in 2017 compared to 17.86% in 2016.

Despite the seemingly contradicting statements above PCC concludes that we are moving towards compliance with the NAQO.

It is not possible to categorically state why the NO_2 levels increased across the city in 2014, decreased in 2015, and to increase again in 2016 just to drop again in 2017 as a multitude of factors influence pollutant generation and their subsequent dispersion. Such influences are wide ranging and complex.

Localised influences such as route popularity or road changes / roadworks may be part of the cause. Others may be of a regional nature perhaps dictated by the meteorological conditions. National or international stimuli such as requirement for improved vehicle emissions technologies are also likely to play a part.

Continuous Air Quality monitoring 2013 - 2017

The NO_2 continuous monitoring program for the period stretching between 2013 and 2017 concluded that:

- The 2013 NO_2 annual mean levels did not exceed the NO_2 annual mean NAQO at any of the four CAQMSs. The maximum recorded concentration was close to breaching the NO_2 annual mean NAQO at London Road station (39.68µg/m^3)

- The 2014 NO_2 levels increased across the four CAQMSs compared to that of 2013, exceeding the NO_2 annual mean NAQO at the kerbside London Road CAQMS (45.68µg/m^3). This demonstrated a worsening in LAQ in this year

- The 2015 NO_2 annual mean levels fell compared to that of 2014 to a level below the NO_2 annual mean NAQO at all four CAQMSs. This demonstrates an improvement in LAQ. The maximum recorded concentration was at London Road kerbside CAQMS (38.4µg/m^3). This level was close to breaching the NO_2 annual mean NAQO

- The 2016 NO_2 annual mean level increased a cross the four CAQMS compared to that of 2015 to a level below the NO_2 annual mean NAQO at all but London Road CAQMSs to result in a worsening in LAQ. The maximum recorded concentration was at London Road kerbside CAQMS (41.21µg/m^3). This level breaches the NO_2 annual mean NAQO

- The 2017 NO_2 annual mean level increased cross 50% of CAQMSs compared to that of 2016, meeting the NO_2 annual mean NAQO at all but London Road CAQMSs to result in a worsening in LAQ. The maximum recorded concentration was at London Road kerbside CAQMS (44.6µg/m^3). This level breaches the NO_2 annual mean NAQO

- The largest increase in 2017 NO_2 annual mean was registered at C2 London Road CAQMS as it increased by 3.39µg/m^3 compared to the level recorded in 2016.

- The NO_2 annual mean at this C2 kerbside monitoring location remained in excess of the NAQO in 2017 for the second consecutive year. NO_2 levels exhibited an **upward** trend in the last five years (2013 to 2017) showing an AQ deterioration compared to the previously reported five year trend commencing year 2012 when a downward trend was exhibited showing an AQ

improvement. In addition, NO_2 annual mean **increased** between 2016 and 2017 by 3.39µg/m^3 **(an increase of 8%)**. Figures F29, (Appendix F) exhibits an **upwar**d trend translated into a worsening in LAQ

- The NO_2 annual mean at this C4 AURN CAQMS remained well below the NAQO in 2017. NO_2 levels exhibited a slight **downward** trend in the last five years (2013 to 2017) showing an AQ improvement. This trend is similar to the previously reported five year trend commencing year 2012 when a **downward** trend was exhibited showing an AQ improvement. In addition, NO_2 annual mean **decreased** between 2016 and 2017 by 0.64µg/m^3 **(a decreased of 3%).** Figures F30, (Appendix F) exhibits a **downward** trend translated into a worsening in LAQ

- The NO_2 annual mean at C6 roadside monitoring location remained below the NAQO in 2017. NO_2 levels exhibited an **upward** trend in the last five years (2013 to 2017) showing an AQ deterioration compared to the previously reported five year trend commencing year 2012 when a downward trend was exhibited showing an AQ improvement. In addition, NO_2 annual mean **increased** between 2016 and 2017 by 0.88µg/m^3 (**an increase of 3%**). Figures F31, (Appendix F) exhibits an **upwar**d trend translated into a worsening in LAQ

- The NO_2 annual mean at this C7 roadside monitoring location remained below the NAQO in 2017. NO_2 levels exhibited a **downward** trend in the last five years (2013 to 2017) showing an AQ improvement. It followed the same trend as the one previously reported for the five year commencing year 2012 when a **downward** trend was exhibited showing an AQ improvement. In addition, NO_2 annual mean **decreased** between 2016 and 2017 by 1.94µg/m^3 (**a reduction of 5%**). Figures F32, (Appendix F) exhibits a **downward** trend translated into an improvement in LAQ.

Table A4 in Appendix A compares the ratified continuous monitoring NO_2 hourly mean concentrations for the past 5 years with the air quality objective 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 since 2012. The highest NO_2 annual mean registered was 45.68µg/m^3 in 2014 at the London Road kerside station.

The NO_2 hourly mean was in excess of 200µg/m^3 seven times in 2012 and once in 2014 at London road kerbside CAQMSs. These do not amount to any exceedances of the NO_2 hourly mean NAQO. No exceedance of this objective was registred at any of the CAQMSs in 2017.

3.2.2 Particulate Matter (PM_{10})

Table A.5 in Appendix A compares the ratified and adjusted monitored PM_{10} annual mean concentrations for the past 5 years with the NAQO of 40µg/m^3.

There has been no exceedance of the PM_{10} annual mean NAQO since 2013 at any of the CAQMSs. The highest registered annual mean since then was in 2016 at the kerbside CAQMS along London Road and was 34.36µg/m^3.

Table A.66 in Appendix A compares the ratified continuous monitored PM_{10} daily mean concentrations for the past 5 years with the daily air quality NAQO of 50µg/m^3 not to be exceeded more than 35 times per year.

The highest number of PM_{10} daily means in excess of 50µg/m^3 was recorded between 2013 and 2017 was at Burrfields Road CAQMS and was 7 time. However this does not amount to an exceedance.

In 2017 the The highest number of daily means in excess of 50 µg/m^3 was recorded at London Road CAQMS and was 4 time.

Summing up PM_{10} monitoring results:

- ***C2 (Figure F33, Appendix F):*** The PM_{10} annual average at this kerbside CAQMS location remained below the NAQO in 2017. PM_{10} levels exhibited a **downward** trend in the last five years (2013 to 2017) showing an AQ improvement. This follows the same **downward** trend as the one previously reported for the five year commencing year 2012 when a **downward** trend was exhibited showing an AQ improvement. However the latest five year trend decreasing rate is higher. In addition, PM_{10} annual average **decreased** slightly between 2016 and 2017 by 0.33µg/m^3 (**a reduction of 2%**)

- ***C4 (Figure F34, Appendix F):*** The PM_{10} annual average at this AURN CAQMS location remained below the NAQO in 2017. PM_{10} levels exhibited a **downward** trend in the last five years (2013 to 2017) showing an AQ improvement. This followed the same **downward** trend as the one previously reported for the five year commencing year 2012. However the latest five year trend decreasing rate is higher. In addition, PM_{10} annual average **decreased** slightly between 2016 and 2017 by 3.5µg/m^3 (**a decrease of 19%**)
- ***C6 (Figure F35, Appendix F):*** The PM_{10} annual average at this Roadside CAQMS location remained below the NAQO in 2017. PM_{10} levels exhibited an **upward** trend in the last five years (2013 to 2017) showing an AQ deterioration. This followed the same trend as the one previously reported for the five year commencing year 2012 when an **upward** trend was exhibited showing an AQ deterioration. However the latest five year trend increased at lower rate. In addition, PM_{10} annual average **increased** slightly between 2016 and 2017 by 0.21µg/m^3 (**an increase of 1%**)
- ***C7 (Figure F36, Appendix F):*** The PM_{10} annual average at this roadside CAQMS location remained below the NAQO in 2017. PM_{10} levels exhibited a **downward** trend in the last five years (2013 to 2017) showing an AQ improvement. The five year trend commencing 2012 however exhibited a light upward trend. However, PM_{10} annual average **increased** between 2016 and 2017 by 4.23µg/m^3 (**an increase of 36%**).

3.2.3 Particulate Matter ($PM_{2.5}$)

PCC monitors $PM_{2.5}$ at the AURN CAQMS of Gatcombe Park (C4), and commenced monitoring $PM_{2.5}$ from January 2017 at the C2 and C7.

Table A.7 in Appendix A presents the ratified and adjusted monitored $PM_{2.5}$ annual mean concentrations for the past 5 years. The highest $PM_{2.5}$ annual mean recorded in Portsmouth was 14.26µg/m^3 back in 2014.

C4 (Figure F37, Appendix F): The $PM_{2.5}$ annual average at this AURN CAQMS location remained below the NAQO in 2017. $PM_{2.5}$ levels at AURN CAQMS exhibited a **downward** trend in the last five years (2013 to 2017) showing an AQ improvement similar to the five year trend commencing 2012 but decreasing at a higher rate. In

addition, $PM_{2.5}$ annual average **decreased** between 2016 and 2017 by 0.46µg/m^3 (**a decrease of 3.9 %**).

3.2.4 Sulphur Dioxide (SO_2)

PCC do not monitor for sulphur dioxide as it is not an AQ issue in Portsmouth.

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	Urban Background	465403	103952	NO_2 PM_{10} $PM_{2.5}$ O_3	N	Chemiluminescent, FDMS	0m	119 m	2.5m
C6	Burrfields Road	Roadside	466004	102348	NO_2 PM_{10}	N	Chemiluminescent, Eberline	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
DEFRA	Anglesea Road	Roadside	463835	100259	NO_2 PM_{10}	Y	Chemiluminescent; FDMS	2m	6.5m	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.

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)
1	Lord Montgomery Way (FST)	Roadside	463872	99874	NO2	Y	0	3.7m	N	2m
2	12 Chadderton Gardens (CG-12)	Urban background	463705	99371	NO2	N	0	N/A	N	2m
3	High Street (HS-121A)	Roadside	463408	99460	NO2	Y	0	3.1m	N	2m
4	Queen Street (QS-Col 30)	Roadside	463190	100390	NO2	Y	N/A	3m	N	2m
5	119 Whale Island Way (WIW-119)	Roadside	464230	102194	NO2	N	0	16.23m	N	2m
6	88 Stanley Road (SR-88)	Roadside	464331	102197	NO2	N	0	9.88m	N	2m
7	138 Lower Derby Road (LDR-138)	Urban background	464291	102279	NO2	N	0	37.57m	N	2m
8	492 Hawthorn Crescent (HC-492)	Urban background	466690	104355	NO2	N	0	34m	N	2m
9	6 Northern Road (NR-6)	Roadside	465621	105528	NO2	N	0	5.43m	N	2m
10	20 Stroudley Avenue (SA-20)	Urban background	467107	104850	NO2	N	0	N/A	N	2m
11	Anchorage Road (AR-Col6)	Roadside	466869	103457	NO2	N	11.76M	6.56m	N	2m
14	4 Merlyn Drive (MD-4)	Roadside	466109	103736	NO2	N	0	11.26m	N	2m
15	29 Milton Road (MR-29)	Roadside	466120	101324	NO2	N	0	7.04m	N	2m
16	Parade Court, London Road (LR-PC)	Roadside	465474	104205	NO2	N	5.32m	5.15m	N	2m
18	4 Milton Road (MR-4)	Roadside	466097	101332	NO2	N	0	6.13m	N	2m

19	7 Velder Avenue (VA-7)	Roadside	466392	100226	NO2	Y	0	4.44m	N	2m
20	136 Eastney Rd (ER-136)	Roadside	466712	99415	NO2	N	0	6.23m	N	2m
21	118 Albert Road (AR-116)	Roadside	465209	98964	NO2	N	0	2.36m	N	2m
22	2 Victoria Road North (VRN-2)	Roadside	464778	99306	NO2	N	0	5.53m	N	2m
23	106 Victoria Road North (VRN-106)	Roadside	464974	99766	NO2	N	2.37m	2.42m	N	2m
24	221 Fratton Road (FR-221)	Roadside	465111	100737	NO2	Y	0	4.21m	N	2m
25	117 Kingston Rd (KR-117)	Roadside	465036	101547	NO2	Y	0	2.46m	N	2m
26	The Tap London Road (Tap)	Kerbside	464900	101976	NO2	Y	0	1.91m	N	2m
30	Market Tavern (Mile End Rd) (MT)	Roadside	464478	101457	NO2	Y	0	12.73m	N	2m
32	Larch Court, Church Rd (CR-Corner)	Roadside	464559	100980	NO2	N	0	5.84m	N	2m
34	Sovereign Gate, Commercial Rd (UF)	Roadside	464425	100893	NO2	Y	0	4.40m	N	2m
35	Hampshire Terrace (AM)	Roadside	463837	99759	NO2	N	0	4.9m to 10.74m	N	2m
36	Elm Grove (EG-103)	Roadside	464501	99329	NO2	N	0	2.26m	N	2m
54	Anglesea Road, Victoria Park, Column 234 (AR-VP-Col)	Roadside	463835	100257	NO2	N	0	1.5	N	2 m
55	Gunwharf Road, Column 12 (GWR-Col12)	Roadside	463224	99590	NO2	n		1.5 m	N	2m
56	Gunwharf Road, Column 4 (GWR-Col4)	Roadside	463261	99782	NO2	N		1.5 m	N	2m
58	St Georges Street-9 (St GS-9)	Roadside	463487	99659	NO2	N	N/A	6	N	2m
65	Mooring Way-12 (MW-12)	Roadside	466681	100373	NO2	N	11.76M	1.5 m	N	2m
70	Milton Primary School (ER-DS)	Roadside	466667	99546	NO2	N	0	5 m	N	2m

92	Locksway Road-13 (LR-13)	Roadside	466525	99736	NO2	N	0	2.5 m,	N	2m
104	219 Jervis Road	Urban background	464120	102717	NO2	N	0	4 m	N	2m
105	Column 8 Tipner	Urban background	464097	102773	NO2	N			N	2m
106	24 Tipner	Urban background	464046	102932	NO2	N	0		N	2m
107	Column 3 Tipner	Urban background	464058	103007	NO2	N	0		N	2m
112	Medina School Fratton Road (MS1)	Urban background	465116	101029	NO2	N	0	30 m	N	2m
113	Medina School Fratton Road (MS2)	Roadside	465119	101015	NO2	N	5.32m	30 m	N	2m
114	233 Southampton Road	Roadside	462331	105651	NO2	N	0	6 m	N	2m
115	Catholic Church St Agatha's Church Market Way	Roadside	464953	100705	NO2	Y	0	4 m	N	2m
116	Catholic Cathedral Alfred Road	Roadside	463891	100479	NO2	N	0	5m	N	2m
42	Kingston Crescent-Admiral Drake PH-(KC-ADPH)	Roadside	464552	101940	NO2	Y	0		N	2m
43	Kingston Crescent-Vanguard House (KC-VH)	Urban background	464774	101922	NO2	N	0		N	2m
44	Market Way-24 (MW-24)	Roadside	464336	100833	NO2	Y	0		N	2m
45	Market Way-79 (MW-79)	Roadside	464344	100808	NO2	Y	N/A		N	2m
46	Market Way-Column 5 (MW-Col5)	Roadside	464339	101273	NO2	N	0		N	2m
47	Stamshaw Road West (1)	Roadside	464586	102125	NO2	N	0		N	2m
48	Stamshaw Road East (28)	Urban background	464597	102119	NO2	N	0		N	2m
49	Half Moon Street-The Ship and Castle(PH) (HMS-S&CPH)	Urban background	463042	100315	NO2	N	0		N	2m

50	Queen Street-47 (QS-47)	Roadside	463388	100398	NO2	N	0		N	2m
51	Queen Street-57 (QS-57)	Urban background	463333	100395	NO2	N	0		N	2m
52	Queen Street-Column 29	Roadside	463235	100412	NO2	N	11.76M		N	2m
53	Anglesea Road Station-DEFRA (AR-Station)	Roadside	463835	100258	NO2	N	0		Y	2m
57	Saint Jude School-Column 7 (StJSc-Col7)	Urban background	463503	99362	NO2	N	5	0.5 m	N	2m
59	Milton Road- Across the road from Column 42 on the fence (MR-Opposite Col42)	Roadside	466263	100334	NO2	N		1.5 m	N	2m
60	Milton Road- Column 42 (MR-Col42)	Roadside	466201	100478	NO2	N	5.32m		N	2m
61	Milton Road-1 to 10 Southwick House (MR- SH(Fence))	Roadside	466136	100610	NO2	N	0		N	2m
62	Milton Road-12 Hambrook House (MR-HH)	Roadside	466165	100573	NO2	Y	0		N	2m
63	Milton Road-209 (SR-209)	Roadside	466354	100172	NO2	N	0		N	2m
64	Milton Road-Summerson Lodge (MR-SL)	Roadside	466326	100165	NO2	N	0		N	2m
66	Velder Avenue-1 (VA-1)	Roadside	466267	100216	NO2	N	0		N	2m
67	Velder Avenue-23 (VA-23)	Roadside	466457	100253	NO2	N	2.37m		N	2m
68	Velder Avenue-36 (VA-36)	Roadside	466501	100277	NO2	Y	0		N	2m
69	Velder Avenue-Column 4 (VA-Col4)	Roadside	466396	100248	NO2	Y	0		N	2m
71	Havant Road-19 (HR-19)	Kerbside	465711	105624	NO2	Y	0		N	2m
72	Northern Road-60 (NR-60)	Roadside	465657	105577	NO2	N	0		N	2m
73	Northern Road-52	Roadside	465653	105544	NO2	Y	0		N	2m

74	Northern Road-Column 38 (NR-Col38)	Roadside	465610	105383	NO2	Y	0		N	2m
75	Southampton Road-1-6 Chipstead House (SR-CH)	Roadside	465618	105619	NO2	N	0		N	2m
76	Copnor Road-142 (CR-142)	Roadside	466002	102053	NO2	Y	0		N	2m
77	Copnor Road-Copnor School Playground (CR-School)	Roadside	466008	102097	NO2	N	0		N	2m
78	Goldsmith Avenue-3 (GA-3)	Roadside	466523	99599	NO2	N	0		N	2m
79	Goldsmith Avenue-Column 1 (GA-Col1)	Kerbside	466555	99598	NO2	Y	1.8 m		N	2m
80	Albert Road -147 (AR-147)	Urban background	465204	98978	NO2	N	0		N	2m
81	Albert Road Column 22 (AR-Col22)	Roadside	465278	98968	NO2	N	0.5 M		N	2m
82	Albert Road-106 t0 108. On Waverley Road (AR-WR)	Roadside	465178	98945	NO2	Y	2m		N	2m
83	Albert Road-141 (AR-141)	Roadside	465166	98982	NO2	n			N	2m
84	Albert Road-145 on Lawrence Road (AR-145)	Roadside	465198	98996	NO2	N			N	2m
85	Albert Road-96 (AR-96)	Urban background	465150	98968	NO2	N	5		N	2m
86	Fawcett Road-91 (FR-91)	Roadside	465201	99734	NO2	N	N/A		N	2m
87	Fawcett Road- Priory School (FR-PSc)	Roadside	465183	99904	NO2	N			N	2m
88	Lawrence Road -1 to 8 Brandon House (LR-BH)	Urban background	465186	98996	NO2	N	0		N	2m
89	Waverley Road-114 (WR-114)	Urban background	465190	98946	NO2	N			N	2m
90	Baffins Road-18 (BR-18)	Urban background	466095	100813	NO2	N	0		N	2m
91	Baffins Road-3 (BR-3)	Urban background	466070	100819	NO2	N	0		N	2m

93	Victoria Road North-40 (Nursery) (VRN-40 Nursery)	Roadside	464826	99500	NO2	N	0		N	2m
94	2&3 Selbourne Terrace	Roadside	465162	100077	NO2	N	11.76M		N	2m
95	189 Collins Place Fratton	Roadside	465109	100005	NO2	N	0		N	2m
96	Mary Rose Centre, Albert Road	Urban background	465465	98937	NO2	N	0		N	2m
97	29 Rowan Court, Goldsmith Avenue	Roadside	465896	99852	NO2	N	5.32m		N	2m
98	13-29 Eastern Road	Roadside	466700	100591	NO2	N	0		N	2m
99	64-80 Eastern Road	Roadside	466727	100572	NO2	Y	0		N	2m
100	340 Havant Road	Roadside	467783	105677	NO2	N	0		N	2m
101	Havant Road Column 52	Roadside	467693	105687	NO2	N	0		N	2m
102	Hillside & Wymering Centre	Roadside	464585	105714	NO2	N	0		N	2m
103	UTC Portsmouth	Roadside	465556	103968	NO2	N	2.37m		N	2m
108	137 London Road	Roadside	464951	102418	NO2	Y	0		N	2m
109	122/124 London Road	Roadside	464961	102383	NO2	Y	0		N	2m
110	2a/2b Gladys Avenue	Roadside	464913	102419	NO2				N	2m
111	Column 3 Gladys Avenue	Roadside	464898	102414	NO2				N	2m

Notes:

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

(2) N/A if not applicable.

Table A.3 – Annual Mean NO_2 Monitoring Results

Site ID	Site Type	Monitoring Type	Valid Data Capture for Monitoring Period (%) (1)	Valid Data Capture 2017 (%) (2)	NO_2 Annual Mean Concentration (µg/m^3) (3)				
					2013	2014	2015	2016	2017
1	Roadside	Diffusion Tube	95	100.00	**41.9**	**42.57**	**44.33**	**43.52**	38.8
2	Urban background	Diffusion Tube	100	100.00	16.5	16.55	15.74	17.4	16.38
3	Roadside	Diffusion Tube	75	100.00	22.1	25.67	24.07	25.75	23.7
4	Roadside	Diffusion Tube		100.00	31.51	27.97	30.54	34.7	34.2
5	Roadside	Diffusion Tube		100.00	27.49	28.93	27.53	29.52	24.38
6	Roadside	Diffusion Tube		75.00	38.29	34.85	**46.06**	36.08	32.08
7	Urban background	Diffusion Tube		91.67	30	26.53	26.05	28.09	27.32
8	Urban background	Diffusion Tube		100.00	27.22	28.37	28.43	29.94	26.75
9	Roadside	Diffusion Tube		83.33	31.95	33.88	34.98	**40.86**	37.06
10	Urban background	Diffusion Tube		100.00	17.66	16.66	16.48	19.54	17.58
11	Roadside	Diffusion Tube		100.00	29.54	33.29	28.27	28.1	23.5
14	Roadside	Diffusion Tube		100.00	21.61	27.21	26.87	22.2	21.28
15	Roadside	Diffusion Tube		100.00	28.15	27.57	26.21	28.97	28.95
16	Roadside	Diffusion Tube		100.00	33.98	32.32	32.01	36.45	35.44
18	Roadside	Diffusion Tube		100.00	27.8	28.9	26.91	29.3	29.62
19	Roadside	Diffusion Tube		100.00	30.1	37.24	35.08	39.61	34.72
20	Roadside	Diffusion Tube		100.00	27.42	28.9	27.58	29.12	29.73
21	Roadside	Diffusion Tube		100.00	32.88	35.18	35.28	**40.05**	38.37
22	Roadside	Diffusion Tube		100.00	28.69	30.8	28.06	31.23	26.48

23	Roadside	Diffusion Tube		100.00	30.4	28.8	31	37	34
24	Roadside	Diffusion Tube		100.00	**42.48**	**40.49**	36.32	37.74	38.3
25	Roadside	Diffusion Tube		91.67	38.69	**52.18**	**41.79**	**43.65**	**44.28**
26	Kerbside	Diffusion Tube		100.00	**50.93**	**40.81**	**43.12**	**49.16**	**43.09**
30	Roadside	Diffusion Tube		100.00	38.83	**44.12**	34.31	39.34	38.48
32	Roadside	Diffusion Tube		100.00	31.09	34.93	31.68	33.51	32.87
34	Roadside	Diffusion Tube		58.33	34.65	35.52	34.65	36.06	36.17
35	Roadside	Diffusion Tube		83.33	28.96	**41.42**	28.48	30.68	30.13
36	Roadside	Diffusion Tube		83.33	30.33	34.81	29	33.32	29.74
54	Roadside	Diffusion Tube		83.33					33.82
55	Roadside	Diffusion Tube		66.67					30.40
56	Roadside	Diffusion Tube		66.67					36.17
58	Roadside	Diffusion Tube		66.67					33.80
65	Roadside	Diffusion Tube		100.00					27.62
70	Roadside	Diffusion Tube		83.33					23.69
92	Roadside	Diffusion Tube		100.00					28.69
104	Roadside	Diffusion Tube		100.00					20.67
105	Roadside	Diffusion Tube		91.67					21.82
106	Roadside	Diffusion Tube		100.00					21.18
107	Roadside	Diffusion Tube		100.00					22.57
112	Roadside	Diffusion Tube		50.00					20.84
113	Roadside	Diffusion Tube		50.00					20.07
114	Roadside	Diffusion Tube		25.00					15.71
115	Roadside	Diffusion Tube		91.67					30.11
116	Roadside	Diffusion Tube		83.33					**42.56**
C2	Kerbside	Automatic		44.6	39.68	**45.68**	38.4	**41.21**	**44.6**

C4	Urban background	Automatic		98.1	20.27	22.17	18.78	20.05	19.41
C6	Roadside	Automatic		66.6	33.52	35.93	32.81	34.34	35.22
C7	Roadside	Automatic		98.34	35.94	36.51	30.25	35.48	33.54

☒ **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.TG16 if valid data capture for the full calendar year is less than 75%. See Appendix C for details.

Table A.4 – 1-Hour Mean NO_2 Monitoring Results

Site ID	Site Type	Monitoring Type	Valid Data Capture for Monitoring Period (%) (1)	Valid Data Capture 2017 (%) (2)	NO_2 1-Hour Means > 200µg/m^3 (3)				
					2013	2014	2015	2016	2017
C2	Kerbside	Automatic		89.33	0	1	0	0	0
C4	Urban background	Automatic		98.1	0	1	0	0	0
C6	Roadside	Automatic		66.6	0	0	0	0	0
C7	Roadside	Automatic		98.36	0	0	0	0	0

Notes:

Exceedances of the NO_2 1-hour mean objective (200µg/m^3 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.

Table A.5 – Annual Mean PM_{10} Monitoring Results

Site ID	Site Type	Valid Data Capture for Monitoring Period (%) [1]	Valid Data Capture 2017 (%) [2]	PM_{10} Annual Mean Concentration ($\mu g/m^3$) [3]				
				2013	2014	2015	2016	2017
C2	Kerbside		79.21	30.72	32.43	34.36	20.04	19.71
C4	Urban background		79	18.17	18.48	16.16	18.15	14.65
C6	Roadside		45.37	15.39	26.92	26.45	19.75	19.96
C7	Roadside		99.91	16.33	17.53	23.45	11.88	16.11

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

Notes:

Exceedances of the PM_{10} annual mean objective of 40$\mu g/m^3$ 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.

Table A.6 – 24-Hour Mean PM_{10} Monitoring Results

Site ID	Site Type	Valid Data Capture for Monitoring Period (%) (1)	Valid Data Capture 2017 (%) (2)	PM_{10} 24-Hour Means > 50µg/m^3 (3)				
				2013	2014	2015	2016	2017
C2	Kerbside		79.21	0	0	1	1	4
C4	Urban background		79	2	0	2	2	0
C6	Roadside		45.37	0	7	4	1	1
C7	Roadside		99.91	0	0	1	0	1

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.

Table A.7 – $PM_{2.5}$ Monitoring Results

Site ID	Site Type	Valid Data Capture for Monitoring Period (%) (1)	Valid Data Capture 2017 (%) (2)	$PM_{2.5}$ Annual Mean Concentration ($\mu g/m^3$) (3)				
				2013	2014	2015	2016	2017
C2	Kerbside		79.2					12.28
C4	Urban background		73.42	14.11	14.26	10.5	11.63	11.17
C7	Roadside		99.91					10.54

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

Notes:

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

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

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

Appendix B: Full Monthly Diffusion Tube Results for 2017

Table B.1 – NO_2 Monthly Diffusion Tube Results - 2017

Site ID	NO_2 Mean Concentrations ($\mu g/m^3$)														
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual Mean		
													Raw Data	Bias Adjusted (0.95) and Annualised (1)	Distance Corrected to Nearest Exposure (2)
1	44.69	45.89	44.52	42.64	46.54	40.79	43.48	35.82	17.52	45.55	41.81	40.93	40.85	38.80	
2	25.60	18.01	16.80	15.42	15.77	13.50	12.43	14.49	20.78	15.90	20.34	17.89	17.24	16.38	
3	32.31	26.85	23.25	25.15	22.98	21.52	18.43	19.85	25.40	24.62	30.26	28.77	24.95	23.70	
4	41.17	39.50	34.33	33.66	37.84	30.42	31.81	28.22	43.96	37.79	35.50	37.75	36.00	34.20	
5	37.55	34.82	29.25	19.69	26.71	4.77	24.57	21.03	26.19	28.22	31.55	23.59	25.66	24.38	
6		41.56	33.75	21.73	32.88	27.87		28.33	48.97		35.13	33.67	33.77	32.08	
7	34.11	36.78	31.66	22.60	27.27	22.41	25.75	23.43		29.05	32.26	31.01	28.76	27.32	
8	37.55	33.34	28.44	20.64	31.91	22.68	24.88	27.94	14.99	32.84	32.32	30.37	28.16	26.75	
9			42.40	35.65	44.86	27.77	35.74	33.06		48.31	51.36	41.92	40.12	38.11	
10	29.66	20.24	18.58	13.91	15.12	13.54	15.85	10.33	18.94	20.34	23.28	22.24	18.50	17.58	
11	39.85	30.33	27.45	14.93	21.61	20.50	23.78	26.59	20.78	31.77	39.92	31.65	27.43	26.06	23.5
14	36.70	23.45	22.82	17.88	19.45	16.10	14.31	19.23	23.19	22.64	28.50	24.51	22.40	21.28	
15	38.50	32.12	30.28	26.55	29.95	26.23	24.34	20.52	43.96	29.32	32.91	31.07	30.48	28.95	
16	93.08	35.94	33.71	34.39	32.00	30.11	29.25	25.84	14.58	37.29	43.95	37.50	37.30	35.44	
18	34.87	32.01	29.00	25.94	30.38	23.43	22.81	22.45	44.73	31.72	37.44	39.36	31.18	29.62	

19	55.62	39.45	36.96	34.76	41.60	32.09	32.19	26.26	22.47	41.27	40.50	35.45	36.55	34.72	
20	44.46	26.92	27.89	27.74	34.69	26.16	27.85	21.56	43.22	30.70	35.14	29.20	31.30	29.73	
21	50.20	40.35	39.17	35.93	44.84	32.78	36.66	29.25	43.49	46.39	44.86	40.74	40.39	38.37	
22	40.32	28.89	32.21	28.63	30.99	30.36	24.79	20.40	6.55	33.26	32.28	25.81	27.87	26.48	
23	55.35	40.17	39.17	30.96	37.77	34.41	30.13	31.35	32.87	40.97	49.41	41.81	38.70	36.76	34.0
24	47.75	35.52	39.05	40.81	44.97	32.29	37.46	36.01	40.16	41.94	47.18	40.60	40.31	38.30	
25	52.81	44.49	42.77	40.66	48.15		42.69	41.93	41.97	50.67	60.32	46.30	46.61	**44.28**	
26	54.27	29.86	57.67	39.95	59.02	37.61	48.00	47.86	17.59	46.95	58.64	46.87	45.36	**43.09**	
30	48.56	41.91	42.18	40.89	39.96	31.89	37.32	39.48	24.85	45.08	47.44	46.49	40.50	38.48	
32	42.04	34.23	35.00	29.19	32.86	26.69	30.45	29.53	40.16	48.26	35.45	31.42	34.61	32.87	
34	49.65	35.25		33.86		35.58				33.61	40.07	29.21	36.75	28.98	
35	39.07	30.88			33.67	28.49	25.82	22.70	52.49	28.35	29.85	25.84	31.72	30.13	
36		31.02	33.64	30.84		26.49	16.83	27.59	35.25	37.12	43.63	30.63	31.30	29.74	
54				32.22	35.19	29.92		33.16	36.87	46.98	19.59	24.96	32.36	33.82	
55					23.04	22.28	21.61	20.89	35.22	34.39	33.44	27.90	27.35	30.40	
56					35.97	40.19		35.02	24.82	39.87	38.39	35.27	34.61	36.17	
58					32.38	25.43	28.58	25.77	34.99	34.81	31.86	29.43	30.41	33.80	
65	34.34	31.48	27.21	25.23	26.91	20.73	25.48	24.05	24.78	32.46	37.66	38.60	29.08	27.62	
70	32.76	24.76	23.47	25.16	24.66	20.09	16.21			22.93	32.75	26.53	24.93	23.69	
92	32.80	29.81	28.99	24.79	30.18	21.57	23.64	22.68	41.88	33.12	39.68	33.20	30.19	28.69	
104	31.22	23.53	21.77	17.65	21.01	17.66	9.56	17.70	28.13	24.28	25.31	23.29	21.76	20.67	
105	34.69		28.15	24.66	19.83	9.68	9.57	21.51	18.79	27.40	29.00	29.41	22.97	21.82	
106	28.57	31.52	24.07	19.15	19.71	17.63	13.48	20.29	17.62	25.28	24.63	25.58	22.29	21.18	
107	33.86	24.97	25.41	22.22	13.44	19.33	18.60	20.88	23.72	24.29	29.04	29.35	23.76	22.57	
112	37.83	24.29	22.79	20.25	19.90	22.82							24.65	20.84	
113	30.67	26.02	22.69	18.87	20.59	23.63							23.74	20.07	

114					17.67		16.79	15.15					16.54	15.71	
115		30.69	33.52	28.60	31.92	26.55	30.64	30.19	36.47	36.62			31.69	30.11	
116		41.47	41.77	39.51		36.02	37.80		29.10	44.69			38.62	42.56	

☒ **Local bias adjustment factor used**

☒ **National bias adjustment factor used**

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

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

Notes:

Exceedances of the 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

1 QA / QC of automatic monitoring

1.1 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.

1.2 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 check 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:

- six-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

- six-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 carried out by National Environmental Technology Centre Network engineers prior to each Horiba's major service.

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.

1.3 Calibration check methods

The calibration procedure for NO_x for sites C2, C4, C6 and C7 is based on a two 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 with 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

1.4 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:

- instrument span, F = C/(Vs-Vz) and
- pollutant concentration (ppb) = Fx(Va-Vz) where:
  - C is the set gas value on the gas certificate
  - Vs span value
  - Vz zero span value
  - Va 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.

1.5 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.

2 QA / QC of diffusion tube monitoring

2.1 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].

2.2 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.

2.3 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.

2.4 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:

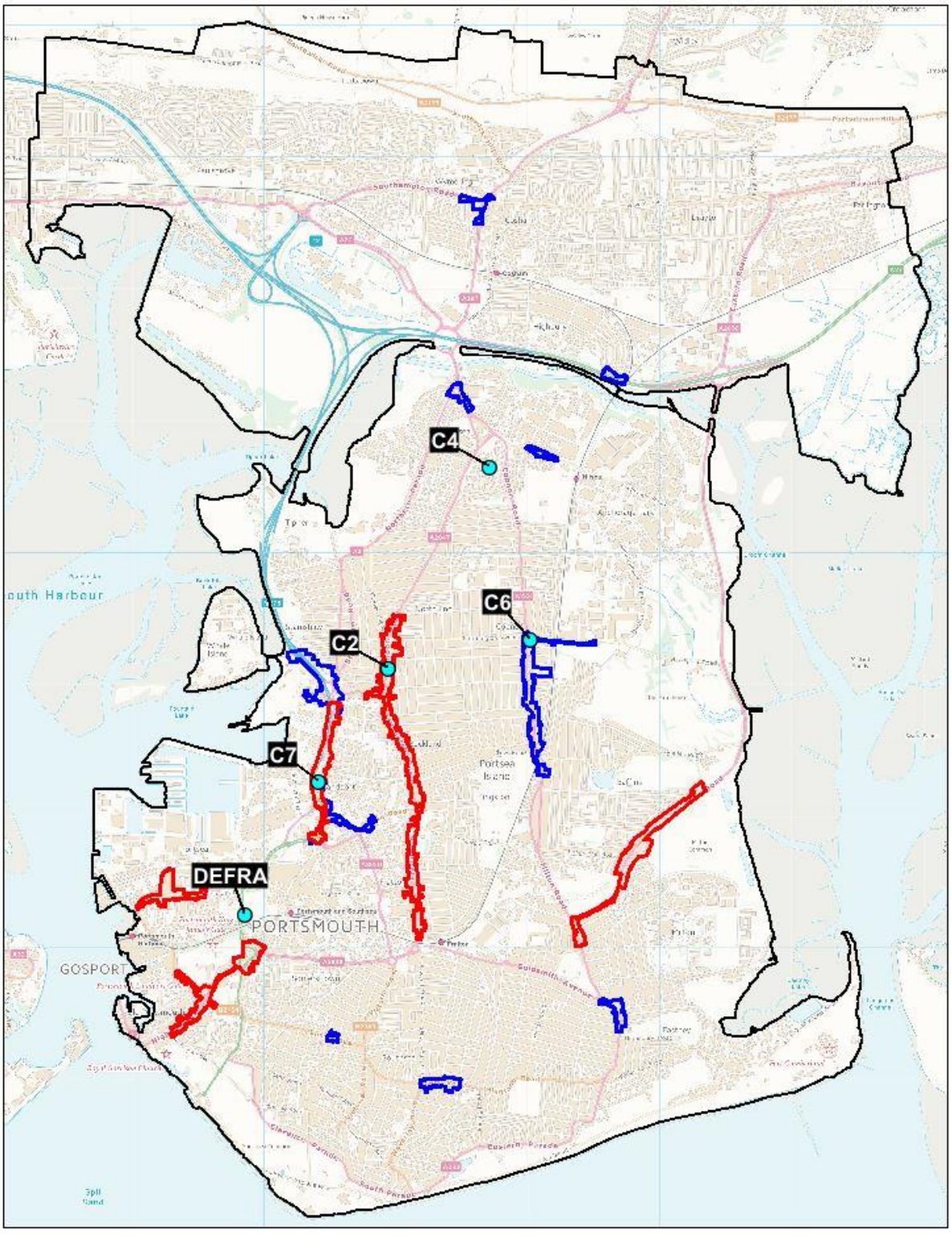
- Firstly, PCC use the data from the local collocation study of NO_2 diffusion tubes to calculate the bias following the approach prescribed in Box 6.4 of LAQM TG (16) using the appropriate continuous monitoring data from the local air quality monitoring network for individual NO_2 monitored site according 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 (16) using data from both Portsmouth and Southampton AURN stations

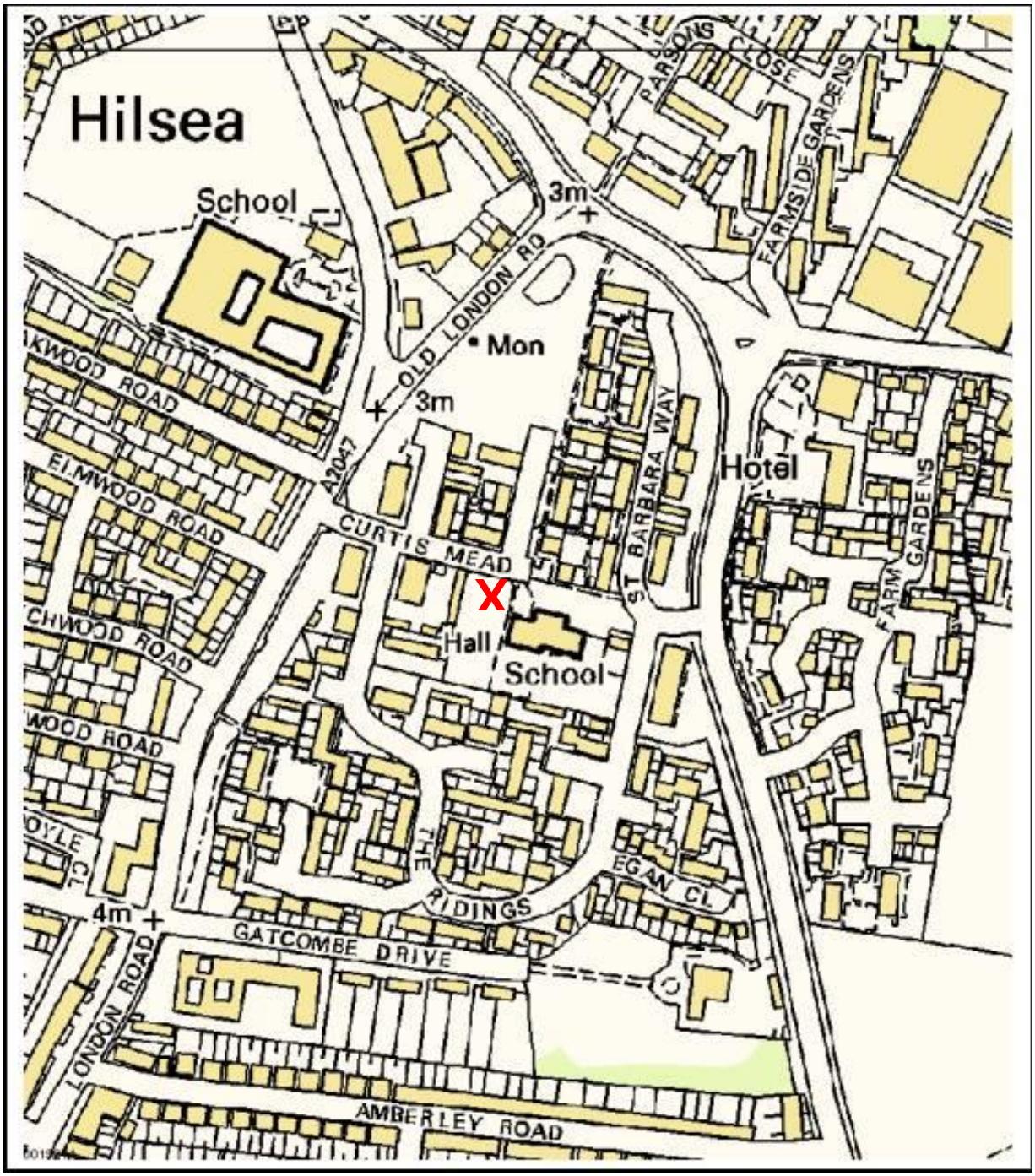
- The corrected results are then reported and used for comparison only, i.e. not for verification processes in the Further Assessment (Review and Assessment process).

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

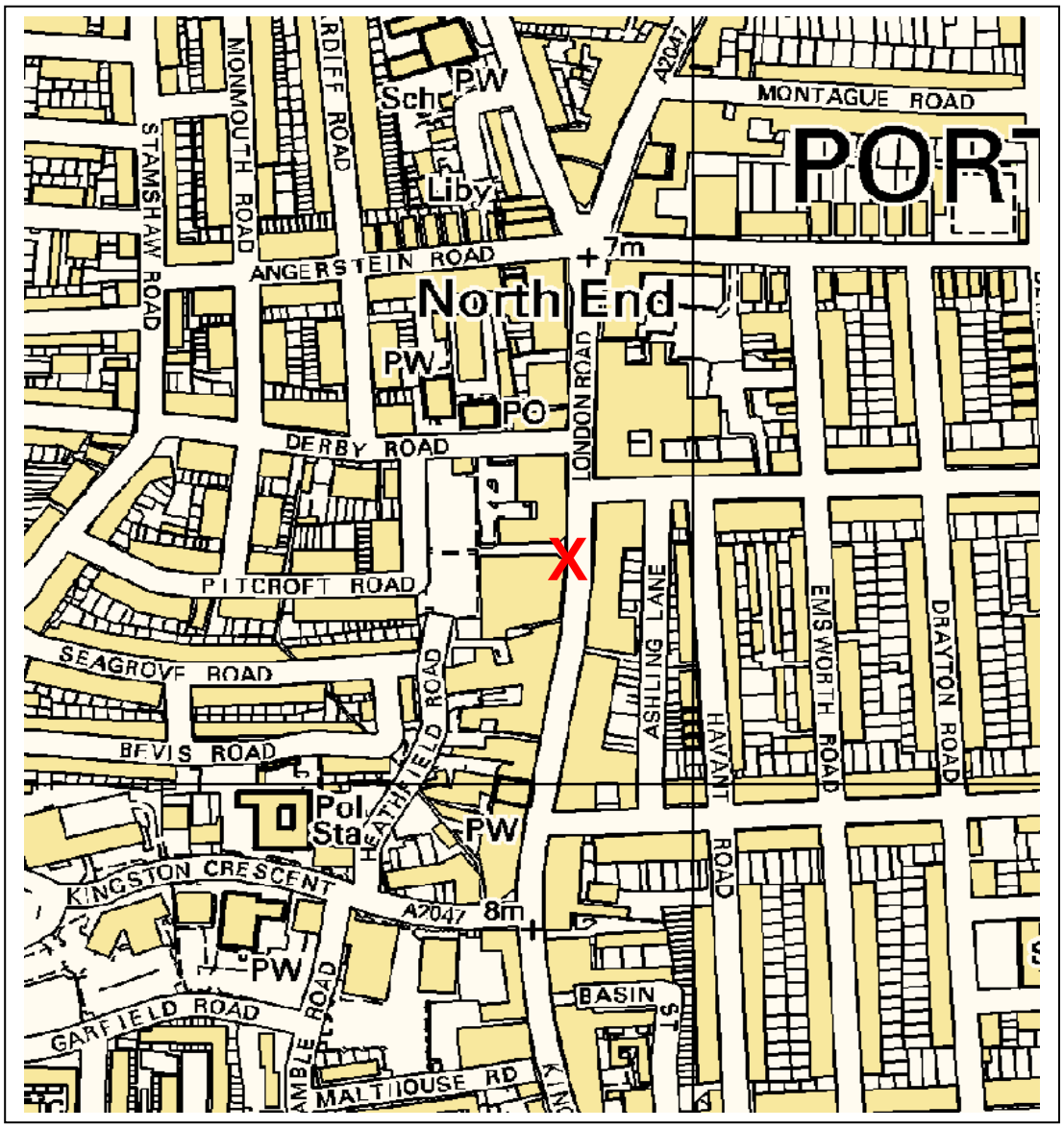
Map 1 – PCC's CAQMS locations (C2, C4, C6 and C7) and DEFRA's station



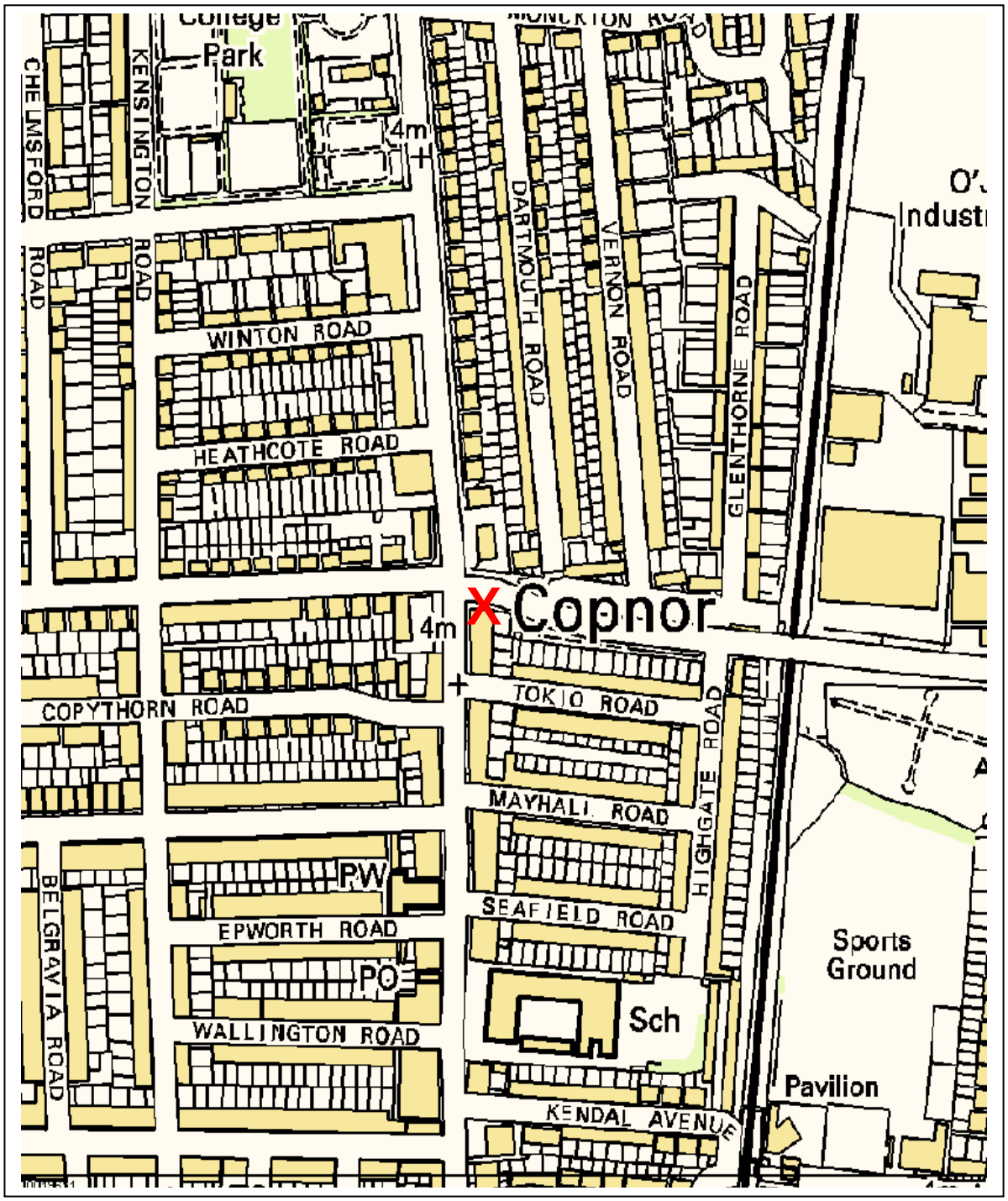
Map 2 – PCC's background CAQMS: Location (C4) at Gatcombe Park Primary School, Hilsea



Map 3 – PCC's Kerbside CAQMS: Location (C2) along London Road, North End

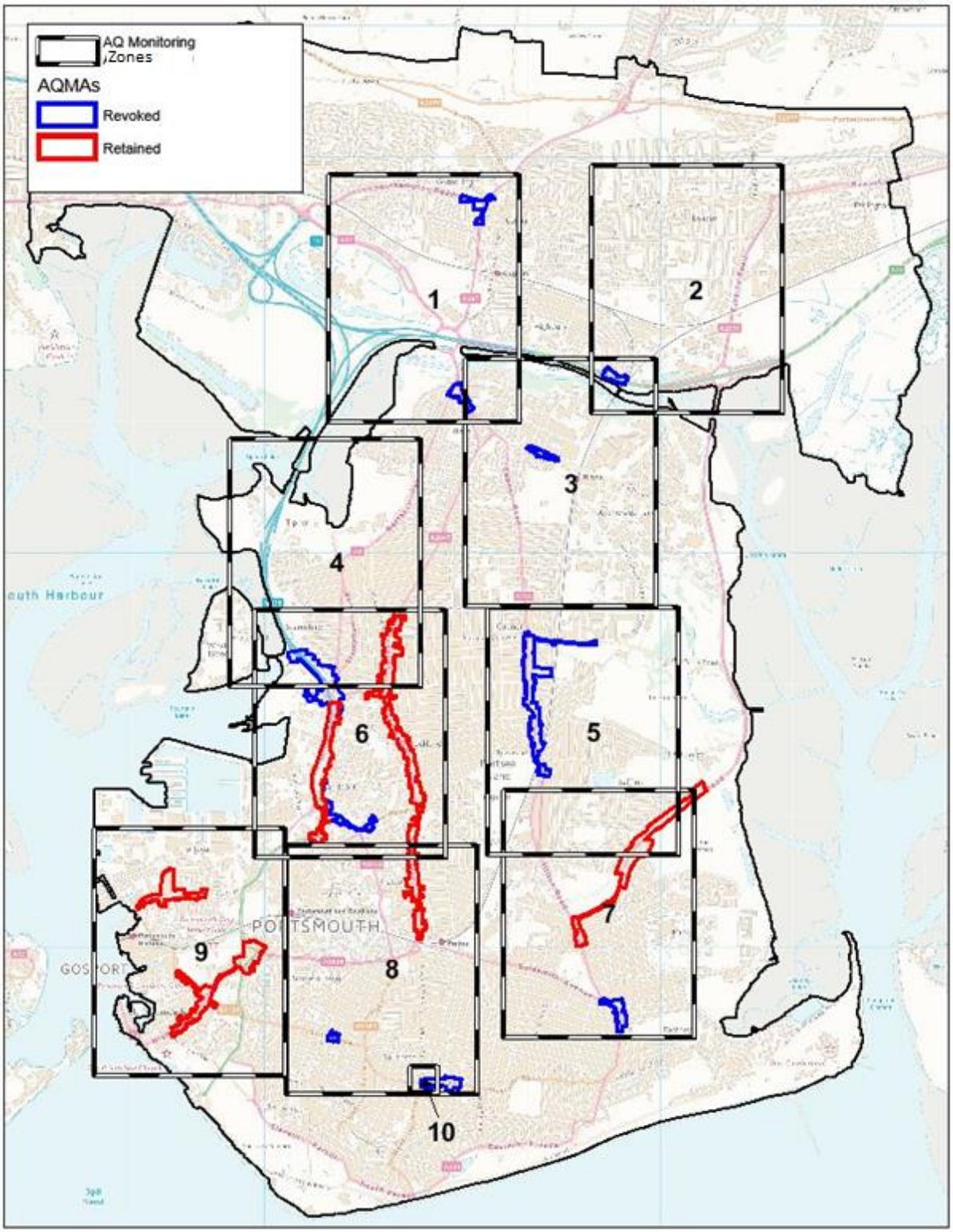


Map 4 – PCC's Roadside CAQMS: Location (C6) along Burrfields Road, Baffins

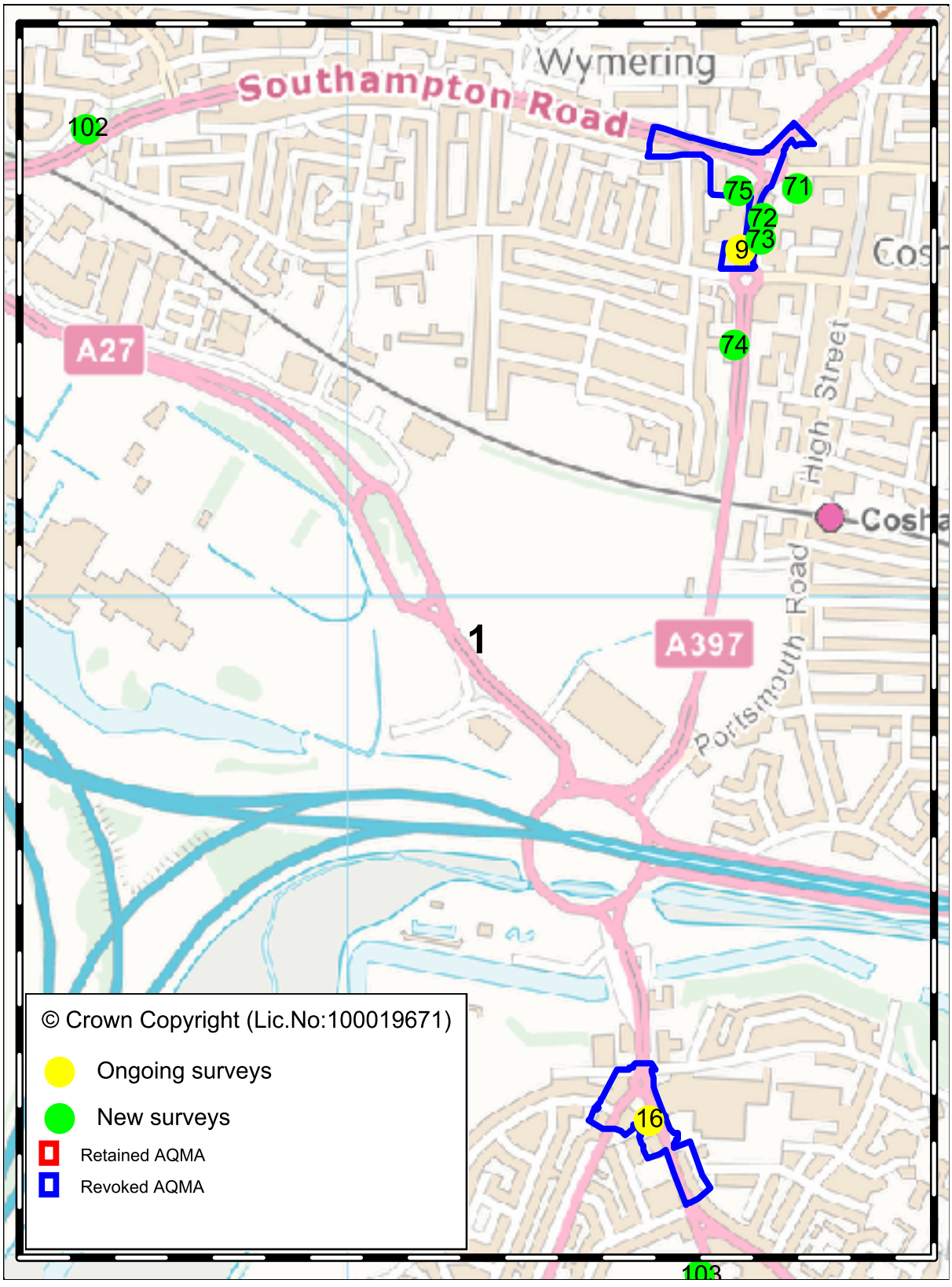


Map 5 – PCC's Roadside CAQMS: Location (C7) along Mile End Road, Buckland

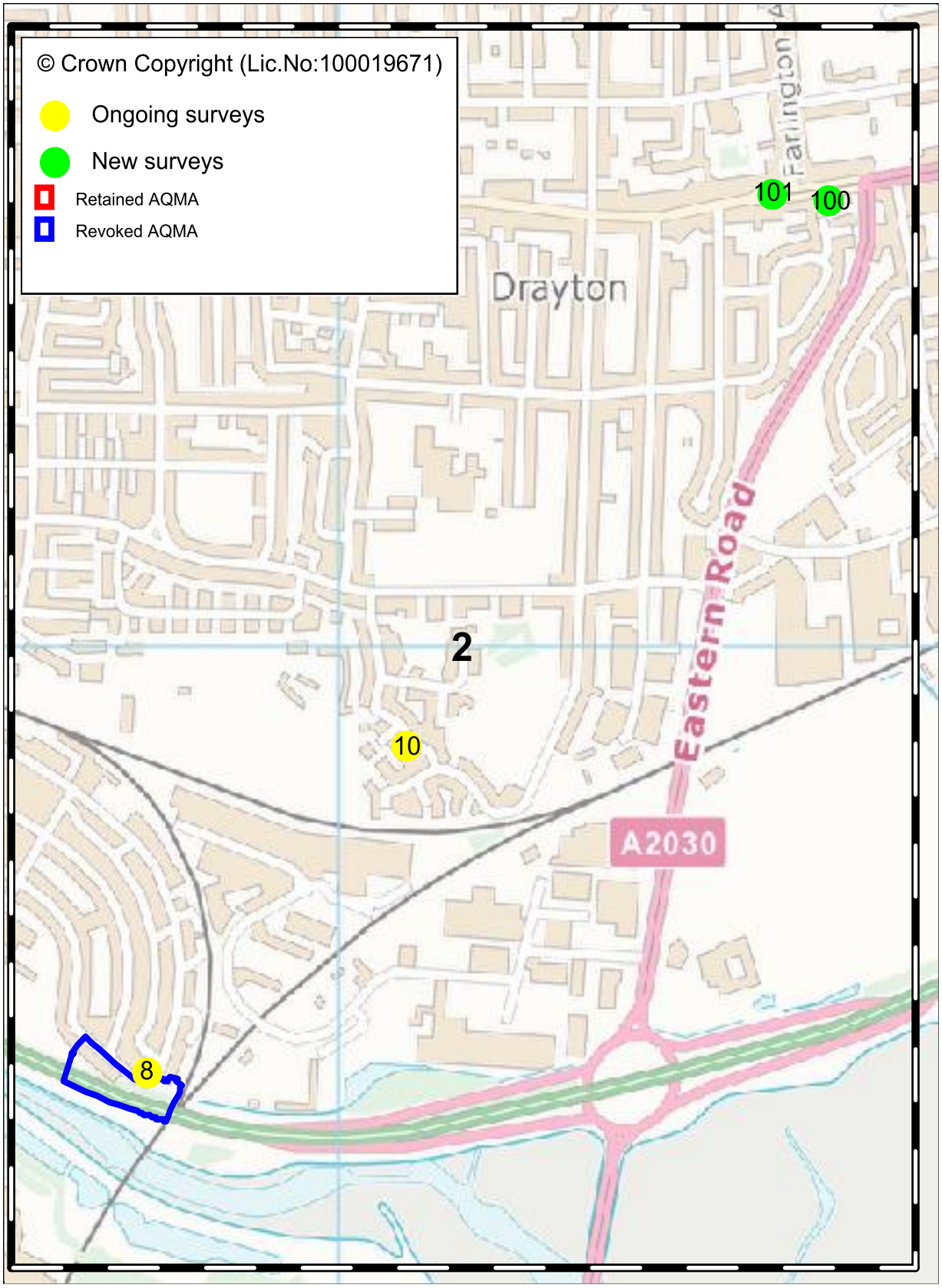
Map 6 – PCC's AQMAs and nitrogen dioxide diffusion tube monitoring locations



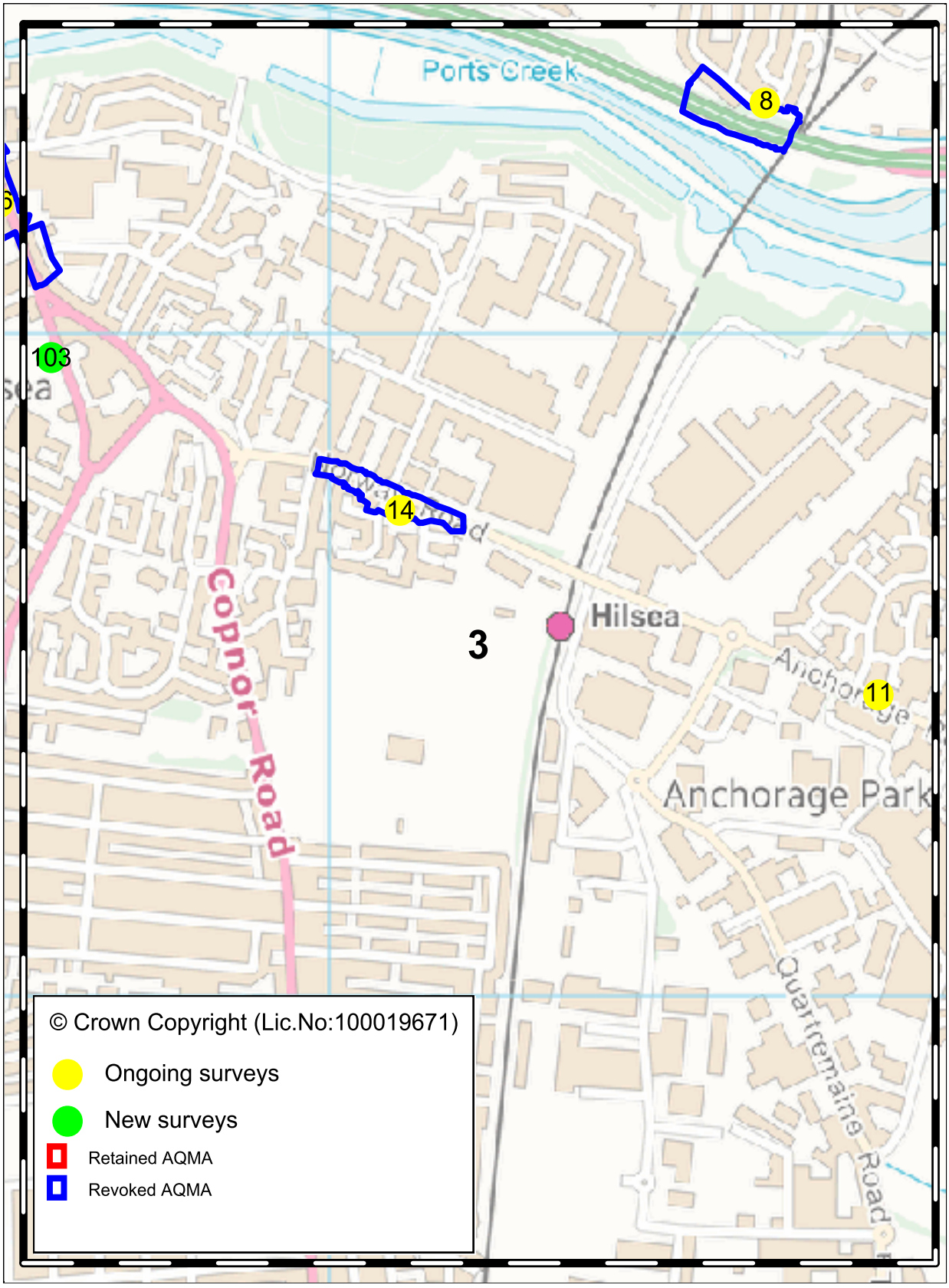
Map 7 – PCC's nitrogen dioxide diffusion tube monitoring locations Zone 1



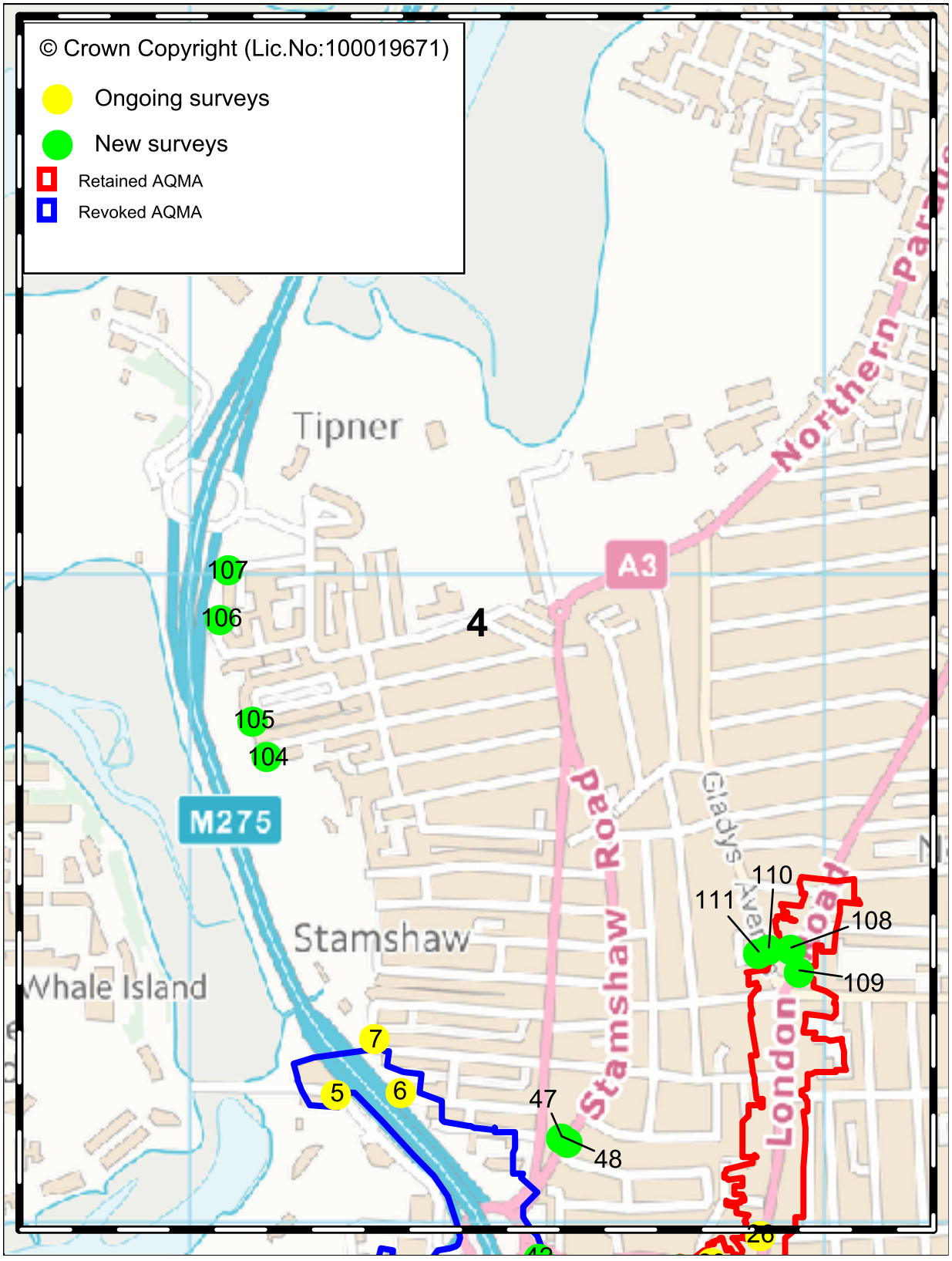
Map 8 – PCC's nitrogen dioxide diffusion tube monitoring locations Zone 2



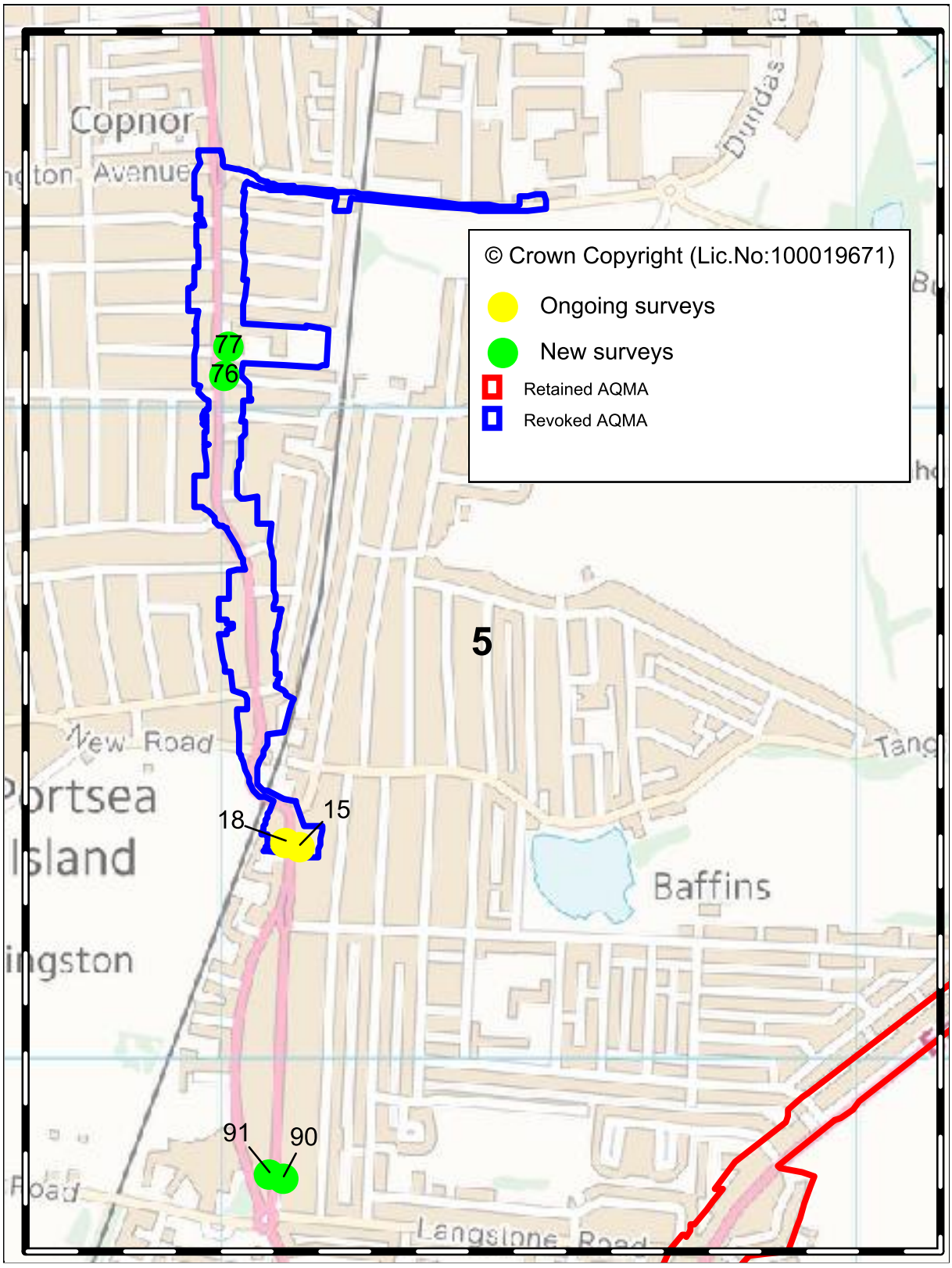
Map 9 – PCC's nitrogen dioxide diffusion tube monitoring locations Zone 3



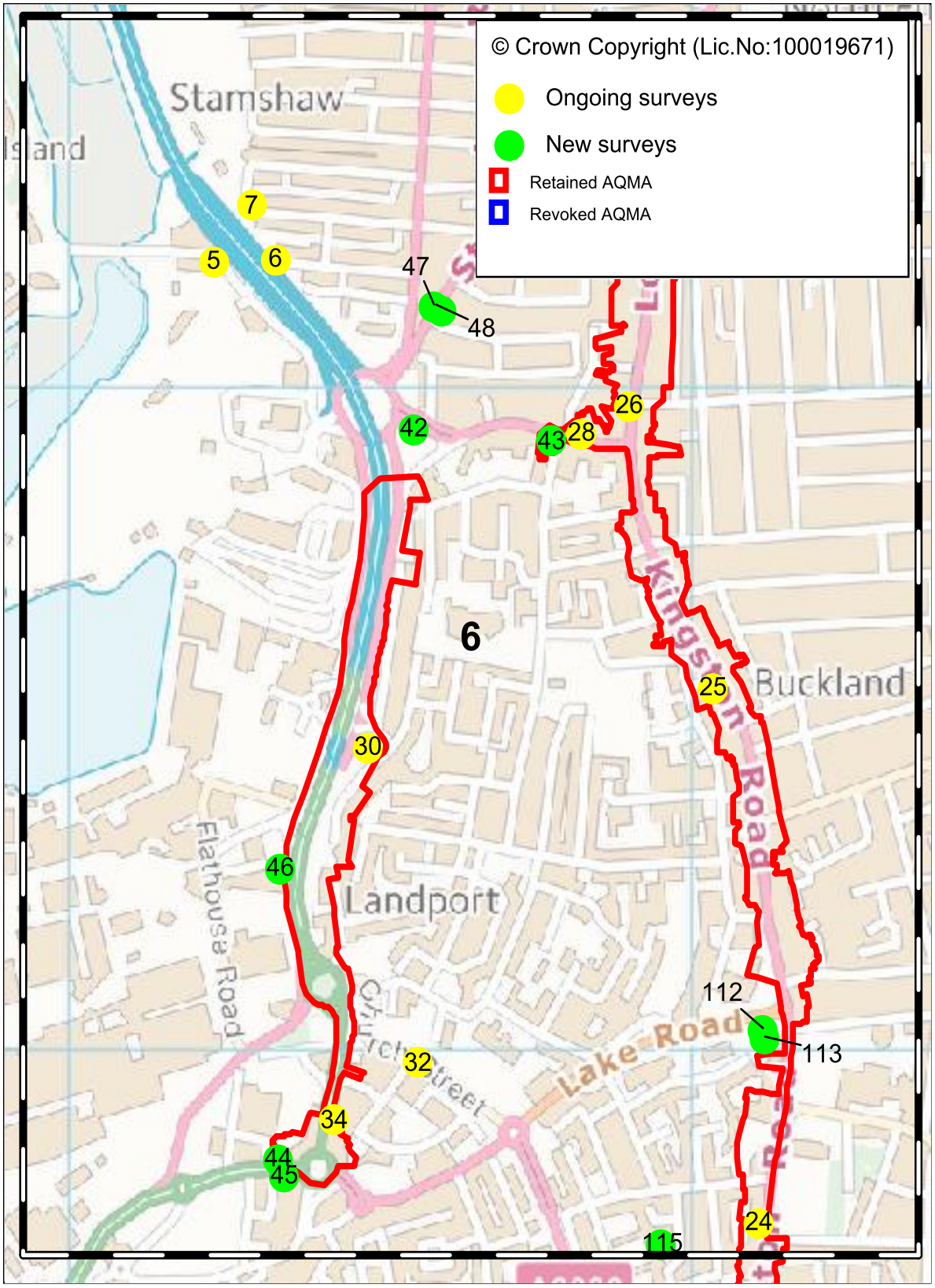
Map 10 – PCC's nitrogen dioxide diffusion tube monitoring locations Zone 4



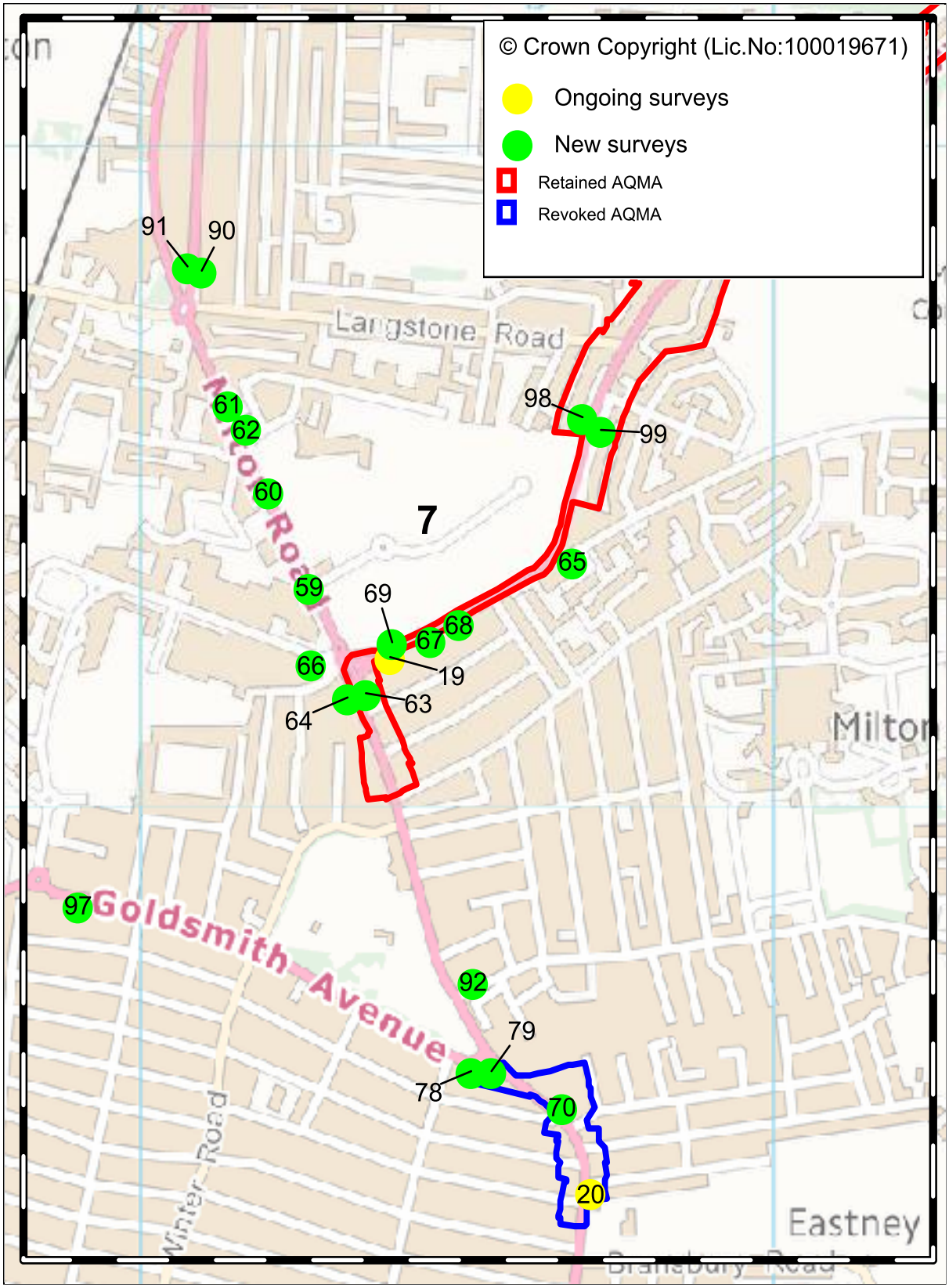
Map 11 – PCC's nitrogen dioxide diffusion tube monitoring locations Zone 5



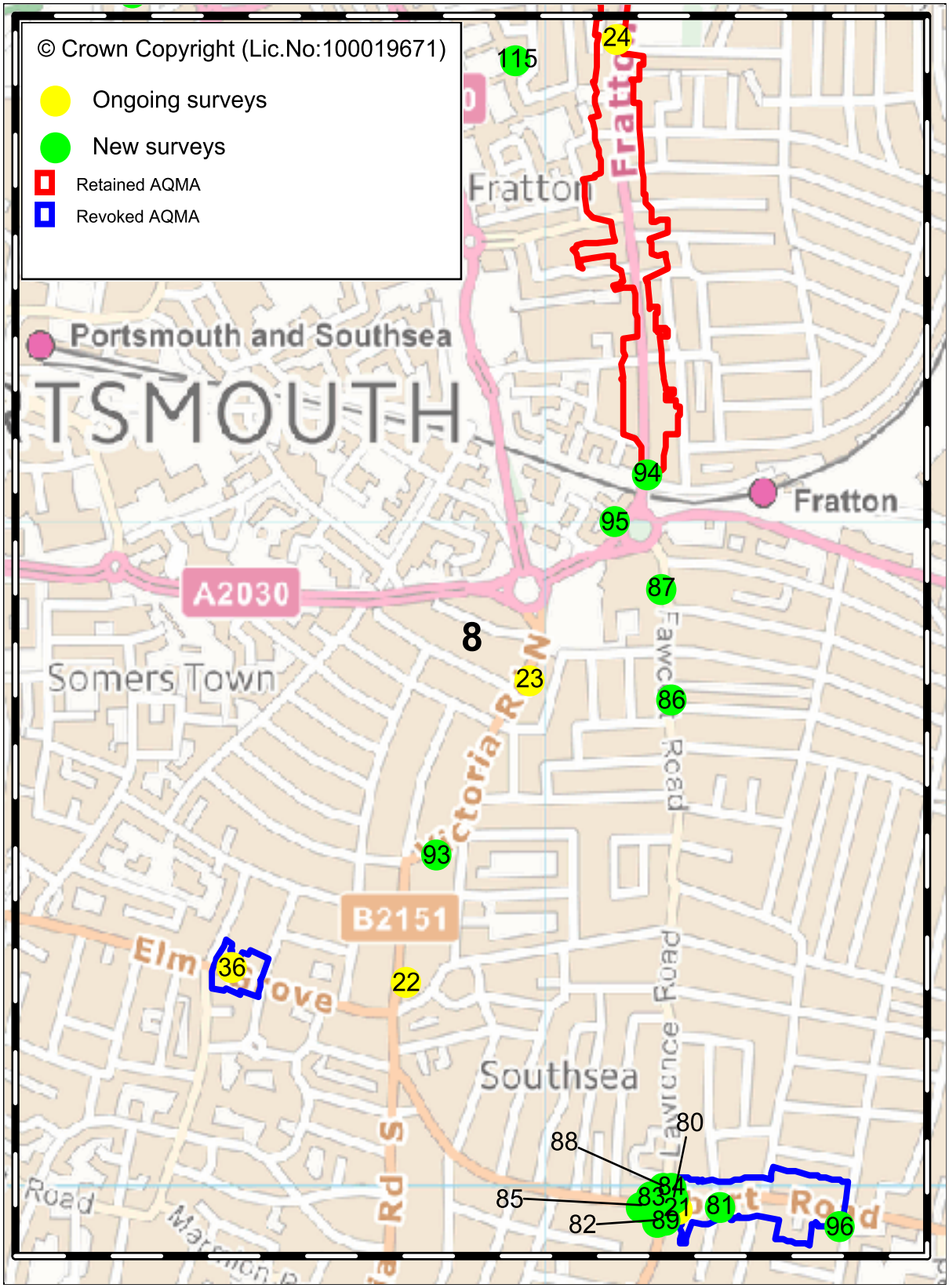
Map 12 – PCC's nitrogen dioxide diffusion tube monitoring locations Zone 6



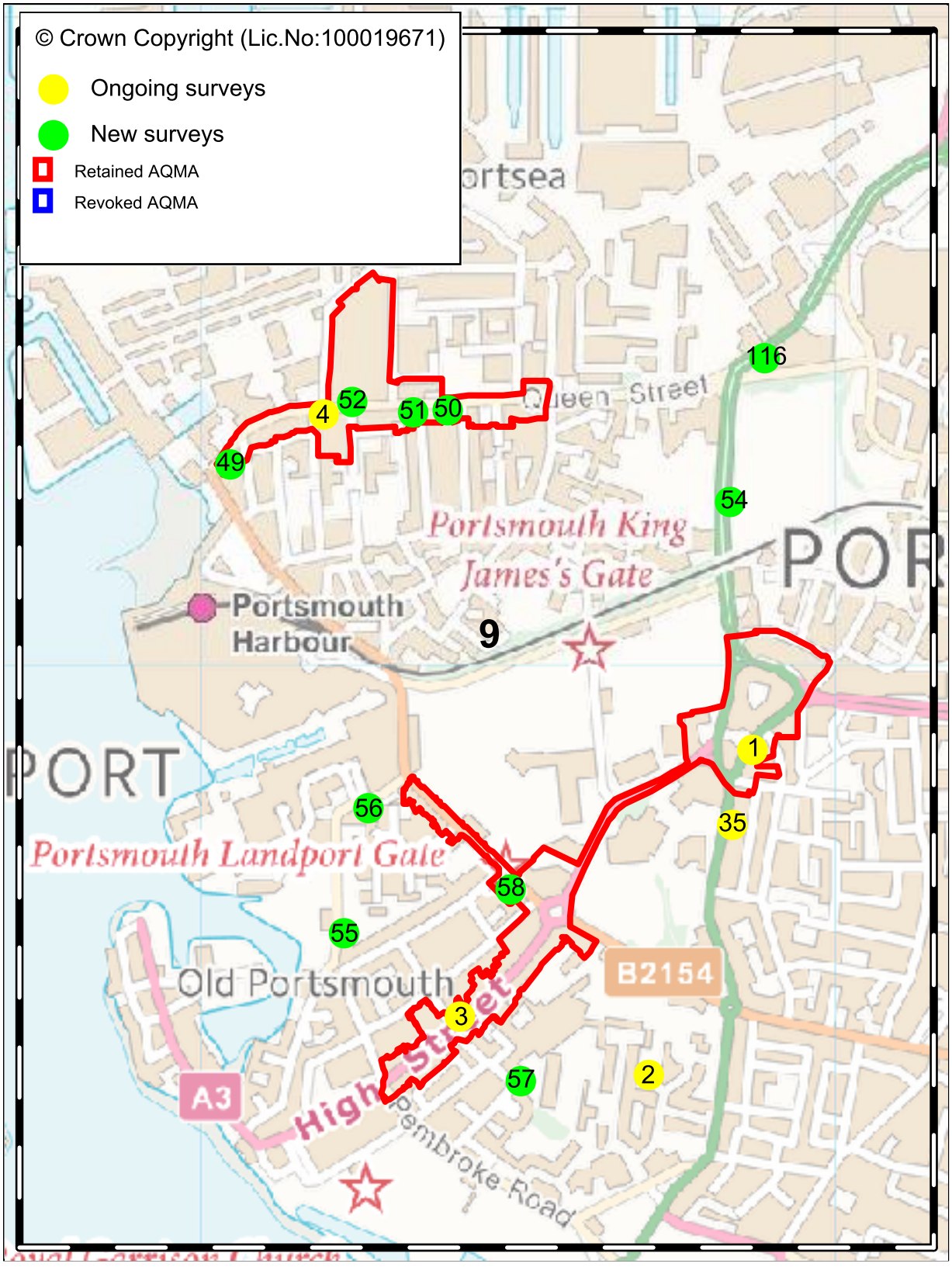
Map 13 – PCC's nitrogen dioxide diffusion tube monitoring locations Zone 7



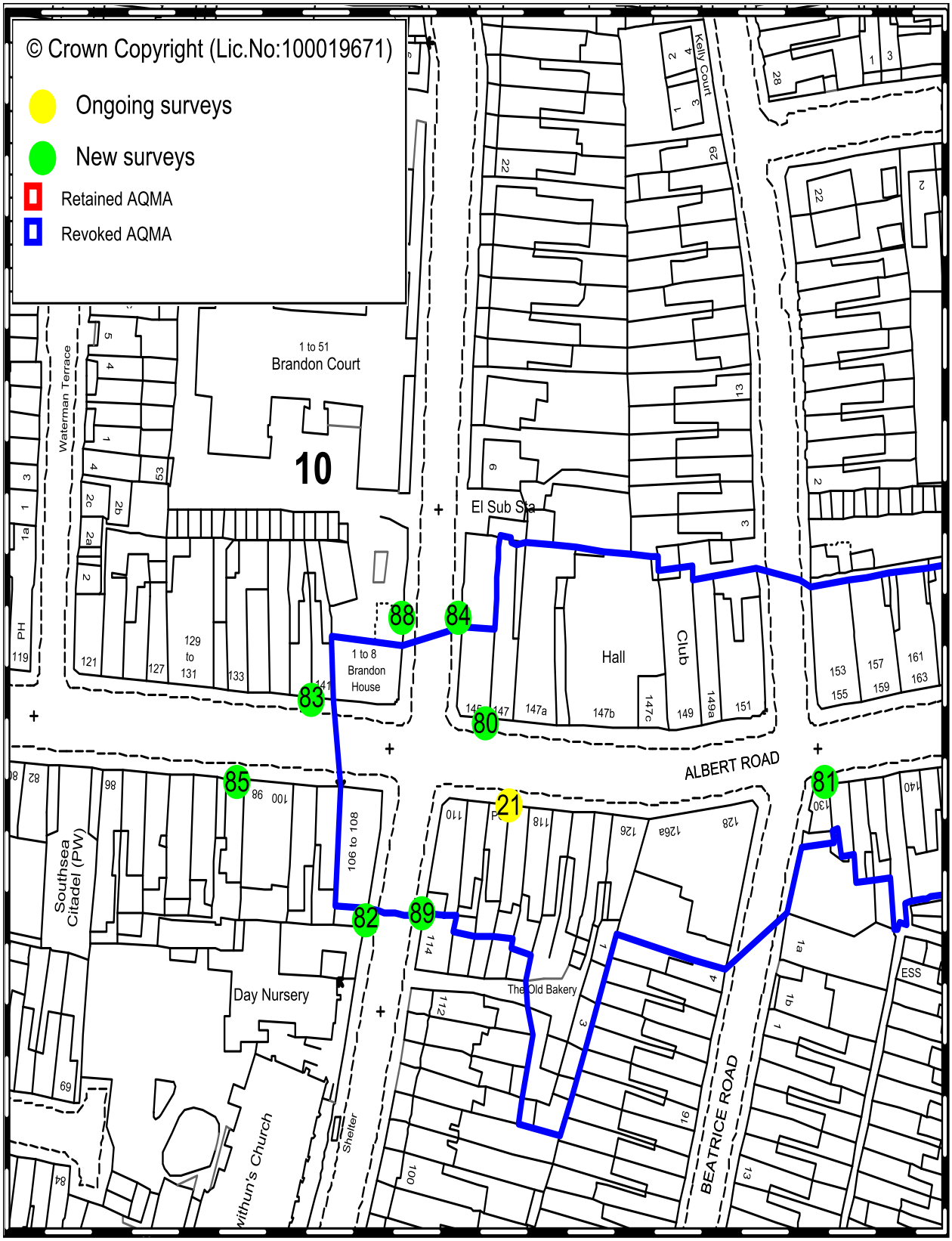
Map 14 – PCC's nitrogen dioxide diffusion tube monitoring locations Zone 8



Map 15 – PCC's nitrogen dioxide diffusion tube monitoring locations Zone 9



Map 16 – PCC's nitrogen dioxide diffusion tube monitoring locations Zone 10



Appendix E: Summary of Air Quality Objectives in England

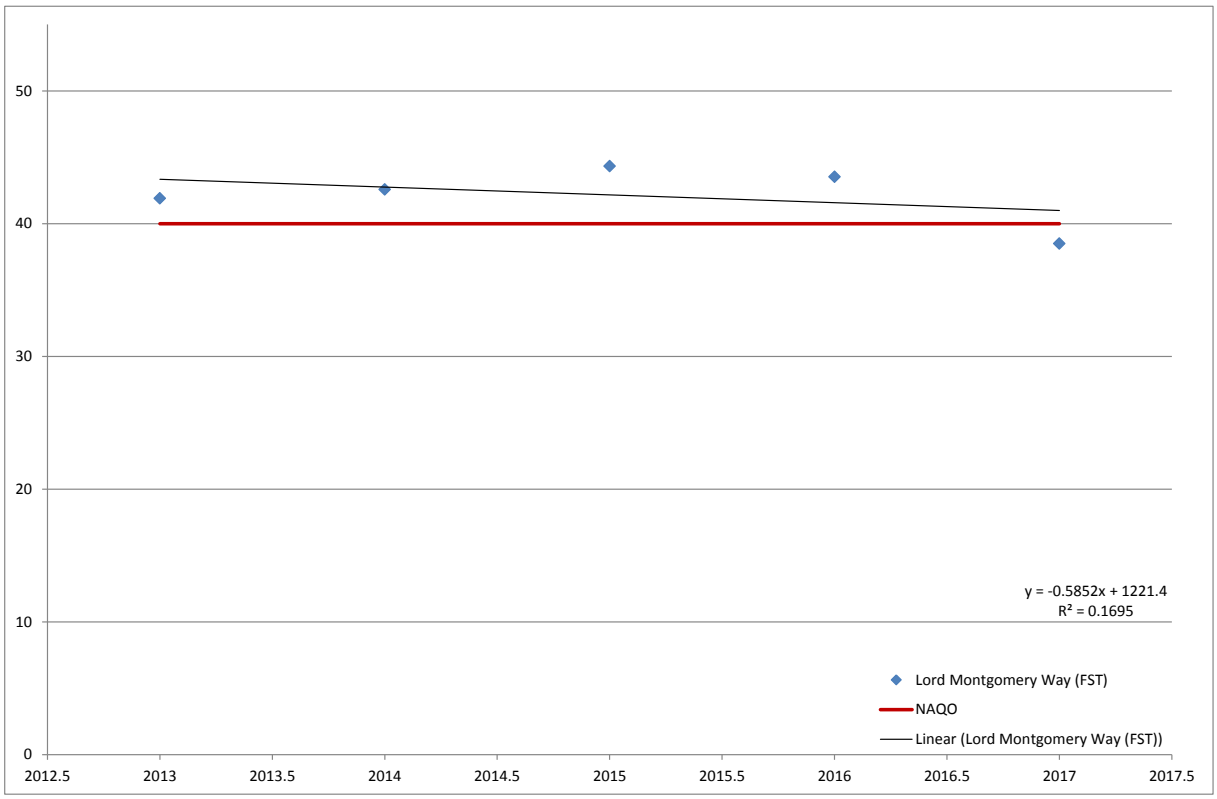
Table E.1 – Air Quality Objectives in England

Pollutant	Air Quality Objective[5]	
	Concentration	Measured as
Nitrogen Dioxide (NO_2)	200µg/m^3 not to be exceeded more than 18 times a year	1-hour mean
	4 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
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

[5] The units are in microgrammes of pollutant per cubic metre of air (µg/m^3).

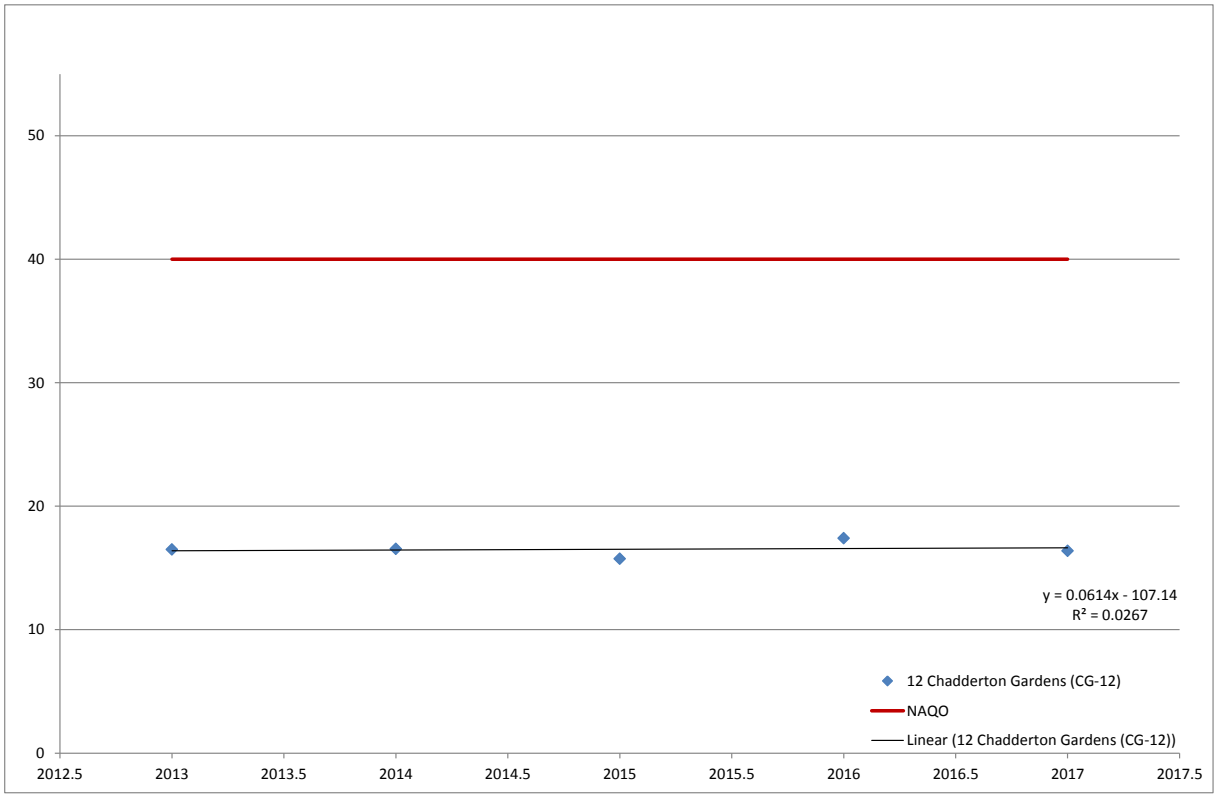
Appendix F: Figures for NDDT 5 year trends

Figure F.1: **Lord Montgomery Way (FST)** NDDT data exhibited a **downward** trend



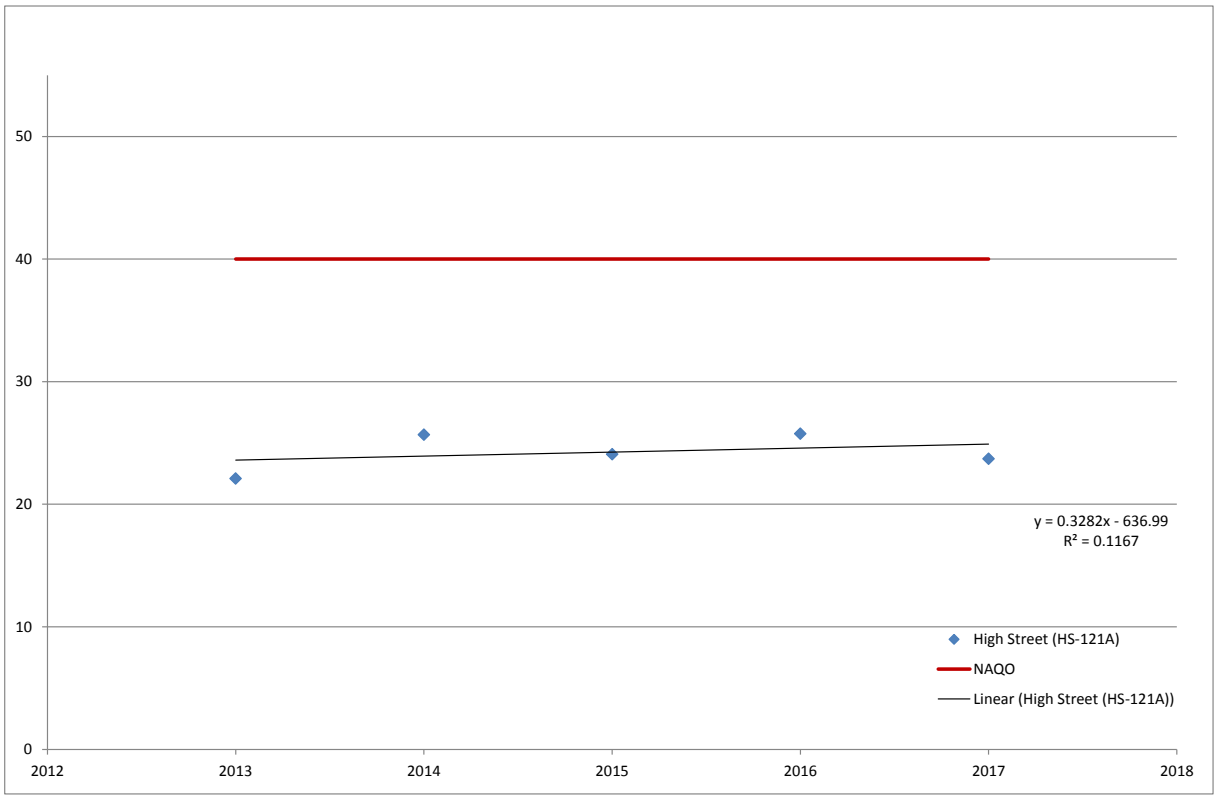
The NO_2 annual average at this roadside monitoring location was below the NAQO in 2017. NO_2 levels exhibited a **downward** trend in the last 5 years (2013 to 2017) showing an AQ improvement compared to the previously reported 5 year trend commencing year 2012 that showed an **upward** trend. Most importantly, NO_2 annual average **decreased** to level below the NAQO for the first time in the last 6 years by 4.72µg/m^3 **(a reduction of 11%)** between 2016 and 2017.

Figure F.2: **12 Chadderton Gardens (CG-12)** NDDT data exhibited an **upward** trend



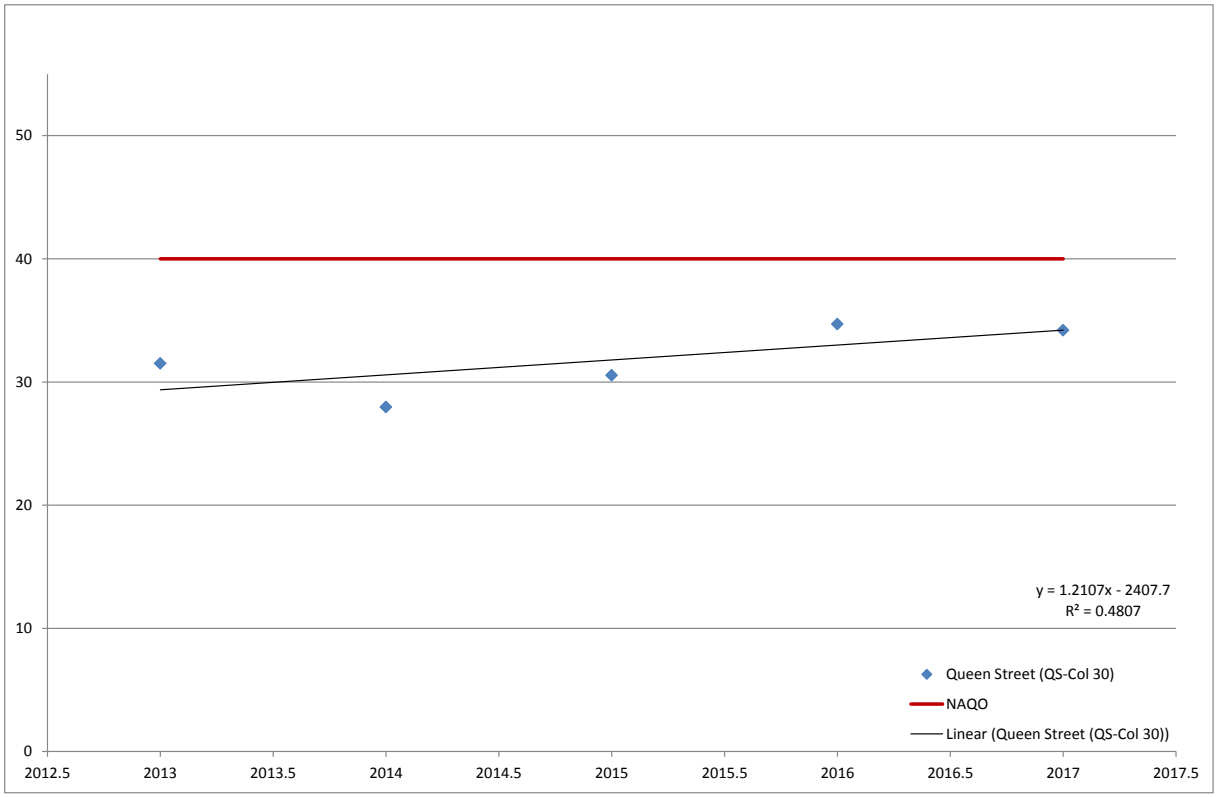
The NO_2 annual average at this urban background monitoring location remained well below the NAQO in 2017. NO_2 levels exhibited a slight **upward** trend in the last 5 years (2013 to 2017) showing no significant change in NO_2 levels compared to the previously reported 5 year trend commencing year 2012 when a slight AQ improvement was exhibited. However, NO_2 annual average slightly **decreased** in 2017 compared to 2016 by 1.02µg/m^3 **(a reduction of 6%)** between 2016 and 2017. No significant AQ deterioration occurred as the trend is relatively constant.

Figure F.3: **121A High Street (HS-121A)** NDDT Data exhibited an **upward** trend



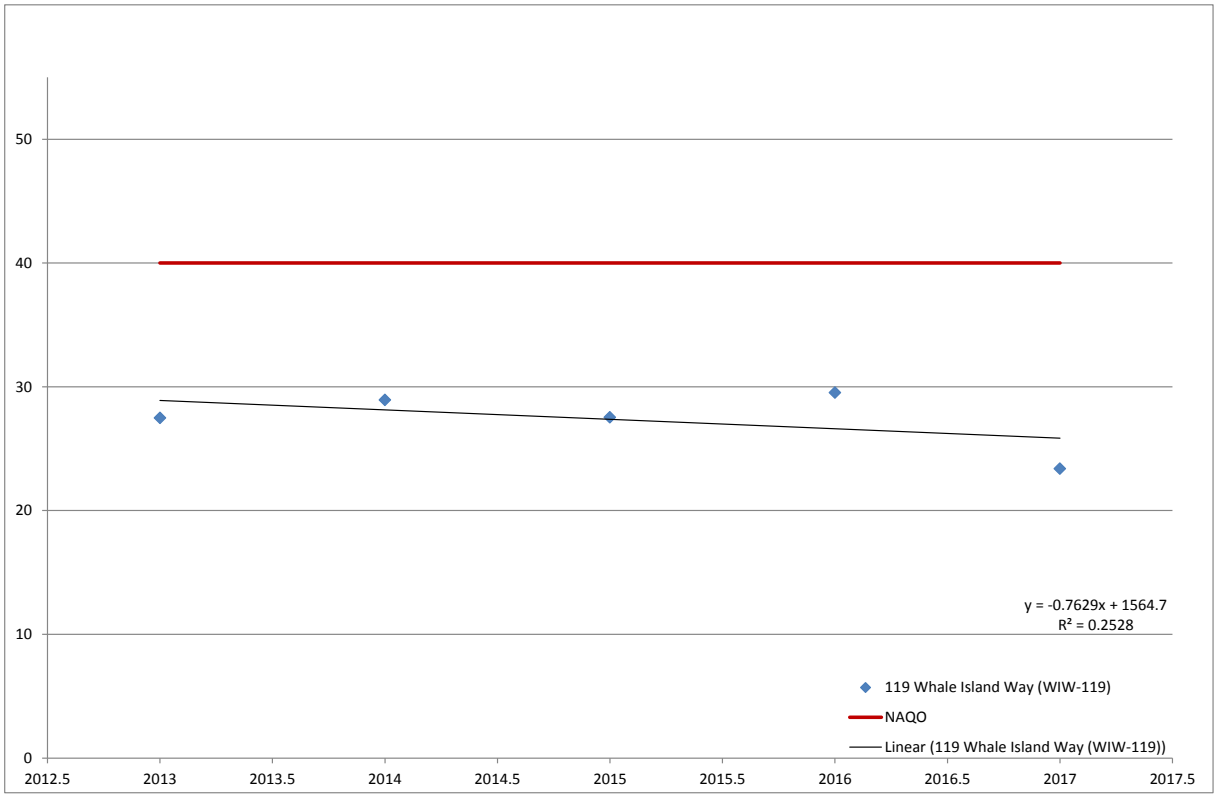
The NO_2 annual average at this roadside monitoring location remained well below the NAQO in 2017. NO_2 Levels exhibited an **upward** trend in the last 5 years (2013 to 2017) showing a deterioration in AQ similar to the previously reported trend for 5 years commencing year 2012 but not as the same rate. Only this time with a higher rate of deterioration as the linear trend is characterised by a stronger slop. However, NO_2 annual average **decreased** by 2.05µg/m^3 **(a reduction of 8%)** between 2016 and 2017.

Figure F.4: **Column 30 Queen Street (QS-Col30)** NDDT data exhibited an **upward** trend



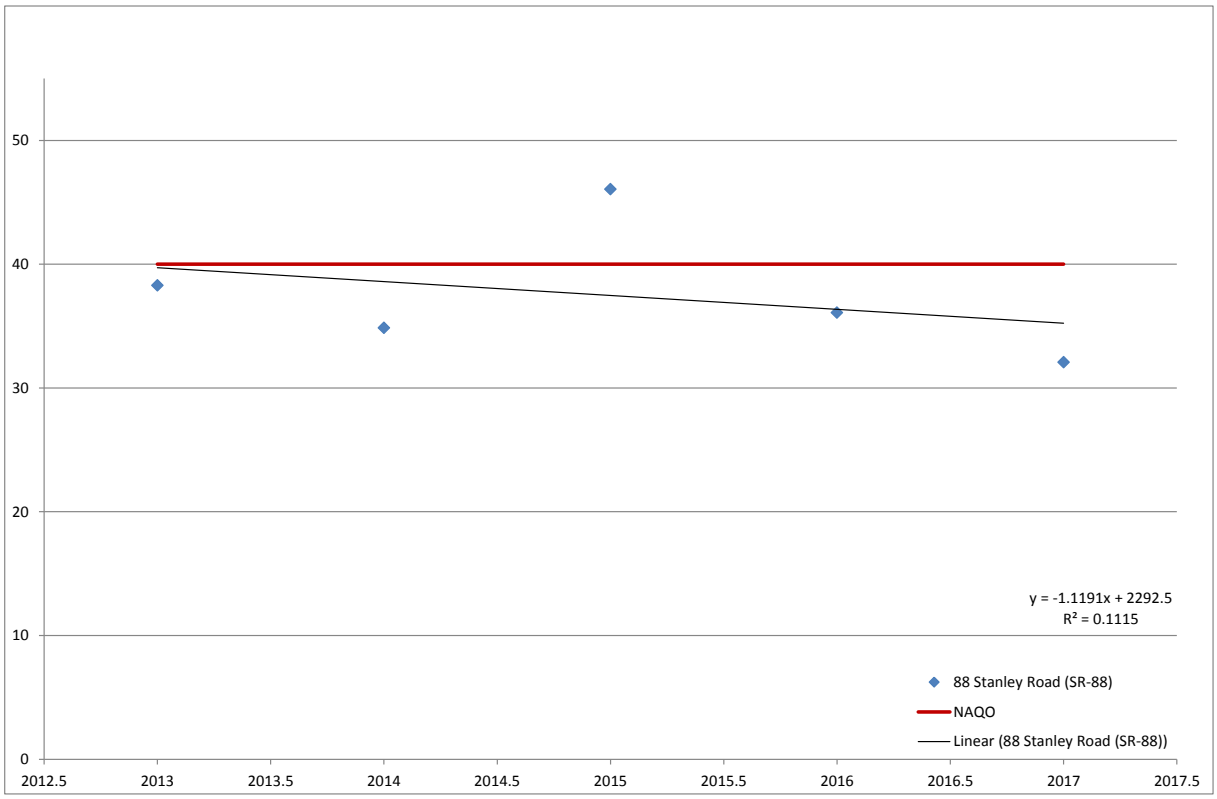
The NO_2 annual average at this roadside monitoring location remained below NAQO in 2017. NO_2 levels exhibited an **upward** trend in the last 5 years (2013 to 2017) showing an AQ deterioration compared to the previously reported 5 year trend commencing year 2012 when a **downward** trend was exhibited showing an AQ improvement. However, NO_2 annual average slightly **decreased** in 2017 compared to 2016 by 0.5µg/m^3 **(a reduction of 1%)** between 2016 and 2017.

Figure F.5: **119 Whale Island Way (WIW-119)** NDDT data exhibited a **downward** trend



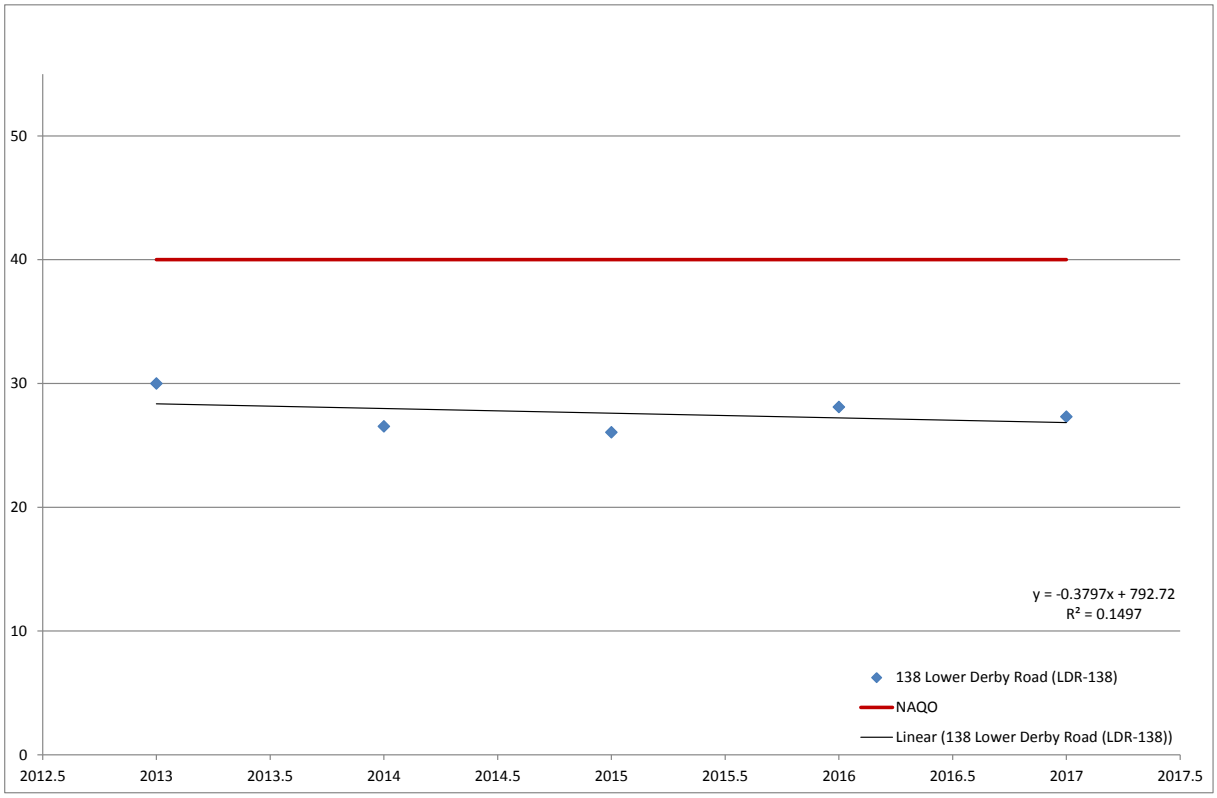
The NO_2 annual average at this roadside monitoring location remained below the NAQO in 2017. NO_2 levels exhibited a **downward** trend in the last 5 years (2013 to 2017) showing an AQ improvement compared to the previously reported 5 year trend commencing year 2012 where an **upward** trend was exhibited showing an AQ deterioration. In addition, NO_2 annual average **decreased** in 2017 compared to 2016 by 5.14µg/m^3 **(a reduction of 17%)** between 2016 and 2017.

Figure F.6: **88 Stanley Road (SR-88)** NDDT data exhibited a **downward** trend



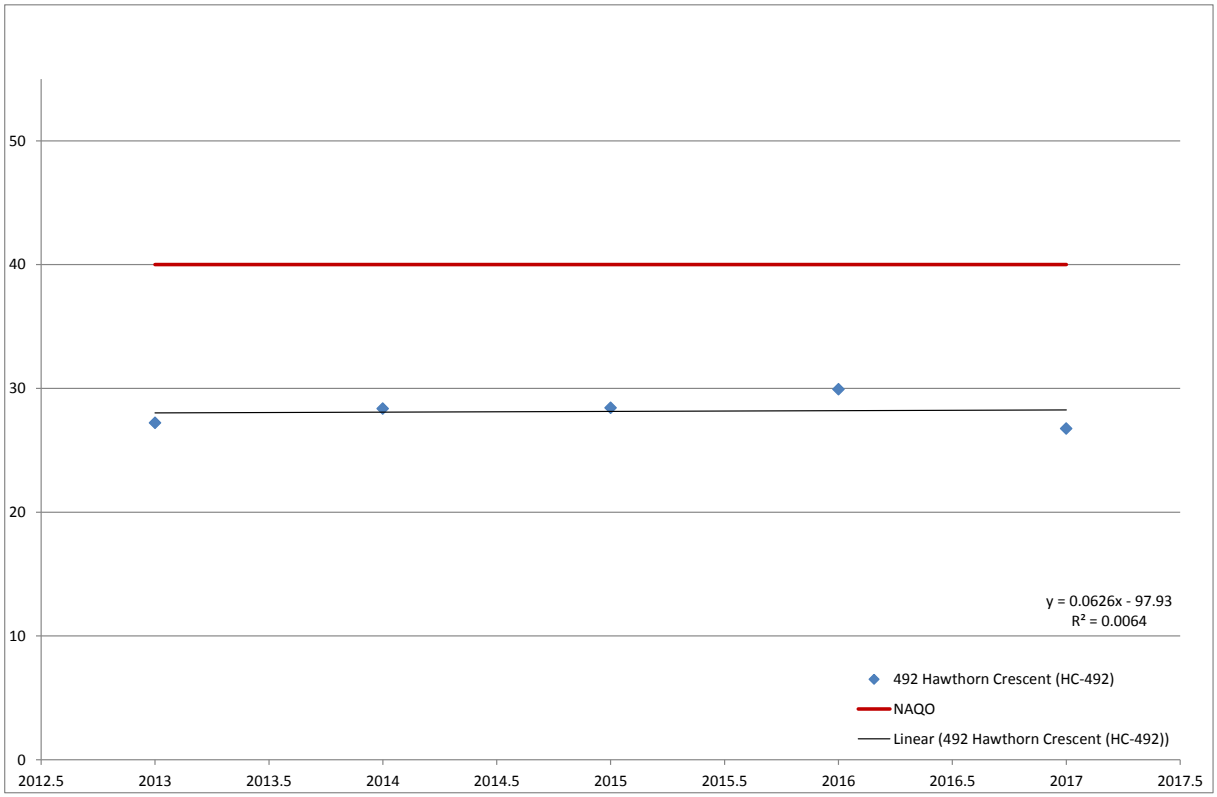
The NO_2 annual average at this roadside monitoring location remained below the NAQO in 2017 for the second consecutive year. NO_2 levels exhibited a **downward** trend in the last 5 years (2013 to 2017) showing an improvement in AQ levels compared to the previously reported 5 year trend commencing year 2012 when an **upward** trend was exhibited showing an AQ deterioration. In addition, NO_2 annual average **decreased** by 4µg/m^3 **(a reduction of 11%)** between 2016 and 2017.

Figure F.7: **138 Lower Derby Road (LDR-138)** NDDT data continued exhibiting a **downward** trend



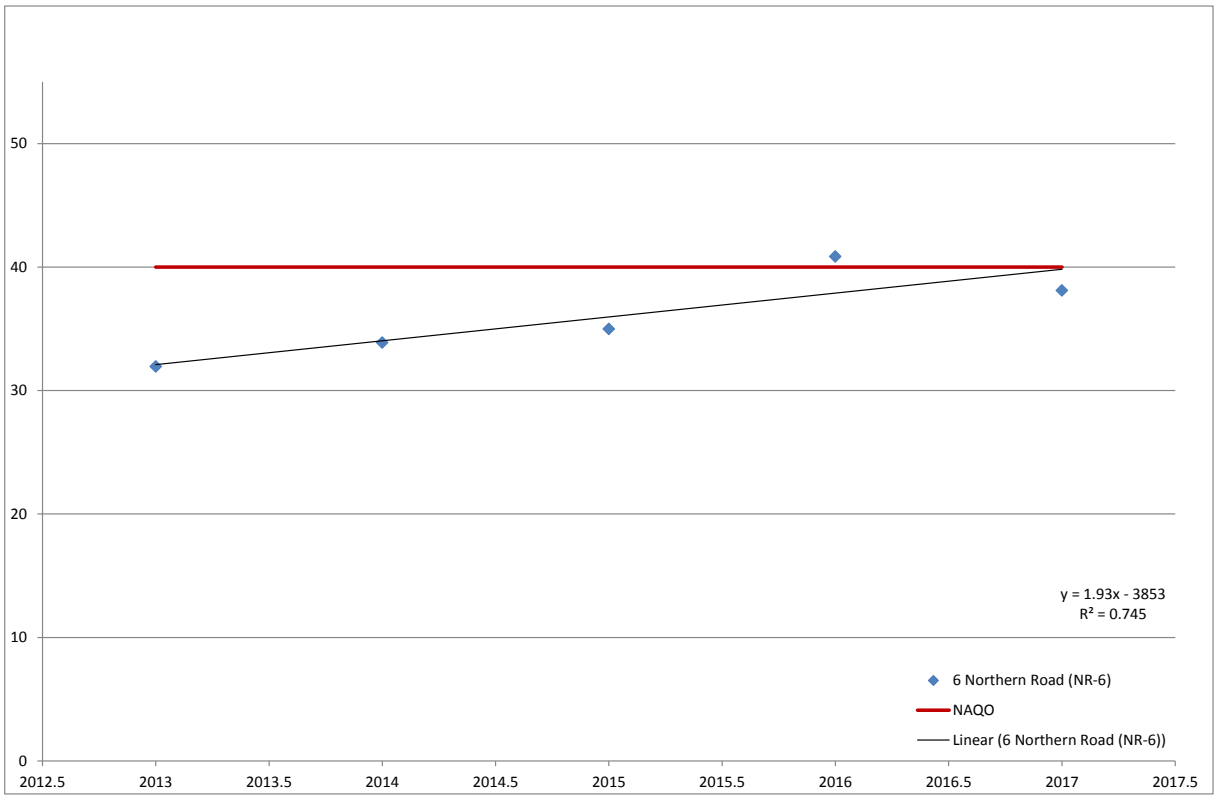
The NO_2 annual average at this roadside monitoring location remained below the NAQO in 2017. NO_2 level exhibited a **downward** trend in the last 5 years (2013 to 2017) showing an AQ improvement similar to the previously reported 5 year trend commencing year 2012. Only this times AQ improved at a lower rate. Also, NO_2 annual average **decreased** by 0.77µg/m^3 **(a reduction of 3%)** between 2016 and 2017.

Figure F.8: **492 Hawthorn Crescent (HC-492)** NDDT data exhibited a slight an **upward** trend



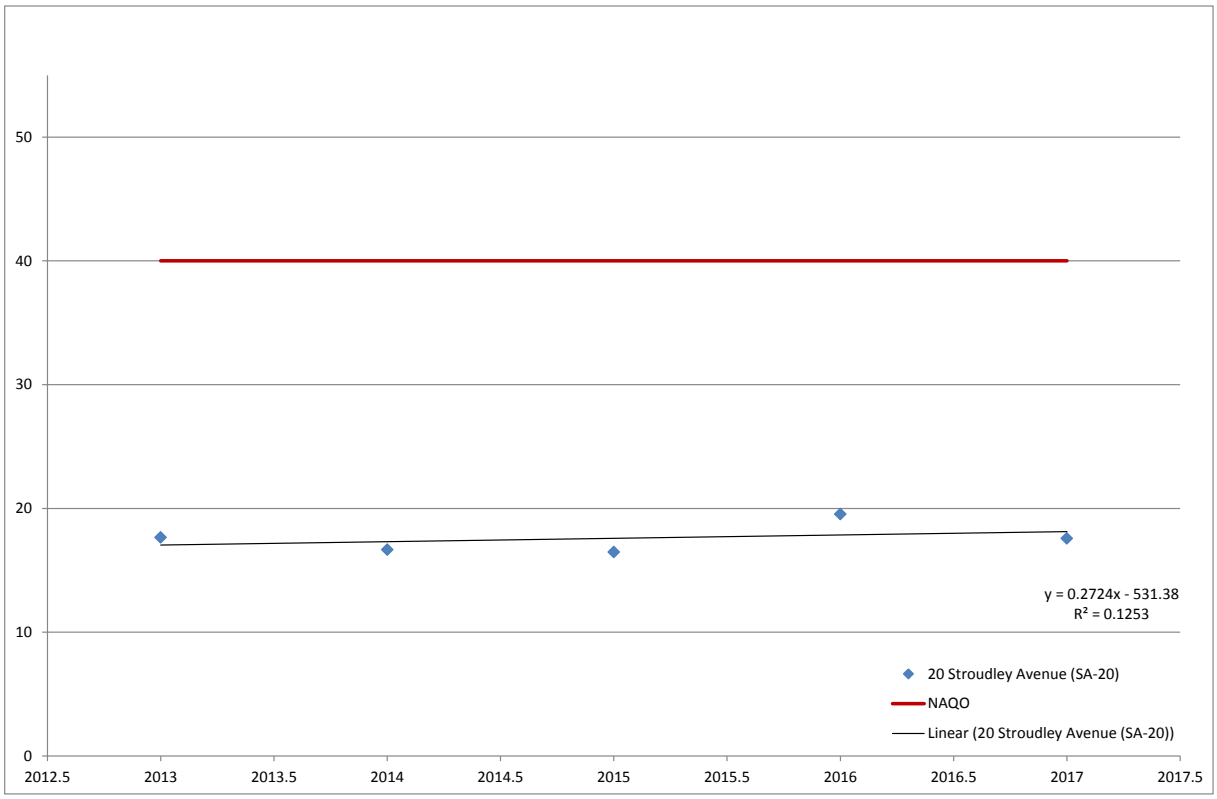
The NO_2 annual average at this roadside monitoring location remained below the NAQO in 2017. NO_2 levels exhibited a slight **upward** trend in the last 5 years (2013 to 2017) showing an AQ deterioration similar to the previously reported 5 year trend commencing year 2012. Only this time with a lower rate of deterioration as the linear trend is characterised by a shallower slop. However, NO_2 annual average **decreased** by 3.19µg/m^3 **(a reduction of 11%)** between 2016 and 2017.

Figure F.9: **6 Northern Road (NR-6)** NDDT data exhibited an **upward** trend



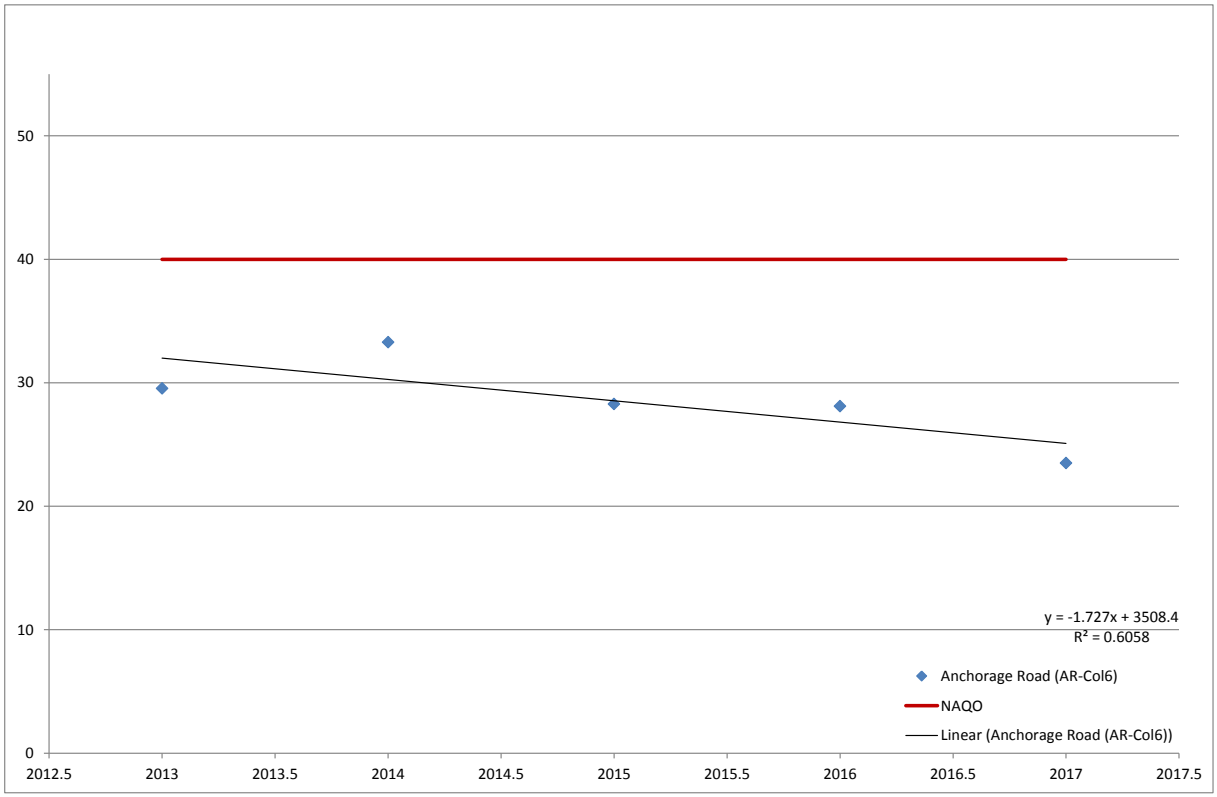
The NO_2 annual average at this roadside monitoring location was below the NAQO in year 2017. NO_2 levels exhibited an **upward** trend in the last 5 years (2013 to 2017) showing an AQ deterioration similar to the previously reported trend for 5 years commencing year 2012. Only this time with a higher rate of deterioration as the linear trend is characterised by a stronger slop. However, NO_2 annual average **decreased** by 2.75µg/m^3 **(a reduction of 8%)** between 2016 and 2017, to meet the NAQO as it was exceeded in 2016. This site will remain under review.

Figure F.10: **20 Stroudley Avenue (SA-20)** NDDT data exhibited an **upward** trend



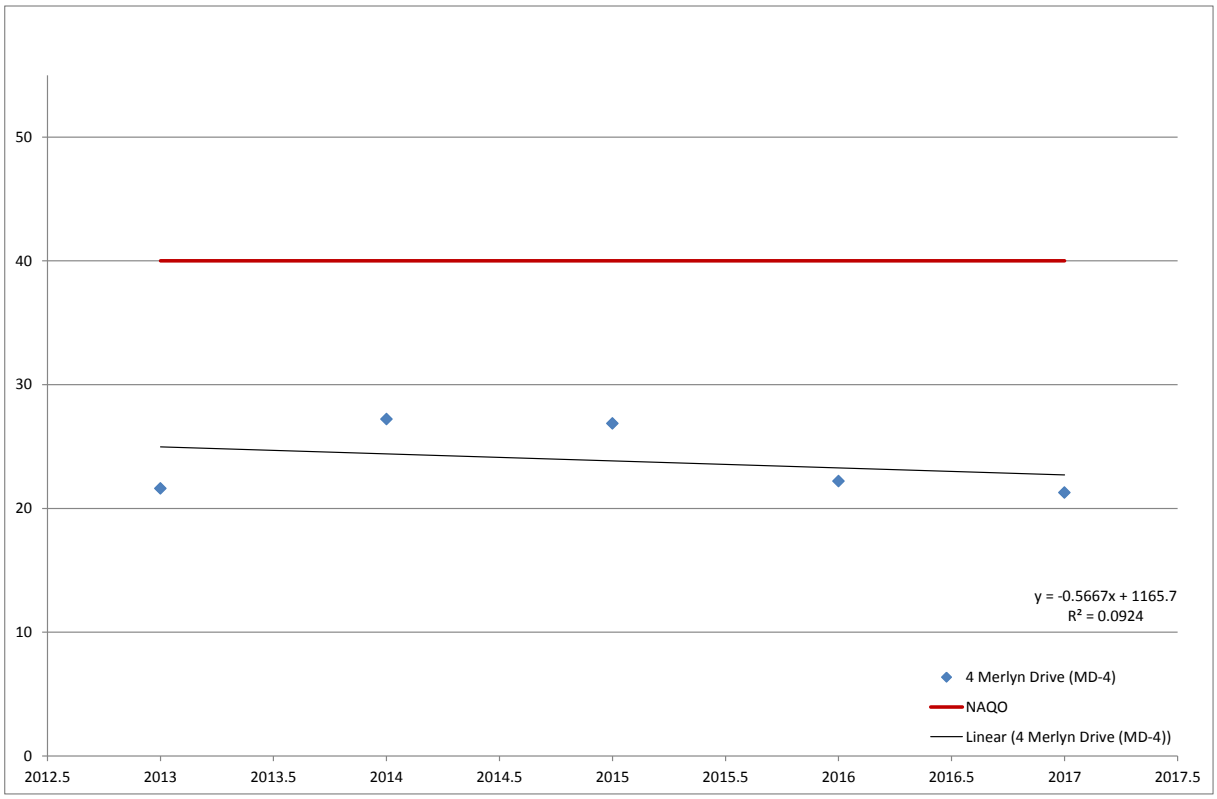
The NO_2 annual average at this urban background monitoring location remained well below the NAQO in 2017. NO_2 levels exhibited an **upward** trend in the last 5 years (2013 to 2017) showing an AQ deterioration similar to the previously reported 5 year trend commencing year 2012. Only this time with a slightly higher rate of deterioration as the linear trend is characterised by a stronger slop. However, NO_2 annual average **decreased** by 1.96µg/m^3 **(a reduction of 10%)** between 2016 and 2017.

Figure F.11: **Column 6 Anchorage Road (AR-Col6)** NDDT data exhibited a **downward** trend



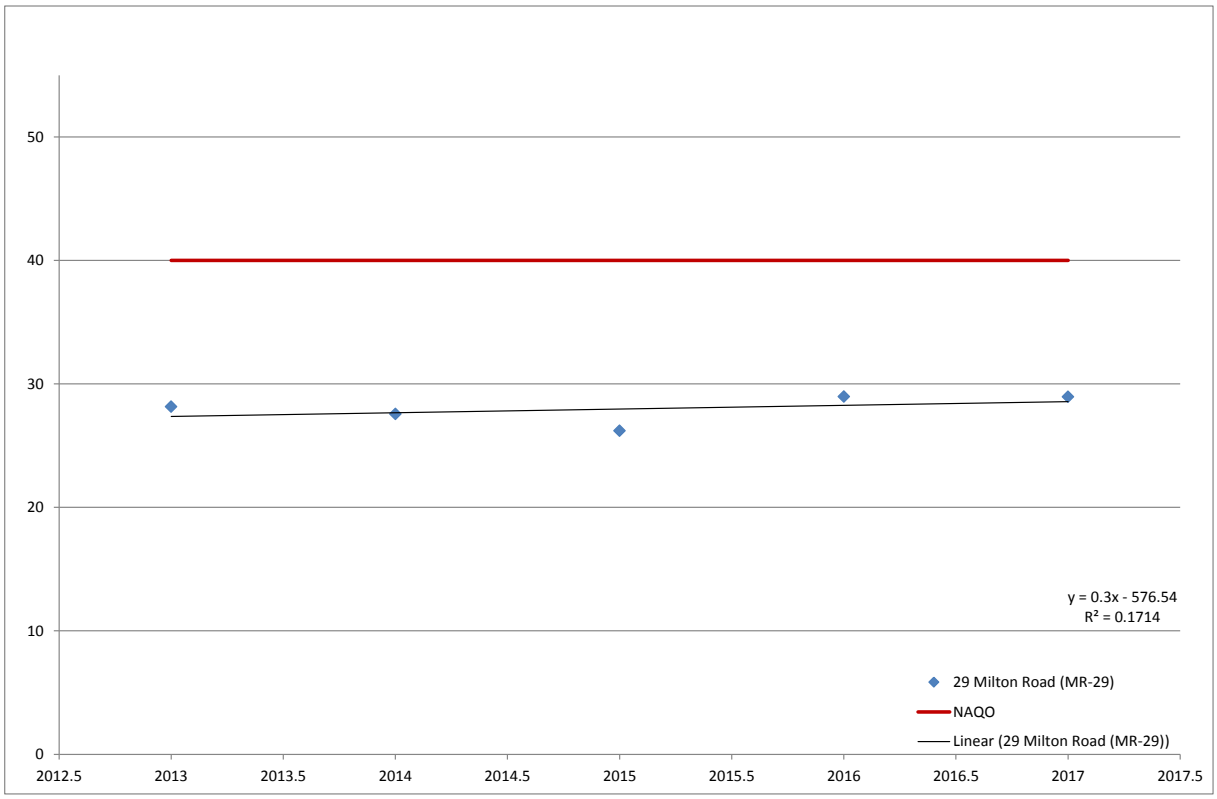
The NO_2 annual average at this roadside monitoring location remained below the NAQO. NO_2 levels exhibited a **downward** trend in the last 5 years (2013 to 2017) showing an AQ improvement similar to the previously reported 5 year trend commencing year 2012. Only this time with a slightly higher rate of improvement as the linear trend is characterised by a stronger slop. In addition, NO_2 annual average **decreased** by 4.6µg/m^3 **(a reduction of 16%)** between 2016 and 2017.

Figure F.12 : **4 Merlyn Drive (MD-4)** NDDT data exhibited a **downward** trend



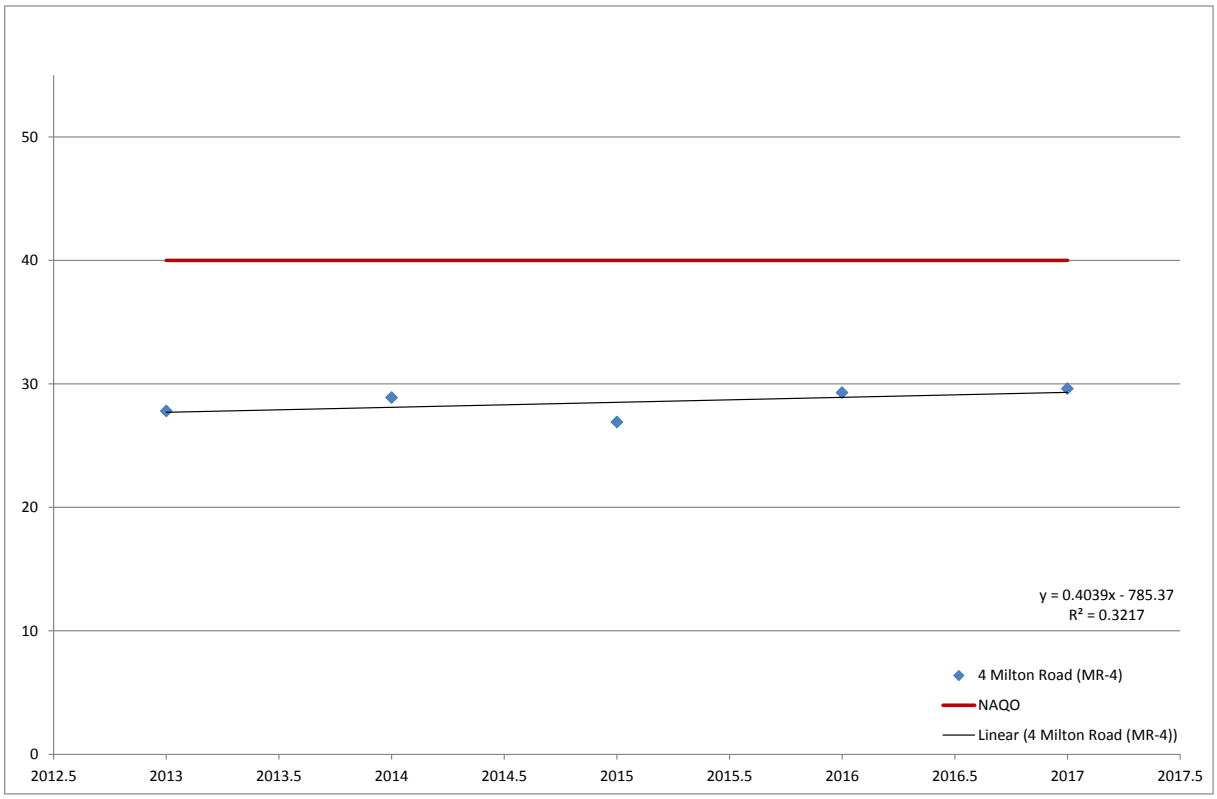
The NO_2 annual average at this roadside monitoring location remained below the NAQO in 2017. **NO_2 levels** exhibited a **downward** trend in the last 5 years (2013 to 2017) showing an AQ improvement compared to the previously reported 5 year trend commencing year 2012 that showed an **upward** trend. In addition, The NO_2 annual average **decreased** by 0.92µg/m^3 **(a reduction of 4%)** between 2016 and 2017.

Figure F.13: **29 Milton Road (MR-29)** NDDT data exhibited an **upward** trend



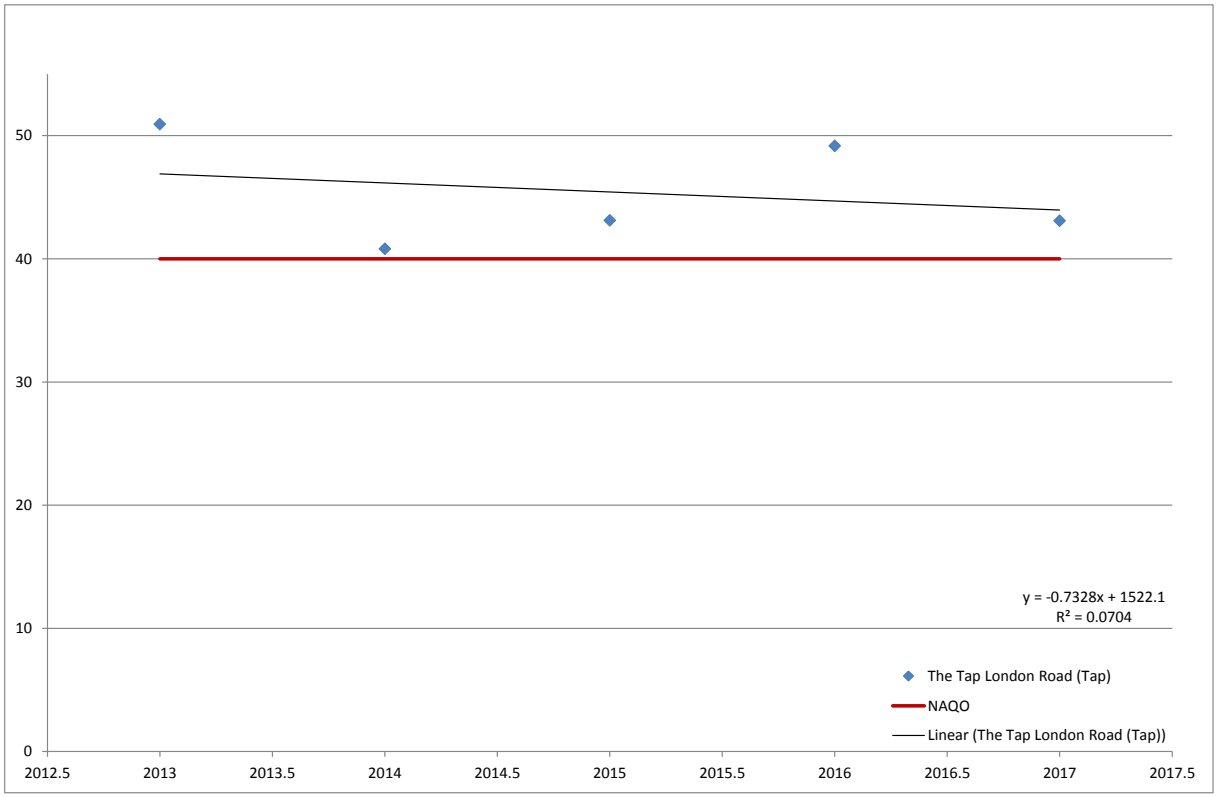
The NO_2 annual average at this roadside monitoring location remained below the NAQO in 2017. NO_2 levels exhibited an **upward** trend in the last 5 years (2013 to 2017) showing an AQ deterioration compared to the previously reported 5 year trend commencing year 2012 that showed a **downward** trend. However, the 2017 NO_2 annual average remained relatively the same as that of 2016.

Figure F.14: **4 Milton Road (MR-4)** NDDT data exhibited an **upward** trend



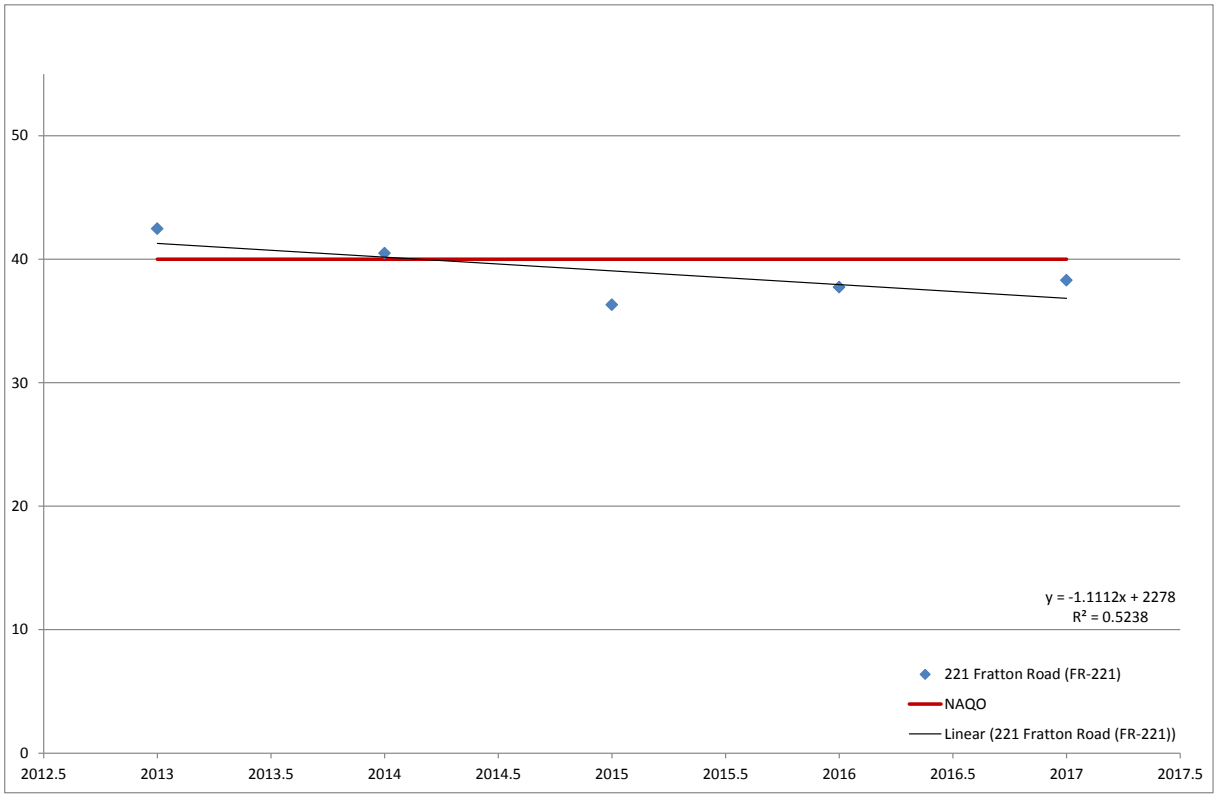
The NO_2 annual average at this roadside monitoring location remained below the NAQO in 2017. NO_2 levels exhibited an **upward** trend in the last 5 years (2013 to 2017) showing an AQ deterioration compared to the previously reported 5 year trend commencing year 2012 that showed a slight **downward** trend. In addition, NO_2 annual average, marginally, **increased** by 0.32µg/m^3 **(an increase of 1%)** between 2016 and 2017.

Figure F.15: **"The Tap" Public House London Road (LR-Tap)** NDDT data continues exhibiting a **downward** trend



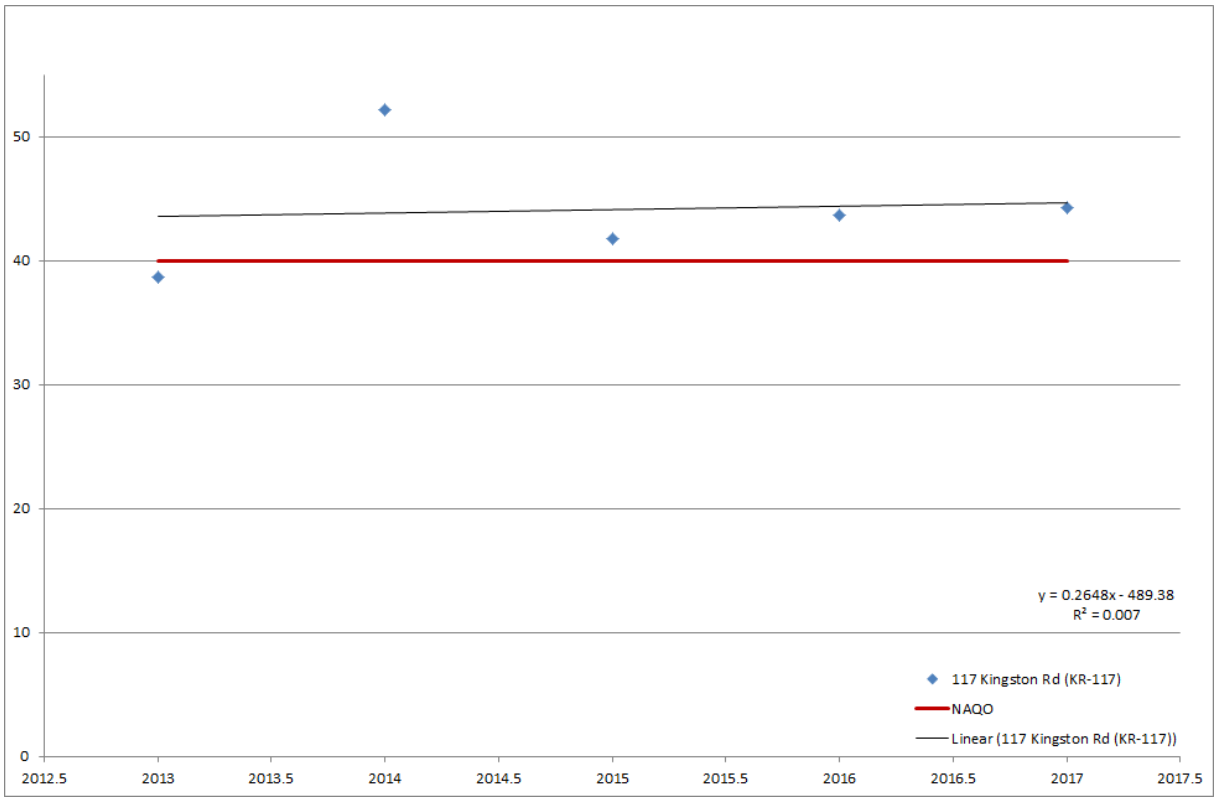
The NO_2 annual average at this kerbside monitoring location remained above the NAQO in 2017. NO_2 levels exhibited a **downward** trend in the last 5 years (2013 to 2017) showing an AQ improvement similar to the previously reported 5 year trend commencing year 2012. Only this time with a slightly weaker rate of improvement as the linear trend is characterised by a shallower slop. In addition NO_2 annual average **decreased** by 6.07µg/m^3 **(a reduction of 12%)** between 2016 and 2017.

Figure F.16: **221 Fratton Road (FR-221)** NDDT data continued exhibiting a **downward** trend



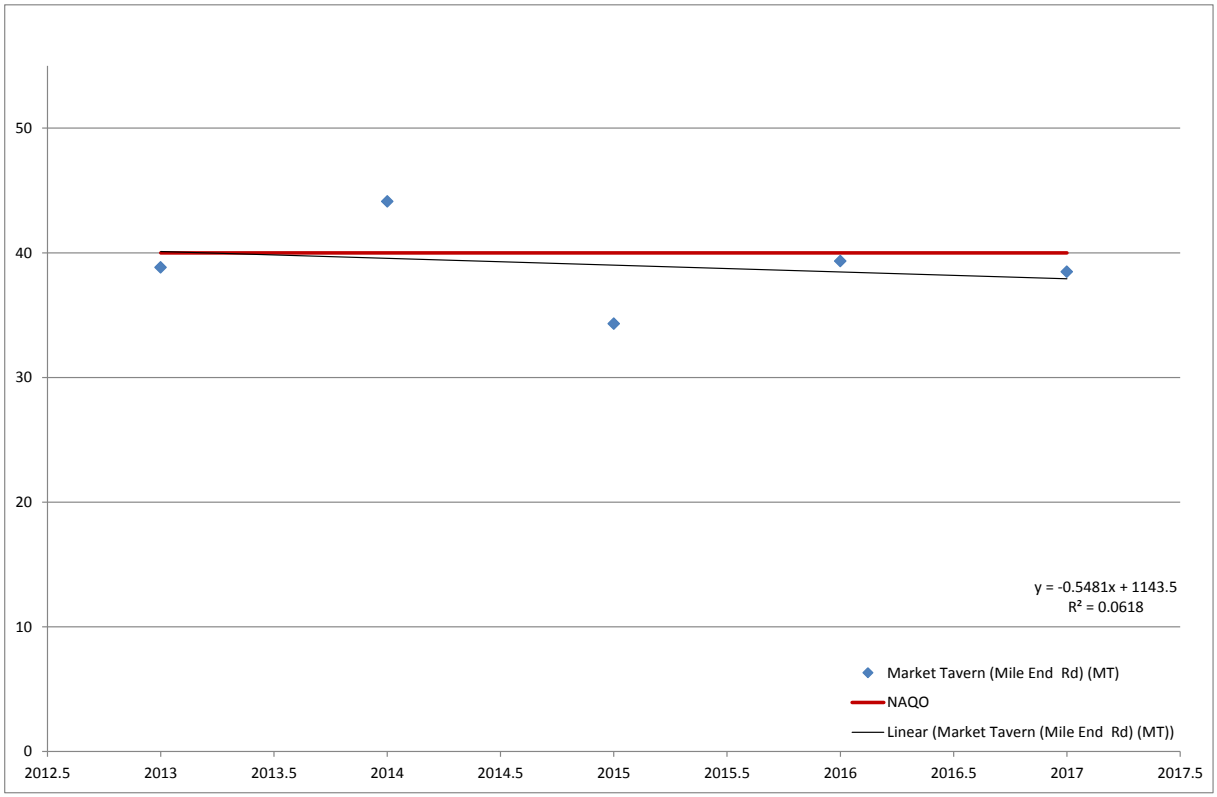
The NO_2 annual average at this roadside monitoring location remained below the NAQO in 2017. NO_2 levels exhibited a **downward** trend in the last 5 years (2013 to 2017) showing an AQ improvement similar to the previously reported 5 year trend commencing year 2012. Only this time with a slightly higher rate of improvement as the linear trend is characterised by a stronger slop. However, NO_2 annual average slightly **increased** by 0.56µg/m^3 **(an increase of 1%)** between 2016 and 2017.

Figure F.17: **117 Kingston Road (KR-117)** NDDT data exhibited an **upward** trend



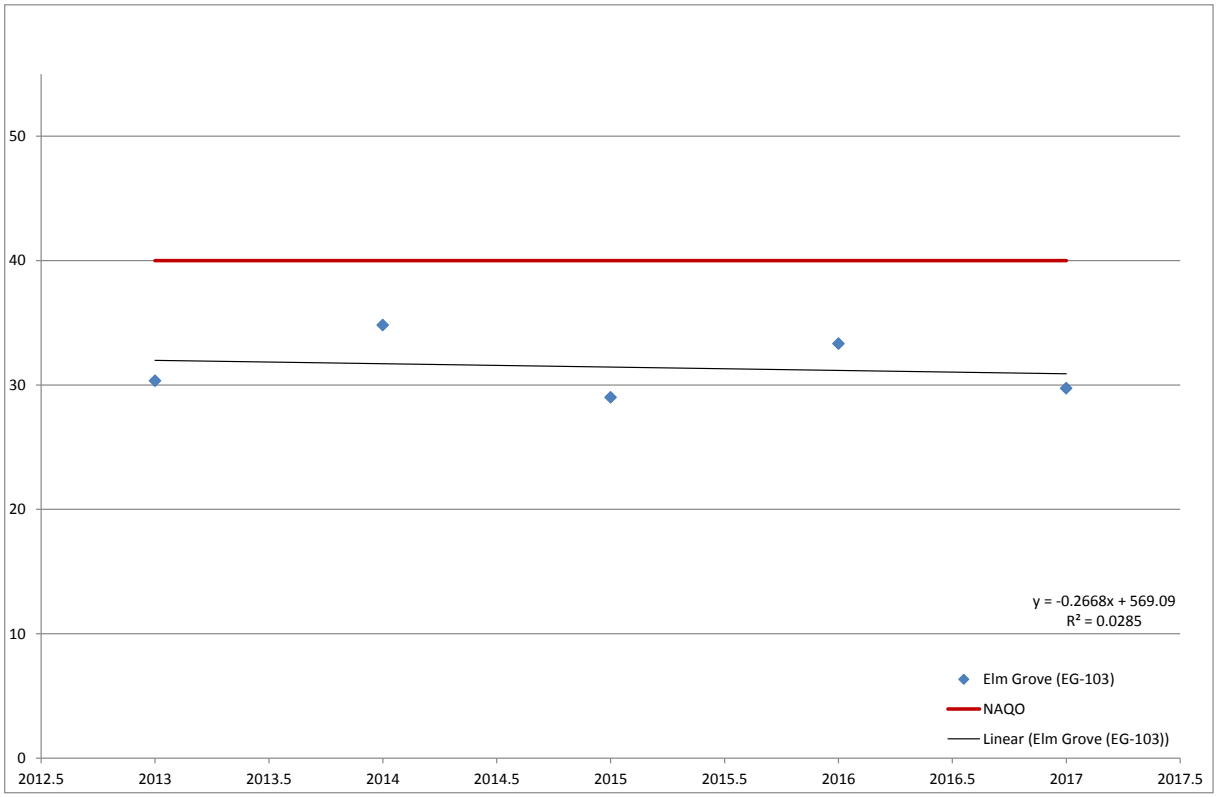
The NO_2 annual average at this roadside monitoring location remained above the NAQO in 2017. NO_2 levels exhibited a slight **upward** trend in the last 5 years (2013 to 2017) showing an AQ deterioration similar to the previously reported 5 year trend commencing year 2012. Only this time with a slightly higher rate of deterioration as the linear trend is characterised by a stronger slop. In addition, NO_2 annual average slightly **increased** by 0.63µg/m^3 **(an increase of 1%)** between 2016 and 2017.

Figure F.18: **"Market Tavern" Public House Mile End Road (MER-MT)** NDDT data continued exhibiting a **downward** trend



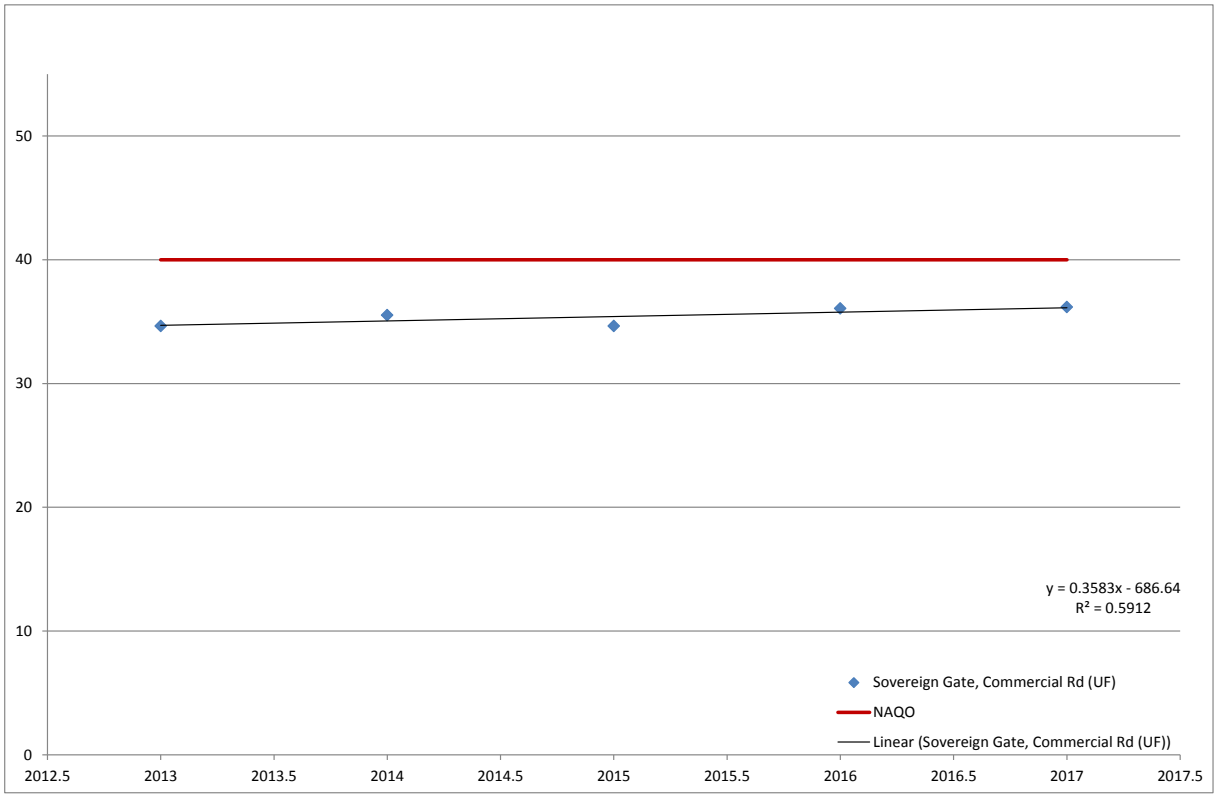
The NO_2 annual average at this roadside monitoring location remained below the NAQO in 2017 for the third consecutive year. NO_2 levels exhibited a **downward** trend in the last 5 years (2013 to 2017) showing an AQ improvement similar to the previously reported 5 year trend commencing year 2012. Only this time with a slightly higher rate of improvement as the linear trend is characterised by a stronger slop. In addition, NO_2 annual average **decreased** by 0.86µg/m^3 **(a reduction of 2%)** between 2016 and 2017.

Figure F.19: **103 Elm Grove (EG-103)** NDDT data continued exhibiting a **downward** trend



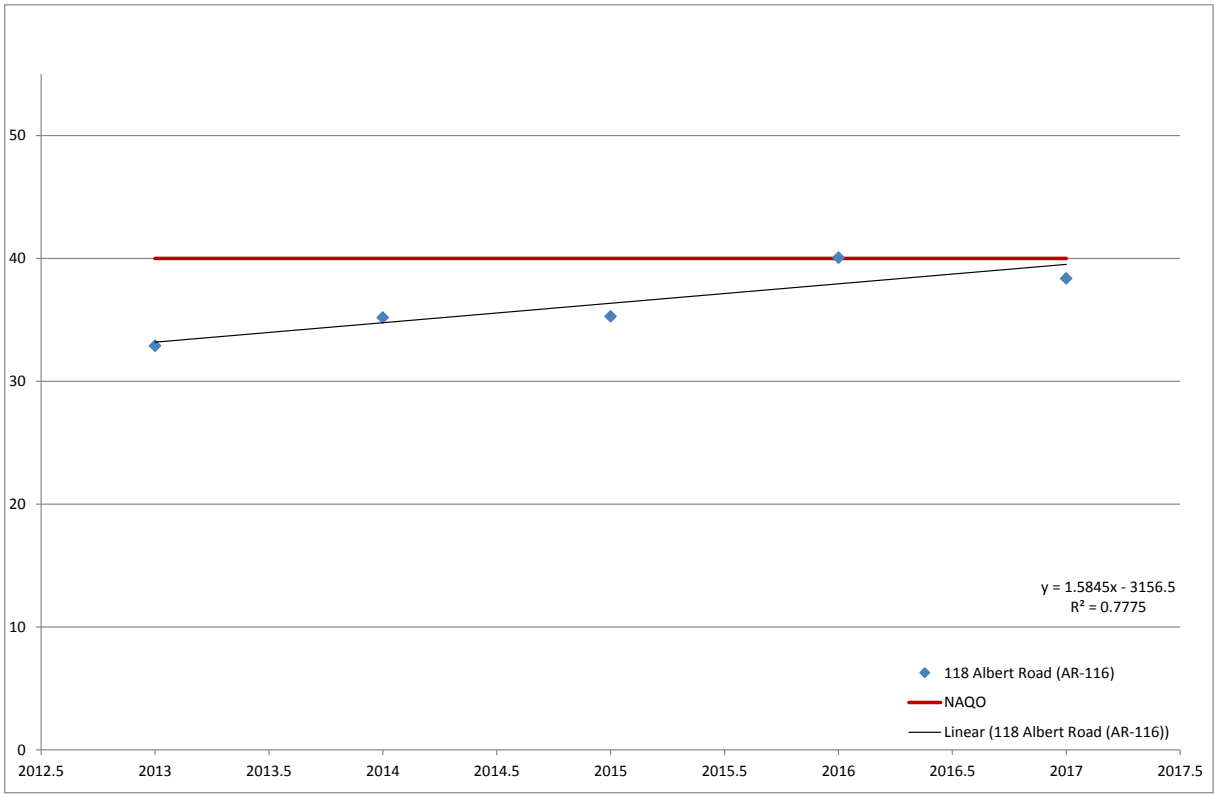
The NO_2 annual average at this roadside monitoring location remained below the NAQO. NO_2 levels exhibited a **downward** trend in the last 5 years (2013 to 2017) showing an AQ improvement similar to the previously reported 5 year trend commencing year 2012. Only this time with a slightly higher rate of improvement as the linear trend is characterised by a stronger slop. In addition, NO_2 annual average **decreased** by 3.58µg/m^3 **(a reduction of 11%)** between 2016 and 2017.

Figure F.20: **106 Victoria Road North (VRN-106)** NDDT data exhibited an **upward** trend



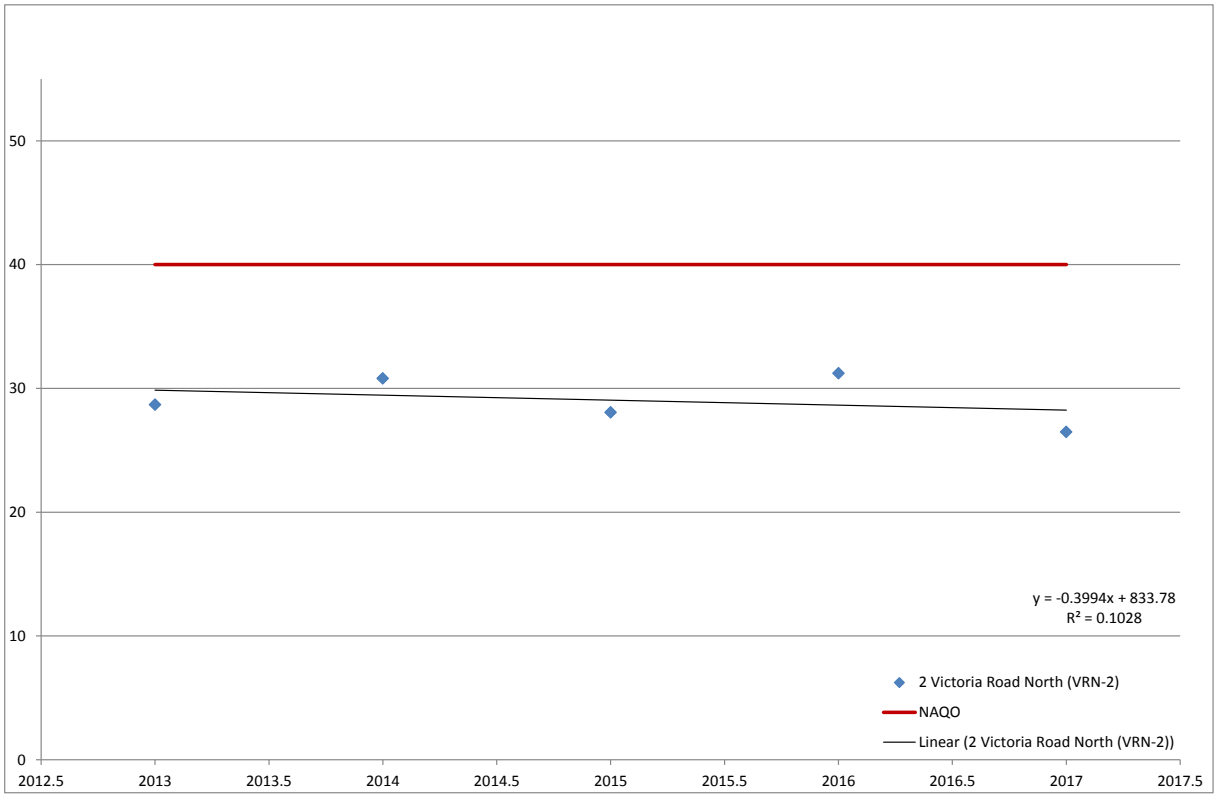
The NO_2 annual average at this roadside monitoring location remained below the NAQO. NO_2 levels exhibited an **upward** trend in the last 5 years (2013 to 2017) showing an AQ deterioration compared to the previously reported 5 year trend commencing year 2012 that showed a **downward** trend. However, NO_2 annual average remained similar between 2016 and 2017.

Figure F.21: **116 Albert Road (AR-116)** NDDT data continued exhibiting an **upward** trend



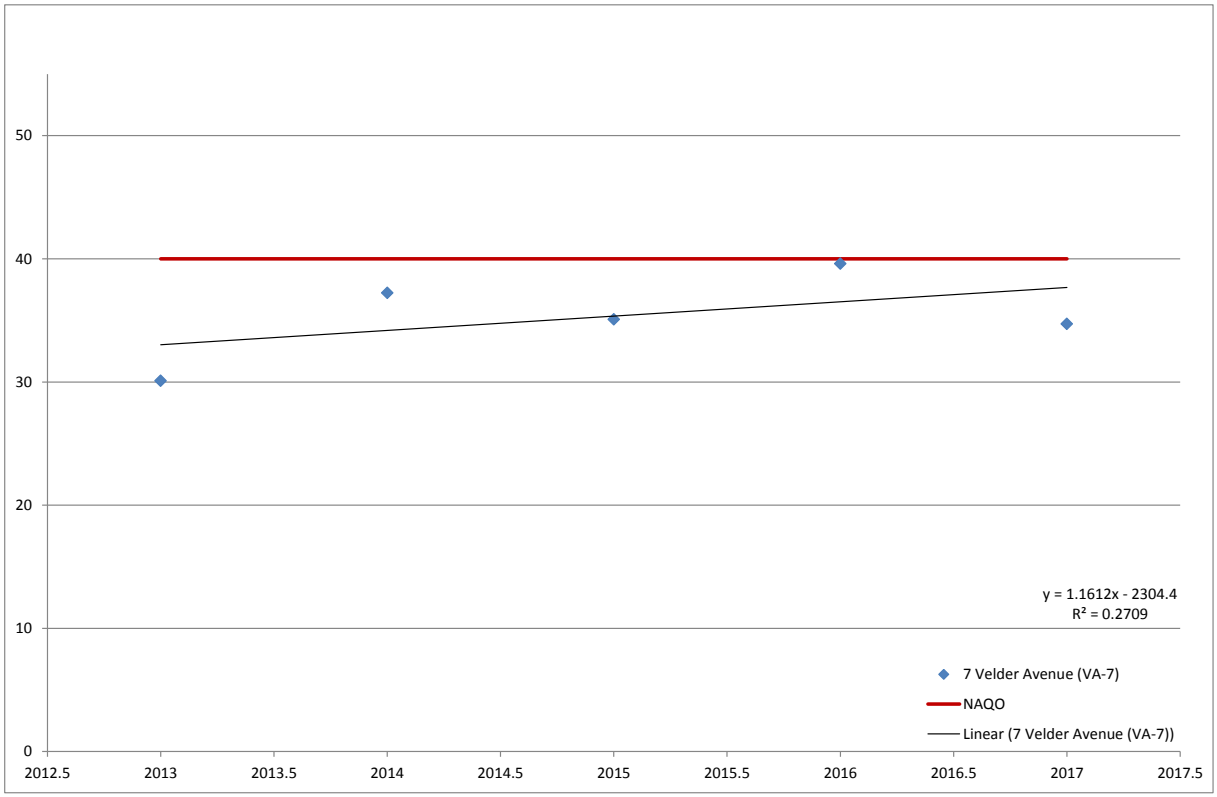
The NO_2 annual average at this roadside monitoring location dropped to level under the NAQO in 2017. NO_2 levels continued exhibiting an **upward** trend in the last 5 years (2013 to 2017) showing a deterioration in AQ similar to the previously reported 5 year trend commencing year 2012. However, NO_2 annual average slightly **decreased** by 1.68µg/m^3 **(a reduction of 4%)** between 2016 and 2017 to meet the NAQO.

Figure F.22: **2 Victoria Road North (VRN-2)** NDDT data continued exhibiting a **downward** trend



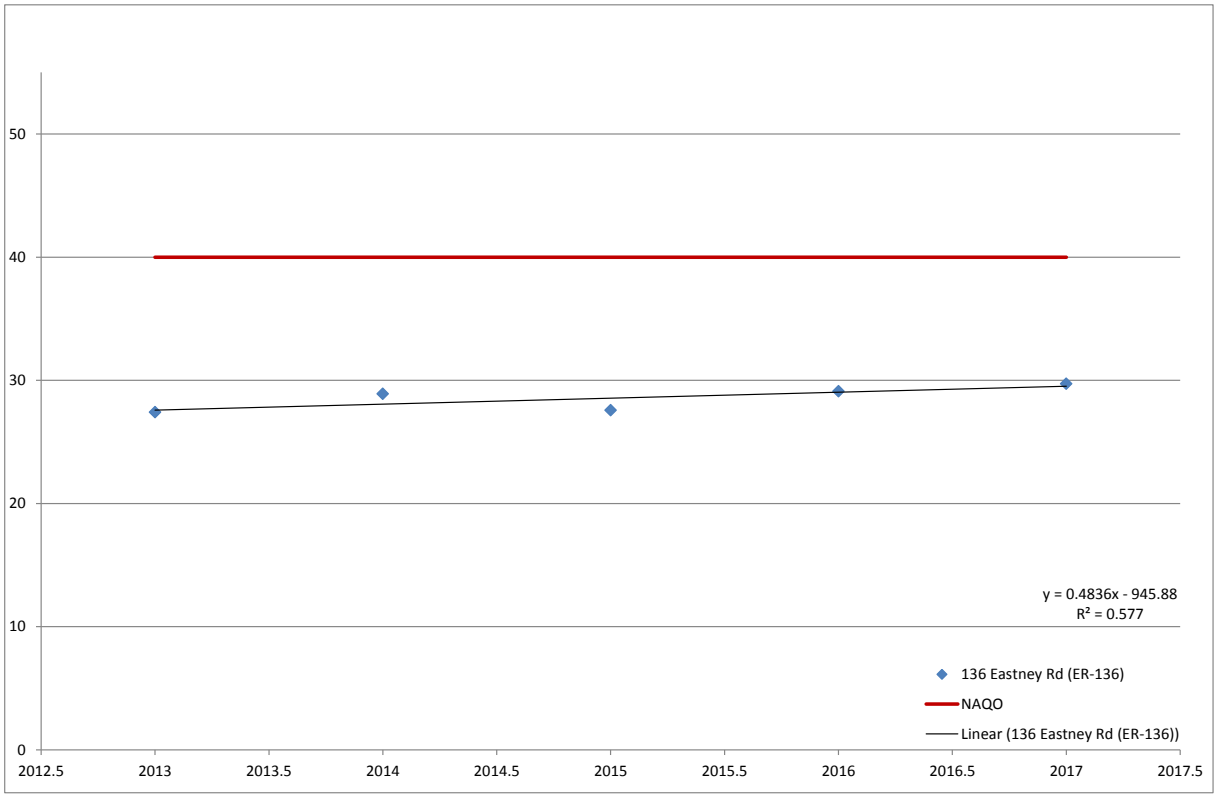
The NO_2 annual average at this roadside monitoring location remained below 2017. NO_2 levels exhibited a **downward** trend in the last 5 years (2013 to 2017) showing an AQ improvement similar to the previously reported 5 year trend commencing year 2012. Only this time with a slightly higher rate of improvement as the linear trend is characterised by a stronger slop. In addition NO_2 annual average decreased by 4.74µg/m^3 **(a reduction of 15%)** between 2016 and 2017.

Figure F.23: **7 Velder Avenue (VA-7)** NDDT data continued exhibiting an **upward** trend



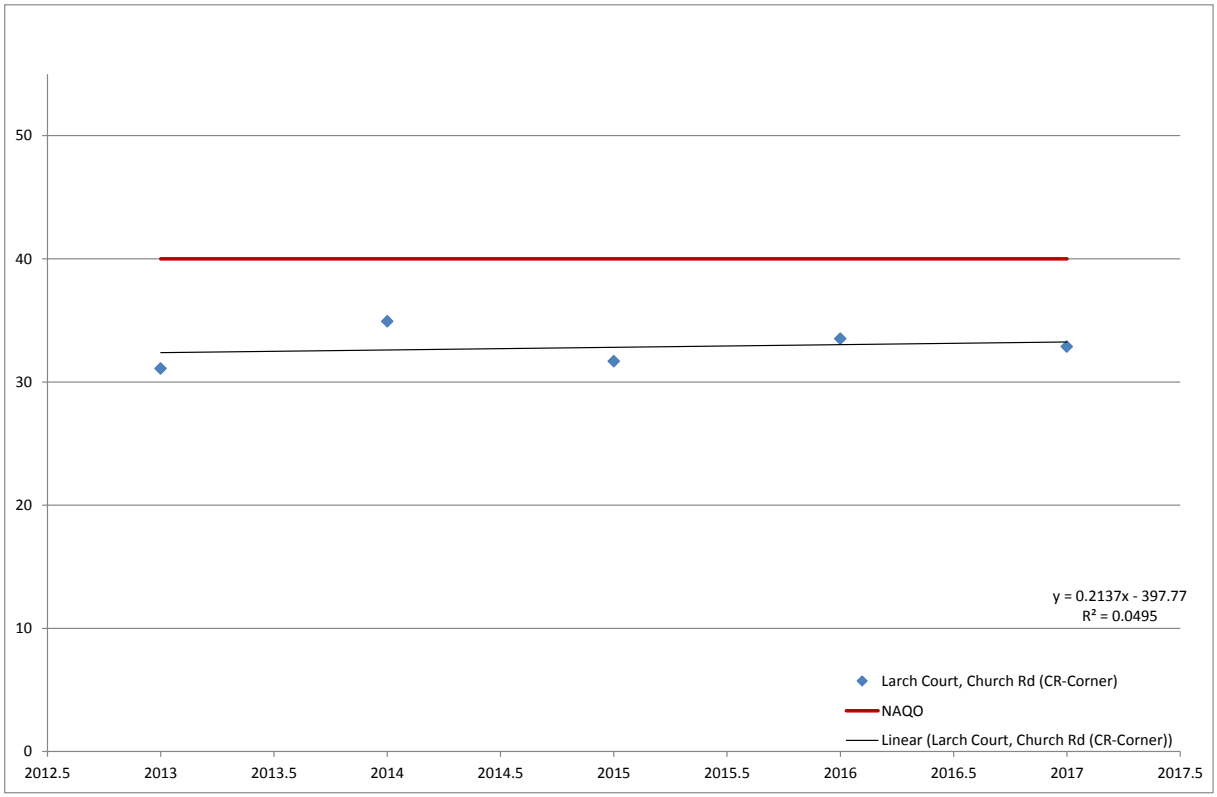
The NO_2 annual average at this roadside monitoring location remained below the NAQO in 2017. NO_2 levels exhibited an **upward** trend in the last 5 years (2013 to 2017) showing an AQ deterioration `similar to the previously reported 5 year trend commencing year 2012. Only this time with a slightly lower rate of deterioration as the linear trend is characterised by a shallower slop. However, NO_2 annual average **decreased** by 4.89µg/m^3 **(a reduction of 12%)** between 2016 and 2017.

Figure F.24: **138 Eastney Road (ER-136)** NDDT data continued exhibiting an **upward** trend



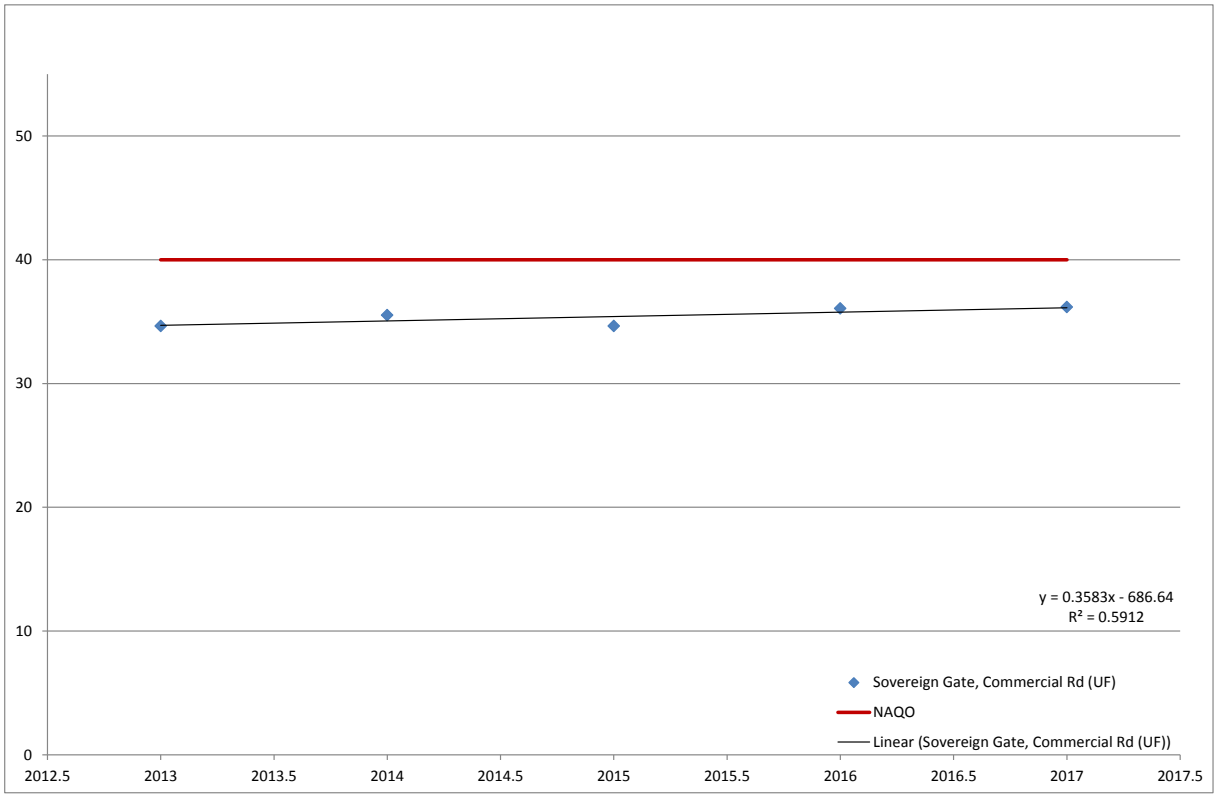
The NO_2 annual average at this roadside monitoring location remained below the NAQO in 2017. NO_2 levels exhibited an **upward** trend in the last 5 years (2013 to 2017) showing an AQ deterioration similar to the previously reported 5 year trend commencing year 2012. Only this time with a slightly lower rate of deterioration as the linear trend is characterised by a shallower slop. In addition, NO_2 annual average **increased** by 0.61µg/m^3 **(an increase of 2%)** between 2016 and 2017.

Figure F.25: **Larch Court Church Road (CR-LC Corner)** NDDT data exhibited an **upward** trend



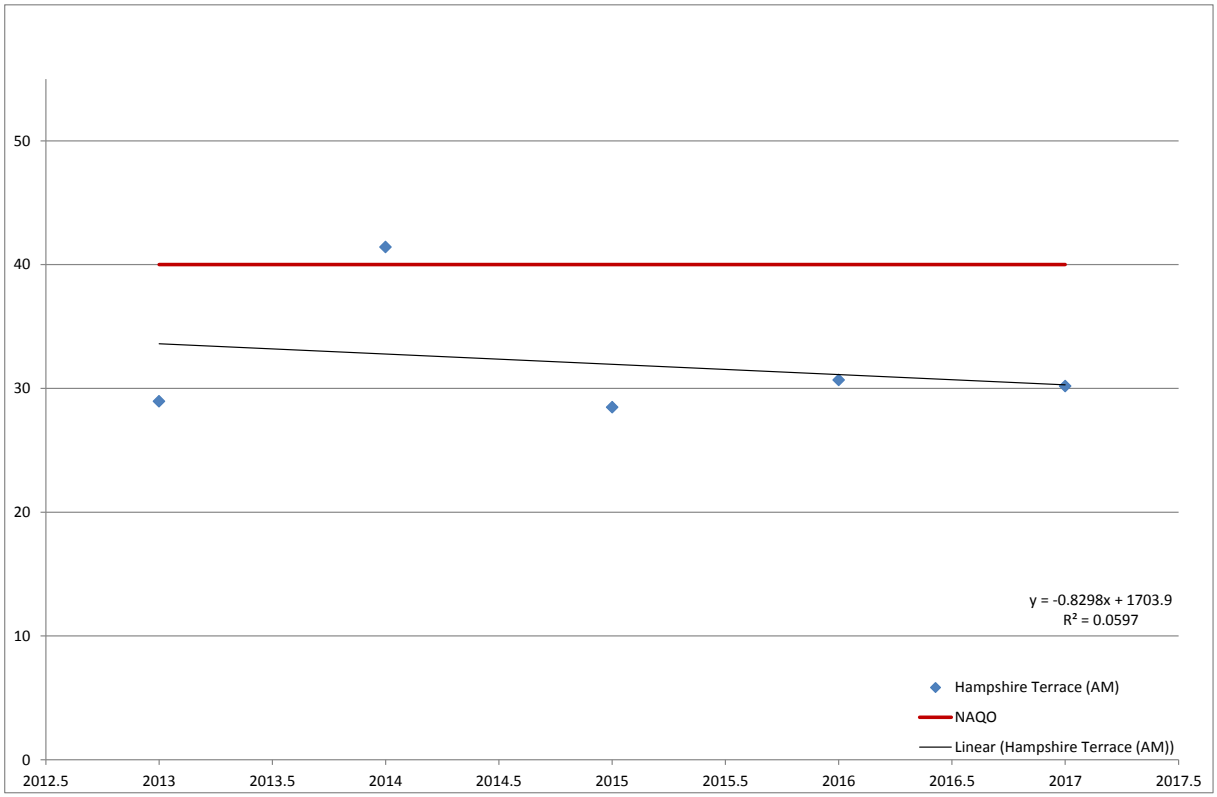
The NO_2 annual average at this roadside monitoring location remained below the NAQO in 2017. NO_2 levels exhibited a slight **upward** trend in the last 5 years (2013 to 2017) showing an AQ deterioration compared to the previously reported 5 year trend commencing year 2012 when a **downward** trend was exhibited showing an AQ improvement. However, NO_2 annual average slightly **decreased** in 2017 compared to 2016 by 0.64µg/m^3 **(a reduction of 2%)** between 2016 and 2017.

Figure F.26: **Sovereign Gate, United Friendly Commercial Road (CR- UF)** NDDT data exhibited an **upward** trend



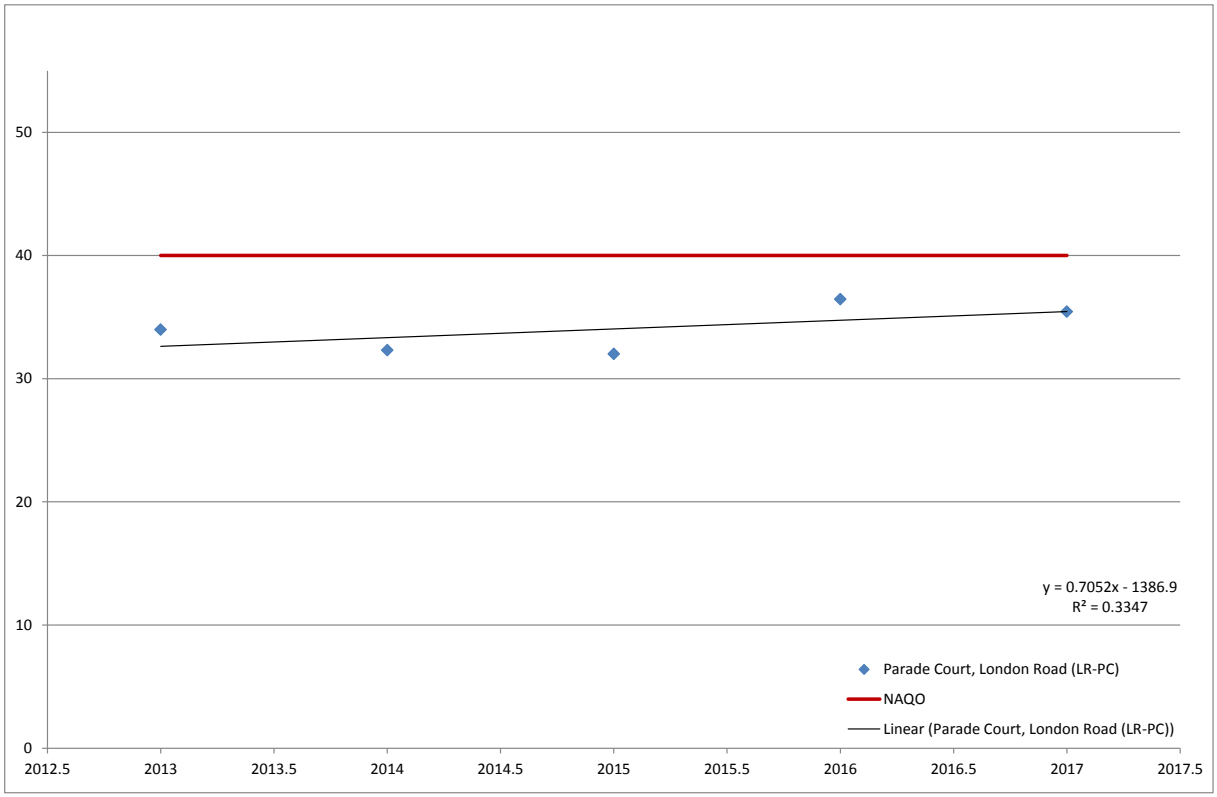
The NO_2 annual average at this roadside monitoring location remained below the NAQO. NO_2 levels exhibited a slight **upward** trend in the last 5 years (2013 to 2017) showing an AQ deterioration compared to the previously reported 5 year trend commencing year 2012 when a **downward** trend was exhibited showing an AQ improvement. In addition, NO_2 annual average remained the same in 2017 compared to 2016.

Figure F.27: **11/12 Hampshire Terrace (HT-AM)** NDDT data continued exhibiting a **downward** trend



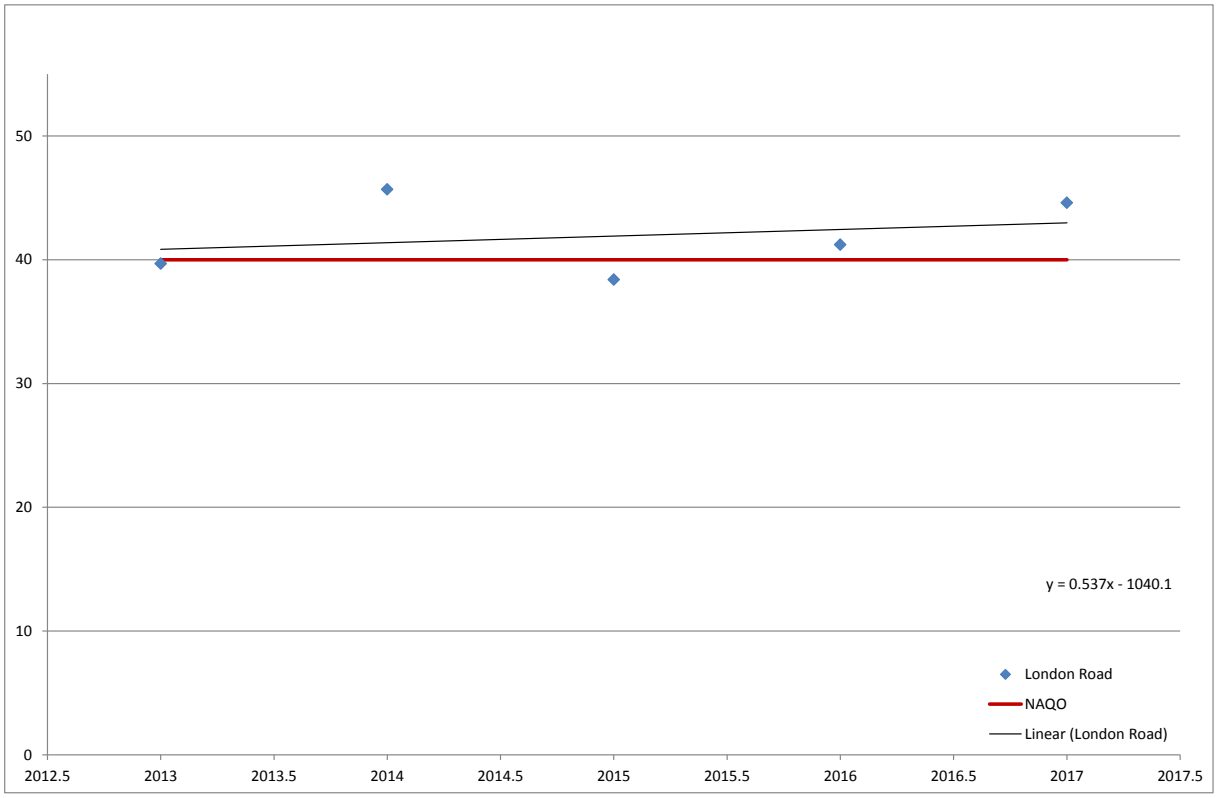
The NO_2 annual average at this roadside monitoring location remained below the NAQO in 2017. NO_2 levels exhibited a **downward** trend in the last 5 years (2013 to 2017) showing an AQ improvement similar to the previously reported 5 year trend commencing year 2012. Only this time AQ improved at a higher rate. Also NO_2 annual average **decreased** by 0.5µg/m^3 **(a reduction of 2%)** between 2016 and 2017.

Figure F.28 – **Parade Court London Road (LR-PC)** NDDT data exhibited an **upward** trend



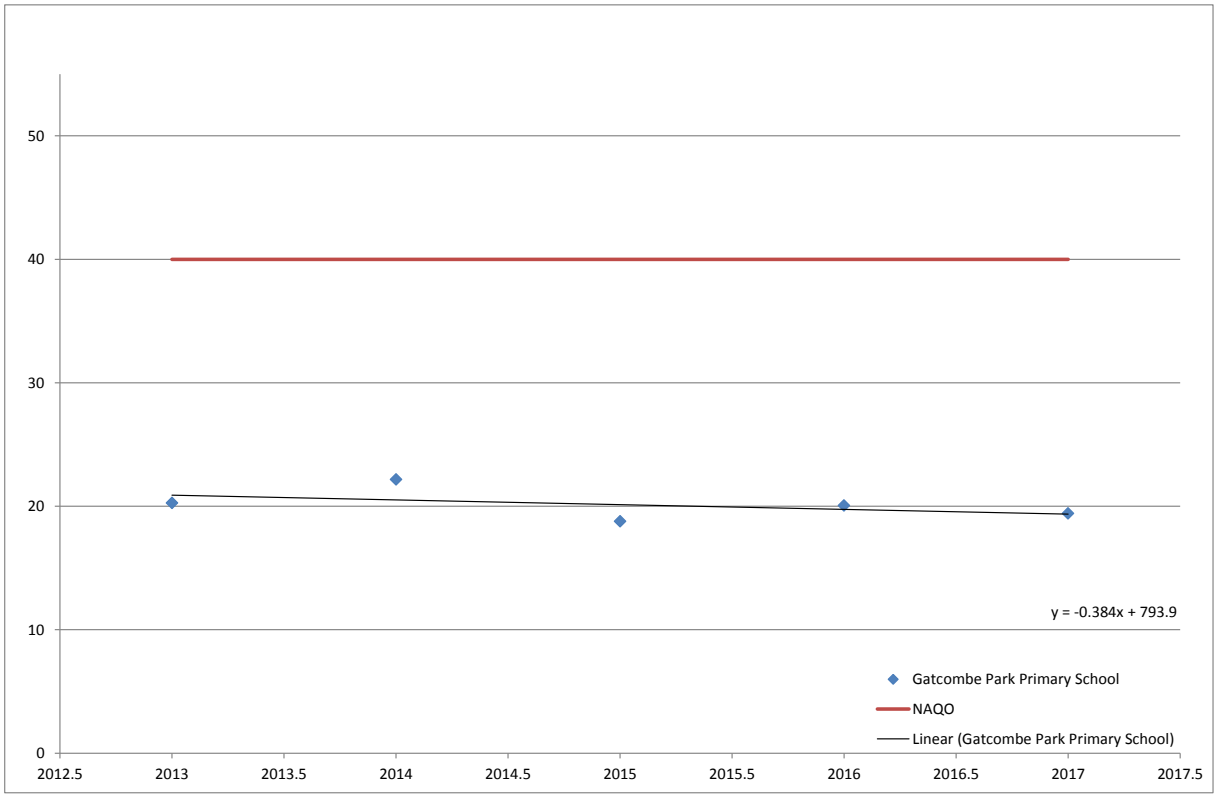
The NO_2 annual average at this roadside monitoring location remained below the NAQO in 2017. NO_2 levels exhibited an **upward** trend in the last 5 years (2013 to 2017) showing an AQ deterioration compared to the previously reported 5 year trend commencing year 2012 when a **downward** trend was exhibited showing an AQ improvement. However, NO_2 annual average has slightly **decreased** in 2017 compared to 2016 by 1.01µg/m^3 **(a reduction of 3%)**.

Figure F.29: **London Road NO_2 CAQMS (LR-C2)** data exhibited an **upward** trend (Kerbside)



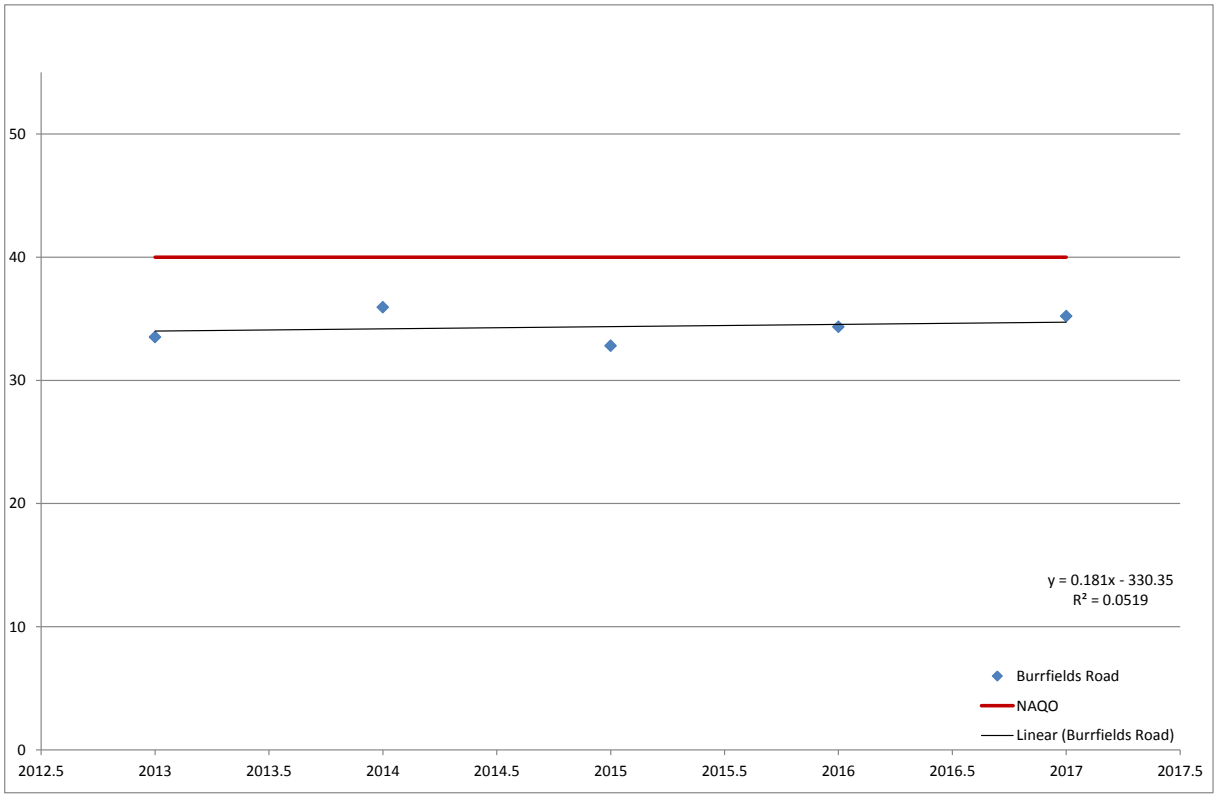
The NO_2 annual average at this kerbside monitoring location remained in excess of the NAQO in 2017. NO_2 levels exhibited an **upward** trend in the last 5 years (2013 to 2017) showing an AQ deterioration compared to the previously reported 5 year trend commencing year 2012 when a **downward** trend was exhibited showing an AQ improvement. In addition, NO_2 annual average **increased** between 2016 and 2017 by 3.39µg/m^3 **(an increase of 8%)**.

Figure F.30: **Gatcombe Park NO_2 CAQMS (AURN-C4)** data exhibited a **downward** trend (Urban Background)



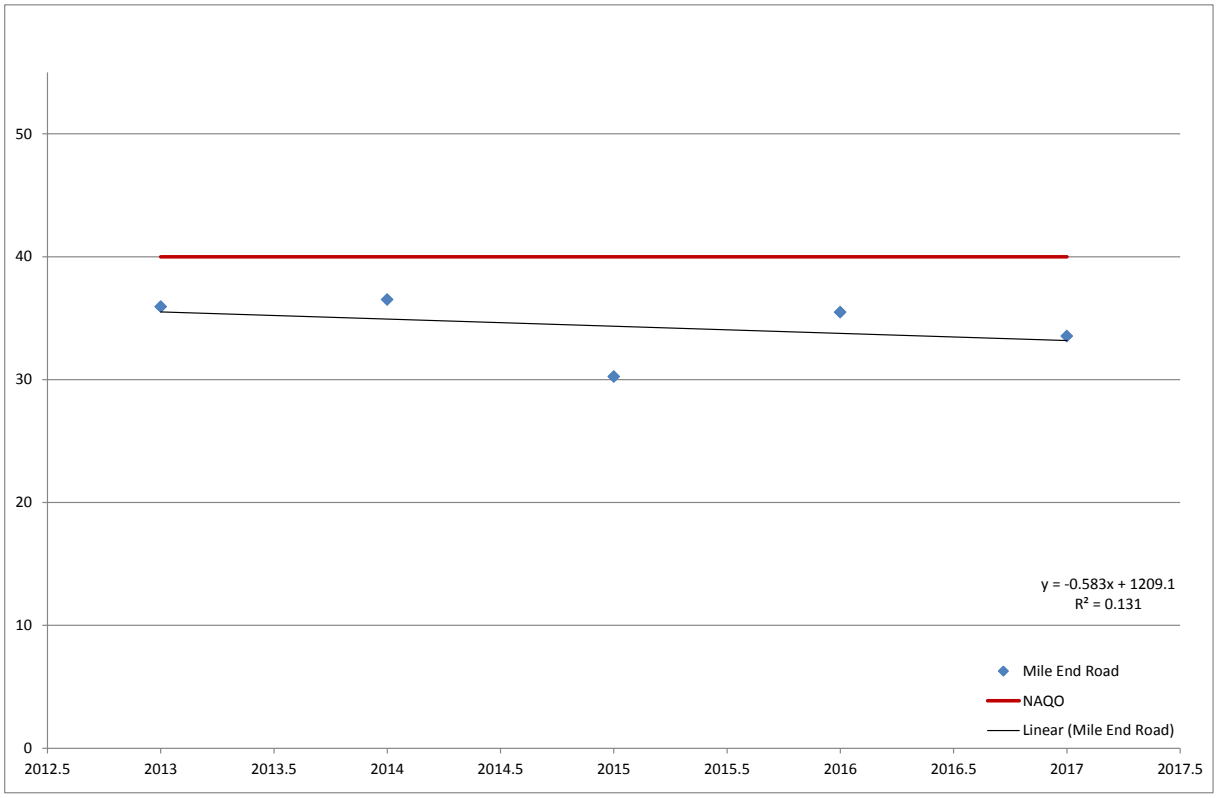
The NO_2 annual average at this urban background monitoring location remained well below the NAQO in 2017. NO_2 levels exhibited a slight **downward** trend in the last 5 years (2013 to 2017) showing an AQ improvement. This trend is similar to the previously reported 5 year trend commencing year 2012 when a **downward** trend was exhibited showing an AQ improvement. In addition, NO_2 annual average **decreased** between 2016 and 2017 by 0.64µg/m^3 **(a decreased of 3%)**.

Figure F.31: **Burrfield Road NO_2 CAQMS (BR-C6)** data exhibited an **upward** trend (Roadside)



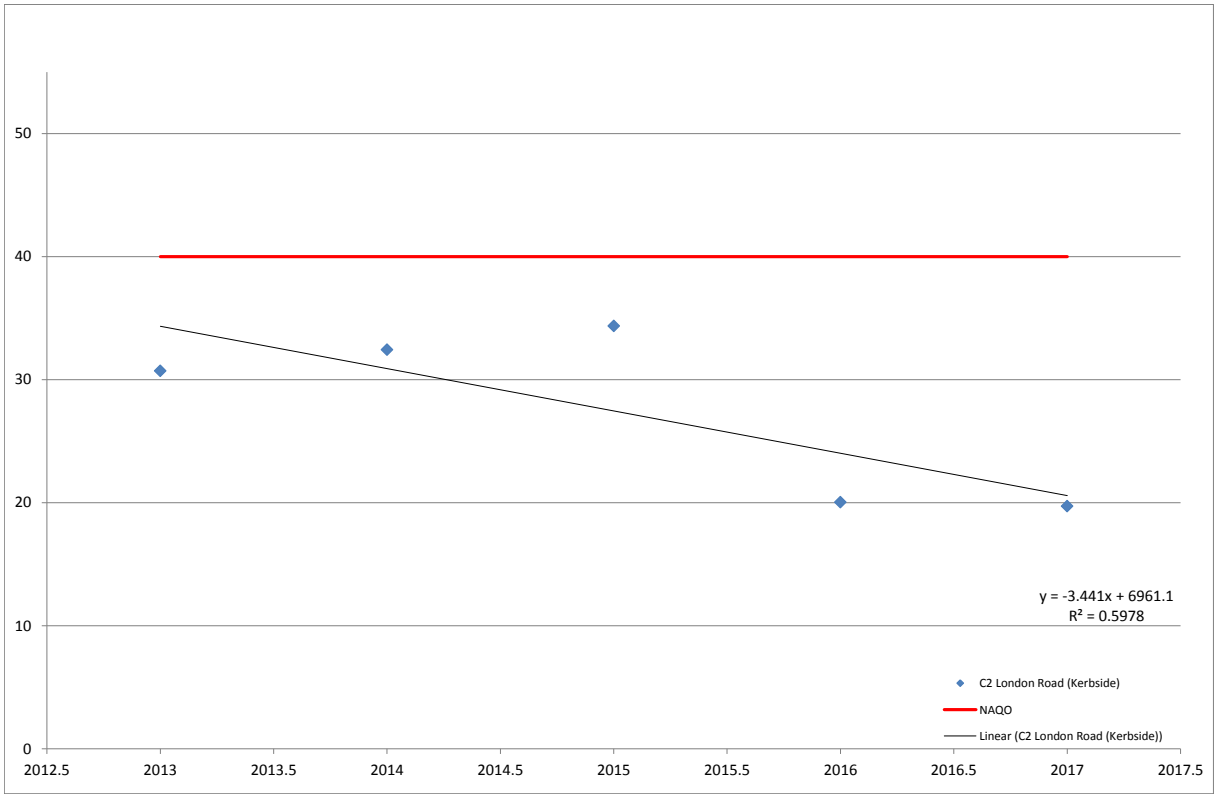
The NO_2 annual average at this roadside monitoring location remained below the NAQO in 2017. NO_2 levels exhibited an **upward** trend in the last 5 years (2013 to 2017) showing an AQ deterioration compared to the previously reported 5 year trend commencing year 2012 when a **downward** trend was exhibited showing an AQ improvement. In addition, NO_2 annual average **increased** between 2016 and 2017 by 0.88µg/m^3 **(an increase of 3%)**.

Figure F.32: **Mile End Road NO_2 CAQMS (MER-C7)** data exhibited a **downward** trend (Roadside)



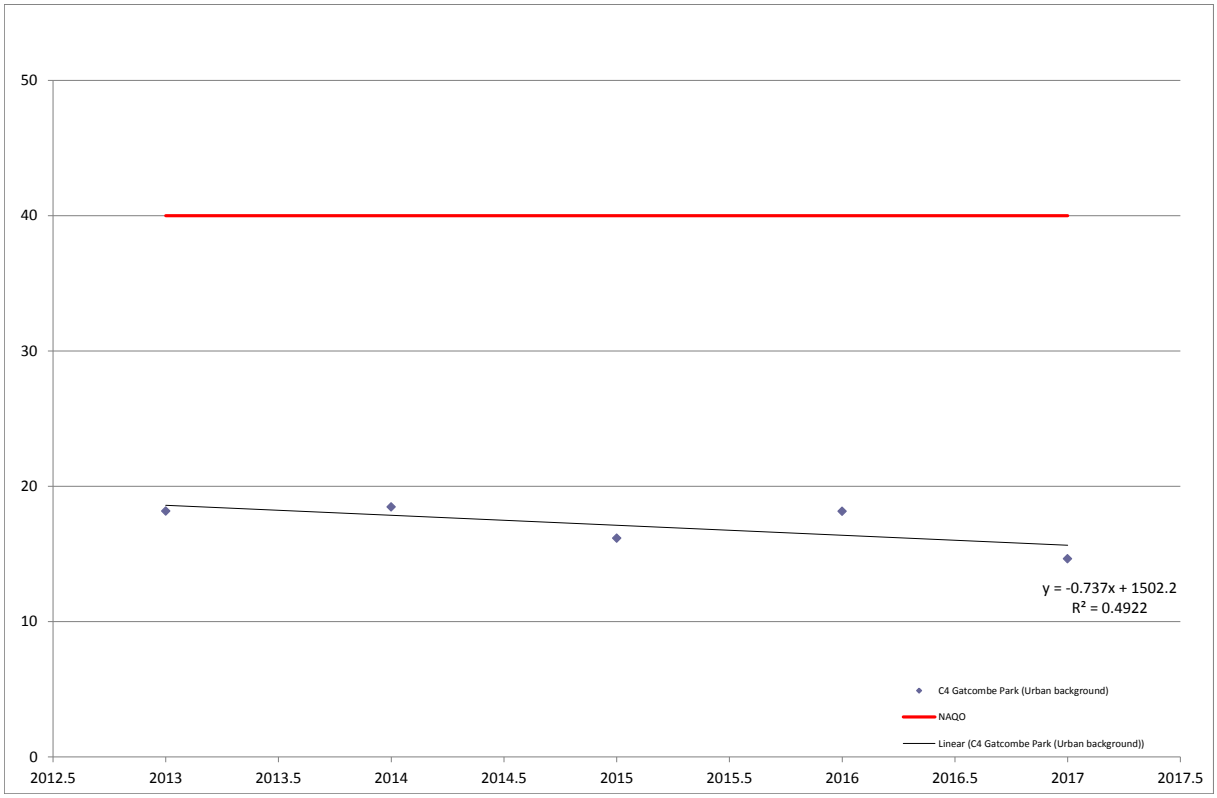
The NO_2 annual average at this roadside monitoring location remained below the NAQO in 2017. NO_2 levels exhibited a **downward** trend in the last 5 years (2013 to 2017) showing an AQ improvement. It followed the same trend as the one previously reported for the 5 year commencing year 2012 when a **downward** trend was exhibited showing an AQ improvement. In addition, NO_2 annual average **decreased** between 2016 and 2017 by 1.94µg/m^3 **(a decrease of 5%)**.

Figure F.33: **London Road PM_{10} CAQMS (LR-C2)** data exhibited a **downward** trend (Kerbside)



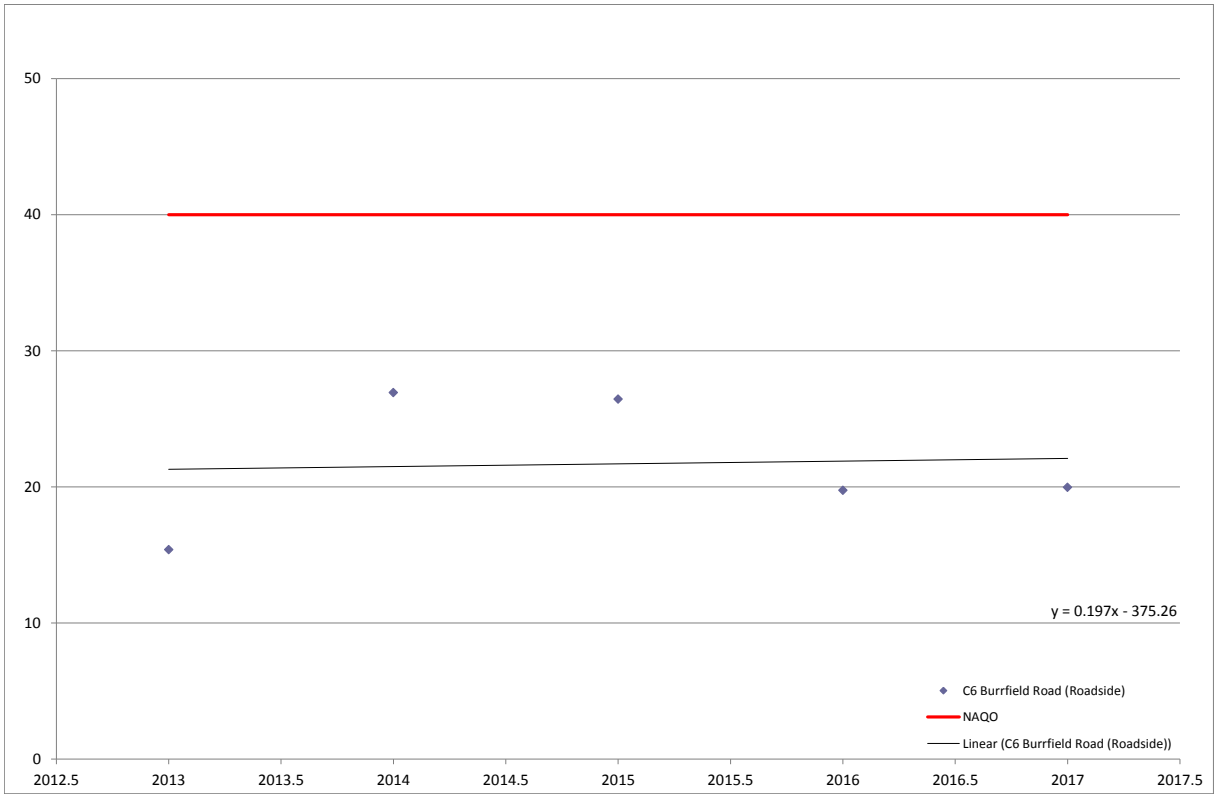
The PM_{10} annual average at this kerbside CAQMS location remained below the NAQO in 2017. PM_{10} levels exhibited a **downward** trend in the last 5 years (2013 to 2017) showing an AQ improvement. It followed the same **downward** trend as the one previously reported for the 5 year commencing year 2012 when a **downward** trend was exhibited showing an AQ improvement. However, the latest 5 year improvement trend is stronger. In addition, PM_{10} annual average **decreased** slightly between 2016 and 2017 by 0.33µg/m^3 **(a reduction of 2%)**.

Figure F.34: **Gatcombe Park PM_{10} CAQMS (AURN-C4)** data exhibited a **downward** trend (Urban Background)



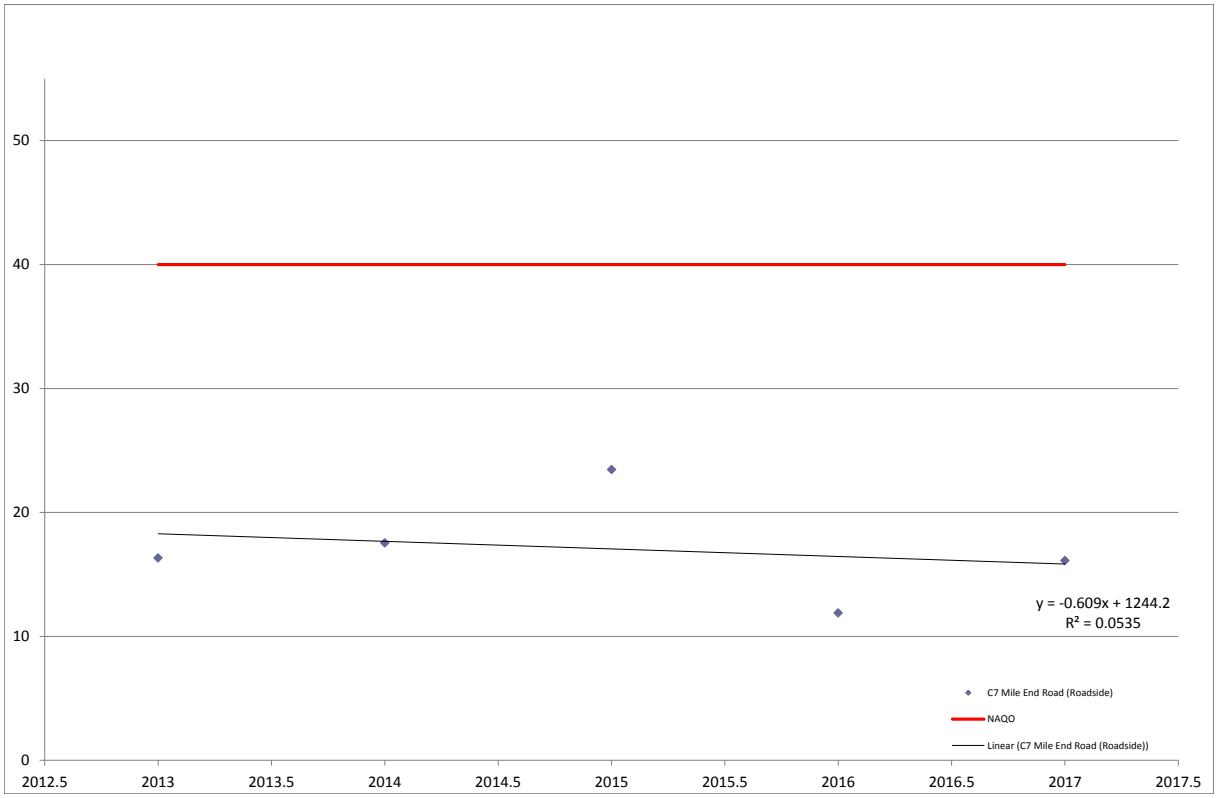
The PM_{10} annual average at this urban background CAQMS location remained below the NAQO in 2017. PM_{10} levels exhibited a **downward** trend in the last 5 years (2013 to 2017) showing an AQ improvement. It followed the same **downward** trend as the one previously reported for the 5 year commencing year 2012. However the latest 5 year improvement trend is stronger. In addition, PM_{10} annual average **decreased** slightly between 2016 and 2017 by 3.5µg/m^3 **(a decrease of 19%)**.

Figure F.35: **Burrfields Road PM_{10} CAQMS (BR-C6)** data exhibited an **upward** trend (Roadside)



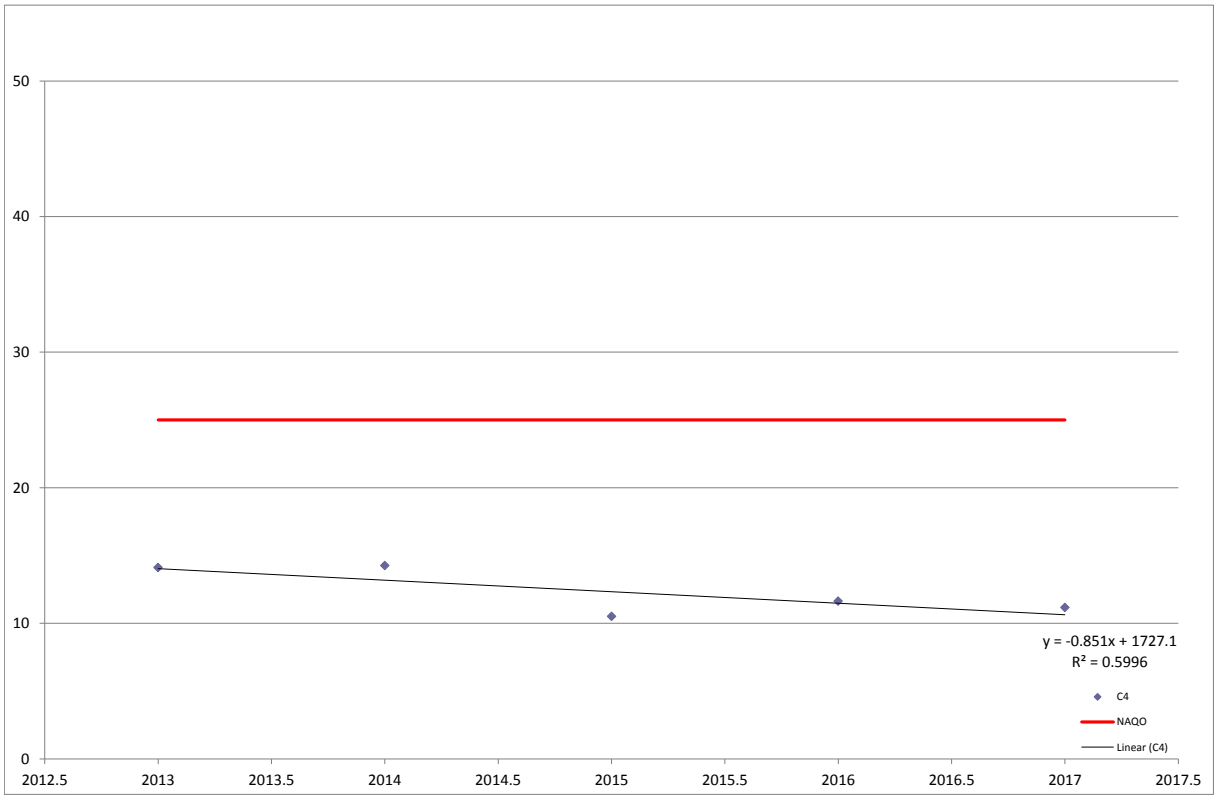
The PM_{10} annual average at this Roadside CAQMS location remained below the NAQO in 2017. PM_{10} levels exhibited an **upward** trend in the last 5 years (2013 to 2017) showing an AQ deterioration. This followed the same trend as the one previously reported for the 5 year commencing year 2012 when an **upward** trend was exhibited showing an AQ deterioration. However, the latest 5 year trend increased at lower rate. In addition, PM_{10} annual average **increased** slightly between 2016 and 2017 by 0.21µg/m^3 **(an increase of 1%)**.

Figure F.36: **Mile End Road PM_{10} CAQMS (MER-C7)** data exhibited a **downward** trend (Roadside)



The PM_{10} annual average at this roadside CAQMS location remained below the NAQO in 2017. PM_{10} levels exhibited a **downward** trend in the last 5 years (2013 to 2017) showing an AQ improvement. The 5 year trend commencing 2012 however exhibited a light upward trend. PM_{10} annual average **increased**, between 2016 and 2017, by 4.23µg/m^3 **(an increase of 36%)**.

Figure F.37: **Gatcombe Park $PM_{2.5}$ CAQSM (AURN-C4)** data exhibited a **downward** trend (Urban Background)



The $PM_{2.5}$ annual average at this roadside CAQMS location remained below the NAQO in 2017. $PM_{2.5}$ levels at this urban background CAQMS exhibited a **downward** trend in the last 5 years (2013 to 2017) showing an AQ improvement similar to the 5 year trend commencing 2012 but decreasing at a higher rate. In addition, $PM_{2.5}$ annual average **decreased** between 2016 and 2017 by 0.46µg/m^3 **(a decrease of 3.9 %)**.

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	Air Quality Management Area – An area where air pollutant concentrations exceed / are likely to exceed the relevant air quality objectives. AQMAs are declared for specific pollutants and objectives
AQS	Air Quality Strategy
AQSG	Air quality Steering Group
ASR	Annual Status Report
AURN	Automatic Urban and Rural Network
AURN	Automatic Urban and Rural Network
CAQMS	Continuous Air Quality Monitoring Station
DEFRA	Department for Environment Food & Rural Affairs
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
FA	Further Assessment
FDMS	Filter Dynamics Measurement System
JAQU	Joint Air Quality Unit
LA	Local Authority
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)
LAQRA	Local Air Quality Review and Assessment
LAQS	Local Air Quality Strategy
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
PCAN	Portsmouth Clean Air Network
PCC	Portsmouth City Council
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

RSW	Report Submission Website
SAS	Source Apportionment Study
SO_2	Sulphur Dioxide
TFS	Targeted Feasibility Study