Annual Progress Report (APR)

2019 Air Quality Annual Progress Report (APR) for
Perth and Kinross Council

In fulfilment of Part IV of the
Environment Act 1995

Local Air Quality Management

December 2019

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Executive Summary: Air Quality in Our Area

Air Quality in Perth and Kinross

The air quality within Perth and Kinross is generally good; however, there are a few hotspot areas within Perth City centre and Crieff. The main pollutants of concern are Nitrogen Dioxide (NO_2) and Particulate Matter (PM_{10}) from vehicle emissions, which cannot escape due to the canyoning effect of high buildings within the effected streets.

Perth and Kinross Council (PKC) have declared two air quality management areas (AQMA), one covering the whole of Perth City and another encompassing the high street corridor running through Crieff.

The decision to declare the whole of Perth City an AQMA was made so that the air quality issues could be addressed holistically throughout the city.

Crieff ‘s AQMA has the trunk road A85 running through it which Transport Scotland (TS) has adopted and maintains, therefore PKC are working closely with TS and this agency is represented on the Stakeholder Group formed to develop the Air Quality Action Plan (AQAP). Work on the AQAP has continued to progress, and by the end of 2018 the draft AQAP had been put out for public consultation.

Perth and Kinross Council also work in close partnership with TACTRAN, this includes a regional Transport Partnership with Angus, Dundee, Stirling and Perth and Kinross. The partnership has developed a regional travel information portal for visitors and residents: http://www.tactranconnect.com/

Only one exceedance for NO_2 has been identified within Perth during 2018; this was within Atholl Street. However overall a downward trend in concentrations has been observed in this street, which in past years has had some of the highest levels within the region. One further exceedance for NO_2 was identified within Crieff, however the result for this location has been influenced by two unexplained high readings at the end of the year.

The recorded levels of PM_{10} have decreased at Atholl Street, and Crieff real time monitors (RTM), however a slight increase from 2017 has been observed at the Muirton background RTM. PM_{10} is not currently being recorded at the High Street RTM.

PKC also monitors for $PM_{2.5}$ at all RTMs; no exceedances of objective levels were observed in 2018. Therefore, at present there is no evidence to indicate that the AQMA orders in either Perth or Crieff require to be amended to include $PM_{2.5}$.

Actions to Improve Air Quality

Perth & Kinross Council has taken forward several measures during the current reporting year of 2018/19. These key measures are:

- PKC will continue to increase its Electric Vehicle Charging point network annually in partnership with Transport Scotland, the Office for Low Emission Vehicles, and the Energy Saving Trust. There are 35 chargers within 13 location across the region, with plans to implement more.
- PKC ECOStars heavy duty vehicles fleet recognition and management scheme commenced in April 2019 after a long procurement process. To date the scheme has 69 members that all have depots within the Perth & Kinross Council region.
- An iBike Officer embedded within PKC schools to implement various ongoing projects with sessions at primary schools throughout Perth & Crieff covering bike maintenance, scooter & cycle skills, bike balance and Dr, Bike Checks. This encourages pupils to take up sustainable and active travel.
- PKC with Scottish Sustran's Safer Routes to Schools funding programme has made improvements to footways around schools and has also expanded the Green Route Network within Perth. Schemes such as the installation of cycle & scooter parking facilities at Our Lady's Primary School, a bike port (on order) and cycle racks (to be installed in Crieff in 2019) all encourage sustainable travel.

- The draft Crieff AQAP was approved on 5 September 2018 by The Environment and Infrastructure Committee and the consultation exercise was undertaken from 7 January 2019 to 18 February 2019. Following the completion of the consultation, the results were collated and published on the PKC Consultation Hub website (available at: https://consult.pkc.gov.uk/change-and-improvement/crieff-draft-air-quality-action-plan-consultation/) and an infographic was created and distributed to all consultees. The Steering group reconvened to review the draft measures and the final AQAP was completed. The Final AQAP is to be submitted to the August 2019 committee for approval.
- PKC supported and participated in the 'Clean Air Day' on June 21 2019. Scottish Government funding was used to commission consultants Systra to carry out a Crieff Clean Air Day promotional campaign. The campaign activities included engagement with the local Crieff Primary and St Dominic's Primary schools, a bike try-out event for members of the public and complementary media coverage.

'Clean Air Day 2019'

- The completion of the updated 2018 Paramics Traffic Model for Crieff, which was then used to model the impact on traffic flow and Air Quality of three Traffic Management Options. These options were: The removal of 50% and

100% of parking on A85 High Street Crieff and changes to traffic signal controls and pedestrian crossings at 3 locations on High Street. The removal of on street parking showed a slight reduction in the NO_2 annual mean at the West High Street and Comrie Street junction but this is not enough to achieve compliance of the air quality objective of 40ugm^3. Traffic signal control provided the greatest benefit with respect of NO_2 annual mean reduction at the West High Street and Comrie Street junction.

- The Air Quality Supplementary Guidance document consultation period has been completed and will be statutory guidance in line with the Local Development Plan 2 being adopted.

Local Priorities and Challenges

As Perth is a major strategic hub in the Scottish transport network and has major road connections to all of Scotland's cities combined with major new developments, PKC are conscious of the potential for traffic congestion and of the air quality issues (likely to be exacerbated) and these needed to be addressed. Addressing these issues will ensure the long term growth of Perth as set out in the Local Development Plan (LDP) and the Perth City Plan (2015 -2035) https://www.pkc.gov.uk/smartgrowth.

Therefore, a package of measures has been developed as the Perth Transport Futures Project http://www.pkc.gov.uk/transportfutures which is focussed on the need for major road infrastructure to address key congestion points in the existing road network and to provide linkages to growth areas as set out in LDP.

The measures are to be delivered over several years and are split into four phases:

- Phase 1 A9/A85 Junction Improvement and Link Road to Bertha Park
- Phase 2 Cross Tay Link Road (CTLR) – A9 to A93 and A94
- Phase 3 Bertha Park North Link to A9 (Linking phase 1 and 2)
- Phase 4 Associated City Improvement such as traffic management measures and further develop the cycling, walking and public transport networks in and around Perth to encourage travel by more sustainable modes.

Phase 1 A9/A85 Junction Improvement and link road to Betha Park is completed and now operational.

Phase 2 Cross Tay Link Road delays in the submission of planning application as further discussions were undertaken with regards to route options to the North of Scone.

Phase 4 Mill Street public realm improvement development to create a 'Cultural Quarter' which includes a new streetscape and new plaza area to improve access links to Perth Concert Hall, Theatre, Museum and Art Gallery for pedestrians has been completed. Further city centre improvements are to be undertaken such as walking and cycling infrastructure on major routes into city.

PKC aspires that Perth will be one of Europe's great small cities and to achieve this it has been identified that investment is required in public transport, walking and cycling networks. PKC recently developed an Active Travel Strategy which promotes walking and cycling across Perth & Kinross: Active Travel Strategy for Perth and Kinross.

Perth is collaborating with Sustrans in Bike Life residents survey first report: www.susutrans.org.uk/bikelife

How to Get Involved

For further information on air quality within Perth and Kinross visit the PKC air quality website at: http://www.pkcairquality.org.uk/

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1. Local Air Quality Management

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

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

Table 1.1 – Summary of Air Quality Objectives in Scotland

Pollutant	Air Quality Objective		Date to be achieved by
	Concentration	Measured as	
Nitrogen dioxide (NO_2)	200 µg/m^3 not to be exceeded more than 18 times a year	1-hour mean	31.12.2005
	40 µg/m^3	Annual mean	31.12.2005
Particulate Matter (PM_{10})	50 µg/m^3, not to be exceeded more than 7 times a year	24-hour mean	31.12.2010
	18 µg/m^3	Annual mean	31.12.2010
Particulate Matter ($PM_{2.5}$)	10 µg/m^3	Annual mean	31.12.2020
Sulphur dioxide (SO_2)	350 µg/m^3, not to be exceeded more than 24 times a year	1-hour mean	31.12.2004
	125 µg/m^3, not to be exceeded more than 3 times a year	24-hour mean	31.12.2004

Pollutant	Air Quality Objective		Date to be achieved by
	Concentration	**Measured as**	
	266 µg/m^3, not to be exceeded more than 35 times a year	15-minute mean	31.12.2005
Benzene	3.25 µg/m^3	Running annual mean	31.12.2010
1,3 Butadiene	2.25 µg/m^3	Running annual mean	31.12.2003
Carbon Monoxide	10.0 mg/m^3	Running 8-Hour mean	31.12.2003
Lead	0.25 µg/m^3	Annual Mean	31.12.2008

2. Actions to Improve Air Quality

2.1 Air Quality Management Areas

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

A summary of AQMAs declared by Perth and Kinross Council can be found in

Table 2.1. Further information related to declared or revoked AQMAs, including maps of AQMA boundaries are available online at:

https://uk-air.defra.gov.uk/images/aqma_maps/Perth.pdf for Perth. The map for Crieff is not available on DEFRA site, but is on the Scottish Air Quality site at: http://www.scottishairquality.co.uk/assets/aqma-maps/Perth02.pdf

Table 2.1 – Declared Air Quality Management Areas

AQMA Name	Pollutants and Air Quality Objectives	City / Town	Description	Action Plan
Perth AQMA	• NO_2 annual mean • PM_{10} annual mean	Perth	The whole area of Perth City was designated an AQMA in 2006.	Perth and Kinross Air Quality Action Plan 2009 http://www.pkc.gov.uk/media/35448/2009-Air-Quality-Action-Plan/pdf/Perth_and_Kinross_Air_Quality_Action_Plan Name and Link to Action Plan
Crieff	• NO2	Crieff	From the point at the Y-	The Action Plan is in

AQMA Name	Pollutants and Air Quality Objectives	City / Town	Description	Action Plan
AQMA	annual mean • PM10 annual mean		Junction at Perth Road and Dollerie Terrace, follow the A85 east to East High Street, the Cross, High Street, James Square then on to West High Street stopping at the junction of Galvemore Street and Lodge Street and north up to Comrie Street to the Y-Junction at Coldwells Road and the mid-point of Comrie street. The AQMA takes in the whole of the buildings along East High Street/High Street/West High Street and Comrie Street.	the process of being finalised. The draft Action Plan has undergone internal consultation (including Transport Scotland) and went out to external consultation in January 2019. The final Action Plan is expected to be in place by August 2019.

2.2 Progress and Impact of Measures to address Air Quality in Perth and Kinross Council

Perth and Kinross Council has taken forward a number of measures during the current reporting year of 2018 in pursuit of improving local air quality. Details of all measures completed, in progress or planned are set out in Table 2.2. More detail on these measures can be found in the Air Quality Action Plan relating to the Perth AQMA. The key completed measures are:

- PKC ECOStars heavy duty vehicles fleet recognition and management scheme commenced in April 2019, after a long procurement process. To date the scheme has 69 members that all have depots within the Perth & Kinross region.
- An iBike Officer embedded within PKC schools to implement various ongoing projects with sessions at primary schools throughout Perth & Crieff covering bike maintenance, scooter & cycle skills, bike balance and Dr, Bike Checks. This encourages pupils to take up sustainable and active travel.
- PKC with Scottish Sustran's Safer Routes to Schools funding programme has made improvements to footways around schools and has also expanded the Green Route Network within Perth. Schemes such as the installation of cycle & scooter parking facilities at Our Lady's Primary School, a bike port (on order) and cycle racks (to be installed in Crieff in 2019) all encourage sustainable travel.
- The draft Crieff AQAP was approved on 5 September 2018 by The Environment and Infrastructure Committee and the consultation exercise was undertaken from 7 January 2019 to 18 February 2019. Following the completion of the consultation, the results were collated and published on the PKC Consultation Hub website and an infographic was created and distributed to all consultees. The Steering group reconvened to review the draft measures and the final AQAP was completed. The Final AQAP is to be submitted to the August 2019 committee for approval.
- PKC supported and participated in the 'Clean Air Day 2019' on June 21 using Scottish Government funding to commission consultants Systra to carry out a Crieff Clean Air Day promotional campaign. The campaign activities included engagement with the local Crieff Primary and St Dominic's Primary schools, a bike try-out event for members of the public and a complementary media campaign.
- The completion of the updated 2018 Paramics Traffic Model for Crieff, which was then used to model the impact on traffic flow and Air Quality of three Traffic Management Options. These options were: The removal of 50% and 100% of parking on A85 High Street Crieff and changes to traffic signal

controls and pedestrian crossings at 3 locations on High Street. The removal of on street parking showed a slight reduction in the NO_2 annual mean at the West High Street and Comrie Street junction but this is not enough to achieve compliance of the air quality objective of 40ugm^3. Traffic signal control provided the greatest benefit with respect of NO_2 annual mean reduction at the West High Street and Comrie Street junction.

- The Air Quality Supplementary Guidance document consultation period has been completed and will be statutory guidance in line when the Local Development Plan 2 is adopted.

Progress on the following measures has been slower than expected:

- The Perth AQAP review, due to contractual matters has not been undertaken as previously stated in the 2018 APR. Therefore, under the new AQ contract, consultants SWECO have been commissioned to undertake the Perth AQAP review.
- Relocation of the RTM from High Street Perth to Bridgend Perth to monitor AQ within a hot spot area and establish the effects on AQ once the CTLR is operational in 2022. Delays were due to AQ contract renewal and site location constraints.

PKC expects the following measures to be completed over the course of the next reporting Year:

- Continuation of EV charging point installation throughout the Perth & Kinross area. PKC have applied for funding through the Switched On Towns & Cities Challenge Fund for the development of a city centre EV charging hub.

- The Perth AQAP review, due to contractual matters has not been undertaken as previously stated in the 2018 APR. Therefore, under the new AQ contract, consultants SWECO have been commissioned to undertake the Perth AQAP review.

- The Corporate Travel Plan staff travel survey to be undertaken to establish a baseline of PKC staff travel modes which will advise a Travel Survey Report to go to committee.

- Continuation of the ECOStars Scheme for heavy duty vehicles and a promotional launch to encourage engagement with transport providers to achieve air quality improvements within Perth city.

- Continued support for Active Travel related projects including completing missing sections of cycle paths along key routes into Perth, along the Dunkeld Road with junction improvements and on the Perth Road.

- The final AQAP for Crieff approved and published followed by public engagement workshops in 2020 to establish community opinion on the modelled traffic management scenarios proposed.

- Relocation of RTM to Bridgend Perth.

Table 2.2 – Progress on Measures to Improve Air Quality – Perth AQAP

Measure No.	Measure	Category	Focus	Lead Authority	Planning Phase	Implementation Phase	Key Performance Indicator	Target Pollution Reduction in the AQMA	Progress to Date	Estimated Completion Date	Comments
	Cross Tay Link Road (CTLR)	Transport Planning and Infrastructure	New crossing of the Tay linking the A9 to the A94 north of Scone, including package of associate bus priority, cycle and pedestrian measures 'locking in the benefits' to Perth city center.	PKC Transport Planning Planning & Development TACTRAN Transport Scotland	2009- ongoing to circa 2024			PKC Regional Modelling Predicted a (-) 16.70% reduction in NO_2 at Atholl Street hotspot	Phase 1 A85/A9 has now been completed and is open to connect with Bertha Park. Phase 2 PAN has been submitted 19/00004/PAN for the CTLR A9 over the river Tay to the A93 and A94 north of Scone AQ and Noise assessment as part of EIA 18/01661/SCOP are being undertaken by consultants and peer reviewed	Completed 2024 2019	

Measure No.	Measure	Category	Focus	Lead Authority	Planning Phase	Implementation Phase	Key Performance Indicator	Target Pollution Reduction in the AQMA	Progress to Date	Estimated Completion Date	Comments
	Integrate AQ into Regional Transport Strategy (RTS)	Policy guidance and development control	Ensure that this AQAP is integrated into the delivery of the RTS.	PKC TACTRAN	2009/10	2009/10 and as RTS is delivered	We will report annually on our meetings with TACTRAN and provide a discussion as to how the AQAP is influencing delivery of the RTS.	Medium - High	AQ considerations are influencing RTS delivery, in the past 5 years PKC and TACTRAN continue to work in conjunction to ensure AQ is considered in the RTS and projects such as freight consolidation, park and ride, lift share, walking and cycling initiatives. The RTS was refreshed in 2015 Regional Transport Strategy 2015-2036.	Ongoing	

Measure No.	Measure	Category	Focus	Lead Authority	Planning Phase	Implementation Phase	Key Performance Indicator	Target Pollution Reduction in the AQMA	Progress to Date	Estimated Completion Date	Comments
	Integrate AQ into Local Transport Strategy (LTS)	Policy and guidance development control	Ensure that the AQAP is integrated into the delivery of the LTS.	PKC	LTS published in 2010 on going implementation of the schemes.	Ongoing	We will comment on any specific air quality provisions contained in the LTS.	Medium - High	An Active Travel Strategy for Perth and Kinross has been approved at committee. Shaping Perth's Transport Future 2011 and the wider regional document published Transport Strategy for Perth Shaping Perth's Transport Future. The LTS preferred strategy is one of an integrated approach and air quality is one of the Strategy objectives: http://www.pkc.gov.uk/article/17627/Transport-planning-Policy-and-strategy To work towards meeting national air quality standards and prevent further breach and exceedances and to reduce transport emissions.	EH continue to attend meetings with PKC's transport planning team for projects such as Perth City Centre Traffic, Shaping Perth's Transport Future and Perth Public Transport Interchange Study.	Transport Colleagues have acknowledged that the LTS needs to be reviewed in line with CAFS.

Measure No.	Measure	Category	Focus	Lead Authority	Planning Phase	Implementation Phase	Key Performance Indicator	Target Pollution Reduction in the AQMA	Progress to Date	Estimated Completion Date	Comments
	Park & Ride	**Transport Planning and Infrastructure**	Operate existing Park & Ride (PR) Schemes. Perth PR (Broxden) Scone PR Kinross PR Walnut Grove PR Planning Permission 15/01808/FLM approved. Maintain high levels of usage. We will carry out intermittent surveys to assess vehicles using the sites.	PKC	2009 - ongoing	Ongoing	Annual usage statistics A calculator of avoided NOx /PM10 will be provided.	Medium	An Electric Hub has been developed at the Broxden PR with the installation of 3'Rapid' DC/AC chargers 3'Fast' AC chargers servicing 12 EV parking bays. European Funding is being sought and planning permission in principle submitted for a hydrogen refuelling station South east of Broxden P&R 18/00482/IPL and a solar array for an electricity supply to support electric vehicle charging points to meet much of the energy requirements of the proposed Broxden Low Carbon Transport HUB	Ongoing Ongoing	

Measure No.	Measure	Category	Focus	Lead Authority	Planning Phase	Implementation Phase	Key Performance Indicator	Target Pollution Reduction in the AQMA	Progress to Date	Estimated Completion Date	Comments
	Bus Quality Improvements	Transport planning and infrastructure	Bus Strategy 7 Quality Bus Partnerships	TACTRAN PKC	2009-2040	More specific timescales are available in TACTRAN's RTS Delivery plan/capital and revenue programmes.	Shift to alternative modes - this will be monitored by TACTRAN as part of the evaluation process of their RTS Delivery Plan.	Medium	Continued improvements involving PKC, TACTRAN and bus operators and improvements on bus shelter facilities and interchanges. Continued review of timetables which are amended to reflect demand and fares revised: passengers now benefit by being able to use Stagecoach network tickets (Dayrider and Megarider).	Ongoing	

Measure No.	Measure	Category	Focus	Lead Authority	Planning Phase	Implementation Phase	Key Performance Indicator	Target Pollution Reduction in the AQMA	Progress to Date	Estimated Completion Date	Comments
	Freight Improvements	Freight and delivery management	Establish a TACTRAN –wide Freight Quality Partnership (FQP), in liaison with freight interests and Councils drawing upon established guidance, to help deliver cost effective packages of freight related interventions across the region	TACTRAN PKC	Ongoing to 2024	Ongoing to 2024 More specific timescales are available in TACTRAN's RTS delivery plan/capital and revenue programme.	PKC will seek regular updates from TACTRAN on progress and report on these annually.	High	A TACTRAN – wide freight quality partnership has been formed including members from PKC, Scottish Enterprise and the private freight sector. PKC and Dundee's EH managers are members of the Freight Quality Partnership. AQ is integrated into the Freight Quality partnership.	EH continue to attend meetings to ensure AQ is integrated into the FQP.	

Measure No.	Measure	Category	Focus	Lead Authority	Planning Phase	Implementation Phase	Key Performance Indicator	Target Pollution Reduction in the AQMA	Progress to Date	Estimated Completion Date	Comments
	Travel Planning	Promoting travel alternatives	PKC Corporate Travel Plan (CTP); including encouraging Flexible working, car/lift sharing/ alternative modes, salary sacrifice bicycle scheme, pool car usage, home working.	PKC	Initiated year two of this AQAP	On going	Activity data will be collected by survey to support the working of the PKC Corporate Travel Plan (CTP). A base survey of staff travel habits will also be carried out. We will estimate vehicle km avoided in the AQMA and report emissions of NOx and PM10.	Medium	The 2010 Travel Plan is now being reviewed in line with CAFs PKC has received SG funding to produce a CTP. A working group has been set up to develop the CTP and a graduate employed to progress.	2020	PKC at present promotes the salary sacrifice scheme to staff and Walk to Work Week and lift share via staff intranet.

Measure No.	Measure	Category	Focus	Lead Authority	Planning Phase	Implementation Phase	Key Performance Indicator	Target Pollution Reduction in the AQMA	Progress to Date	Estimated Completion Date	Comments
		Promoting travel alternatives	We will work with regional partners to further encourage development and employee use of Green Travel Plans (GTP) for our large employers within Perth & Kinross.	TACTRAN (through the sustainable Travel Liaison Group) PKC.	2009	2009 then ongoing	Activity data will be sought from the main employers as to the journeys avoided from their GTPs. If this is provided, it will allow for estimates of vehicle km avoided in the AQMA and report reduction in emissions of NOx and PM10.	Medium	TACTRAN has been represented on SSE's Travel Plan Steering group and provided advice and promotional material. Perth College has also been given information and support of use of lift share. Aviva, PRI and Murray Royal Hospitals have been given advice and guidance in travel planning process and PRI provided with grants for travel planning measures, promotion of travel plan implementation software, TACTRAN travel knowhow to support businesses developing and implementing travel plans.	Ongoing	

Measure No.	Measure	Category	Focus	Lead Authority	Planning Phase	Implementation Phase	Key Performance Indicator	Target Pollution Reduction in the AQMA	Progress to Date	Estimated Completion Date	Comments
		Promoting travel alternatives	We will continue to support schools developing Green Travel Plans (GTP) through our school co-ordinator and collect activity data to assess their use through our school co-ordinators.	PKC	2009 then ongoing	Ongoing	Survey data will be requested from PKC schools as to the journeys avoided from their GTPs. We will estimate vehicle kilometers avoided in the AQMA and report reduction in emissions of NOx and PM10.	Medium	SG grant funding allows for the continued support for green travel plans. The road network team promotes Cycling, walking (WoW) initiatives	Ongoing	Hands up survey 2018 determined that the percentage of Perth primary pupils regularly cycling to school is 6.6% and 6.5% pupils scooted or skated to school.

Measure No.	Measure	Category	Focus	Lead Authority	Planning Phase	Implementation Phase	Key Performance Indicator	Target Pollution Reduction in the AQMA	Progress to Date	Estimated Completion Date	Comments
		Promoting travel alternatives	Regional/PKC car and Lift Share schemes - there is both a wider scheme, and one specific to PKC employees. We will improve use of PKC scheme through our own GTP.	TACTRAN PKC	2009 then ongoing	Ongoing	Activity data will be collected annually from both schemes and we will estimate vehicle km avoided in the AQMA and report reduction in emission of NOx and PM10.	Small-Medium	Continued promotion of Lift share including PKC and PRI, SSE and Aviva with stalls within workplaces. Participation in national Lift share week and leaflet promotion through employers.	Ongoing	

Measure No.	Measure	Category	Focus	Lead Authority	Planning Phase	Implementation Phase	Key Performance Indicator	Target Pollution Reduction in the AQMA	Progress to Date	Estimated Completion Date	Comments
		Promoting travel alternatives	Green Travel Plans for new development. We will continue to seek travel plans from large development under existing planning arrangements.	PKC	2009 then ongoing	Ongoing	Number of GTPs and estimation of specified in reporting year.	Low	This is a continual process through planning and is requested by Transport Planning Team who are internal consultees for planning.	Ongoing	GTP are requested through the planning process

Measure No.	Measure	Category	Focus	Lead Authority	Planning Phase	Implementation Phase	Key Performance Indicator	Target Pollution Reduction in the AQMA	Progress to Date	Estimated Completion Date	Comments
8.	Traffic Management	Traffic Management	Keep "City Traffic Management Review" under continual review our traffic and environmental teams will liaise regularly to discuss the effects of component measures of City Centre Traffic Management Review (CCTMR) on Air Quality.	PKC	Ongoing as required	Ongoing	We will report annually on any changes to the CCTMR and how we anticipate this effecting air quality.	Medium	A Stratos UTM Common Database has been installed and a main link has been secured.	Ongoing	We will continue to review managing traffic within AQMA.

Measure No.	Measure	Category	Focus	Lead Authority	Planning Phase	Implementation Phase	Key Performance Indicator	Target Pollution Reduction in the AQMA	Progress to Date	Estimated Completion Date	Comments
9.	Planning and Air Quality	Policy Guidance and Development Control	Consider air quality as an issue for the Local Development Plan.	PKC	2014	2014-2017	It is not possible to assign a quantitative indicator. We will report on the delivery of the Local Development Plan (LD), and provide evidence that air quality considerations have been formalized within the LDP.	Medium	PKC Local Development Plan: http://www.pkc.gov.uk/media/23633/Local-Development-Plan/pdf/Adopted_LDP_Web_Version The current LDP is under review: http://www.pkc.gov.uk/ldp2 and AQ will be considered within the new plan for the whole region, not just AQMAs. The review will be in line with CAFs. The reviewed LPD should be completed and adopted by 2019	2019-24	

Measure No.	Measure	Category	Focus	Lead Authority	Planning Phase	Implementation Phase	Key Performance Indicator	Target Pollution Reduction in the AQMA	Progress to Date	Estimated Completion Date	Comments
		Policy guidance and development control	Complete the supplementary planning guidance (SPG) on Air Quality This will include results of regional air quality modelling currently being undertaken by Ricardo E&E.	PKC	2014	2020 Statutory	It is not possible to assign a qualitative indicator. We will report progress on the development of the plan.	Small	PKC have produced a new draft AQ SPG, consultation period undertaken, and approved AQ SG will be linked with the new revised LDP (2019) and will therefore become a statutory document.	2020 to be adopted in line with new LDP and become a statutory document	

Measure No.	Measure	Category	Focus	Lead Authority	Planning Phase	Implementation Phase	Key Performance Indicator	Target Pollution Reduction in the AQMA	Progress to Date	Estimated Completion Date	Comments
		Policy guidance and development control	Consider air quality in planning decisions and formalise decision making process/interaction with Environmental Health. This can relate not only to new transportation sources, but also new biomass installations or industrial sources	PKC	Ongoing	Ongoing as required	It is not possible to assign a qualitative indicator. We will report on cases where air quality was a consideration in the reporting period, and any outcomes of any decisions made	Low	Environmental Health will continue to check the weekly planning list and comment on applications which may adversely impact on local air quality. The AEA/EPUK screening tools are used to assess applications.	Ongoing	

Measure No.	Measure	Category	Focus	Lead Authority	Planning Phase	Implementation Phase	Key Performance Indicator	Target Pollution Reduction in the AQMA	Progress to Date	Estimated Completion Date	Comments
10.	Procurement and Air Quality	Vehicle fleet efficiency	Air Quality will be formally considered in tendering processes for new PKC vehicles. PKC currently specify stringent Euro Standards than necessary. A fleet survey will be necessary in the short term to establish the baseline for improvements.	PKC	Fleet Survey in year 1 of AQAP, then ongoing as tender arises as part of the standards specification.	Ongoing	If vehicles are replaced like for like, the number will be reported annually, with Euro standards and that of the vehicle replaced. This will feed into an emissions calculation and the saving in NOx and Pm10 will be reported annually. If additional vehicles are bought, Euro Standards will be reported and an estimation of impact of specifying a more stringent standard will be reported.	Small – Medium	PKC introduced E-bikes as part of our pool vehicles use within Perth City Centre for a trial period. PKC continue to expand electric charging point network PKC continue to replace Euro Standard vehicles with newer Euro 6 vehicles or electric vehicles where appropriate.	Ongoing	PKC are continually looking to incorporate new electric charging points throughout the region. The PKC region covers is vast and the range of electric vehicles is taken into consideration when reviewing fleet vehicle replacement

Measure No.	Measure	Category	Focus	Lead Authority	Planning Phase	Implementation Phase	Key Performance Indicator	Target Pollution Reduction in the AQMA	Progress to Date	Estimated Completion Date	Comments
11.	Eco-driver training	Vehicle fleet efficiency	PKC will seek to expand the existing provision of eco driver training utilizing the former training team to develop and add an eco-training course into existing modular training syllabus. The eco-driving module will become part of our regular driver Certificate of Professional Competence (CPC) training package which will be delivered on an ongoing basis.	PKC	Expand programme by 2011 then ongoing	2011-Ongoing	PKC intend to assess drivers after they have completed the training. The outcomes of these assessments (i.e. the fuel saving per driver) will allow simple calculations of avoided emissions of NOx and PM10	Small	The eco-module also forms part of future training for all council drivers as part of the driver assessment programme, which will also cover the driver's responsibilities on legislation and what pre-use vehicle checks need to be carried out and documented. PKC have 4 Trainers to deliver the Drivers CPC Programme. PKC now run an in house, Service need, LGV Training Centre. PKC have a Qualified LGV driving instructor to deliver LGV Training to staff.	Ongoing	PKC continue to deliver CPC Programme

Measure No.	Measure	Category	Focus	Lead Authority	Planning Phase	Implementation Phase	Key Performance Indicator	Target Pollution Reduction in the AQMA	Progress to Date	Estimated Completion Date	Comments
	Set up vehicle group MPG indicators	Vehicle fleet efficiency	MPG Key Performance Indicators (KPIs).	PKC	2016/17	2017/19	MPG KPIs	Small	Cleansing database and fuel information cultural change to ensure accurate mileages and machine hours are accurately recorded at each fueling event.	2018/19	Fleet KPIs are being reviewed and PKC are undertaking the installation of telematics systems into small fleet vehicles

Measure No.	Measure	Category	Focus	Lead Authority	Planning Phase	Implementation Phase	Key Performance Indicator	Target Pollution Reduction in the AQMA	Progress to Date	Estimated Completion Date	Comments
	Better utilisation of the small vehicle fleet by installing telematics	Vehicle fleet efficiency	Small Vehicle Fleet	PKC	2016/17	2017/19	Less grey fleet mileage with better use of Council pool vehicles.	Small	As part of the Council's Vehicle Fleet Utilisation and Optimisation Review all Council fleet vehicles are to be installed with tracking systems. The telematics systems will allow PKC to analyse the usage and identify improved utilisation of pool and operational vehicle fleet.	2020	

Measure No.	Measure	Category	Focus	Lead Authority	Planning Phase	Implementation Phase	Key Performance Indicator	Target Pollution Reduction in the AQMA	Progress to Date	Estimated Completion Date	Comments
12.	Provision of Travel Information	Public Information	Develop, promote and maintain a comprehensive Travel Information System, covering all modes and users and make this information available in on-line formats. Delivered through TACTRAN's regional Travel Information Strategy.	TACTRAN PKC	Study and develop strategy by 2011 specific measures on going to circa 2018	2018	We will liaise with TACTRAN and report annually on the findings of the feasibility work. As initiatives are implemented, we will report progress on these individually.	Medium	The website went under a branding, public awareness and modernisation review in 2014. Traveline Scotland in partnership with PKC continues to develop the website and apps to provide and enhance public transport information Scotland-wide. https://www.tactran.gov.uk/index.php	Ongoing	

Measure No.	Measure	Category	Focus	Lead Authority	Planning Phase	Implementation Phase	Key Performance Indicator	Target Pollution Reduction in the AQMA	Progress to Date	Estimated Completion Date	Comments
13.	Signage	Public Information	Investigate the potential of variable message signage linked to pollution monitoring system.	PKC	Feasibility work by 2011	2016/17	We will report annually the findings of any feasibility work that is carried out and develop the measure further based on the findings.	PKC Public Transport team carried out a feasibility study to install the provision of RTI and signage at certain locations within the Perth and Kinross area. The RTI feasibility study was for travel information only SG funding was secured. However due to budgetary cuts the ongoing costs of maintaining the system after installation could not be met.	PKC have installed a RTI within our Perth City Centre offices public reception area giving bus time table information.	2018	

Measure No.	Measure	Category	Focus	Lead Authority	Planning Phase	Implementation Phase	Key Performance Indicator	Target Pollution Reduction in the AQMA	Progress to Date	Estimated Completion Date	Comments
14.	Alternative Modes	Promoting Travel Alternatives	Work closely with TACTRAN to aid delivery of the Walking and Cycling Strategy for the region to ensure walking and cycling are part of an integrated transport system	TACTRAN PKC	Initial Study - 20019/10 Ongoing liaison /review	Ongoing liaison/review	We will liaise with TACTRAN annually and report progress with individual measures implemented under the Strategy.	Medium	Cycle training and bike repair training provided to staff. SG funding attained this year again for several walking/cycling initiatives including training and safety events. PKC match funds the IBike Project within schools. '*Perth/Crieff on the Go'* delivers cycle/walking route maps and bus timetables to residents and travel planning through school initiatives. Bikeability Officer employed with SG funding.		

Measure No.	Measure	Category	Focus	Lead Authority	Planning Phase	Implementation Phase	Key Performance Indicator	Target Pollution Reduction in the AQMA	Progress to Date	Estimated Completion Date	Comments
									PKC are in the process of producing a Business case for the Low Carbon Transport and Active Travel Hubs. The project will be carried out in two phases through match funding from ERDF and Tay City Deal.		

Measure No.	Measure	Category	Focus	Lead Authority	Planning Phase	Implementation Phase	Key Performance Indicator	Target Pollution Reduction in the AQMA	Progress to Date	Estimated Completion Date	Comments
15.	Better access to public transport (note: access to service, not person access to individual buses)	Transport Planning and Infrastructure	Work with planning colleagues to assess provision of public transport at new and existing developments	PKC	2009-Ongoing	Ongoing	We will report on findings of reviews and any improvements made to the existing public transport network and new developments that have given public transport facilities.	Small	Ongoing improvements on bus shelter improvements	Ongoing	
16.	Idling Emission Reduction	Promoting Low Emission Transport	Enforce Vehicle Idling Regulations.	PKC	Feasibility Study 2010	No Progress	Number of vehicles subject to enforcement.	Small	A SMT report is to be produced to establish if this measure is to be taken forward and which Service.	2020	
17.	Roadside Emission Testing	Roadside Emission Testing	Authorised Personnel to carry out roadside testing.	PKC and Police	Feasibility Study involving surrounding Local authorities by end 2010.	No Progress	Number of vehicles subject to enforcement	Small	No progress	No progress	

Measure No.	Measure	Category	Focus	Lead Authority	Planning Phase	Implementation Phase	Key Performance Indicator	Target Pollution Reduction in the AQMA	Progress to Date	Estimated Completion Date	Comments
18.	LAQM Marketing	Public Information	Enhance existing provisions of publicity materials and ensure they reach their target audience. Organise publicity initiatives in schools, large employers and public sector.	PKC		Commence 2009 - Ongoing	Publication of materials, events held	Small-Medium	PKC's Social Marketing Campaign '*Perth & Crieff on the Go'* allowed further promotional work within schools and businesses funding permitting. Continue to promote 'Clean Air Day' carrying out events with schools promoting active and sustainable travel.	Ongoing	

Measure No.	Measure	Category	Focus	Lead Authority	Planning Phase	Implementation Phase	Key Performance Indicator	Target Pollution Reduction in the AQMA	Progress to Date	Estimated Completion Date	Comments
19.	LAQM Monitoring and Reporting	Statutory Duties LAQM	Statutory Duties LAQM	PKC	Ongoing	Ongoing	Monitoring data will be provided in the annual progress report as will the progression of measures within AQAP.	Small	PKC continue to review Monitoring network.	Ongoing	

2.3 Cleaner Air for Scotland

Cleaner Air for Scotland – The Road to a Healthier Future (CAFS) is a national cross-government strategy that sets out how the Scottish Government and its partner organisations propose to reduce air pollution further to protect human health and fulfil Scotland's legal responsibilities as soon as possible. A series of actions across a range of policy areas are outlined, a summary of which is available at https://www.gov.scot/Publications/2015/11/5671/17. Progress by Perth and Kinross Council against relevant actions within this strategy is demonstrated below.

2.3.1 Transport – Avoiding travel – T1

All local authorities should ensure that they have a corporate travel plan (perhaps within a carbon management plan) which is consistent with any local air quality action plan. Perth and Kinross Council has employed a graduate to help take forward the PKC Corporate Travel Plan. A PKC Staff Travel Survey has recently been released as a pre-cursor to the Corporate Travel Plan and a separate report detailing the results of this survey will be used as a baseline to create and evaluate the final plan.

2.3.2 Climate Change – Effective co-ordination of climate change and air quality policies to deliver co-benefits – CC2

The Scottish Government expects any Scottish local authority which has or is currently developing a Sustainable Energy Action Plan to ensure that air quality considerations are covered. Perth and Kinross Council has the second highest installed capacity for renewable energy in Scotland and in the UK.

PKC have an agreed set of sustainable development principles and aspirations [39Kb] that are considered throughout our organisational operations, service delivery and decision-making. These cross-cutting and interconnected principles are organised across 11 main themes, and collectively reflect the five themed objectives of the Community Plan [10Mb].

Perth & Kinross are at the forefront of and have signed Scotland's Climate change declaration and are participating in a carbon management programme, run by the Carbon Trust.

PKCs Climate Change and Board/Low Carbon Working Group are developing a draft Climate Change Interim Report and Action Plan.

3 Air Quality Monitoring Data and Comparison with Air Quality Objectives

3.1 Summary of Monitoring Undertaken

3.1.1 Automatic Monitoring Sites

This section sets out what monitoring has taken place and how local concentrations of the main air pollutants compare with the objectives.

Perth and Kinross Council undertook automatic (continuous) monitoring at 4 sites during 2018. Table A.1 in Appendix A shows the details of the sites. National monitoring results are available at:

http://www.scottishairquality.co.uk/latest/summary?view=la

Maps showing the location of the monitoring sites are provided in the above link. Further details on how the data has been adjusted are included in Appendix C.

3.1.2 Non-Automatic Monitoring Sites

Perth and Kinross Council undertook non-automatic (passive) monitoring of NO_2 at 65 sites during 2018. Table A.2 in Appendix A shows the details of the sites.

Perth and Kinross Council have provided details of the locations of the passive monitoring site locations as part of a project to include this information on the Air Quality in Scotland website. The maps are now available at: http://www.scottishairquality.scot/latest/diffusion-sites .

For six months of 2018 (April – September), Perth and Kinross Council had one tube from each of the seven triplicate locations analysed by an alternative laboratory. With the exception of a few occasions agreement between tubes at these sites was reasonably good, and therefore it is considered unlikely that this has had any significant impact on the overall results.

3.2 Individual pollutants

The air quality monitoring results presented in this section are, where relevant, adjusted for annualisation and bias. Further details on the annualisation calculations are provided in Appendix C.

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 diffusion tubes, the full 2018 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.

The automatic monitor located in Atholl Street shows no exceedance of the annual mean standard with a concentration of 37µg/m^3, a decrease from 40µg/m^3 in 2017. This is part of an overall downward trend shown in Figure 1. There were also no exceedances of the hourly mean in 2018, down from one exceedance in 2017.

No exceedances of either the annual mean or the hourly mean were recorded at either of the other two automatic monitors during 2017, with a continued downward trend indicated at both locations in Figures 2 and 3.

Diffusion tube monitoring shows exceedances at 2 locations, one within Perth (P43) and one within Crieff (P73). This is an overall decrease from 2017 where 4 exceedances were identified within Perth, although there were none in Crieff. Both exceedances for 2018 were within AQMAs; neither location had an annual mean value in excess of 60µg/m^3.

It should be noted that over the period from November – December 2018 there were unusually high readings at one location in Crieff – P73. The analysing laboratory were unable to identify any reason for this, nor were there any local factors which would accounts for these results. As it has not been possible to identify any satisfactory explanation for the results it has been determined that they cannot be excluded. However the annual mean value for this location should be treated with some caution.

At P43, which is a triplicate site, there were unusually low results for two of the tubes in May 2018, and no data for the third tube. This data is not considered representative for this location, and therefore it has been decided that a conservative approach must be taken and discounts from the calculations must be made.

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 air quality objective of 18µg/m^3.

Table A.6 in Appendix A compares the ratified continuous monitored PM_{10} daily mean concentrations for the past 5 years with the air quality objective of 50µg/m^3, not to be exceeded more than 7 times per year.

There has been a general downward trend in Atholl Street for this pollutant as shown in Figure 4. In 2018 the annual mean was recorded as 14µg/m^3 down from the 17µg/m^3 recorded in 2017, whilst in Crieff the level decreased from 11µg/m^3 to 10µg/m^3. The Muirton background monitor increased slightly from to 9µg/m^3 in 2017 to 10µg/m^3 in 2018. The PM_{10} trends for North Muirton and Crieff are shown in Figures 5 and 6 respectively. PM_{10} levels were not recorded at the High Street RTM during 2018.

There were no exceedances for this objective at any of the monitoring locations. This is a decrease from 2017 where four exceedances were recorded at Atholl Street, and one at High Street.

2018 is the fourth year in a row where the PM_{10} value for Crieff has not exceeded the objective level. We will continue to review data from this location in order to consider whether revocation of the AQMA for PM_{10} may be possible in the future. However it should be noted that due to limited pavement space the continuous monitor is not located within the street canyon, and therefore the PM_{10} results from Crieff do not likely represent the worst case.

3.2.3 Particulate Matter ($PM_{2.5}$)

Table A.7 in Appendix A compares the ratified and adjusted monitored $PM_{2.5}$ annual mean concentrations for the past 5 years with the air quality objective of 10µg/m^3.

Monitoring of $PM_{2.5}$ began at three locations within Perth and Kinross in late 2017 – Atholl Street, High Street and Crieff. The data indicates no exceedances of the objective at any of these locations. Graphs indicating data trends for $PM_{2.5}$ have not been included as $PM_{2.5}$ has only been monitored for a relatively short time and therefore this type of data analysis does not provide any meaningful information.

No $PM_{2.5}$ data is available for the Muirton site, although monitoring began here at the beginning of 2019. Therefore for this location the conversion calculation described in method 2 of annex B in TG.16 has been used to provide estimates from $PM_{2.5}$ based on the PM_{10} data – See Table 3.1

Table 3.1 – PM_{10} to $PM_{2.5}$ Conversion

PM_{10} to $PM_{2.5}$ Conversion		
Monitoring Site	PM_{10} Annual Mean	TG.16 Adjustment (0.7) – $PM_{2.5}$
Perth 3 (Muirton)	10	7

This indicates levels of $PM_{2.5}$ were below the objective level at this location.

3.2.4 Sulphur Dioxide (SO_2)

Perth and Kinross Council do not currently monitor SO_2.

3.2.5 Carbon Monoxide, Lead and 1,3-Butadiene

Perth and Kinross Council do not currently monitor carbon monoxide, lead or 1,3-butadiene

4 New Local Developments

4.1 Road Traffic Sources

A85

During the A9/A85 junction construction works at the outskirts of Perth complaints were received from local residents regarding concerns about increased levels of dust. In response to these concerns PKC conducted an investigation which included monitoring of PM_{10} and $PM_{2.5}$ in a location close to the works. The monitoring data was collected using a real-time AQMesh sensor system. The results indicate that it is unlikely that objective levels for either $PM_{2.5}$ or PM_{10} would have been exceeded at this location during the works.

It should be noted that the monitoring site was within the existing Perth AQMA.

4.2 Other Transport Sources

No new sources within Perth and Kinross have been identified.

4.3 Industrial Sources

No new sources within Perth and Kinross have been identified.

4.4 Commercial and Domestic Sources

Table 4.1 below shows all planning applications for biomass boilers, between 50kW and 20MW. No areas of significant solid fuel burning or CHP plants were identified.

Table 4.1 Planning applications for biomass boilers 50kW – 20MW

Biomass Developments				
Planning Ref	Location	Thermal Ourput (kW)	In AQMA	DA Required
18/00650/FLL	Scarth Road, Luncarty	70	No	No
18/00649/FLL	Rumbling Bridge Care Home, Rumbling Bridge	180	No	No
18/00174/FLL	Blackcraig Castle, Ballintuim, Blairgowrie	60 x 2	No	Yes

4.5 New Developments with Fugitive or Uncontrolled Sources

No new sources within Perth and Kinross have been identified.

5 Planning Applications

Perth 18/00408/FLM (pending decision) – Change of use from hospital to form 58 flats. An air quality assessment has been completed for this development and has identified that the impact of the development on air quality is expected to be negligible.

Scone 18/02139/FLM (approved) – Erection of 51 retirement flats. An air quality screening assessment was carried out, this identified that the proposed use will have fewer vehicle movements than the current site use, and therefore there should be no negative impact upon local air quality.

6 Conclusions and Proposed Actions

6.1 Conclusions from New Monitoring Data

Monitoring continues to indicate a downward trend in both NO_2 and PM_{10} across all locations. Only one exceedance for NO_2 was identified within the Perth AQMA – on Atholl Street. There was also one exceedance on West High Street in Crieff however this result was heavily affected by unusually high readings in November and December.

No exceedances were observed for PM_{10} at any of the continuous monitoring stations. 2018 was also the first year where we have been able to assess $PM_{2.5}$ data collected at the monitoring stations. This indicates no exceedance of $PM_{2.5}$ at any of the monitoring locations.

6.2 Conclusions relating to New Local Developments

Concerns raised by local residents in relation to the A9/A85 junction construction were investigated by PKC. Monitoring results indicate that it is unlikely that residents were exposed to levels of PM2.5 or PM10 above objective levels during these works. This phase of construction work is now complete.

Two proposed developments have been considered for potential impact in air quality – one in Perth, within the existing AQMA, and one in Scone. Assessments carried out identified that it was unlikely that either development would have a significant impact upon local air quality.

6.3 Proposed Actions

Perth and Kinross Council do not consider that there is presently enough confidence to revoke either of the AQMAs currently in place. We will therefore continue to monitor air quality in these areas in order to gather further information, to help confirm whether the downward trend in pollutant concentrations is sustained. The AQAP for Crieff is expected to be finalised in August 2019; this document includes a range of measures which will be taken forward, aimed at achieving improvements in the local air quality. The Perth AQAP is also scheduled for review with this expected to be carried out in 2019/20.

Appendix A: Monitoring Results

Table A.1 – Details of Automatic Monitoring Sites

Site ID	Site Name	Site Type	X OS Grid Ref	Y OS Grid Ref	Pollutants Monitored	In AQMA?	Monitoring Technique	Distance to Relevant Exposure (m) (1)	Distance to kerb of nearest road (m) (2)	Inlet Height (m)
Perth 1	High Street	Roadside	311687	723626	NO2; PM2.5	Y	Chemiluminescent; TEOM/FIDAS	20.4	4.8	1.5
Perth 2	Atholl Street	Roadside	311575	723917	NO2; PM10; PM2.5	Y	Chemiluminescent TEOM/FIDAS	22.3	2.3	1.5
Perth 3	Muirton	Background	310658	725658	PM10	Y	FDMS	N/A	N/A	2
Crieff 1	James Sq	Roadside	286363	721614	NO2; PM10; PM2.5	Y	Chemiluminescent FDMS/FIDAS	9.5	5.3	1.5

(1) 0 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?
P1	42 Scott St Perth	R	311690	723500	NO2	Y	3	2.5	N
P2	17 Speygate Perth	R	312020	723411	NO2	Y	2.9	2.05	N
P5	8 Stormont Street	UC	311586	723993	NO2	Y	10	1.7	N
P6	41 Mull Place	UB	310510	725767	NO2	Y	6	1.7	N
P7	257 Rannoch Road	UC	308925	724287	NO2	Y	8.3	2.1	N
P13	86 South Street	R	311847	723453	NO2	Y	0	2.6	N
P20	2 Crieff Road	R	311057	724395	NO2	Y	0	1.9	N
P29	37 York Place	R	311253	723517	NO2	Y	8	4.1	N

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?
P30	104 South Street	R	311798	723457	NO2	Y	0	2.4	N
P31	45-47 South Street	R	311917	723466	NO2	Y	0	3.5	N
P32	135 South Street	R	311698	723483	NO2	Y	0	4.6	N
P33	216 South Street	R	311582	723475	NO2	Y	0	2.5	N
P34	10 County Place	R	311510	723480	NO2	Y	2	3	N
P35	17 Princes Street	R	311932	723422	NO2	Y	1.5	1.8	N
P36	51 Glasgow Road	R	310776	723556	NO2	Y	7.2	2.6	N
P37	Riggs Road	R	310856	723581	NO2	Y	10	1.9	N
P38	93 Main Street	R	312263	724167	NO2	Y	1	7	N

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?
P39	39 Main Street	R	312253	724019	NO2	Y	7	2.1	N
P40	18 Main Street	R	312244	723965	NO2	Y	1	2.4	N
P41	76 Atholl Street	R	311465	723941	NO2	Y	1	2.5	N
P43	17 Atholl Street	R	311635	723950	NO2	Y	2	3	N
P45	Ballantine Place	UC	311097	724358	NO2	Y	4	1.7	N
P46	204 Crieff Road	R	309328	724878	NO2	Y	11.5	2	N
P47	5 East Huntingtower	R	308274	724895	NO2	N	5.5	1.8	N
P51	2 West Bridge St	R	312235	723927	NO2	Y	12.5	3.7	N
P54	RTM, 176 High Street	R	311687	723626	NO2	Y	4.58	7.2	Y

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?
P55	7 West High Street, Crieff, PH7 3AF	UC	286332	721638	NO2	Y	1.83	0.45	N
P56	39 High Street, Crieff, PH7 3HT	UC	286505	721555	NO2	Y	2.34	1.2	N
P57	62 High Street, Crieff, PH7 3HT	UC	286550	721562	NO2	Y	0.12	1	N
P58	9 East High Street, Crieff, PH7 3AF	UC	286577	721554	NO2	Y	0.36	0.3	N
P61	RTM, Atholl Street	R	311584	723931	NO2	Y	0.9	3.7	Y
P62	84 Dundee Road	R	312504	722929	NO2	Y	1	1.7	N
P63	30 Dundee Road	R	312413	723252	NO2	Y	1.5	1.4	N

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?
P64	Isla Road	R	312228	724118	NO2	Y	1	1.4	N
P65	5 Charlotte Street	R	311943	723865	NO2	Y	3.3	2	N
P67	1 Atholl Street	R	311691	723939	NO2	Y	1	2.3	N
P68	2 Atholl Street	R	311720	723955	NO2	Y	2.5	0.8	N
P69	Church, Kinnoull St	R	311660	723908	NO2	Y	3	2.6	N
P71	134 Dunkeld Road	R	310615	724958	NO2	Y	7.8	1.5	N
P72	82 Crieff Road	R	310331	724552	NO2	Y	1	2.4	N
P73	19 West High Street, Crieff, PH7 4AU	UC	286302	721651	NO2	Y	0.12	1.65	N
P74	43 High Street, Crieff,	UC	286517	721553	NO2	Y	0.2	1.8	N

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?
	PH7 3HT								
P75	RTM, Crieff	R	286360	721619	NO2	Y	4.84	3.4	Y
P76	10/12 West High Street, Crieff, PH7 4DL	UC	286324	721632	NO2	Y	0.12	2	N
P78	1 Lodge Street, Crieff, PH7 4AX	UC	286195	721691	NO2	Y	0.12	1.78	N
P79	17 Main Street	R	312262	723976	NO2	Y	0	3.3	N
P81	76 High Street, Kinross, KY13 8JA	R	311936	702187	NO2	N	0.12	1.1	N
P82	66 High Street, Auchterarder,	R	294569	712888	NO2	N	1.6	0.65	N

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?
	PH3 1BN								
P83	176 High Street, Auchterarder, PH3 1BN	R	294268	712730	NO2	N	2.2	1	N
P86	2 Friarton Road	R	311790	721398	NO2	Y	4.5	2.0	N
P87	Hollybush Road	BG	287028	721485	NO2	N	8	6	N
P89	59 South Methven St	R	311547	723544	NO2	Y	0	3.2	N
P90	22 North Methven St	R	311539	723797	NO2	Y	0	3	N
P94	Queen Street, Coupar Angus	UC	322232	739915	NO2	N	2	1	N
P95	26-28 Atholl Street	K	311635	723950	NO2	Y	2	0.78	N

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?
P96	22 Barrack St	K	311422	723950	NO2	Y	2.7	0.3	N
P97	St Ninians School,	R	311370	724050	NO2	Y	3.4	3.2	N
P98	30 Edinburgh Road	R	311496	721862	NO2	Y	37	2.5	N
P99	15 Murray Cr Perth	UB	310534	722926	NO2	Y	2.9	2.05	N
P100	9 Comrie Street, Crieff, PH7 4AX	UC	286271	721553	NO2	Y	0	2.7	N
P101	28 Dunkeld Road	R	311010	724484	NO2	Y	5.1	2.1	N
P102	30 Perth Road, Scone	R	313699	726058	NO2	N	3	2	N
P103	28 York Place	R	311186	723506	NO2	Y	12	2.4	N
P104	202 Glasgow Road	R	310158	722635	NO2	Y	5.5	1.5	N

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?
P105	Atholl Road, Pitlochry	R	313699	726058	NO2	N	3	2	N
P106	Victoria Terrace, Crieff	R	286480	721913	NO2	N	23	1	N
P107	1 Glover Street Perth	R	311201	722871	NO2	Y	3.46	1.01	N
P108	Balmoral Road, Blairgowrie	R	318292	745414	NO2	N	0.23	1.72	N
P109	44 Kinnoull Street	R	311660	723893	NO_2	Y	0.25	2.65	N

(1) 0 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 2018 (%) (2)	NO_2 Annual Mean Concentration ($\mu g/m^3$) (3)				
					2014	2015	2016	2017	2018
High Street	R	Automatic	N/A	93	22	22	23	17	21
Atholl Street	R	Automatic	N/A	94	45	49	45	40	37
James Square	R	Automatic	N/A	94	23	23	26	25	17
P1	R	Diffusion	N/A	100	40	36	37	35	33
P2	R	Diffusion	N/A	58	21	22	22	22	18
P5	UC	Diffusion	N/A	100	20	21	20	20	18
P6	UB	Diffusion	N/A	92	11	12	11	11	10
P7	UC	Diffusion	N/A	58	18	15	19	16	21
P13	R	Diffusion	N/A	100	30	32	31	31	27
P20	R	Diffusion	N/A	100	27	26	27	26	25
P29	R	Diffusion	N/A	92	40	40	33	31	29

Site ID	Site Type	Monitoring Type	Valid Data Capture for Monitoring Period (%) (1)	Valid Data Capture 2018 (%) (2)	NO_2 Annual Mean Concentration ($\mu g/m^3$) (3)				
					2014	2015	2016	2017	2018
P30	R	Diffusion	N/A	100	34	35	33	35	30
P31	R	Diffusion	N/A	100	29	27	27	25	23
P32	R	Diffusion	N/A	83	29	33	33	32	29
P33	R	Diffusion	N/A	92	35	35	35	31	30
P34	R	Diffusion	N/A	100	45	44	43	41	38
P35	R	Diffusion	N/A	100	26	26	26	23	21
P36	R	Diffusion	N/A	100	30	28	29	28	27
P37	R	Diffusion	N/A	100	27	26	26	25	23
P38	R	Diffusion	N/A	100	30	27	28	27	27
P39	R	Diffusion	N/A	83	44	40	38	35	36
P40	R	Diffusion	N/A	100	**42**	**43**	**41**	40	34
P41	R	Diffusion	N/A	100	**42**	37	39	37	34
P43	R	Diffusion	N/A	88	**49**	**47**	**46**	**44**	**41**
P45	UC	Diffusion	N/A	83	21	19	21	20	17
P46	R	Diffusion	N/A	58	30	29	31	25	25
P47	R	Diffusion	N/A	100	25	23	25	22	21

Site ID	Site Type	Monitoring Type	Valid Data Capture for Monitoring Period (%) (1)	Valid Data Capture 2018 (%) (2)	NO_2 Annual Mean Concentration ($\mu g/m^3$) (3)				
					2014	2015	2016	2017	2018
P51	R	Diffusion	N/A	100	27	27	27	27	24
P55	UC	Diffusion	N/A	83	44	40	42	38	37
P56	UC	Diffusion	N/A	92	29	25	26	24	25
P57	UC	Diffusion	N/A	92	28	25	27	25	24
P58	UC	Diffusion	N/A	100	39	36	34	34	31
P64	R	Diffusion	N/A	83	43	46	43	42	39
P65	R	Diffusion	N/A	100	34	30	30	28	26
P67	R	Diffusion	N/A	100	35	35	33	34	30
P68	R	Diffusion	N/A	100	30	30	29	28	23
P69	R	Diffusion	N/A	50	31	32	34	40	37
P71	R	Diffusion	N/A	83	28	18	16	15	14
P72	R	Diffusion	N/A	92	16	37	34*	33	28
P73	UC	Diffusion	N/A	92	39	38	39	39	**47**
P74	UC	Diffusion	N/A	92	31	28	29	29	25
P76	UC	Diffusion	N/A	92	36	35	34	33	31
P78	UC	Diffusion	N/A	100	25	21	23	21	20

Site ID	Site Type	Monitoring Type	Valid Data Capture for Monitoring Period (%) (1)	Valid Data Capture 2018 (%) (2)	NO_2 Annual Mean Concentration ($\mu g/m^3$) (3)				
					2014	2015	2016	2017	2018
P79	R	Diffusion	N/A	94	40	36	37	34	32
P81	R	Diffusion	N/A	100	25	23	23	22	18
P82	R	Diffusion	N/A	100	27	29	26	24	22
P83	R	Diffusion	N/A	100	22	20	19	15	15
P86	R	Diffusion	N/A	100	28	26	25	25	23
P87	BG	Diffusion	N/A	92	7	6	6	7	6
P89	R	Diffusion	N/A	100	37	37	37	34	28
P90	R	Diffusion	N/A	100	34	30	30	30	26
P94	UC	Diffusion	N/A	83	N/A	26*	24	21	19
P95	K	Diffusion	N/A	67	N/A	N/A	40*	43	35
P96	K	Diffusion	N/A	75	N/A	N/A	35*	33	33
P97	R	Diffusion	N/A	92	N/A	N/A	33*	31	33
P98	R	Diffusion	N/A	92	N/A	N/A	22*	20	22
P99	UB	Diffusion	N/A	100	N/A	N/A	18*	17	15
P100	UC	Diffusion	N/A	83	N/A	N/A	21*	19	18
P101	R	Diffusion	N/A	92	N/A	N/A	28*	26	23

Site ID	Site Type	Monitoring Type	Valid Data Capture for Monitoring Period (%) (1)	Valid Data Capture 2018 (%) (2)	NO_2 Annual Mean Concentration (µg/m^3) (3)				
					2014	2015	2016	2017	2018
P102	R	Diffusion	N/A	83	N/A	N/A	24*	24	22
P103	R	Diffusion	N/A	100	N/A	N/A	41*	38	37
P104	R	Diffusion	N/A	100	N/A	N/A	31*	30	27
P105	R	Diffusion	N/A	58	N/A	N/A	18*	21	18
P106	R	Diffusion	N/A	92	N/A	N/A	N/A	9	9
P107	R	Diffusion	N/A	75	N/A	N/A	N/A	29	29
P108	R	Diffusion	N/A	92	N/A	N/A	N/A	N/A	23
P109	R	Diffusion	N/A	42	N/A	N/A	N/A	N/A	26

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 LAQM.TG(16) 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 2018 (%) (2)	NO_2 1-Hour Means > 200µg/m^3 (3)				
					2014	2015	2016	2017	2018
Perth 1 (High Street)	Roadside	Automatic	93	93	0	0	0	0	0
Perth 2 (Atholl Street)	Roadside	Automatic	94	94	**13**	0	0	**1**	0
Crieff (James Square)	Roadside	Automatic	94	94	0	0	**4**	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.

Figure 1. Annual Mean Trend for NO_2 at Atholl Street

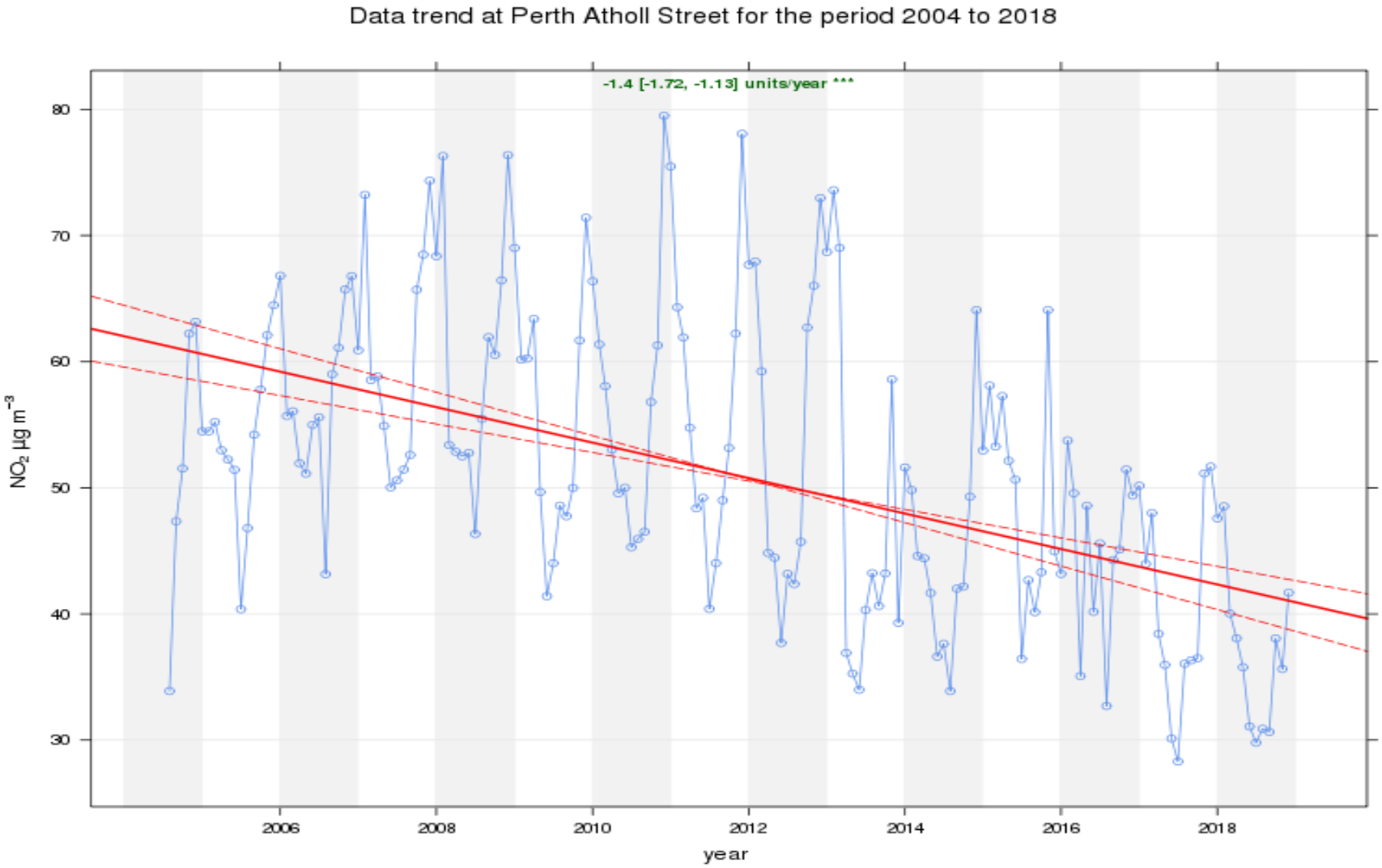


Figure 2. Annual Mean Trend for NO_2 at High Street

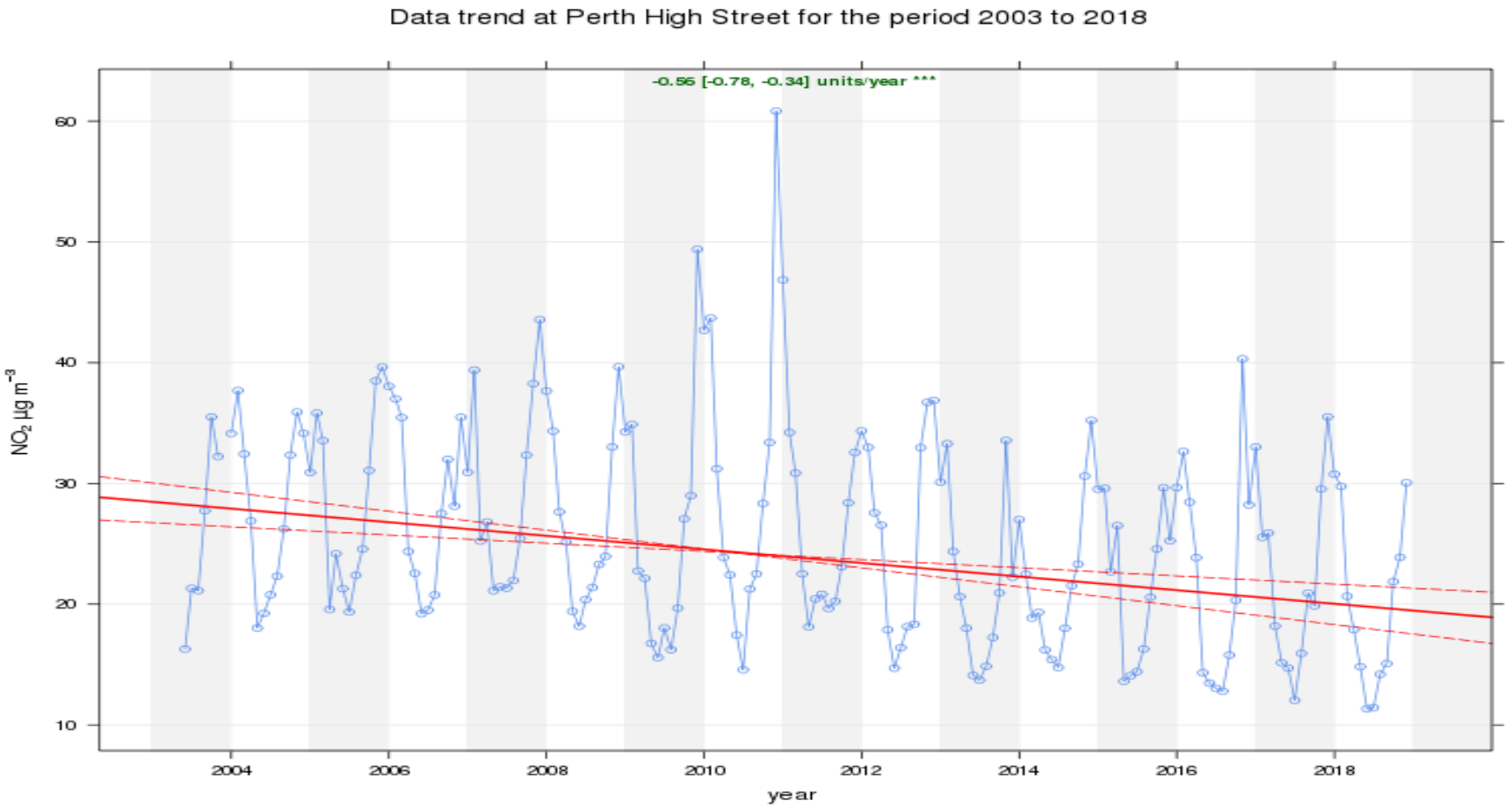


Figure 3. Annual Mean Trend for NO_2 at Crieff

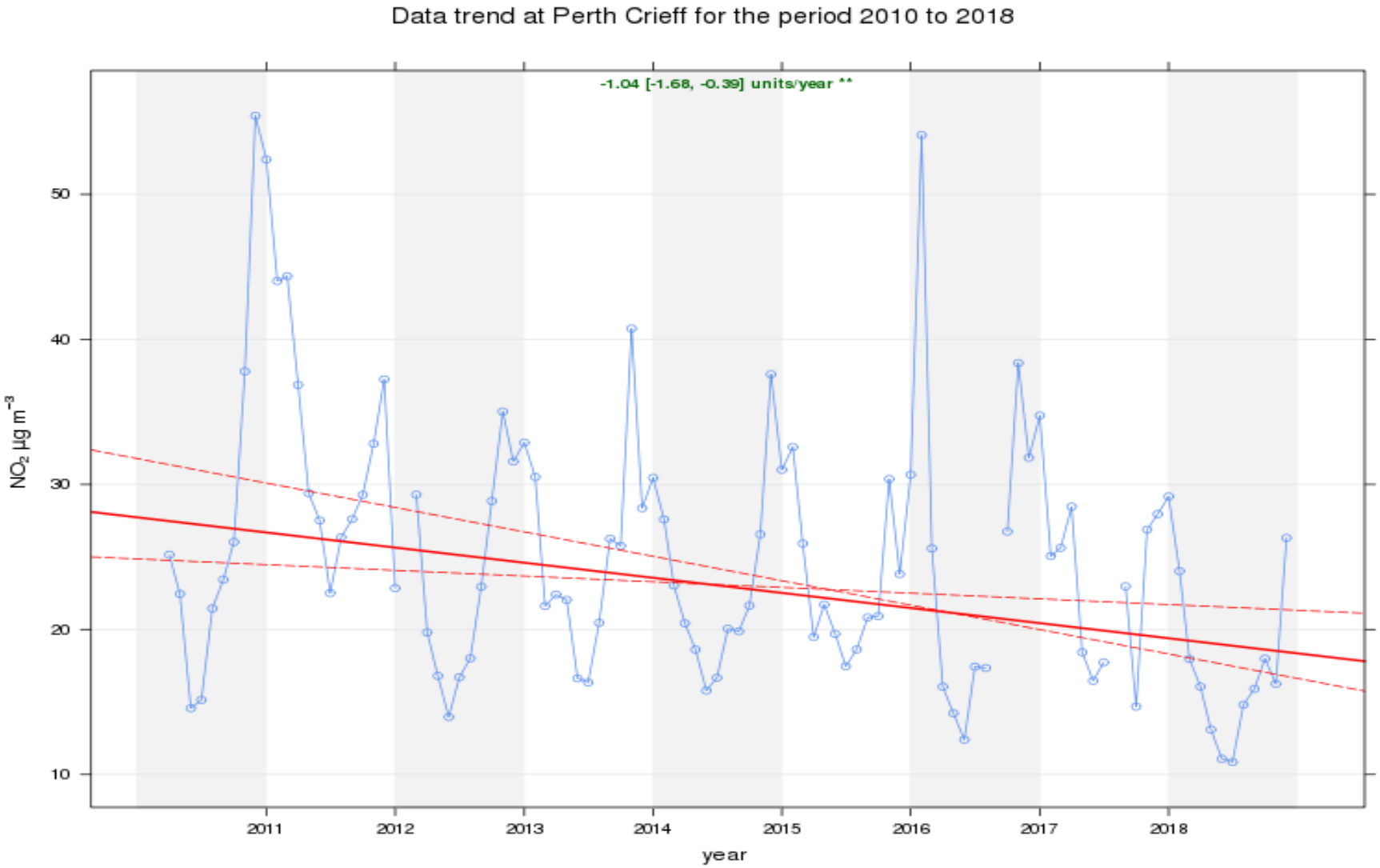


Table A.5 – Annual Mean PM_{10} Monitoring Results

Site ID	Site Type	Valid Data Capture for Monitoring Period (%) (1)	Valid Data Capture 2018 (%) (2)	PM_{10} Annual Mean Concentration (µg/m^3) (3)				
				2014	2015	2016	2017	2018
Perth 2 (Atholl Street)	Roadside	N/A	95	**20**	**18**	**18**	17	14
Perth 3 (Muirton)	Background	N/A	86	10	9	10	9	10
Crieff (James Square)	Roadside	N/A	97	**20**	14	16	11	10

Notes: Exceedances of the PM_{10} annual mean objective of 18µg/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 LAQM.TG(16), 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 2018 (%) (2)	PM_{10} 24-Hour Means > 50µg/m^3 (3)				
				2014	2015	2016	2017	2018
Perth 2 (Atholl Street)	Roadside	N/A	95	**1**	**6**	0	**4**	0
Perth 3 (Muirton)	Background	N/A	86	0	0	0	0	0
Crieff (James Square)	Roadside	N/A	97	**1**	0	0	0	0

Notes: Exceedances of the PM_{10} 24-hour mean objective (50µg/m^3 not to be exceeded more than 7 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 98.1st percentile of 24-hour means is provided in brackets.

Figure 4. PM_{10} Trend for Atholl Street

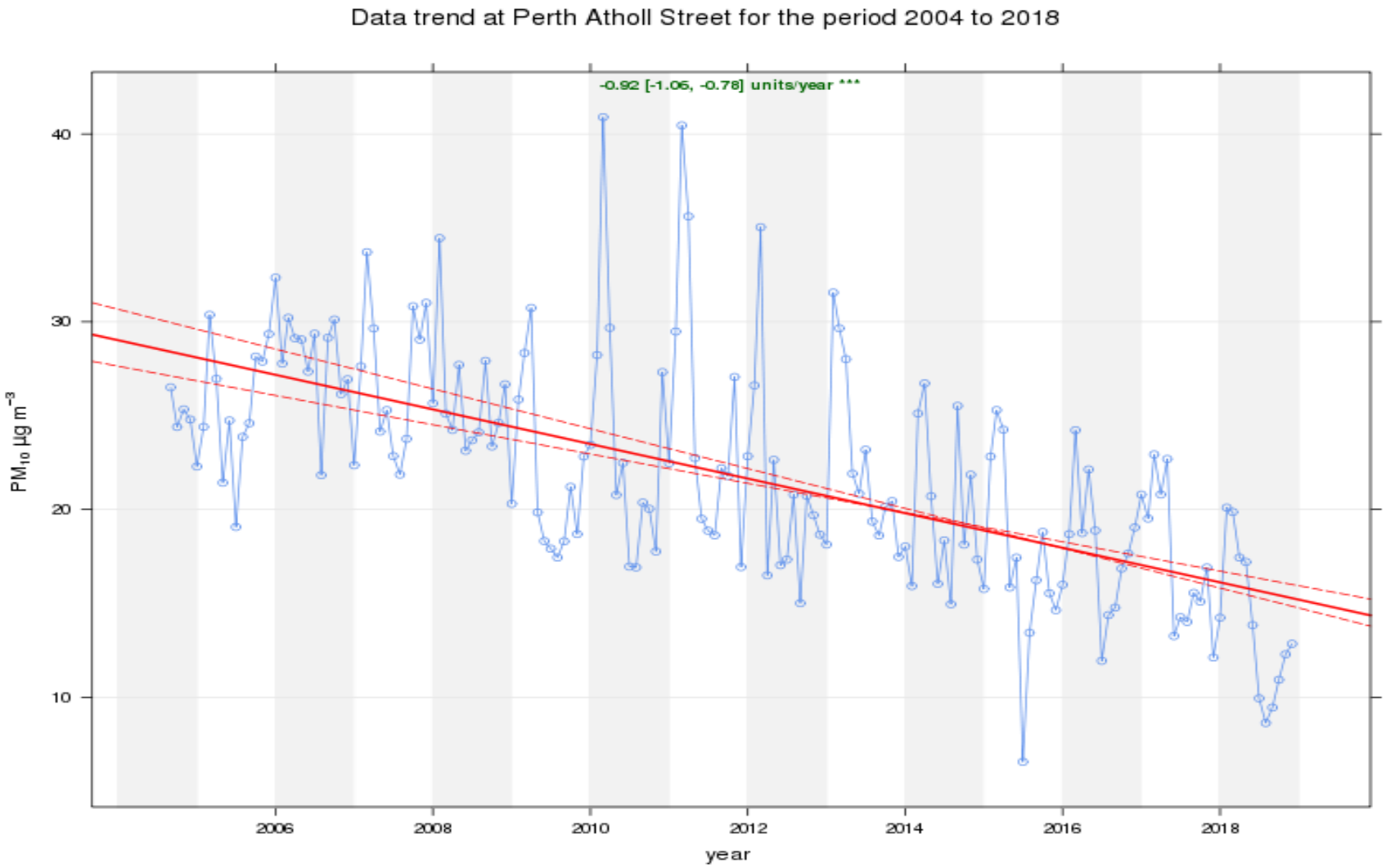


Figure 5. PM_{10} Trend for North Muirton

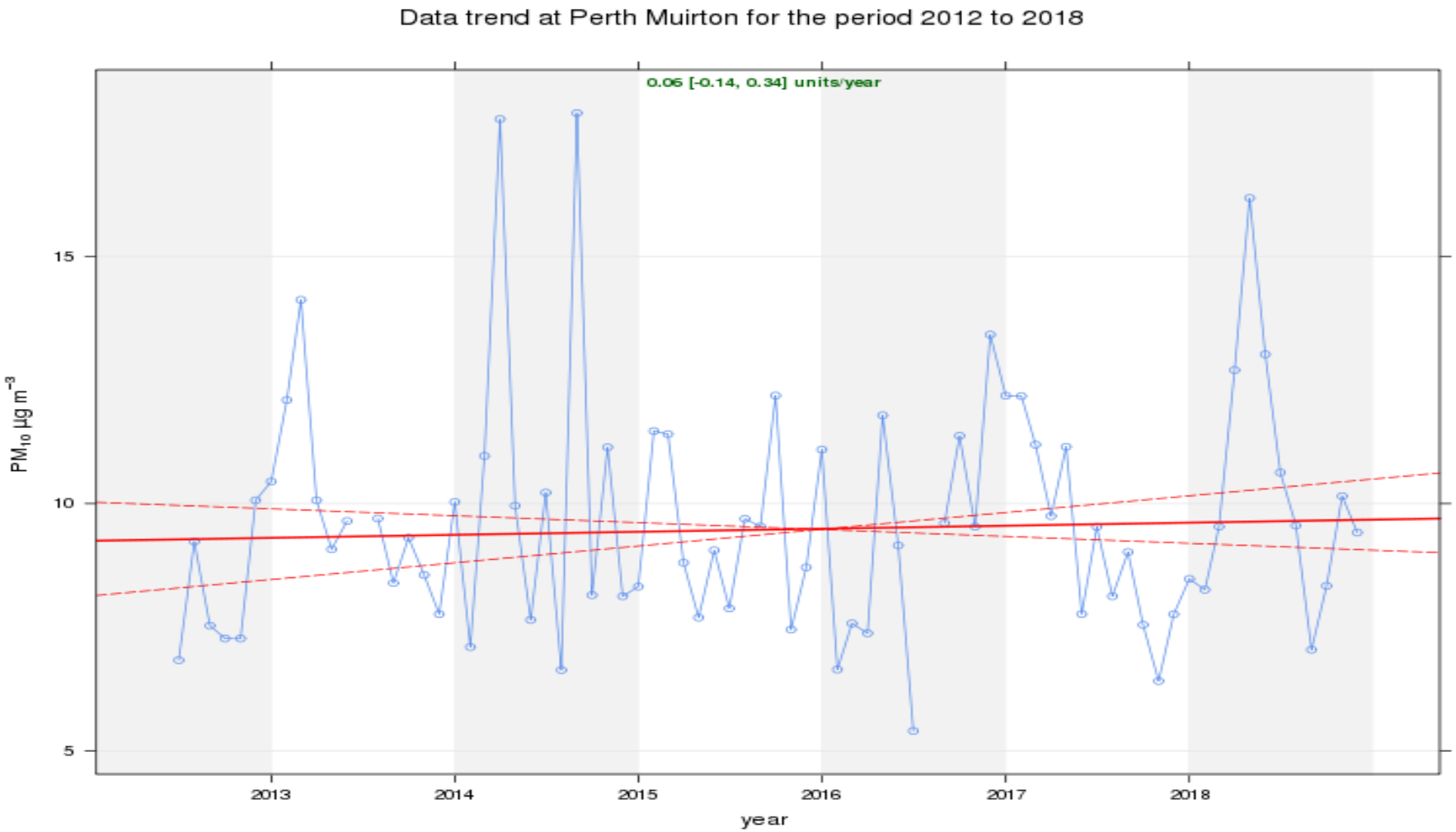


Figure 6. PM_{10} Trend for Crieff

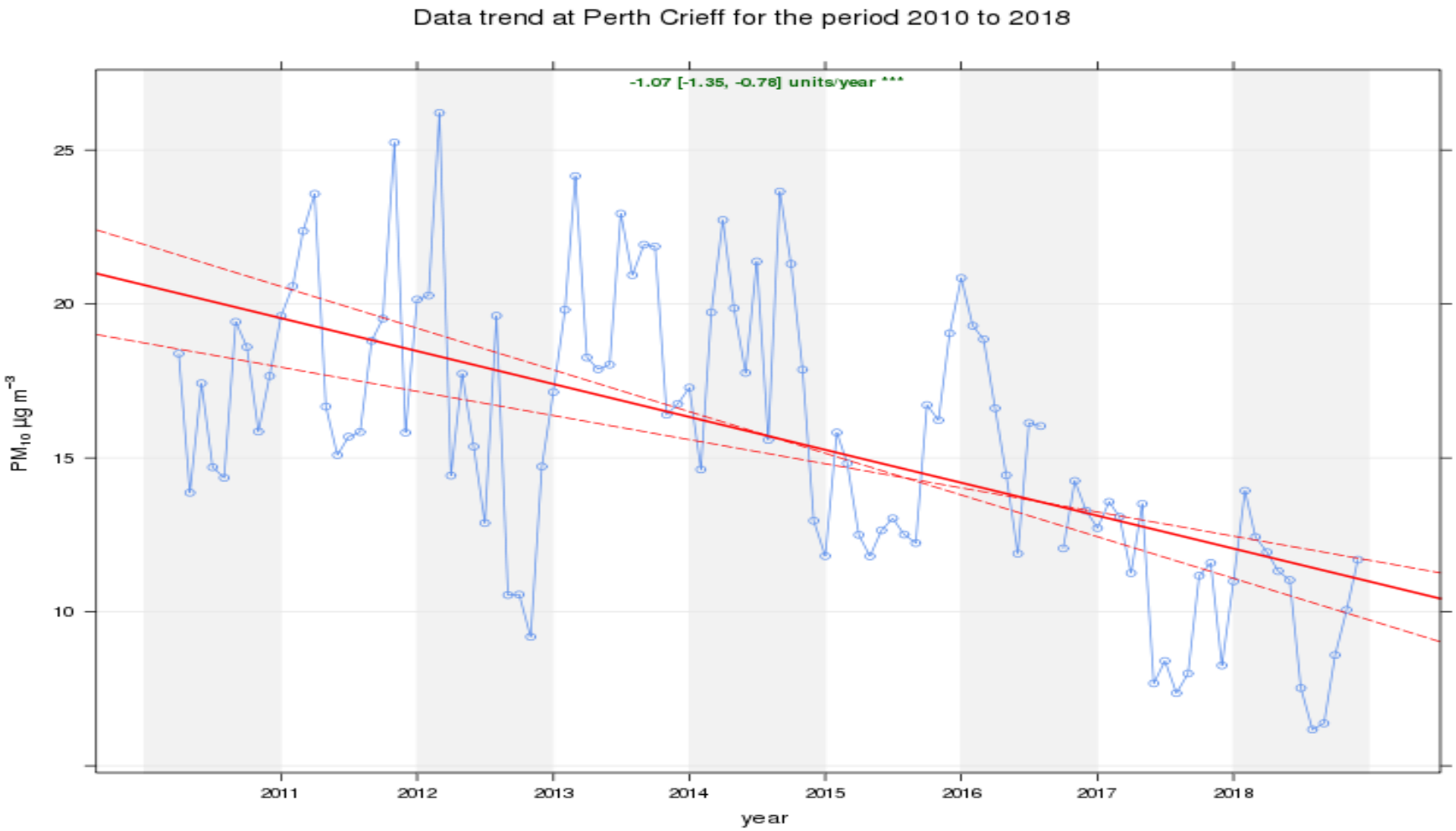


Table A.7 – Annual Mean $PM_{2.5}$ Monitoring Results

Site ID	Site Type	Valid Data Capture for Monitoring Period (%) (1)	Valid Data Capture 2018 (%) (2)	$PM_{2.5}$ Annual Mean Concentration (µg/m^3) (3)				
				2014	2015	2016	2017	2018
Perth 1 (High Street)	Roadside	N/A	99	N/A	N/A	N/A	N/A	7
Perth 2 (Atholl Street)	Roadside	N/A	95	N/A	N/A	N/A	N/A	7
Crieff (James Square)	Roadside	N/A	97	N/A	N/A	N/A	N/A	6

Notes: Exceedances of the PM_{10} annual mean objective of 10µg/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 LAQM.TG(16), valid data capture for the full calendar year is less than 75%. See Appendix C for details.

Appendix B: Full Monthly Diffusion Tube Results for 2018

Table B.1 – NO_2 Monthly Diffusion Tube Results for 2018

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 (1)
P1	50.2	50.3	47.5	41.2	41.4	27.1	29.0	28.8	28.0	37.0	45.9	45.2	39	33
P2	32.9	31.3	19.4	X	X	X	14.3	X	X	22.1	26.8	29.6	21	18
P5	27.8	30.6	17.4	17.1	19.1	12.2	14.7	17.8	19.8	22.1	24.8	28.9	21	18
P6	22.1	20.5	X	8.7	8	4.4	5.8	7.6	7.1	12.3	15.4	19.1	12	10
P7	27.3	25.5	18.5	X	38.3	X	X	X	X	17.3	23.4	24.3	25	21
P13	43.3	42.4	29.8	28	31.2	23.5	22.9	25.9	26.1	32.4	33.3	37.9	31	27
P20	40.9	41	28.2	28	27.6	20.2	18.6	21.3	20.9	29.3	33.4	36.7	29	25
P29	47.3	39.8	36.9	32.6	31.5	22.2	22.9	21.2	X	35.8	40.5	41.2	34	29
P30	48.9	46.7	31.3	32.8	32.4	25.5	28.1	29.9	30.6	36.6	35.1	43.5	35	30
P31	32.7	36.9	32.3	28.3	23.2	18.6	17.9	18.2	19.4	27.2	33.6	35.4	27	23
P32	44.4	42.1	36.4	X	X	24.5	25.1	26.6	30.3	34.6	39.8	43.2	35	29

Site ID	NO_2 Mean Concentrations (µg/m^3)													
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual Mean	
													Raw Data	Bias Adjusted (1)
P33	47.6	45.2	35.6	31.2	40.3	X	24.6	27	27.8	32.7	38.2	42.9	36	30
P34	57.7	57.5	43.9	44.4	53.1	36.7	37.9	39	39.1	40	46.7	47.3	45	38
P35	38	36.2	24.5	19.6	19.3	14.3	14.2	18.1	21.6	25.6	29.5	33.1	25	21
P36	43.7	44.8	34.6	29.9	29.7	21	22.5	25.2	23	33.5	37.6	39.1	32	27
P37	37.6	38.7	31.6	26.2	26	19.3	18.7	19.1	19.3	26.8	33	34.9	28	23
P38	33	32.6	37	34.6	32.4	26.7	23.5	21.6	19.6	30	55.9	29.1	31	27
P39	48.1	49.3	46.6	46.4	X	37.7	39.7	X	30	37.2	46	41.1	42	36
P40	50.7	54	39.2	31.8	39.2	32	35.1	36.1	40.1	38.5	39.2	45.5	40	34
P41	46	49.4	47.2	48.1	44.3	31.6	31.5	29.5	25.8	38.7	44.3	42.9	40	34
P43	57.1	56.9	54.7	45.4	X	42.2	43.5	43.2	40.3	46.7	50.0	51.9	48	**41**
P45	X	X	25.1	20.2	20	13	12.5	13.2	11.6	22.7	28.2	31.6	20	17
P46	34.5	33.8	32.2	31.1	X	X	X	X	11.6	X	30.6	34.1	30	25
P47	32.8	31.5	25.9	17	25	19.6	19.1	17.2	15.6	25.4	33	32.4	25	21
P51	38.4	39.5	30.9	32.4	25	20.6	18.9	19.4	21.8	27.1	30.8	32.7	28	24
P54	34.0	33.0	22.2	21.4	18.5	14.2	14.5	18.0	19.0	25.3	41.2	32.8	25	21

Site ID	NO_2 Mean Concentrations (µg/m^3)													
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual Mean	
													Raw Data	Bias Adjusted (1)
P55	57	45.2	47.3	49.1	X	X	34.6	33.7	30.2	37.9	48.9	48.5	43	37
P56	38.9	30.7	31.7	29.5	X	49.9	18.9	18.6	20.1	25.8	32.7	32.3	30	25
P57	34.7	32.7	25.5	26	24	19.7	X	25.2	23.6	29.1	35.7	34.8	28	24
P58	48.1	43.2	34.4	38	38.2	30.7	28.2	30.2	26.1	35.1	42.4	44.2	37	31
P61	55.1	55.2	41.2	44.9	50.6	33.1	39.0	38.9	39.7	44.2	46.0	47.1	45	38
P62	36.5	38.1	34.4	29.4	30	22.5	23.3	23.6	19.7	26.4	37.8	32.1	29	25
P63	44.3	48.1	39.4	28.9	40	35.5	32.2	29.9	30	36.8	36.8	37.5	37	31
P64	52.7	57.3	38.7	43.1	42.1	X	X	41.6	43	46.1	48.9	47.1	46	39
P65	38.7	37.3	34.1	35.9	32.3	26	23.4	23.2	19.6	29.4	31.9	35.4	31	26
P67	45.8	47.2	30.6	33.6	34.7	26.7	31	32.3	35.6	29.7	37.5	37.6	35	30
P68	38.1	37.6	25.1	23.9	25.8	19.7	20.7	23.8	25.1	16.1	29.8	36.9	27	23
P69	60.8	64.4	42.1	52.8	33.4	23.5	X	X	X	X	X	X	43	37
P71	27	25.4	17.9	X	X	8.2	8.9	9.1	8.5	16.1	23.7	24.1	17	14
P72	40.9	48.1	X	16	32.6	26	26.5	28.8	30.2	34.4	36.8	41.4	33	28
P73	61.8	56.7	X	44.7	43.1	33	32.5	34	27.9	60.3	105.5	106.9	55	47

Site ID	NO_2 Mean Concentrations (µg/m^3)													
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual Mean	
													Raw Data	Bias Adjusted (1)
P74	39.6	38.8	35.2	32.1	32.4	17.6	X	19.6	20.4	22.4	31.6	32.3	29	25
P75	32.8	28.7	21.4	19.5	16.5	13.3	X	29.5	20.9	21.4	21.0	27.7	23	20
P76	45.6	43.5	36.8	38.6	38.6	X	31.6	29.4	29.7	31	39.4	42.1	37	31
P78	32.6	25.8	28.9	25.8	24.5	18.2	16.1	15.5	15.1	19.7	29.2	28.5	23	20
P79	44.9	45.2	45.8	44.7	39.8	27.9	28.9	29.4	24.4	34.7	42.4	38.6	37	32
P81	28.1	29.4	19.8	20.5	18.1	13.4	14.8	17.5	18.9	22.2	23.8	29.9	21	18
P82	41.1	38.1	28.8	25.4	25.4	16.3	18.2	19.4	20.6	23.7	31.7	26.3	26	22
P83	24.8	22.9	23.2	17	17.5	10.8	11.1	12.2	11.3	16.3	25.3	20.9	18	15
P86	40.1	36.4	28.6	24.3	27.5	19.6	18.7	20.1	20	26.3	33.9	29.9	27	23
P87	13.4	9.2	6.3	5.3	4.4	2.1	X	3.1	3.1	5.9	9.5	11.5	7	6
P89	45.3	41	28.4	32.1	33	24.3	11.3	27.8	33.1	39	35.6	42.7	33	28
P90	38.1	41.1	29.5	30.4	29.6	20.5	23.1	25.3	28.3	33.6	32.9	34.9	31	26
P94	33.1	X	X	22.1	26	19	19	17.3	14.6	22.9	28.6	18.3	22	19
P95	58.3	X	X	X	42	32.4	33.9	32.9	33.6	X	44.1	47.6	41	35
P96	50.7	46.8	42.6	39.9	35.3	X	25.2	X	22.4	X	42	43.2	39	33

Site ID	NO_2 Mean Concentrations (µg/m^3)													
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual Mean	
													Raw Data	Bias Adjusted (1)
P97	89.8	48	30.1	28.7	32.9	22.6	24.6	29.3	X	38.9	37.6	43.9	39	33
P98	32.1	33.5	24	26.2	X	43.8	16.1	15.7	13.8	21.9	32.2	28	26	22
P99	27.5	24.9	20.8	14.4	12.8	8.5	8.6	11.4	12.2	20.2	27.1	24.8	18	15
P100	28.8	24.8	22.6	22.9	X	X	15.4	13.7	11.7	17.9	28.6	27.3	21	18
P101	37.5	X	28.2	26.1	25.1	19.9	21.5	20.6	23.1	28	27.9	36.6	27	23
P102	36.4	33.7	28.4	26.1	20.3	14.3	13.8	16.9	X	39.8	29.1	X	26	22
P103	53.3	57	41	41.8	44.3	34.8	37.1	35.3	34.7	42.9	53.1	50.3	44	37
P104	46.3	46.6	33.6	33.7	28.2	20.4	21.5	22	24.5	30.6	39.8	39.9	32	27
P105	30.7	29.4	18	20.6	18.9	15.7	16.8	X	X	X	X	X	21	18
P106	X	39.7	10.1	7.6	7.8	4.1	3.8	4	4.8	7.9	13.5	15.3	11	9
P107	52.6	49.5	X	X	X	21	21.9	26.1	25.8	30	39.4	37.8	34	29
P108	X	28.5	28.2	32.9	32.5	22.6	24.8	24.7	19.6	21.6	37.9	28.9	27	23
P109	X	X	X	X	X	X	X	23.9	26.8	34	34.5	34.4	31	26

(1) See Appendix C for details on bias adjustment

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

Bias Adjustment of data

The data for Perth and Kinross has been adjusted using a local adjustment factor. The adjustment factor has been calculated for each of the three roadside monitoring stations and then an average of these values has been taken. Please see below for the spreadsheets showing the calculations for each of the three sites.

Atholl Street

Checking Precision and Accuracy of Triplicate Tubes

AEA Energy & Environment
From the AEA group

Diffusion Tubes Measurements										Automatic Method		Data Quality Check	
Period	Start Date dd/mm/yyyy	End Date dd/mm/yyyy	Tube 1 µgm^{-3}	Tube 2 µgm^{-3}	Tube 3 µgm^{-3}	Triplicate Mean	Standard Deviation	Coefficient of Variation (CV)	95% CI of mean	Period Mean	Data Capture (% DC)	Tubes Precision Check	Automatic Monitor Data
1	01/01/2018	31/01/2018	51.9	58.2	55.2	55	3.2	6	7.8	48	99	Good	Good
2	01/02/2018	28/02/2018	54.7	55.5	55.3	55	0.4	1	1.0	49	100	Good	Good
3	01/03/2018	31/03/2018	41.3	41.8	40.6	41	0.6	1	1.5	40	90	Good	Good
4	01/04/2018	30/04/2018	44.6	47.4	42.72	45	2.4	5	5.9	38	38	Good	or Data Captu
5	01/05/2018	31/05/2018	51.8	53.9	46.02	51	4.1	8	10.1	36	99	Good	Good
6	01/06/2018	30/06/2018	36.5	36	26.71	33	5.5	17	13.7	31	100	Good	Good
7	01/07/2018	31/07/2018	40.1	36.5	40.4	39	2.2	6	5.4	30	100	Good	Good
8	01/08/2018	31/08/2018	37.3	40.7	38.82	39	1.7	4	4.2	31	100	Good	Good
9	01/09/2018	30/09/2018	37.8	41	40.36	40	1.7	4	4.2	31	99	Good	Good
10	01/10/2018	31/10/2018	47.4	42.7	42.6	44	2.7	6	6.8	38	100	Good	Good
11	01/11/2018	30/11/2018	44.1	47.3	46.5	46	1.7	4	4.1	36	100	Good	Good
12	01/12/2018	31/12/2018	47.2	44.5	49.7	47	2.6	6	6.5	42	100	Good	Good
13													
											Overall survey -->	Good precision	Good Overall DC

It is necessary to have results for at least two tubes in order to calculate the precision of the measurements

(Check average CV & DC from Accuracy calculations)

Site Name/ ID:

Precision: 12 out of 12 periods have a CV smaller than 20%

Accuracy (with 95% confidence interval) without periods with CV larger than 20%

Bias calculated using 11 periods of data
Bias factor A: 0.84 (0.79 - 0.9)
Bias B: 19% (11% - 27%)

Diffusion Tubes Mean: 45 µgm^{-3}
Mean CV (Precision): 6

Automatic Mean: 37 µgm^{-3}
Data Capture for periods used: 99%

Adjusted Tubes Mean: 37 (35 - 40) µgm^{-3}

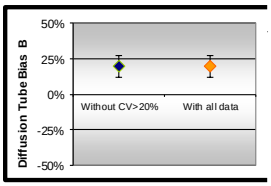
Accuracy (with 95% confidence interval) WITH ALL DATA

Bias calculated using 11 periods of data
Bias factor A: 0.84 (0.79 - 0.9)
Bias B: 19% (11% - 27%)

Diffusion Tubes Mean: 45 µgm^{-3}
Mean CV (Precision): 6

Automatic Mean: 37 µgm^{-3}
Data Capture for periods used: 99%

Adjusted Tubes Mean: 37 (35 - 40) µgm^{-3}



Jaume Targa, for AEA
Version 04 - February 2011

High Street

Checking Precision and Accuracy of Triplicate Tubes

AEA Energy & Environment
From the AEA group

Period	Start Date dd/mm/yyyy	End Date dd/mm/yyyy	Tube 1 µgm^{-3}	Tube 2 µgm^{-3}	Tube 3 µgm^{-3}	Triplicate Mean	Standard Deviation	Coefficient of Variation (CV)	95% CI of mean	Period Mean	Data Capture (% DC)	Tubes Precision Check	Automatic Monitor Data
1	01/01/2018	31/01/2018	35.4	32.4	34.2	34	1.5	4	3.8	31	95	Good	Good
2	01/02/2018	28/02/2018	32.5	34.1	32.3	33	1.0	3	2.5	30	99	Good	Good
3	01/03/2018	31/03/2018	23.2	22.7	20.8	22	1.3	6	3.1	21	99	Good	Good
4	01/04/2018	30/04/2018	19.7	22.1	22.36	21	1.5	7	3.6	18	100	Good	Good
5	01/05/2018	31/05/2018	18.3	19.9	17.29	18	1.3	7	3.3	15	99	Good	Good
6	01/06/2018	30/06/2018	12.2	<0.5 X	16.19	14	2.8	20	25.3	11	90	Poor Precision	Good
7	01/07/2018	31/07/2018	14	X	14.95	14	0.7	5	6.0	11	59	Good	or Data Captu
8	01/08/2018	31/08/2018	17.9	18.2	17.82	18	0.2	1	0.5	14	87	Good	Good
9	01/09/2018	30/09/2018	19.2	19.8	18.04	19	0.9	5	2.2	15	94	Good	Good
10	01/10/2018	31/10/2018	25.7	26.2	23.9	25	1.2	5	3.0	22	99	Good	Good
11	01/11/2018	30/11/2018	30.3	29.1	64.3	41	20.0	48	49.6	24	99	Poor Precision	Good
12	01/12/2018	31/12/2018	33	32.6	32.7	33	0.2	1	0.5	30	99	Good	Good
13													
											Overall survey -->	Good precision	Good Overall DC

Diffusion Tubes Measurements | Automatic Method | Data Quality Check

It is necessary to have results for at least two tubes in order to calculate the precision of the measurements

(Check average CV & DC from Accuracy calculations)

Site Name/ ID:

Precision 10 out of 12 periods have a CV smaller than 20%

Accuracy (with 95% confidence interval) without periods with CV larger than 20%

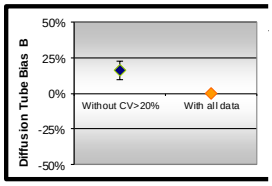
Bias calculated using 9 periods of data

Bias factor A	0.87 (0.83 - 0.93)
Bias B	14% (8% - 21%)
Diffusion Tubes Mean:	25 µgm^{-3}
Mean CV (Precision):	4
Automatic Mean:	22 µgm^{-3}
Data Capture for periods used:	97%
Adjusted Tubes Mean:	22 (21 - 23) µgm^{-3}

Accuracy (with 95% confidence interval) WITH ALL DATA

Bias calculated using 11 periods of data

Bias factor A	
Bias B	
Diffusion Tubes Mean:	25 µgm^{-3}
Mean CV (Precision):	10
Automatic Mean:	21 µgm^{-3}
Data Capture for periods used:	96%
Adjusted Tubes Mean:	µgm^{-3}



Jaume Targa, for AEA
Version 04 - February 2011

James Square, Crieff

Checking Precision and Accuracy of Triplicate Tubes

AEA Energy & Environment
From the AEA group

Period	Start Date dd/mm/yyyy	End Date dd/mm/yyyy	Tube 1 µgm^{-3}	Tube 2 µgm^{-3}	Tube 3 µgm^{-3}	Triplicate Mean	Standard Deviation	Coefficient of Variation (CV)	95% CI of mean	Period Mean	Data Capture (% DC)	Tubes Precision Check	Automatic Monitor Data
1	01/01/2018	31/01/2018	32	33.3	33	33	0.7	2	1.7	29	63	Good	or Data Captu
2	01/02/2018	28/02/2018	29.5		27.9	29	1.1	4	10.2	24	100	Good	Good
3	01/03/2018	31/03/2018	22.2	21.5	20.4	21	0.9	4	2.3	18	93	Good	Good
4	01/04/2018	30/04/2018	19.4	0.5	19.64	13	11.0	83	27.3	16	99	Poor Precision	Good
5	01/05/2018	31/05/2018	16.3	35.3	16.67	23	10.9	48	27.0	13	98	Poor Precision	Good
6	01/06/2018	30/06/2018	12.7	12.7	14.41	13	1.0	7	2.5	11	99	Good	Good
7	01/07/2018	31/07/2018	0.5	0.5	0.57	1	0.0	8	0.1	11	100	Good	Good
8	01/08/2018	31/08/2018	29.1	28.5	30.91	30	1.3	4	3.1	15	90	Good	Good
9	01/09/2018	30/09/2018	20.5	20.9	21.27	21	0.4	2	1.0	16	93	Good	Good
10	01/10/2018	31/10/2018	20.9	21.7	21.6	21	0.4	2	1.1	18	100	Good	Good
11	01/11/2018	30/11/2018	19.6	20.2	23.2	21	1.9	9	4.8	16	100	Good	Good
12	01/12/2018	31/12/2018	27.8	28.2	27	28	0.6	2	1.5	26	99	Good	Good
13													
											Overall survey -->	Good precision	Good Overall DC

Diffusion Tubes Measurements | Automatic Method | Data Quality Check

It is necessary to have results for at least two tubes in order to calculate the precision of the measurements

(Check average CV & DC from Accuracy calculations)

Site Name/ ID:

Precision 10 out of 12 periods have a CV smaller than 20%

Accuracy (with 95% confidence interval) without periods with CV larger than 20%

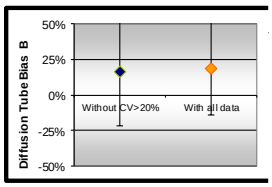
Bias calculated using 9 periods of data

Bias factor A	0.84 (0.64 - 1.23)
Bias B	19% (-19% - 57%)
Diffusion Tubes Mean:	20 µgm^{-3}
Mean CV (Precision):	5
Automatic Mean:	17 µgm^{-3}
Data Capture for periods used:	97%
Adjusted Tubes Mean:	17 (13 - 25) µgm^{-3}

Accuracy (with 95% confidence interval) WITH ALL DATA

Bias calculated using 11 periods of data

Bias factor A	0.84 (0.65 - 1.15)
Bias B	20% (-13% - 53%)
Diffusion Tubes Mean:	20 µgm^{-3}
Mean CV (Precision):	16 caution
Automatic Mean:	17 µgm^{-3}
Data Capture for periods used:	97%
Adjusted Tubes Mean:	17 (13 - 23) µgm^{-3}



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The average of the values above is 0.85. The decision to use a local adjustment factor is consistent with what we have done previously and is also more conservative than using the national adjustment factor of 0.8.

Annualisation

Where less than 75% data capture for the diffusion tubes has been achieved the data has been annualised using the procedure laid out in LAQM TG.16. The data has been annualised using two continuous background monitors located within 50 miles of Perth and Kinross. Annualisation has been carried out for the following locations

- P2
- P69
- P105
- P109

Copies of the spreadsheets below show the calculations which have been completed for these locations.

Site ID - P2												
Dundee Mains Loan Urban Background							Grangemouth Moray Urban Background					
Month	B1	D1	B1 when D1 available				Month	B1	D1	B1 when D1 available		
Jan	22	32.9	22				Jan	23	32.9	23		
Feb	16	31.3	16				Feb	22	31.3	22		
Mar	10	19.4	10				Mar	23	19.4	23		
Apr	10						Apr	16				
May	10						May	15				
Jun	7						Jun	14				
Jul	8	14.3	8				Jul	9	14.3	9		
Aug	7						Aug	8				
Sep	7						Sep	9				
Oct	13	22.1	13				Oct	17	22.1	17		
Nov	16	26.8	16				Nov	19	26.8	19		
Dec	21	29.6	21				Dec	25	29.6	25		
Average	12.25	25.2	15.14				Average	16.67	25.2	19.71		
B1 Annual Mean				12.25			B1 Annual Mean				16.67	
B1 Period Mean				15.14			B1 Period Mean				19.71	
Ratio Annual Mean: Period Mean				0.81			Ratio Annual Mean: Period Mean				0.85	
Average Ratio		0.83										
Annualised Average for P2			**21**									

Site ID - P69												
Dundee Mains Loan Urban Background							Grangemouth Moray Urban Background					
Month	B1	D1	B1 when D1 available				Month	B1	D1	B1 when D1 available		
Jan	22	60.8	22				Jan	23	60.8	23		
Feb	16	64.4	16				Feb	22	64.4	22		
Mar	10	42.1	10				Mar	23	42.1	23		
Apr	10	52.8	10				Apr	16	52.8	16		
May	10	33.4	10				May	15	33.4	15		
Jun	7	23.5	7				Jun	14	23.5	14		
Jul	8						Jul	9				
Aug	7						Aug	8				
Sep	7						Sep	9				
Oct	13						Oct	17				
Nov	16						Nov	19				
Dec	21						Dec	25				
Average	12.25	46.17	12.5				Average	16.67	46.17	18.83		
B1 Annual Mean				12.25			B1 Annual Mean				16.67	
B1 Period Mean				12.5			B1 Period Mean				18.83	
Ratio Annual Mean: Period Mean				0.98			Ratio Annual Mean: Period Mean				0.88	
Average Ratio		0.93										
Annualised Average for P69			**43**									

Site ID - P105													
Dundee Mains Loan Urban Background							Grangemouth Moray Urban Background						
Month	B1	D1	B1 when D1 available				Month	B1	D1	B1 when D1 available			
Jan	22	30.7	22				Jan	23	30.7	23			
Feb	16	29.4	16				Feb	22	29.4	22			
Mar	10	18	10				Mar	23	18	23			
Apr	10	20.6	10				Apr	16	20.6	16			
May	10	18.9	10				May	15	18.9	15			
Jun	7	15.7	7				Jun	14	15.7	14			
Jul	8	16.8	8				Jul	9	16.8	9			
Aug	7						Aug	8					
Sep	7						Sep	9					
Oct	13						Oct	17					
Nov	16						Nov	19					
Dec	21						Dec	25					
Average	12.25	21.44	11.86				Average	16.67	21.44	17.43			
B1 Annual Mean				12.25			B1 Annual Mean				16.67		
B1 Period Mean				11.86			B1 Period Mean				17.43		
Ratio Annual Mean: Period Mean				1.03			Ratio Annual Mean: Period Mean				0.96		
Average Ratio		0.99											
Annualised Average for P105			**21**										

Site ID - P109													
Dundee Mains Loan Urban Background							Grangemouth Moray Urban Background						
Month	B1	D1	B1 when D1 available				Month	B1	D1	B1 when D1 available			
Jan	22						Jan	23					
Feb	16						Feb	22					
Mar	10						Mar	23					
Apr	10						Apr	16					
May	10						May	15					
Jun	7						Jun	14					
Jul	8						Jul	9					
Aug	7	23.9	7				Aug	8	23.9	8			
Sep	7	26.8	7				Sep	9	26.8	9			
Oct	13	34	13				Oct	17	34	17			
Nov	16	34.5	16				Nov	19	34.5	19			
Dec	21	34.4	21				Dec	25	34.4	25			
Average	12.25	30.72	12.8				Average	16.67	30.72	15.60			
B1 Annual Mean				12.25			B1 Annual Mean				16.67		
B1 Period Mean				12.80			B1 Period Mean				15.60		
Ratio Annual Mean: Period Mean				0.96			Ratio Annual Mean: Period Mean				1.07		
Average Ratio		1.01											
Annualised Average for P109			**31**										

Please note no annualisation was required for any of the continuous monitoring data.

Appendix D Correspondence with SEPA

Request for information: Local Air Quality Management

Perth and Kinross Council has requested that SEPA supply the following information so that it can undertake its annual review and assessment of local air quality (see below). The findings of this assessment must be submitted to the Scottish Government at the end of June 2019 unless an extension has been agreed. The local authorities are required to consider the following pollutants: nitrogen dioxide, sulphur dioxide, PM_{10}, benzene, 1, 3-butadiene, carbon monoxide and lead.

The **Annual Report** requires that the Local Authority review its previous work and identify recent changes that may affect local air quality. These changes can be positive or negative. The assessment should identify recent monitoring data, new developments and changes to industrial/mineral activities – and this includes SEPA regulated processes. The following questions therefore relate to all processes that are regulated by SEPA.

1. Are you aware of any changes that have been made to any Part A or B processes that will result in a positive or negative effect on the local air quality? (this includes: change of fuel, increased or decreased emissions rates, changes to stack heights, the introduction of a new process etc.).

   No changes.

   The new scrubber at 2 sisters and mercury abatement at the crematorium would have been captured in previous years. They were installed before permit variations all are pre-June 2018 Scrubber installed (May 2017) Mercury abatement (Jan 2018). However, it did not become official in terms of the permit variation until after June 2018 Scrubber-(Dec 2018) Mercury June 2019.

2. Are you aware of any SEPA regulated process that has increased its emissions to air by more than 30%?

   No

3. Are you aware of any new industrial or new commercial developments that are likely to have a significant impact on the local air quality?

   No

4. Are you aware of any Part A or B processes that have ceased to operate?

   No

5. Are you aware of any new petrol stations with an annual throughput of over 2000 cubic metres of petrol?

   No

6. Please identify any of the following potential sources of fugitive or uncontrolled particulate matter, which are new:

   - Landfill sites.
   - Quarries.
   - Unmade haulage roads on industrial sites.
   - Waste transfer stations, etc.
   - Other potential sources of fugitive particulate matter emissions.

   None

7. Are you aware of any new mineral extraction processes that are likely to have a significant impact on local air quality?

No

8. Are you aware of any new poultry units that house >400,000 birds (with mechanical ventilation), >200,000 birds (with natural ventilation) or >100,000 turkeys?

   No new units. No changes to existing Part A IA permitted installations except increase in bird numbers at Madderty Poultry Unit (PPC/A/1158010).

9. Are there any other sources that you would like to see included in Perth and Kinross Councils assessment?

   No changes to operations to report.

   One thing to raise would be that ABP, Perth reported a release of over 2000kg of F-Gas (R404a) throughout 2018, which I understand makes them the number 1 polluter for this gas in Scotland. The sources were accidental releases. SEPA are working with the site to review maintenance, certificates etc. The longer-term plan is that their refrigeration system will be converted to ammonia-glycol in the next 1-2 years.

Glossary of Terms

Abbreviation	Description
AQAP	Air Quality Action Plan - A detailed description of measures, outcomes, achievement dates and implementation methods, showing how the LA intends to achieve air quality limit values'
AQMA	Air Quality Management Area – An area where air pollutant concentrations exceed / are likely to exceed the relevant air quality objectives. AQMAs are declared for specific pollutants and objectives
APR	Air quality Annual Progress Report
AURN	Automatic Urban and Rural Network (UK air quality monitoring network)
Defra	Department for Environment, Food and Rural Affairs
DMRB	Design Manual for Roads and Bridges – Air quality screening tool produced by Highways England
FDMS	Filter Dynamics Measurement System
LAQM	Local Air Quality Management
NO_2	Nitrogen Dioxide
NO_x	Nitrogen Oxides
PM_{10}	Airborne particulate matter with an aerodynamic diameter of 10µm (micrometres or microns) or less
$PM_{2.5}$	Airborne particulate matter with an aerodynamic diameter of 2.5µm or less

QA/QC	Quality Assurance and Quality Control
SO_2	Sulphur Dioxide

References

Smart Growth for Perth http://www.pkc.gov.uk/smartgrowth

Perth Transport Futures http://www.pkc.gov.uk/transportfutures

Active Travel Strategy for Perth and Kinross Active Travel Strategy for Perth and Kinross

Active Travel Strategy Action Plan Active Travel Strategy Action Plan

Regional Transport Strategy http://www.tactran.gov.uk/documents/TACTRANRTS-FinalNov2008.pdf

Perth & Kinross Council Local Development Plan adopted 2014 http://www.pkc.gov.uk/media/23633/Local-Development-Plan/pdf/Adopted_LDP_Web_Version.pdf?m=636099646768900000

Perth & Kinross Council Local Development Plan Review (2018 -2023) http://www.pkc.gov.uk/article/15042/Local-Development-Plan-Review-2018-2023-

Mains Issue Report http://www.pkc.gov.uk/article/15073/Main-Issues-Report

Scotland's Climate Change Declaration (SCCD) Perth and Kinross Council's first annual progress report http://www.keepscotlandbeautiful.org/sustainability-climate-change/sustainable-scotland-network/climate-change-reporting/201415-submitted-reports/?cid=15383

Renewable energy installation capacity Perth & Kinross http://www.pkc.gov.uk/media/13053/Renewables-Installed-Capacity-/pdf/RenewableInstalledCapacity.pdf?m=636118891999370000

Sustainable Design and Zero Carbon Development Supplementary Guidance

http://www.pkc.gov.uk/media/24773/Sustainable-Design-SPG/pdf/P_K_Sustainable_Design_SPG_Corrected_Version

Renewables and Low Carbon Energy http://www.pkc.gov.uk/media/39833/PKCRenewableSG-Draft/pdf/PKCRenewableSG-Draftv1-31

Perth and Kinross Local Climate Impacts Profile (LCLIP)
http://www.pkc.gov.uk/NR/rdonlyres/E590425C-2665-4D13-B8DD-B70C659B3080/0/PerthandKinrossLocalClimateImpactProfile2008_w.pdf

Cleaner Air for Scotland Strategy
https://www.gov.scot/news/cleaner-air-for-scotland-1/