Part IV of the Environment Act 1995
Local Air Quality Management

Perth and Kinross Council

Air Quality Review and Assessment
Progress Report

April 2008

Executive Summary

The Environment Act 1995 established the requirement for all local authorities to undertake the periodic review and assessment of air quality to assess whether any locations are likely to exceed the national objectives and to designate air quality management areas for any locations of likely exceedence. The LAQM regime requires all local authorities to submit appropriately detailed reports according to a specified schedule to create continuity in the reporting of LAQM implementation.

Perth and Kinross Council have collated 2007 data from an array of monitoring sites and other sources in accordance with statutory requirements and guidance. This report provides an update of air quality issues in Perth and Kinross.

The statutory Further Assessment of Air Quality, in draft form, and draft Action Plan for the Perth AQMA were completed in early 2007. Progress towards publication of these documents for consultation was delayed by the statutory requirement to undertake a strategic environmental assessment of the proposals. Severely restricted Perth & Kinross Council staff and financial resources during 2007-08 further delayed progress however all relevant documents and the preparations for consultation have now been collated and, subject to Council approval, it is anticipated that consultation on the draft Action Plan will be completed this year.

Monitoring for nitrogen dioxide during 2007 shows 19 sites in Perth are above the annual mean objective level of 40 µg m^{-3} and 4 are between 35-40 µg m^{-3} . In Crieff, 1 site is now above 40 µg m^{-3} and 2 sites are between 35 and 40 µg m^{-3}.

All the sites in Perth which are above or close to the objective lie within the city centre or close to it on the main “through routes” and are within the existing AQMA. The 2007 progress report found 18 sites above the objective and 4 between 35 and 40 µg m^{-3}.

Monitoring for PM_{10} during 2007 at the High St shows the 24-hour objective was breached on 5 occasions over 5 days during the year. The annual mean at this site complies with the 2004 objective but would exceed the 2010 objective. It shows a slight decrease from data in 2006 but is higher than concentrations from previous years. Concentrations of PM_{10} at Atholl St breached the 24-hour objective on 6 occasions over 6 days during the year. The annual mean at this site complies with the 2004 objective but would exceed the 2010 objective. It

shows a slight decrease from data in 2006 but is higher than concentrations from previous years.

The levels of PM10 and nitrogen dioxide measured in Perth have been considered in developing the draft action plan range of options which will be further developed for the final action plan to enable Perth & Kinross Council to work towards achievement of the objectives.

The 2010 objective for PM_{10} and relatively high local background levels of particulates, over which the council has no direct influence, continue to provide challenges for local management of air quality.

There have been no new developments in 2007 which are likely to have significant adverse effects on air quality in Perth & Kinross.

Contents

Introduction

Legislative Background

The Environment Act 1995 established the requirement for all local authorities to undertake the periodic review and assessment of air quality to assess whether any locations are likely to exceed the national objectives and to designate air quality management areas for any locations of likely exceedence. The LAQM regime requires all local authorities to submit appropriately detailed reports according to a specified schedule to create continuity in the reporting of LAQM implementation.

The latest Air Quality Strategy for England, Scotland, Wales and Northern Ireland was published in July 2007 and sets out the Air Quality standards and Objectives which have been set for the UK. The objectives adopted in Scotland are now based on the Air Quality Standards (Scotland) Regulations 2007 for the purpose of local air quality management.

Current Air Quality Objectives (extract from Scottish Air Quality website[1])

Pollutant	Air Quality Objective		To be achieved by
	Concentration	**Measured as**	
Benzene			
All UK authorities	16.25 µg m^{-3}	Running annual mean	31 December 2003
Authorities in Scotland and N. Ireland	3.25 µg m^{-3}	Running annual mean	31 December 2010
1,3-Butadiene	2.25 µg m^{-3}	Running annual mean	31 December 2003
Carbon Monoxide			
Authorities in Scotland Only	10.0 mg m^{-3}	Running 8-hour mean	31 December 2003
Lead	0.5 mg m^{-3}	Annual mean	31 December 2004
	0.25 mg m^{-3}	Annual mean	31 December 2008

Nitrogen Dioxide	200 µg m^{-3} not to be exceeded more than 18 times a year	1-hour mean	31 December 2005
	40 µg m^{-3}	Annual mean	31 December 2005
Particles (PM10) (gravimetric)			
All authorities	50 µg m^{-3}, not to be exceeded more than 35 times a year	24-hour mean	31 December 2004
	40 µg m^{-3}	Annual mean	31 December 2004
Scotland Only	50 µg m^{-3}, not to be exceeded more than 7 times a year	24-hour mean	31 December 2010
	18 µg m^{-3}	Annual mean	31 December 2010
Particles (PM2.5) (gravimetric) *	25 µg m^{-3} (target)	Annual mean	2020
All UK authorities	15% cut in urban background exposure	Annual mean	2010 - 2020
Authorities in Scotland Only	12 µg m^{-3} (limit)	Annual mean	2010
Sulphur dioxide	350 µg m^{-3}, not to be exceeded more than 24 times a year	1-hour mean	31 December 2004
	125 µg m^{-3}, not to be exceeded more than 3 times a year	24-hour mean	31 December 2004
	266 µg m^{-3}, not to be exceeded more than 35 times a year	15-minute mean	31 December 2005
PAH *	0.25 ng m^{-3}	Annual mean	31 December 2010
Ozone *	100 µg m^{-3} not to be exceeded more than 10 times a year	Daily maximum of running 8-hour mean	31 December 2005

*** not included in regulations at present**

Progress Report 2008

Progress Report Guidance issued in Scotland by the Scottish Executive [2] states that the aims of a progress report are to:

- *Report progress on implementing local air quality management; and*
- *Report progress in achieving, or in many cases maintaining, concentrations below the air quality objectives.*

Perth and Kinross Council have collated 2007 data from an array of monitoring sites and other sources in accordance with statutory requirements and guidance and here provide an update of air quality issues in Perth and Kinross.

LAQM in Perth and Kinross

Perth and Kinross Council began the second cycle of Review and Assessment with an Updating and Screening Assessment [3] which, when published in April 2003, identified nitrogen dioxide and small particulate matter as pollutants at risk of exceeding objective levels. The Detailed Assessment [4] of these pollutants was subsequently published in August 2005 and an Air Quality Management Area (AQMA) covering the whole of Perth for both nitrogen dioxide and particles (PM_{10}) was declared on 5 May 2006.

The decision to designate the whole of Perth an AQMA was made to ensure that areas that are close to, but do not at present exceed, the objectives are covered and also it allows the Action Plan to take in a wider area, thus avoiding moving problems to other parts of the city, while dealing with the areas which are exceeding the objectives. It also helped to ensure that the Air Quality Action Plan (AQAP) would be integrated with other council policies.

Perth & Kinross Council is taking account of the effect of the proposed Air Quality Action Plan on greenhouse gas emissions in accordance with Scottish Government guidance. To inform this process, AEA Energy & Environment was commissioned to undertake a study in terms of the effect of the Air Quality Action Plan on greenhouse

gas emissions (GHG) for the whole of the Perth & Kinross Council area, rather than just the AQMA area and to also consider other forms of mitigation, for the Perth & Kinross area as a whole. This assessment in draft form [5] was completed in May 2007.

The statutory Further Assessment of Air Quality [6], in draft form, and draft Action Plan[7] were completed in early 2007 and discussed with the Scottish Executive and SEPA at that time to demonstrate the council's objective of compliance with the required respective timescales for these tasks of 12 and 12-18 months from declaration of the AQMA. Progress towards publication of these documents for consultation was delayed by the statutory requirement to undertake a strategic environmental assessment of the proposals although consideration of environmental and economic implications of available options is an integral part of the action planning process. Severely restricted Perth & Kinross Council staff and financial resources during 2007-08 further delayed progress however all relevant documents and the preparations for consultation have now been collated and, subject to Council approval, it is anticipated that consultation on the draft Action Plan will be completed by autumn this year.

The Environmental Assessment (Scotland) Act 2005 requires the environmental effects of the Draft AQAP to be considered throughout its development. SEA should therefore lead to final developments of an AQAP that has fewer environmental effects. The Scoping report for Perth & Kinross AQAP SEA was sent to the Scottish Gateway on 6 March 2007, specifying the consultation periods and level of detail to be included in the Environmental Report.
Comments were received back from SEPA, Historic Scotland and Scottish Natural Heritage on 10 April 2007.

The draft Environmental SEA report for Perth & Kinross draft AQAP [8] was completed in August 2007. Environmental effects considered in the assessment include effects on population and health, biodiversity, air quality, landscape, climate change, soils and geology, cultural heritage and material assets. In addition, the "Do Nothing" scenario was assessed to better understand the future environmental baseline conditions in Perth if no AQAP was developed and implemented. Consultation on

this assessment will be undertaken concurrently with the consultation on the Further Assessment and draft Action Plan in the interests of co-ordination of all relevant information and of economy to ensure best value.

The objective of the Further Assessment was to confirm the conclusions of the detailed assessment and to test city centre traffic management (CCTMR) scenarios to assess the likely impact they may have on pollutant concentrations in future years, and therefore their likely effectiveness in reducing air pollution. The report investigated current and potential future NO2 and PM10 levels through an examination of the location and size of principal traffic emission sources, emissions modelling exercises and by reference to monitored air quality data. The following scenarios were assessed for their air quality impacts:

2005 Base Case

2005 scenario with the CCTMR

2010 scenario with the CCTMR

2018 scenario with the CCTMR and a Regional Bridge (3rd Tay crossing)

The report included an assessment of source apportionment and identified emissions from heavy duty vehicles and congested traffic as the main local contributors to elevated levels of nitrogen dioxide and PM_{10} in Perth.

.

It concluded that now and in the foreseeable future the annual mean concentration of nitrogen dioxide (NO2) is highly likely to be above the objectives for this pollutant at many residential properties within the City particularly those close to major routes and junctions on those routes. At the moment, concentrations of particulate material with an aerodynamic diameter equal to or less than 10µm (PM10) achieve the current objectives. However, more stringent objectives come into force in Scotland in 2010 and from this date onwards there is a significant risk that the new objective will not be achieved at several locations in the city.

Planned or proposed measures such as the City Centre Traffic Management Review (CCTMR) and the third river crossing are likely to be beneficial in terms of improving air quality but are insufficient on their own to solve the problems in Perth.

The report recommended that Perth and Kinross Council retain their city wide air quality management area for both NO2 and PM10, and proceed with preparation of an action plan to reduce concentrations. Reductions in road traffic emissions, particularly aimed at reducing HDV traffic and the amount of time that traffic is stationary, would reduce both NO2 and PM10 concentrations locally.

The contributions from several sources of emissions towards the observed and predicted levels of pollution were considered with the following conclusions.

- Overall it is highly unlikely that local actions taken by Perth and Kinross Council alone will achieve all of the relevant human health based air quality objectives at any time in the foreseeable future.

- Local measures that focus on reducing the impacts of heavy duty traffic and congestion would be particularly effective in moving towards achievement of the NO2 air quality objectives in Perth City.

- No action that Perth and Kinross Council can take will guarantee the achievement of the objectives for PM10 post-2010. However, local measures proposed to manage NO2 concentrations should be designed to also reduce local PM10 emissions. In addition Perth and Kinross Council should make representation to regional and national government appealing for additional national policies aimed at reducing background PM10 concentrations.

The Draft AQAP in its current form has been developed to present a range of options with the potential to reduce air pollution in Perth. It has been done in line with statutory guidance and involved meetings with relevant departments of the local authority and other stakeholders. Detailed descriptions of the Options have not been developed as yet as it is intended that consultation will inform this process.

Perth and Kinross Council began the third round of Review and Assessment with an Updating and Screening Assessment [9], in which sources of emissions to air are

reassessed to identify whether the situation has changed since the second round, and if so, what impact this may have on predicted exceedences of the air quality objectives. The Updating and Screening Assessment was undertaken in 2006 (based on 2005 data) and concluded that Perth and Kinross Council is not required to carry out a Detailed Review and Assessment for carbon monoxide, benzene, 1,3-butadiene, lead, nitrogen dioxide, PM_{10} or sulphur dioxide.

Additional areas of exceedence of the annual mean objective for NO2 that were not found in the Detailed Assessment were identified by the Updating and Screening Assessment within Perth City's AQMA. This vindicated the council's decision to designate the whole of Perth as an AQMA. Monitoring data and DMRB modelling indicated a number of exceedences of the annual mean objective for NO2 at busy junctions in Perth. All predicted and measured exceedences were inside the existing AQMA. There were no significant industrial sources of NO2 found in the Perth and Kinross Council area.

The Progress Report [10] undertaken in 2007, using 2006 data, concluded that nitrogen dioxide concentrations at 17 sites were breaching the 2005 annual mean objective of 40µg/m^{-3}, and at 8 sites were between 35 – 39µg/m^{-3}, all close to Perth city centre, and levels of PM10 at both the High Street and Atholl Street monitoring sites appear to be increasing by a small margin year on year.

Chapter 1 – New Monitoring Data

1.1 Monitoring in Perth and Kinross

Perth and Kinross Council has an ongoing commitment to quality assurance and quality control, and accordingly ensures that all measurements fully comply with relevant guidance.

1.1.1 *Automatic monitoring*

Two automated monitoring stations within Perth provide air quality data. Each site samples and records the continuous, real-time concentrations of nitrogen dioxide and small particulate matter with an API M200A chemiluminescent analyser for Oxides of Nitrogen and an R&P TEOM analyser for PM_{10}. Site details for, and current real time data from, these monitors are available in the Scottish Air Quality Website:

All automatic monitoring data has been collected, ratified and supplied to the Council by AEA Energy & Environment (formally Netcen). AEA ensure monitoring instrumentation, methodologies and data conform to consistent and traceable national and international standards. This includes full measurement traceability through the use of UKAS-accredited calibration gases.

1.1.2 *Passive Diffusion Tube Monitoring*

Perth & Kinross Council also maintains a network of passive diffusion tubes to monitor levels of nitrogen dioxide The vast majority of these 52 sites are in Perth, although there are also 2 sites in Glencarse (just off the A90 Perth to Dundee), 4 sites in Crieff and 2 sites in Aberfeldy. A list of site details is provided in appendix 1 of this report. The site location maps provided for the 2007 progress report still pertain and are not reproduced in this document.

Dundee City Council Scientific Services provide and analyse passive diffusion tubes for monitoring NO2 in Perth & Kinross. This laboratory takes part in and meets QA/QC Field Intercomparison standards specified for the National NO_2 Network. The Summary of Precision Results for Nitrogen Dioxide Diffusion Tube Collocation

Studies, by Laboratory which is published on the review and assessment helpdesk operated by Air Quality Consultants/University of the West of England [11] classes precision for Dundee CCSS to be "good". Tube preparation utilises a 20% v/v triethanolamine (TEA) in water methodology. Analysis using colorimetric techniques typically follows four/ five week exposure periods in accordance with the National $NO_{2\ Monitoring}$ Network schedule.

The statistical tool created by AEA Energy & Environment and provided for LAQM assistance on the UK National Air Quality Archive [12 website] was used to confirm good precision and accuracy of data from co-located diffusion tubes in Perth & Kinross.

1.2 **Nitrogen Dioxide**

Objective: By 31 December 2005: 200 micrograms per cubic metre or less, when expressed as an hourly mean, not to be exceeded more than 18 times within any year and 40 micrograms per cubic metre or less, when expressed as an annual mean.

1.2.1 *Automated Monitoring Data*

Provisional data only is available for the period 1 January to 31 December 2007 at the time of writing this report and may be subject to further quality control. Provisional data reports are provided in Appendix 2 and are summarized in tables 1.1, 1.2 below.

Table 1.1

High Street, Perth – Nitrogen Dioxide

Parameter	Objective	Measured	Exceedences
Hourly Mean	200 µg m^{-3}	155 µg m^{-3} (max)	0
Annual Mean	40 µg m^{-3}	28 µg m^{-3}	0
Data capture		96.2 %	

Table 1. 2

Atholl Street, Perth – Nitrogen Dioxide

Parameter	Objective	Measured	Exceedences
Hourly Mean	**200** µg m^{-3}	294 µg m^{-3} (max)	18
Annual Mean	40 µg m^{-3}	60 µg m^{-3}	1
Data capture		99.1 %	

1.2.2 *Diffusion Tube Monitoring Data*

The data for the period from January to December 2007 are presented in Appendix 3

1.2.3 *Bias Adjustment of Passive Diffusion Tube Data*

Collocation studies have been undertaken at both of the automatic monitor sites in Perth, with the diffusion tubes being exposed in triplicate. The measured concentrations were compared with the results from the automatic monitors using guidance in Box 6.4 of LAQM. TG (03) [13] and the results summarised in Table 1.3 below. These collocation studies indicate that accuracy of the diffusion tube measurements is good with the bias adjustment factor for both close to one.

Table 1.3 **Local Bias Factor Calculations**

Site Name	Diffusion Tube Mean Conc (Dm) (µg m^{-3})	Automatic Monitor Mean Conc (Cm) (µg m^{-3})	Bias (B) (Dm-Cm)/Cm	Bias Adjustment Factor (A) (Cm/Dm)
High Street	28.6	28	0.02%	0.979
Atholl Street	56.1	60	-5%	1.069
Mean Bias Factor				1.024

Bias adjustment factors of 0.87(AEA), 1.23(Fife) and 1.03(Overall) for 2007 are published on the UWE website for Dundee Scientific Services. Consideration was given to most recent guidance, published in February 2008 by DEFRA and the Devolved Administrations on ambient monitoring of NO2 using passive diffusion tubes, advice on selection of bias factors in the UWE LAQM website and to the report entitled 'The Relationship between Diffusion Tube Bias and Distance from the Road' carried out by Air Quality Consultants/UWE as to validity of application of the bias factor derived in Perth to the data from tubes outside the city, particularly because of uncertainty regarding significance of tube chemistry and wind turbulence on tube bias at geographically distant and topographically differing sites. Average altitudes in the centres of Perth, Crieff and Aberfeldy are approximately 35, 75 and 105 metres respectively (taken from Google Earth).

Previous assessments of air quality in Perth & Kinross have used the local bias factor derived from co-location studies at the automatic monitors in Perth. Therefore, for consistency and comparison with previous reports, and because of the good precision of all local collocation site data, the locally derived adjustment factor of 1.02 for 2007 has been applied to all the raw data for the purpose of this progress report.

1.2.4 *Discussion*

19 sites in Perth are above the objective level of 40 µg m^{-3} and 4 are between 35-40 µg m^{-3}. In Crieff, 1 site is 40 µg m^{-3} and 2 sites are between 35 and 40 µg m^{-3}.

All the sites in Perth which are above or close to the objective lie within the city centre or close to it on the main "through routes" and are within the existing AQMA. The 2007 progress report found 18 sites above the objective and 4 between 35 and 40 µg m^{-3} so, although there is now one additional site of exceedence, there is one less overall above 35 µg $m^{-3.}$

Automatic monitoring at High St, Perth confirms that neither the hourly nor the annual mean objectives were breached at this location during 2007. This monitor has been in operation since June 2003 so there is now almost 5 years of data available for the site indicating that annual mean concentrations of NO2 have been consistent and well below the objective level throughout that period.

Table 1.4 High Street – Nitrogen Dioxide Annual Mean 2003 – 2007

Year	Annual Mean (µg m^{-3})
2003 (extrapolated)	29.7
2004	28
2005	28
2006	28
2007	28

Automatic monitoring at Atholl St shows that the annual mean objective was breached at this site but the hourly mean was met although there were 18 occasions

when concentrations above 200 µg m^{-3} were recorded. This monitor has operated only since October 2004 so available data is not yet sufficient for a meaningful assessment of trends at this location, however the data shown below indicates that levels of NO_2 at this site appear to be increasing year on year and that the estimated mean for 2004 (extrapolated from incomplete data using prescribed methodology) may have been an underestimation.

Table 1.5 Atholl Street – Nitrogen Dioxide Annual Mean 2003 - 2007

Year	Annual Mean (µg m^{-3})
2004 (estimated)	40
2005	54
2006	57
2007	60

1.2.5 *Comment*

The draft action plan for the Perth AQMA which is about to undergo public consultation contains a range of options which will be further developed for the final action plan to enable Perth & Kinross Council to work towards achievement of the objective for NO2. Measures included are specifically targeted to address problems from heavy goods vehicles and congested traffic in and around the city centre without moving them elsewhere.

1.3 **PM10**

Objectives:

By 31 December 2004: 50 micrograms per cubic metre or less, when expressed as a 24 hour mean, not to be exceeded more than 35 times within any year and 40 micrograms per cubic metre or less, when expressed as an annual mean.

By 31 December 2010: 50 micrograms per cubic metre or less, when expressed as a 24 hour mean, not to be exceeded more than 7 times within any year and 18 micrograms per cubic metre or less, when expressed as an annual mean.

1.3.1 *Automated Monitoring Data*

Measurements in Perth and Kinross are made at 2 sites using TEOM automatic particulate analysers. It is routine practice in the UK that a default correction factor of 1.3 is currently applied to TEOM data to provide a "gravimetric-equivalent result which can be used to assess compliance with the objective.

The Scottish Government has issued additional advice for authorities in Scotland, based on local intercomparison tests: For the annual mean objectives, authorities should correct TEOM concentrations using both a 1.3 factor and a 1.14 factor. The advice states that the 1.3 correction factor should continue to be used for assessment of the 24-hour mean objectives. Measured concentrations presented in this report have therefore been multiplied by a factor of 1.3, and a factor of 1.14 where appropriate, to approximate the gravimetric equivalent value according to the guidance [15].

Provisional data only is available for the period 1 January to 31 December 2007 at the time of writing this report and may be subject to further quality control. Provisional data reports are provided in Appendix 2 and are summarized in tables 1.6, 1.7 below.

N.B. The measured results refer to the results measured by the TEOM automatic particulate analyser before the conversion factors are applied. The exceedences refer to the number of exceedences once the 1.3 factor has been applied.

Table 1.6 **High Street PM_{10} 2007**

Automated PM_{10} Monitoring Levels ($\mu g\ m^{-3}$)			
Parameter	**Objective**	**Measured**	**Exceedences**
24hr Mean	50	55 (max)	5 (5days)
Annual Mean	40	15	0
	18		0
Data Capture		99.4%	

Table 1.7 Atholl Street PM_{10} 2007

Automated PM_{10} Monitoring Levels ($\mu g\ m^{-3}$)			
Parameter	**Objective**	**Measured**	**Exceedences**
24hr Mean	50	60 (max)	6 (6days)
Annual Mean	40	21	0
	18		1
Data Capture		94.7%	

1.3.2 *Discussion*

High Street - The corrected maximum daily average concentration at this site in 2007 was 71.5 (Gravimetric) µg m^{-3}. The 24-hour objective was breached on 5 occasions over 5 days during the year.

Table 1.8 High Street - Pm_{10} Adjusted Annual Mean 2004-07

Year	**Annual Mean (TEOM) ($\mu g\ m^{-3}$)**	**Annual Mean (Gravimetric) ($\mu g\ m^{-3}$)**	
		1.3 factor	1.14 factor
2004	13	17	15
2005	14	18	16
2006	16	21	18
2007	15	20	17

The adjusted annual mean at this site shows a slight decrease from data in 2006 but is still higher than concentrations from previous years. This level complies with the 2004 objective but would exceed the 2010 objective. The projected concentration for 2010 was calculated using the guidance and tools provided on The Air Quality Archive website. The gravimetric equivalent value using the 1.3 correction factor was used for the projection to maintain consistency and enable comparison with previous LAQM reports for Perth & Kinross. The calculation indicates a small reduction in the PM_{10} annual mean to 19.6 µg/m^{-3}, however this would still breach the 2010 annual mean objective.

Atholl Street - The corrected maximum daily average concentration at this site in 2007 was 78 (Gravimetric) µg m^{-3}. The 24-hour objective was breached on 6 occasions over 6 days during the year.

Table1.9 Atholl Street - Pm_{10} Adjusted Annual Mean 2004-07

Year	**Annual Mean (µg m^{-3})**	**Annual Mean (Gravimetric) (µg m^{-3})**	
		1.3 factor	1.14 factor
2004 (period mean Oct – Dec only)	19	25	22
2005	19	25	22
2006	22	29	25
2007	21	27	24

The adjusted annual mean at this site using both factors also shows a slight decrease from data in 2006 but is still higher than concentrations from previous years. These mean levels comply with the 2004 objective but would exceed the 2010 objective. The projected concentration for 2010 indicates a small reduction in the PM_{10} annual mean to 25.7 µg/m^{-3} however this would still breach the 2010 annual mean objective.

1.3.3 *Comment*

The high PM10 levels which have been measured in Perth have been considered in developing the draft action plan range of options which will be further developed for the final action plan to enable Perth & Kinross Council to work towards achievement of the objective for PM10. Measures included are specifically targeted to address problems from heavy goods vehicles and congested traffic in and around the city centre without moving them elsewhere, however the relatively high background levels, over which the council has no direct influence, continue to provide challenges to local management of air quality.

Chapter 2 New Local Developments

2.1 **Industrial Processes Affecting Air Quality**

SEPA has provided information that:

- There are no significant changes in existing authorised processes during 2007 which are likely to affect air quality in Perth & Kinross
- Forest Bio Products, PPC/B/1020963, is a new Part B process (Nov 07) in Scone which manufactures wood pellets, using timber as a fuel to operate its' dryer.
- 1 new Dry Cleaner PPC Permit has been issued in Perth since May 07.

2.2 **New Industrial, Commercial and Transport Developments**

A planning application for Binn Farm energy from waste plant was approved in September 2007. Emissions from this plant will be subject to regulation by SEPA.

Planning applications for several large biomass boiler installations in Perth and other towns in Perth & Kinross have been approved or are under consideration at present. The potential emissions from these installations are assessed using current available guidance relative to their implications for local air quality.

Kinross Park and Ride facility for 126 vehicles, west of the town centre and within easy reach of the M90 motorway, opened in May 2007. Express coach services heading south to Edinburgh and north to Perth as well as certain local bus services use the site.

An extension for an additional 152 spaces at Broxden Park and Ride facility on the outskirts of Perth was approved in November 2007 and is currently under construction.
Proposals for a new foot/cycle bridge over the river Tay in Perth have secured funding but no planning application has yet been submitted.

No new residential developments considered significant in terms of air quality exposure or impact have been granted planning approval during 2007.

75 houses are nearing completion for occupation in June as the first phase of the proposed new village at Oudenarde, Bridge of Earn. The village development is likely to eventually comprise 1200-1600 hoses and a business park within commuting distance of Perth.

2.3 **New Mineral and Landfill Developments**

An application for a new quarry at Wester Bleaton by Kirkmichael was approved in April 2007 to extract 1.1 million tonnes of rock over a 22 year period. No information is available for a date for commencement of operation of this quarry

Perth & Kinross Council has not received any complaints during 2007 regarding dust from quarries/mineral extraction sites

Chapter 3 – Additional Information

Perth and Kinross Council does not monitor ozone, polycyclic aromatic hydrocarbons (PAHs), or any other unregulated air pollutant not previously addressed within this report.

Radiation monitoring is not currently undertaken by Perth and Kinross Council.

No formal action to resolve complaints regarding odour or dust emissions from regulated industrial processes was initiated during 2007.

Chapter 4 – Conclusions and Recommendations

4.1 **Conclusions from New Monitoring Data**

The levels of traffic related pollutants recorded in Perth during 2007 vindicate the council's decision to declare an AQMA to cover the whole of Perth.

The 2010 objective for PM_{10} and relatively high local background levels of particulates, over which the council has no direct influence, continue to provide local challenges for effective management of air quality.

4.2 **Conclusions from New Local Developments**

Improved guidance for assessment of the significance of potential emissions from individual and aggregated biomass boiler installations would assist consideration of their implications for local air quality and greenhouse gas management.

4.3 **Recommendations**

It is recommended that these findings are considered in context of the development and implementation of the pending air quality action plan.

Monitoring of nitrogen dioxide and PM10 should continue in Perth and Kinross.

Further guidance should be sought on selection of appropriate bias correction factors for passive diffusion tube data from sites with differing characteristics.

The data upon which this Report is based will be considered further in the next round of local air quality review and assessment

Biblography

1 http://www.scottishairquality.co.uk/summary.php

2 DEFRA (2003) Part IV of the Environment Act 1995: Local Air Quality Management. Progress Report Guidance LAQM.PRG(03). DEFRA Publications, London, UK.

3 Netcen (2003) Air Quality Updating and Screening Assessment for Perth and Kinross Council. Perth and Kinross Council.

4 Netcen (2005) Air Quality Report Perth and Kinross Council (Detailed Assessment). Perth and Kinross Council.

5 Perth and Kinross Greenhouse Gas Emissions Study (2007), AEA Energy and Environment . (2007). (publication pending)

6 AEA Energy & Environment (2007) Further Assessment of Air Quality-Perth & Kinross Council. Perth and Kinross Council (publication pending)

7 AEA Energy & Environment (2007) Perth and Kinross Council Air Quality Action Plan Consultation Draft. Perth and Kinross Council (publication pending)

8 AEA Energy & Environment (2007) Strategic Environmental Assessment of Perth Draft Air Quality Action Plan. Environmental Report . Perth and Kinross Council (publication pending)

9 Netcen (2006) Air Quality Updating and Screening Assessment. A report produced for Perth and Kinross Council. Perth and Kinross Council.

10 Perth and Kinross Air Quality Review and Assessment Progress Report 2007 Perth and Kinross Council. (publication pending)

11 Review and Assessment Helpdesk Operated by Air Quality Consultants/University of the West of England http://www.uwe.ac.uk/aqm/review/

12 http://www.airquality.co.uk/archive/laqm/tools.php

13 DEFRA (2003) Part IV of the Environment Act 1995: Local Air Quality Management Technical Guidance LAQM.TG(03). DEFRA Publications, London, UK.

14 AEA Energy & Environment. February 2008 Diffusion Tubes for Ambient NO2 Monitoring: Practical Guidance

15 AQM Resource Centre (UWE) Frequently Asked Questions – PM_{10} (Air Quality Review and Assessment website).http://www.uwe.ac.uk/aqm/review/questions.html

Appendix

1

Site Details- Perth Nitrogen Dioxide Diffusion Tube (Oct 2002 onwards)					
ID	**Address**	**Grid Ref**	**Height (m)**	**Dist from kerb (m)**	**Site Class**
P1 L	42 Scott St, Perth, PH1 5PH	NO116235 311690,723503	3.1	3	UC
P1 C	42 Scott St, Perth, PH1 5PH		3.1	3	UC
P1 R	42 Scott St, Perth, PH1 5PH		3.1	3	UC
P2	17 Speygate, Perth, PH2 8PJ	NO120234	2.7	1.6	UC
		312018,723405			
P3 L	5 Murray Cres, Perth, PH2 0HU	NO106227 310646,722783	2.9	2.05	UB
P3 R	5 Murray Cres, Perth, PH2 0HU		2.9	2.05	UB
P5 L	8 Stormont St, Perth, PH1 5NW	NO115239 311586,723991	3	1.7	UC
P5 R	8 Stormont St, Perth, PH1 5NW		3	1.7	UC
P6	41 Mull Place, Perth, PH1 3DP	NO105257	3	1.7	UB
		310509,725767			
P7	257 Rannoch Rd/Newhouse Road Roundabout, Perth, PH1 2DW	NO089242	3	2.1	UC

		308924,724287			
P13 L	86/88 South Street Perth PH2 8PD	NO118234	3	2.6	
P13 R	86/88 South Street Perth PH2 8PD	311840,723453	3	2.6	R
P14 L	15 Main St, Bridgend, Perth, PH2 7HD	NO122239	2.4	2.3	R
P14 C	15 Main St, Bridgend, Perth, PH2 7HD	312262,723968	2.4	2.3	R
P14 R	15 Main St, Bridgend, Perth, PH2 7HD		2.4	2.3	R
P19	St Ninian's School ,Dunkeld Rd, Perth, PH1 5RF	NO113240	3.4	3.2	R
		311366,724059			
P20	2 Crieff Road Perth PH1 5RT	NO110243	3.3	1.9	R
		311059,724394			
P28	28 York Place Perth PH2 8EH	NO111235	2.5	2.4	R
		311190,723505			
P29	37 York Place Perth PH2 8EH	NO112235	2.5	4.1	R
		311252,723518			
P30 L	104 South St, Perth, PH2 8PA	NO117234 311799,723456	2.7	2.4	R
P30 C	104 South St, Perth, PH2 8PA		2.7	2.4	R
P30 R	104 South St, Perth, PH2 8PA		2.7	2.4	R
P31	45-47 South St, Perth, PH2 8PD	NO119234	2.8	3.5	R
		311917,723465			
P32	135 South St, Perth, PH2 8PA	NO117234	3	4.6	R
		311700,723483			
P33	216 South St, Perth, PH1 2NY	NO115234	3	2.5	R
		311591,723474			
P34 L	10 County Place, Perth, PH2 8EE	NO115234	3	3	R
P34 R	10 County Place, Perth, PH2 8EE	311503,723481	3	3	R
P35	17 Princes St, Perth, PH2 8NG	NO119234	2.8	1.8	RUC
		311930,723414			
P36	51 Glasgow Rd, Perth, PH2 0PE	NO107235	3.5	2.6	R
		310778,723556			
P37	Riggs Rd, Perth, PH1 1PR	NO108235	3.3	1.9	R
		310860,723563			

P38	93-109 Main St Bridgend, PH2 7HE	NO122241		7	R
		312262,724167			
P39 L	39 Main St, Bridgend, PH2 7HD	NO122240	3.2	2.1	R
P39 R	39 Main St, Bridgend, PH2 7HD	312256,724015	3.2	2.1	R
P40 L	18 Main St, Bridgend, PH2 7HB	NO122239	2.4	2.4	R
P40 R	18 Main St, Bridgend, PH2 7HB	312244,723965	2.4	2.4	R
P41 L	76 Atholl St, Perth, PH1 5NL	NO114239	2.5	2.5	R
P41 R	76 Atholl St, Perth, PH1 5NL	311465,723941	2.5	2.5	R
P42	26-28 Atholl St, Perth, PH1 6NP	NO116239	3.5	0.3	K
		311637,723951			
P43 L	17 Atholl St, Perth, PH1 5NH	NO116239 311614,723933	3	3	R
P43 C	17 Atholl St, Perth, PH1 5NH		3	3	R
P43 R	17 Atholl St, Perth, PH1 5NH		3	3	R
P44 L	22 Barrack St, Perth, PH1 5RD	NO114239	3.5	0.3	K
P44 R	22 Barrack St, Perth, PH1 5RD	311420,723980	3.5	0.3	K
P45	Ballantine Place, Perth PH1 5RR	NO110243	3	1.7	UC
		311092,724352			
P46	204 A Crieff Rd, Perth, PH1 2PE	NO093248	3.5	2	R
		309327,724878			
P47	5 East Huntingtower, Perth, PH1 3JJ	NO082248	3.5	1.8	R
		308289,724892			
P48	30 Edinburgh Rd, Perth, PH2 8BX	NO114218	3	2.5	R
		311492,721849			
P49	Opp Wood'n Garden, Glencarse, PH2 7LX	NO197216	3.5	2.8	R
		319702,721636			
P50	Linden Garden Centre, Glencarse, PH2 7LX	NO194213	3.6	2.1	R
		319445,721384			
P51	2 West Bridge St, Bridgend, Perth, PH2 7HA	NO122893	2.7	3.7	R
		312233,723927			
P52	Perth Blank				

P53	Perth Blank				
P-TB	Travel Blank				
P-TB	Travel Blank				
P54L	Real Time monitor - Scott St/High St	NO116236 311689,723628	1.6	7.2	R
P54C	Real Time monitor - Scott St/High St		1.6	7.2	R
P54R	Real Time monitor - Scott St/High St		1.6	7.2	R
P55	7 West High st, Crieff	NN863216	3.3	0.4	UC
		286332,721638			
P56	39, High St, Crieff	NN865215	2.5	1.2	UC
		286505,721555			
P57	The Highland Trading Company, 62, High St, Crieff	NN865215	2.8	1	UC
		286550,721562			
P58 L	9 East High St, Crieff	NN865215	2.2	0.3	UC
P58R	9 East High St, Crieff	286577,721554	2.2	0.3	
P59	12 Dunkeld St, Aberfeldy	NN857491		1.7	UC
		285706,749106			
P60L	Highland Gift Shop, Bridgend, Aberfeldy, PH15 2DF	NN857491		2.3	UC
P60R	Highland Gift Shop, Bridgend, Aberfeldy, PH15 2DF	285619,749018		2.3	
P61L	St Andrew's & Parish Church, Atholl St Perth, PH1 5NH	NO115239 311570,723929	1.6	3.7	R
P61C	St Andrew's & Parish Church, Atholl St Perth, PH1 5NH		1.6	3.7	R
P61R	St Andrew's & Parish Church, Atholl St Perth, PH1 5NH		1.6	3.7	R
P62	84 Dundee Rd, Perth PH2 7BA	NO125229	3	1.7	R
		312503,722912			
P63	30 Dundee Rd, Perth PH2 7AQ	NO124232	3	1.4	R
		312414,723242			
P64	The Lodge, Isla Rd, Bridgend, Perth PH2 7HG	NO122241	3.5	1.4	R
		312234,724174			
P65	5-7 Charlotte Street, Perth PH1 5LW	NO119238	5	2	R
		311943,723864			
P67	1 Atholl Street, Perth PH1 5NH	NO116239	3.5	2	R
		311699,723938			

P68	2 Atholl Street, Perth PH1 5NP	NO117239	3.5	0.8	R
		311719,723954			
P69	United Free Church of Scotland, Kinnoull Street, Perth PH1 5EZ	NO116239	3.5	2.6	R
		311659,723907			
P70	Leith Buildings, 28 Dunkeld Rd, Perth PH1 5AJ	NO110244	3.5	2.1	R
		311009,724485			
P71	134-140 Dunkeld Road, Perth PH1 5AS	NO106249	3.5	1.5	R
		310614,724970			
P72	82 Crieff Road, Perth PH1 2RP	NO103240	4	2.4	R
		310354,724028			

Produced by AEA Energy & Environment on behalf of Perth and Kinross Council

PERTH, Atholl Street
01 January to 31 December 2007

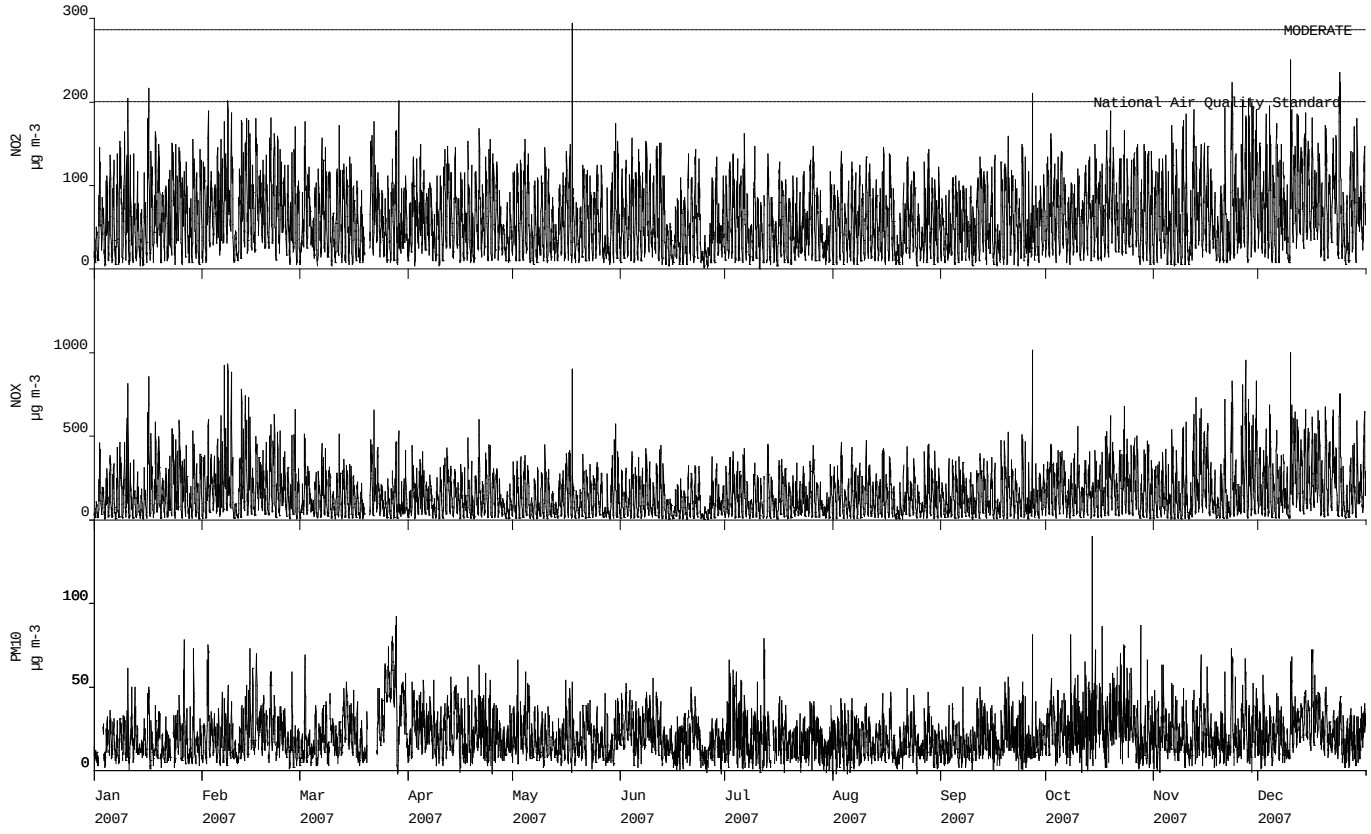
These data are provisional from 01/07/2007 and may be subject to further quality control

POLLUTANT	NO_2	NO_X	PM_{10}+
Number Very High	0	-	-
Number High	0	-	-
Number Moderate	1	-	-
Number Low	8677	-	-
Maximum 15-minute mean	401 µg m^{-3}	1314 µg m^{-3}	319 µg m^{-3}
Maximum hourly mean	294 µg m^{-3}	1016 µg m^{-3}	140 µg m^{-3}
Maximum running 8-hour mean	206 µg m^{-3}	674 µg m^{-3}	74 µg m^{-3}
Maximum running 24-hour mean	120 µg m^{-3}	385 µg m^{-3}	60 µg m^{-3}
Maximum daily mean	119 µg m^{-3}	383 µg m^{-3}	60 µg m^{-3}
Average	60 µg m^{-3}	155 µg m^{-3}	21 µg m^{-3}
Data capture	99.1 %	99.1 %	94.7 %

+ PM_{10} as measured by a TEOM
All mass units are at 20'C and 1013mb
NO_X mass units are NO_X as NO_2 µg m-3

Pollutant	Air Quality Regulations (2000) and Air Quality (Scotland) Amendment Regulations 2002	Exceedences	Days
Nitrogen Dioxide	Annual mean > 40 µg m^{-3}	1	-
Nitrogen Dioxide	Hourly mean > 200 µg m^{-3}	18	11
Nitrogen Oxides (NO_2)	Annual mean > 30 µg m^{-3}	1	-
PM_{10} Particulate Matter (Gravimetric)	Daily mean > 50 µg m^{-3}	6	6
PM_{10} Particulate Matter (Gravimetric)	Annual mean > 40 µg m^{-3}	0	-
PM_{10} Particulate Matter (Gravimetric)	Annual mean > 18 µg m^{-3}	1	-

Perth, Atholl Street - Air Monitoring
Hourly Mean Data for 01 January to 31 December 2007



PERTH, High Street
01 January to 31 December 2007

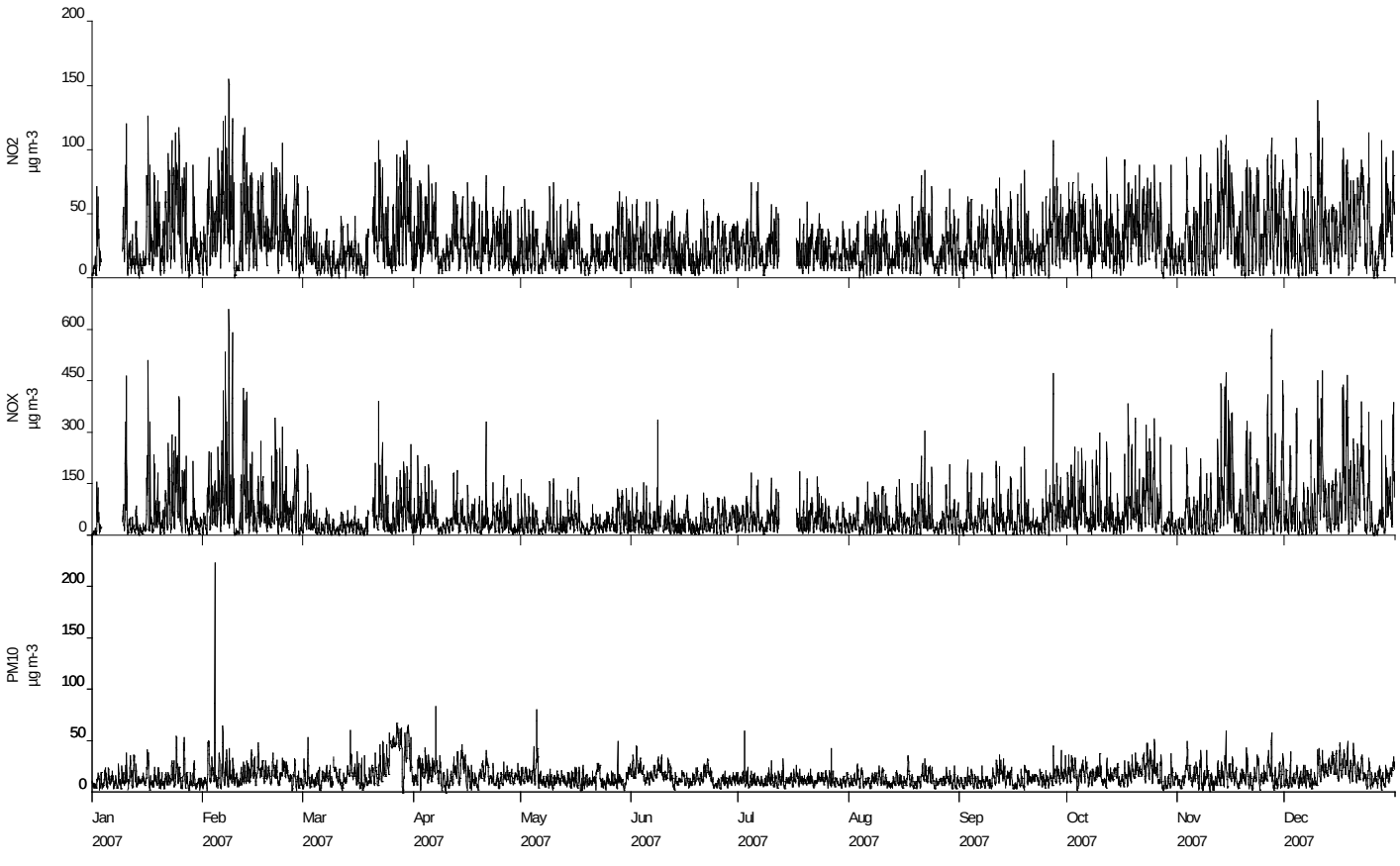
These data are provisional from 01/07/2007 and may be subject to further quality control

POLLUTANT	NO_2	NO_X	PM_{10}+
Number Very High	0	-	-
Number High	0	-	-
Number Moderate	0	-	-
Number Low	8424	-	-
Maximum 15-minute mean	206 µg m^{-3}	1091 µg m^{-3}	314 µg m^{-3}
Maximum hourly mean	155 µg m^{-3}	659 µg m^{-3}	223 µg m^{-3}
Maximum running 8-hour mean	96 µg m^{-3}	399 µg m^{-3}	63 µg m^{-3}
Maximum running 24-hour mean	73 µg m^{-3}	247 µg m^{-3}	55 µg m^{-3}
Maximum daily mean	67 µg m^{-3}	235 µg m^{-3}	55 µg m^{-3}
Average	28 µg m^{-3}	59 µg m^{-3}	15 µg m^{-3}
Data capture	96.2 %	96.2 %	99.4 %

+ PM_{10} as measured by a TEOM
All mass units are at 20'C and 1013mb
NO_X mass units are NO_X as NO_2 µg m-3

Pollutant	Air Quality Regulations (2000) and Air Quality (Scotland) Amendment Regulations 2002	Exceedences	Days
Nitrogen Dioxide	Annual mean > 40 µg m^{-3}	0	-
Nitrogen Dioxide	Hourly mean > 200 µg m^{-3}	0	0
Nitrogen Oxides (NO_2)	Annual mean > 30 µg m^{-3}	1	-
PM_{10} Particulate Matter (Gravimetric)	Daily mean > 50 µg m^{-3}	5	5
PM_{10} Particulate Matter (Gravimetric)	Annual mean > 40 µg m^{-3}	0	-
PM_{10} Particulate Matter (Gravimetric)	Annual mean > 18 µg m^{-3}	1	-

Perth, High Street - Air Monitoring
Hourly Mean Data for 01 January to 31 December 2007



Site No	Address	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Site mean	Bias adjusted mean
P1	42 Scott St, Perth, PH1 5PH	37.9	56	48.3	44	42.4	49	38	41	38.3	46	43.3	43	43.8	44.7
P2	17 Speygate, Perth, PH2 8PJ	28	34	25.5	22.6	21.4	22	22	22	22.5	x	30.3	34	25.8	26.3
P3	15 Murray Cres, Perth, PH2 0HU	17.8	34	18.8	15.7	15.8	18	12	16	18.8	25	23.8	28	20.8	21.2
P5	8 Stormont St, Perth, PH1 5NW	25.9	30	24.1	22.8	21.9	17	18	20	21.8	35	29.7	35	24.8	25.3
P6	41 Mull Place, Perth, PH1 3DP	17.5	23	14.1	9.6	9.9	7.9	8.6	10	11.8	21	16.6	22	14.3	14.6
P7	257 Rannoch Rd/Newhouse Road Roundabout, Perth, PH1 2DW	16.2	30	21.7	14.7	13.8	16	13	17	15.3	26	22.1	29	19.5	19.9
P13	86/88 South Street Perth PH2 8PD	35.7	52	47	40.5	41	33	40	40	39.1	51	42.1	45	41.5	42.3
P14	9 Main St, Bridgend, Perth, PH2 7HD	33.7	47	42.2	39.2	38.3	51	36	41	37.2	41	40.9	43	42.6	43.5
P19	St Ninian's School ,Dunkeld Rd, Perth, PH1 5RF	36.6	49	34.2	33.7	32.2	35	33	32	33.6	45	40.5	38	37.0	37.7
P20	2 Crieff Road Perth PH1 5RT	28.1	41	30.1	26.4	24.6	31	25	27	27.6	37	32.1	38	30.6	31.2
P28	28 York Place Perth PH2 8EH	46.3	58	47.2	45.9	42.3	48	42	43	42.2	54	38.5	46	46.1	47
P29	37 York Place Perth PH2 8EH	36.9	52	42.9	36.7	37.5	40	31	35	35.5	45	44.8	47	40.4	41.2
P30	104 South St, Perth, PH2 8PA	42.3	52	47.7	44	75.8	47	35	39	38.3	46	44.6	47	43	43.9
P31	45-47 South St, Perth, PH2 8PD	24.3	47	34.5	28.9	29.8	29	27	31	28.3	38	35.9	40	32.7	33.4
P32	135 South St, Perth, PH2 8PA	44.3	64	38.1	32.6	32.9	37	36	39	39	45	46.9	47	41.7	42.5
P33	216 South Street Perth PH2 8NY	38.2	55	38.5	40.2	36.1	40	31	37	32.6	46	43.9	42	40.1	40.9
P34	10 County Place, Perth, PH2 8EE	50.2	62	46.3	48.9	49.9	49	41	49	46.2	60	53.5	57	48.9	49.9
P35	17 Princes St, Perth, PH2 8NG	32.6	39	33.3	29.4	25.9	24	25	31	33.3	38	35.1	26	31.0	31.6

P36	51 Glasgow Rd, Perth, PH2 0PE	35.2	46	36.6	33.1	29.2	34	26	30	32.2	39	38.5	29	34.0	34.7
P37	Riggs Rd, Perth, PH1 1PR	29.4	41	30.4	26.6	22.2	31	21	27	27.2	38	30.6	22	28.9	29.5
P38	93-109 Main St Bridgend, PH2 7HE	28.5	42	34.3	33.4	32.7	44	26	26	27.9	34	32.9	22	32.0	32.6
P39	39 Main St, Bridgend, PH2 7HD	43.3	58	90	48.3	53.7	62	44	49	48.3	76	51.2	36	52.5	53.6
P40	18 Main St, Bridgend, PH2 7HB	43.5	50	48.6	51.8	46.5	42	44	50	49	55	42	33	47.3	48.2
P41	76 Atholl St, Perth, PH1 5NL	42.5	56	18.1	52.4	53.6	65	46	57	50.5	55	51	49	50.6	51.6
P42	26-28 Atholl St, Perth, PH1 6NP	47.1	57	47.3	53.6	46	49	42	53	53.2	50	58.1	59	51.2	52.2
P43	17 Atholl St, Perth, PH1 5NH	53.9	47	52.1	56.5	57.3	51	49	52	54.1	49	50.1	61	53.8	54.9
P44	22 Barrack St, Perth, PH1 5RD	35	59	45.1	41.4	37.7	48	34	43	41.2	48	44.9	43	44	44.9
P45	Ballantine Place, Perth PH1 5RR	24.8	35	25.9	21.3	19.2	24	16	19	19.5	27	28.3	36	24.6	25.1
P46	204 A Crieff Rd, Perth, PH1 2PE	30.9	41	33	32	28	33	26	30	29.6	38	35.1	42	33.2	33.9
P47	5 East Huntingtower, Perth, PH1 3JJ	18.6	36	28.8	28.4	28.5	32	20	26	24.5	35	29.5	33	28.3	28.9
P48	30 Edinburgh Rd, Perth, PH2 8BX	21.4	33	24.4	26	23.2	28	19	24	20.9	33	23.5	32	25.7	26.2
P49	Opp Wood'n Garden, Glencarse, PH2 7LX	16.5	27	26.8	27	24.7	28	21	24	21.5	33	24.3	29	25.2	25.7
P50	Linden Garden Centre, Glencarse, PH2 7LX	15.7	34	0.4	58.3	22	30	18	22	18.4	30	23.7	30	25.2	25.7
P51	2 West Bridge St, Bridgend, Perth, PH2 7HA	34.6	39	33.3	28.5	27.3	30	26	30	30.7	31	38.1	36	32.0	32.6
P54L	Real Time Monitor adjacent to 176 High St, Perth PH1 5EW	30	36	29.1	23	22.7	18	22	26	28.5	33	38.4	34	28.6	29.2
P55	7 West High st, Crieff	28.3	50	39	37.5	37.2	50	31	40	36.5	44	37.4	42	39.4	40.2
P56	39, High St, Crieff	33.1	39	37.8	37.5	36.6	41	29	35	31.1	38	35.8	32	35.5	36.2
P57	The Highland Trading Company, 62, High St, Crieff	25.3	40	31.1	29.4	29.5	36	27	31	28.4	33	35.7	37	31.9	32.5
P58	9 East High St, Crieff	33.4	37	40.9	39.7	35.8	x	37	37	34.6	44	43	48	39.1	39.9

P59	12 Dunkeld Street, Aberfeldy	18.9	26	29.1	23.7	23.8	28	22	28	21.3	34	28.8	29	26.1	26.6
P60	Highland Gift Shop, Bridgend, Aberfeldy	13.8	26	19.9	x	20	21	18	21	19.7	20	20.1	21	20.1	20.5
P61	Atholl St, Perth real time monitor	48.4	58	54.7	58.2	55.3	52	48	53	53.9	64	57	62	56.1	57.2
P62	84 Dundee Rd, Perth PH2 7BA	31.3	48	37.1	32.8	35.8	41	35	0.2	69.3	40	49.7	46	38.7	39.5
P63	30 Dundee Rd, Perth PH2 7AQ	32.6	51	42.4	37.9	41	52	37	37	40.3	50	49.3	46	43.0	43.9
P64	The Lodge, Isla Rd, Bridgend, Perth PH2 7HG	49	58	47	43.3	50.3	52	44	55	55.9	57	51.8	53	51.4	52.4
P65	5-7 Charlotte Street, Perth PH1 5LW	33.9	39	31.3	26.5	29.9	39	26	32	27.8	35	34.3	37	32.6	33.3
P67	1 Atholl Street, Perth PH1 5NH	44.9	42	13.5	38.9	37.2	25	33	39	37.2	49	38.1	47	37.1	37.8
P68	2 Atholl Street, Perth PH1 5NP	37.3	38	28.1	29.9	28.5	26	29	32	33.1	38	38.5	36	32.7	33.4
P69	United Free Church of Scotland, Kinnoull Street, Perth PH1 5EZ	50.3	56	52.7	34.2	36.9	34	35	38	41.2	45	48	49	43.4	44.3
P70	Leith Buildings, 28 Dunkeld Rd, Perth PH1 5AJ	36.2	46	33	33.2	25.3	31	27	33	32.9	34	36.5	41	34.0	34.7
P71	134-140 Dunkeld Road, Perth PH1 5AS	17.2	31	18.5	14.7	12.9	17	12	15	14.4	23	22.5	25	18.6	19
P72	82 Crieff Road, Perth PH1 2RP	36.4	52	36.3	36.8	31.9	36	30	37	40.5	45	43.6	46	39.2	40