2014 Air Quality Progress Report for Perth and Kinross Council

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

December 2014

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Executive Summary

The report fulfils the requirements of the Local Air Quality Management (LAQM) process as set out in Part IV of the Environmental Act (1955), the Air Quality Strategy for England, Scotland, Wales and Northern Ireland 2007 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 exceedances are 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.

Perth & Kinross Council declared the whole of Perth city an AQMA in May 2006 after the Detailed Assessment in 2004 found that there would be areas of exceedances for NO_2 and PM_{10} where relevant exposure occurred. The 2007 Further Assessment confirmed the conclusions of the Detailed Assessment and recommended that Perth & Kinross Council retain their city wide AQMA for NO_2 and PM_{10} and those exceedances of these pollutants were due mainly to queuing and congested traffic specifically HDV traffic. The Progress Reports to date show that all sites in Perth which are above or close to the objectives lie within the city centre or close to it on the main through routes and are within the existing AQMA.

This Progress Report considered monitoring data from 61 sites within Perth & Kinross and when assessing the bias corrected annual mean nitrogen dioxide concentrations against the national standard, identified that there were exceedances at 11 sites in Perth, and 3 out with Perth (all in Crieff). The permitted number of exceedances of the 1 hour standard (18 exceedances) was met at Atholl St (in Perth) which had 13, a drop from 25 in 2012.

The annual mean PM_{10} standard was exceeded at Atholl St and Crieff real time monitors, with both monitors recording an increase in PM_{10} in 2013. There was however a decrease of the daily mean at the Atholl St monitor to 7 exceedances, bringing the number of exceedances below the objective of no more than 7. The reduction of the PM_{10} and NO_2 short term breaches is thought to be due to an improvement in the timing of the traffic signals in this corridor.

The Crieff High St Corridor was declared an AQMA in April2014 and the results of a Further Assessment of air quality here are awaited and work on an AQAP should begin in 2015.

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1 Introduction

1.1 Description of Local Authority Area

The Perth & Kinross local authority area is made up of Perthshire and Kinrossshire. Collectively the Perth & Kinross area was formerly known as Perthshire. Perth & Kinross is one of the 32 unitary council areas formed by the reorganisation of Scottish local authority boundaries in 1996. Perth & Kinross is the 5th largest council area in Scotland, but it is only the 14th largest in terms of population, reflecting its extensive rural and upland areas. Important settlements in Perth & Kinross include Perth, Kinross, Auchterarder, Aberfeldy, Blairgowrie, Blair Atholl, Pitlochry, Coupar Angus and Crieff.

The 'Fair City' of Perth lies to the east, on the banks of the Tay, the largest river in Britain. Blairgowrie and East Perthshire have quiet glens, peaceful lochs and the mountains of Glenshee.

Known as the 'big county', Perth & Kinross, is the gateway to the Highlands and home to around 140,000 people. The "big" county refers to not only its physical area, but to the diversity of towns and countryside. Perth & Kinross features everything you associate with Scotland including lochs, mountains, forests and castles. Perth & Kinross is bordered on its north by Highland and Aberdeenshire; on its east by Angus and the City of Dundee; and on its south by Fife, Clackmannanshire and Stirling.

It covers 5,406 sq. km (includes fresh and tidal waters) with a land area of 5,311 sq km.

Perth is a hub for employment, commerce, leisure and tourism for the wider area of Perth & Kinross and this contributes to the traffic issues that arise within our designated AQMA's.

The main and strategic roads within Perth & Kinross include the A90, A9, M90, A85, A827 and the two roads A93 and A94 which are the major road links associated with the proposed Cross-Tay Link Road (CTLR).Four main line rail routes converge in the city of Perth.

1.2 Purpose of Progress Report

This report fulfils the requirements of the Local Air Quality Management (LAQM) process as set out in Part IV of the Environment Act (1995), the Air Quality Strategy for England, Scotland, Wales and Northern Ireland 2007 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 exceedences are considered likely, the local authority must then declare an AQMA and prepare an AQAP setting out the measures it intends to put in place in pursuit of the objectives.

Progress Reports are required in the intervening years between the three-yearly Updating and Screening Assessment reports. Their purpose is to maintain continuity in the LAQM process.

They are not intended to be as detailed as Updating and Screening Assessment Reports, however, if the Progress Report identifies the risk of an exceedence of an Air Quality Objective, the Local Authority should undertake a Detailed Assessment immediately, and not wait until the next round of Review and Assessment.

1.3 Air Quality Objectives

The air quality objectives applicable to LAQM **in Scotland** are set out in the Air Quality (Scotland) Regulations 2000 (Scottish SI 2000 No 97), the Air Quality (Scotland) (Amendment) Regulations 2002 (Scottish SI 2002 No 297), and are shown in Table 1.1. This table shows the objectives in units of micrograms per cubic metre (µg/m^3 (milligrammes per cubic metre, mg/m^3 for carbon monoxide) with the number of exceedences in each year that are permitted (where applicable).

Table 1.1 Air Quality Objectives included in Regulations for the purpose of LAQM in Scotland

Pollutant	Air Quality Objective		Date to be achieved by
	Concentration	Measured as	
Benzene	16.25 µg/m^3	Running annual mean	31.12.2003
	3.25 µg/m^3	Running annual mean	31.12.2011
1,3-Butadiene	2.25 µg/m^3	Running annual mean	31.12.2003
Carbon monoxide	10 mg/m^3	Running 8-hour mean	31.12.2003
Lead	0.50 µg/m^3	Annual mean	31.12.2004
	0.25 µg/m^3	Annual mean	31.12.2008
Nitrogen dioxide	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}) (gravimetric)	50 µg/m^3, not to be exceeded more than 7 times a year	24-hour mean	31.12.2011
	18 µg/m^3	Annual mean	31.12.2011
Sulphur dioxide	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
	266 µg/m^3, not to be exceeded more than 35 times a year	15-minute mean	31.12.2005

1.4 Summary of Previous Review and Assessments

Perth and Kinross Council has completed the following Review and Assessments of air quality to date:

- Stage 1 March 1999, Stage 1 (Revised)
- Stage 2 (September 2002)
- Upgrading and Screening Assessment (2003)
- Detailed Assessment (2004) NO_2 & PM_{10}
- Progress Report (2005)
- Air Quality Management Area Declared (May 2006) for NO_2 &PM_{10}
- Updating and Screening Assessment (2006)
- Progress Report (2007)
- Further Assessment (2007) NO_2 & PM_{10}
- Progress Report (2008)
- Updating and Screening Assessment (2009)
- Air Quality Action Plan adopted by council and approved by Scottish Government (2009)
- Progress Report (2010)
- Progress Report (2011)
- Updating and Screening Assessment (2012)
- Detailed Assessment of Air Quality A85 at Crieff (2012)
- Air Quality Management Area Declared April 2014 for NO_2 &PM_{10} in Crieff

The previous assessments of the air quality in Perth & Kinross concluded that there were likely exceedances of the annual mean objectives for NO_2 as a result of traffic sources in Perth city. Projections also indicated likely exceedances of the annual mean objectives for PM_{10} in 2010.

Perth & Kinross Council declared the whole of Perth City an AQMA for both pollutants in May 2006. Figure 1 (1.1) shows the extent of the area designated The decision to designate the whole of Perth city in the AQMA was made to ensure that areas that are close to, but do not at presently exceed the objectives are included. This approach also 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.

Perth & Kinross Council has taken account of the effect of the proposed AQAP for Perth 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 AQAP on greenhouse gas emissions (GHG) for the whole of the Perth & Kinross Council area, rather than just the AQMA, this assessment was completed in May 2007.

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

The 2008 further assessment confirmed the conclusions of the 2007 detailed assessment and tested the city centre traffic management (CCTMR) scenarios to assess the likely impact they may have on pollutant concentrations. The report included an assessment of source apportionment and identified emissions from heavy duty vehicle and congested traffic as the main local contributors to elevated levels of nitrogen dioxide and PM_{10} in Perth.

The 2008 Progress Report, using 2007 data, concluded that nitrogen dioxide concentrations at 19 sites in Perth were above the annual mean objective of 40ug/m^3 and 4 were between 35-40ug/m^3. Also in Crieff, 1 site is now above 40ug/m^3 and 2 sites are between 35 – 40 ug/m^3. As the sites which are exceeding the standard are kerbside and not representative of exposure for the annual standard and the façade level tubes are below 40ug/m^3, it was decided not to proceed to a Detailed Assessment in 2008, but instead to undertake automatic monitoring in Crieff.

A Draft Air Quality Action Plan, Strategic Environmental Assessment Report (2008), Climate Change Implication of the Draft Air Quality Action Plan (2008) and the Further Assessment (2008) all went out for consultation in June 2008.

The 2009 Updating and Screening Assessment, using 2008 data, concluded that nitrogen dioxide concentrations at 23 sites within Perth's AQMA were above the annual mean objective of 40ug/m^3 as were two sites in Crieff (out with Perth's AQMA). As a result two additional monitoring sites at the façade of buildings were introduced at Crieff.

Perth & Kinross Council's Air Quality Action Plan for Perth was approved by The Scottish Government and Adopted as Council Policy in August 2009.

The 2010 progress report showed exceedances at 16 sites within the AQMA and a reduction at both High St and Atholl St real time monitors of 27 to 25 $\mu g/m^3$ and 60 to 56 $\mu g/m^3$. There was one site out with the Perth AQMA (7 West High St Crieff) above the objective. This is a road side site with the corresponding façade level tubes being slightly below the objective.

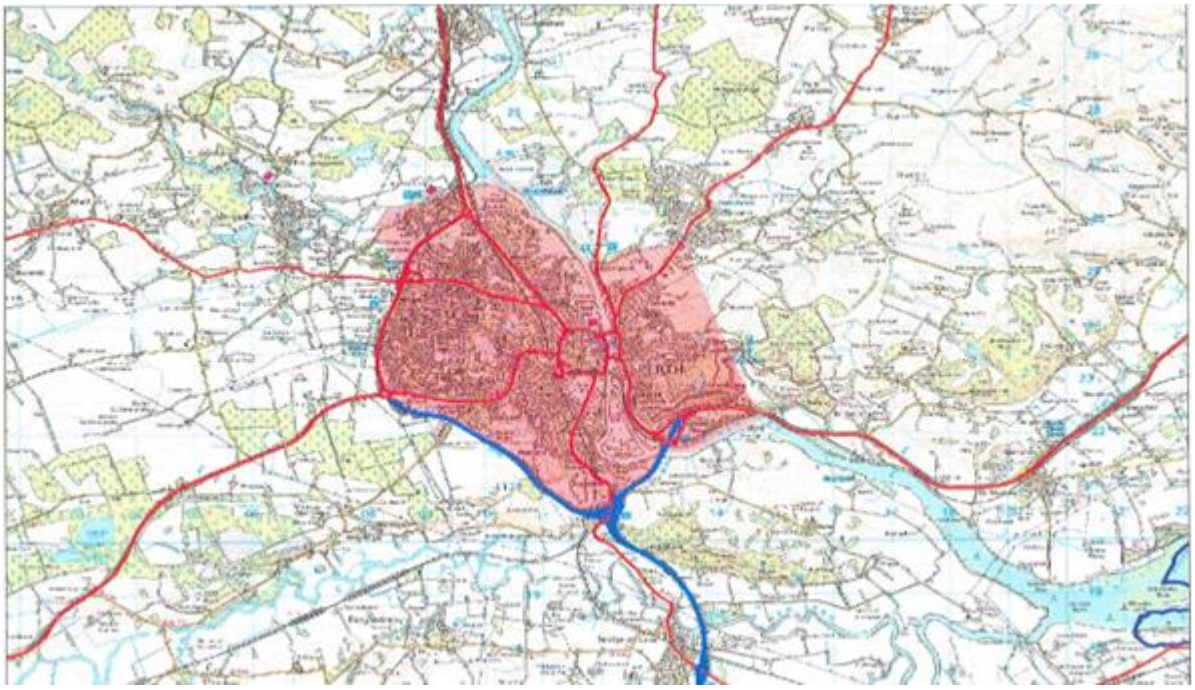
The 2011 progress report recorded exceedances at 20 diffusion tube sites within the Perth AQMA and 3 outside (all in Crieff). The Atholl St real time monitor

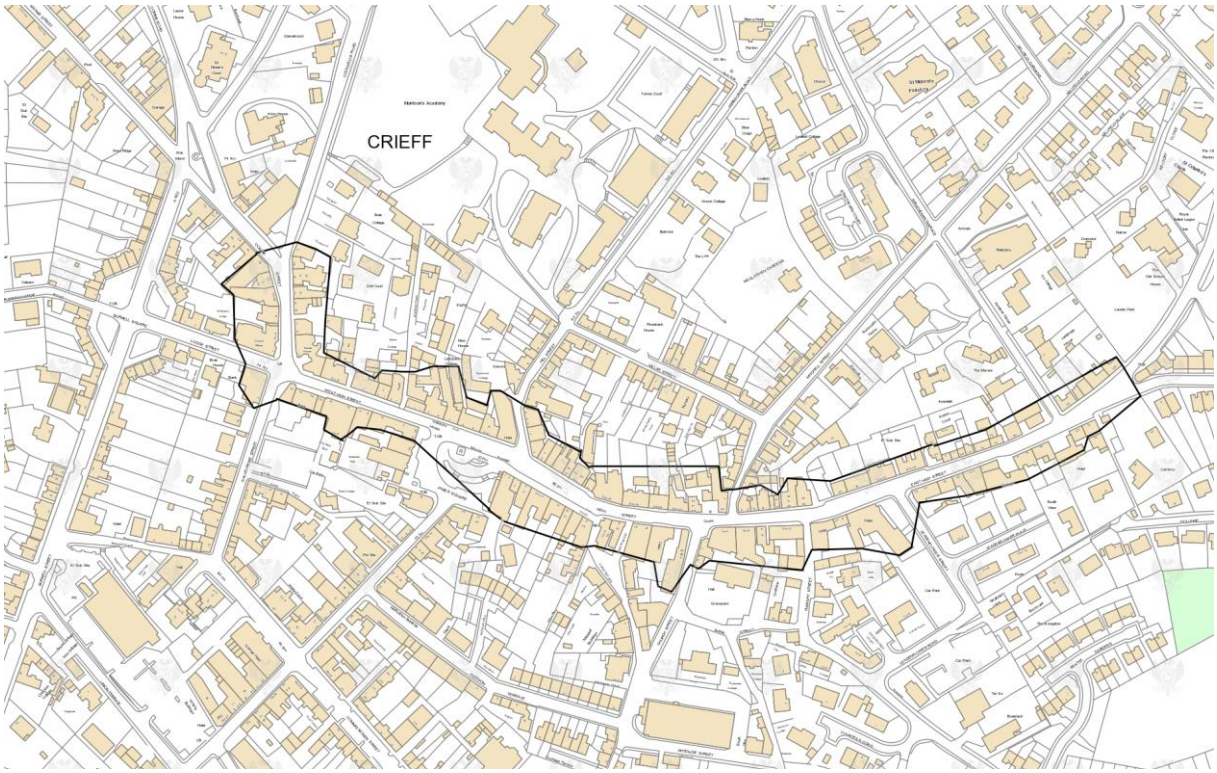
remained at an annual average of 56ugm^{-3}, whilst the High St monitor saw an increase to 30ugm^{-3}.

The 2012 Updating and Screening Assessment saw no significant change in NO_2 and PM_{10}. The diffusion tubes in Crieff continue to show NO_2 levels above the objective; therefore Perth and Kinross Council commissioned AEA to conduct a Detailed Assessment which confirmed exceedances of both PM_{10} and NO_2 annual mean objectives.

The 2013 Progress report continued to show exceedances of PM_{10} and NO_2 in both Perth and Crieff, and as a consequence Crieff was declared an AQMA in April 2014.

Figure 1.1 Maps of AQMA Boundaries for Perth and Crieff respectively





2 New Monitoring Data

2.1 Summary of Monitoring Undertaken

2.1.1 Automatic Monitoring Sites

Figure 2.1a Map of Automatic Monitoring Central Perth

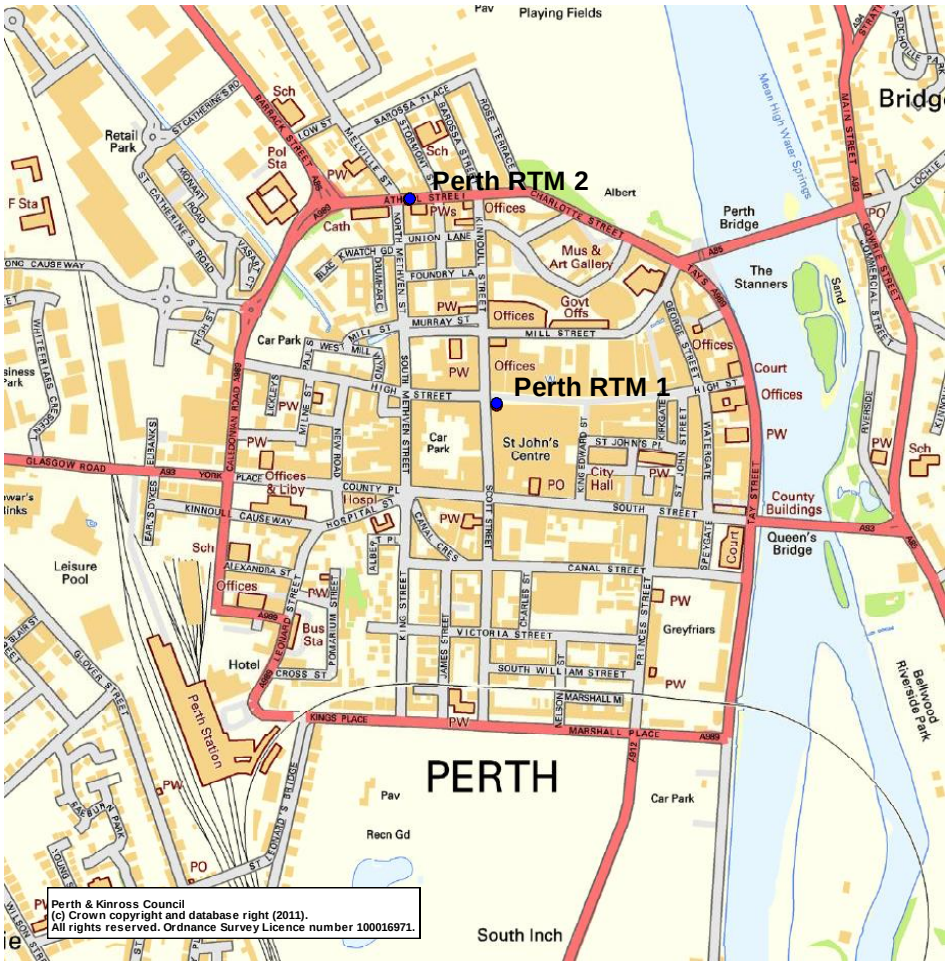


Figure 2.1b Automatic Monitoring North Muirton

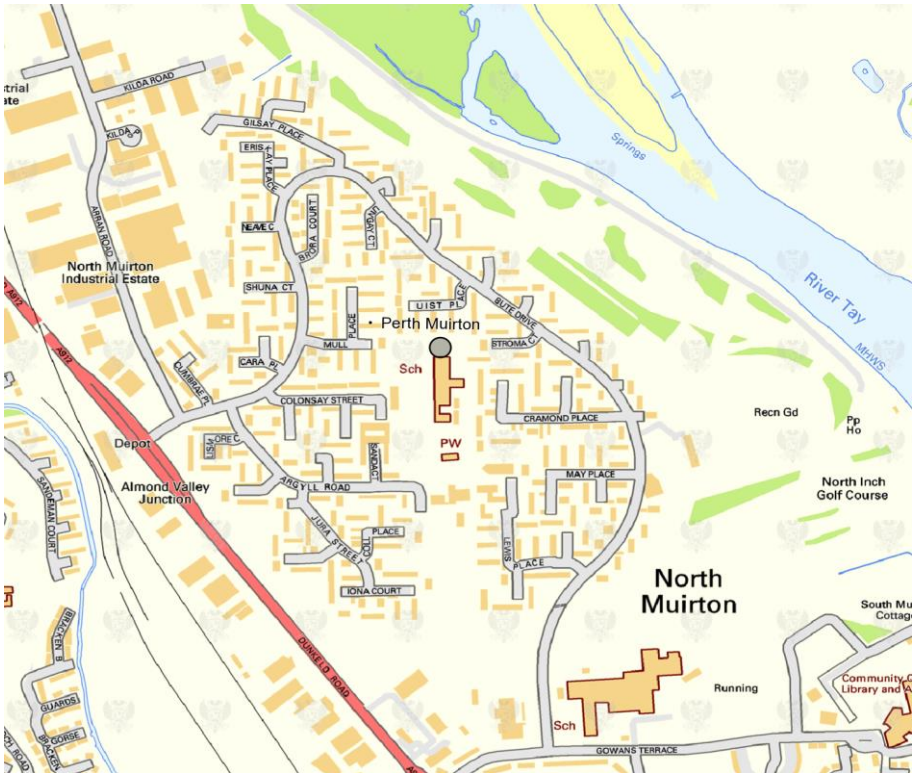


Figure 2.1c Automatic Monitoring Crieff

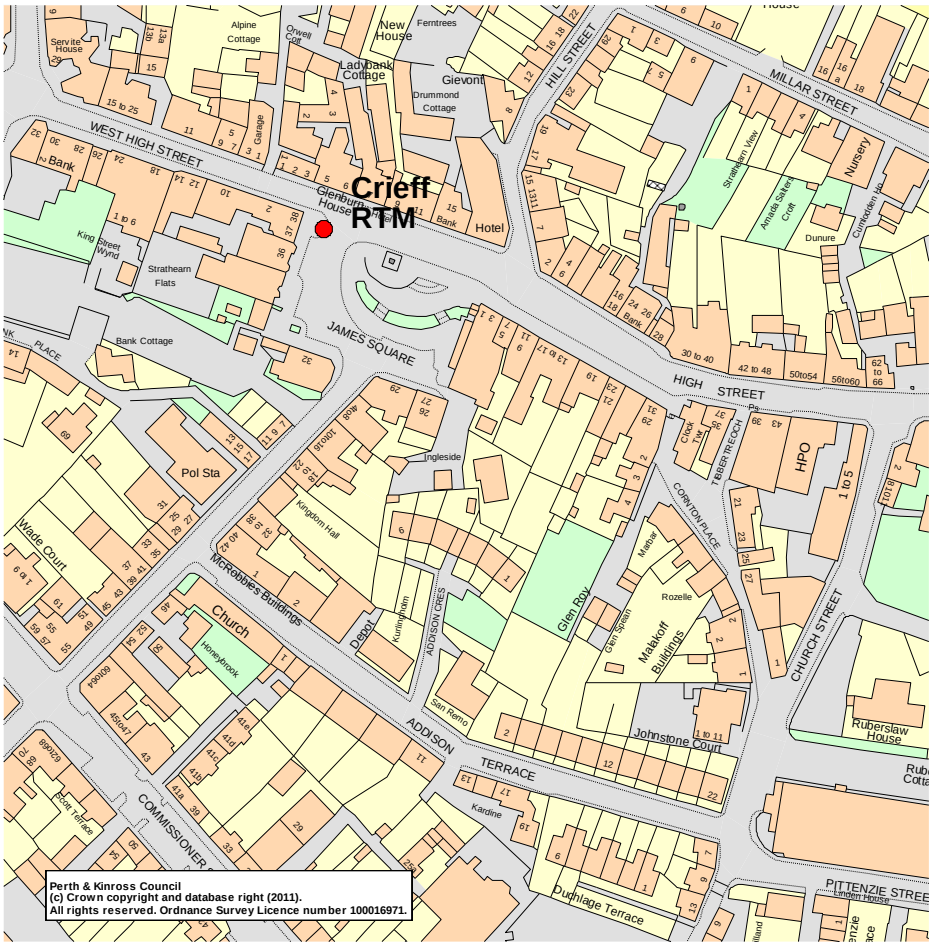


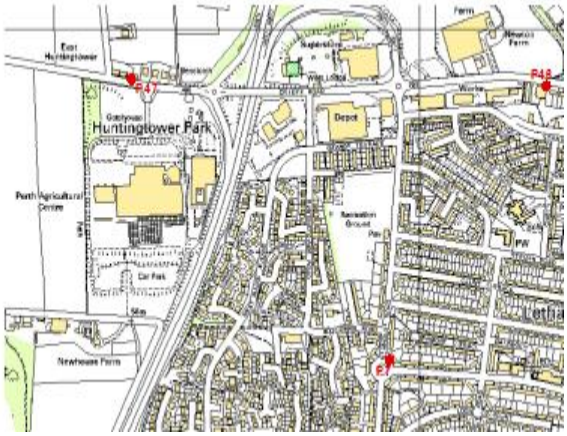
Table 2.1 Details of Automatic Monitoring Sites

Site Name	Site Type	OS Grid Ref		Pollutants Monitored	Monitoring Technique	In AQMA?	Relevant Exposure? (Y/N with distance (m) to relevant exposure)	Distance to kerb of nearest road (N/A if not applicable)	Does this location represent worst-case exposure?
Perth 1-High Street (RTM1)	Roadside	311680	723624	NO_2 & PM_{10}	AP1 M200A chemiluminescent analyser for Oxides of Nitrogen & R&P TEOM analyser for PM_{10}	Y	Y (20.4m)	4.8m	Y
Perth 2-Atholl Street (RTM2)	Roadside	311575	723917	NO_2 & PM_{10}	AP1 M200A chemiluminescent analyser for Oxides of Nitrogen & R&P TEOM analyser for PM_{10}	Y	Y (22.3m)	2.3m	Y
Perth 3-North Muirton	Urban Background	310658	725658	PM_{10}	FDMS TEOM Analyser	Y	N(30m)	N/A	N
Crieff-St James Sq	Roadside	286363	721614	NO_2 & PM_{10}	AP1 M200A chemiluminescent analyser for Oxides of Nitrogen & FDMS TEOM analyser for PM_{10}	Y	Y (9.5m)	5.3m	N

2.1.2 Non-Automatic Monitoring Sites

Figure 2.2a Maps of Non-Automatic Monitoring Sites, Diffusion tube locations within Perth's AQMA

South Street/Scott Street Area



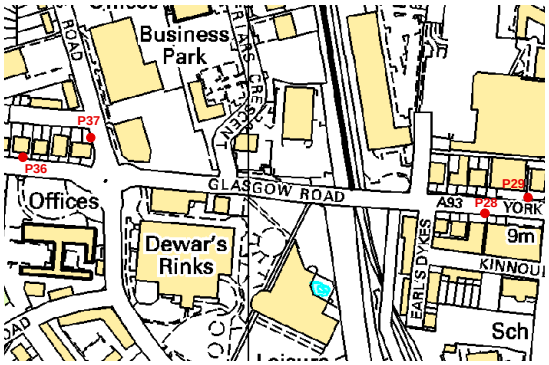
NW Perth Area

Atholl Street

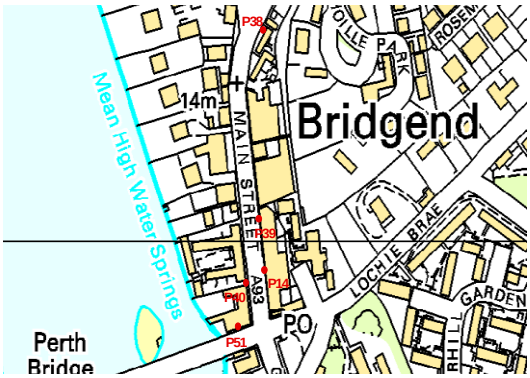
Edinburgh Road

Glasgow Rd West

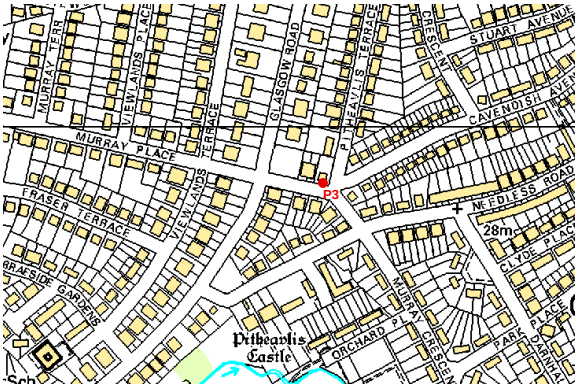
Lower Muirton Area



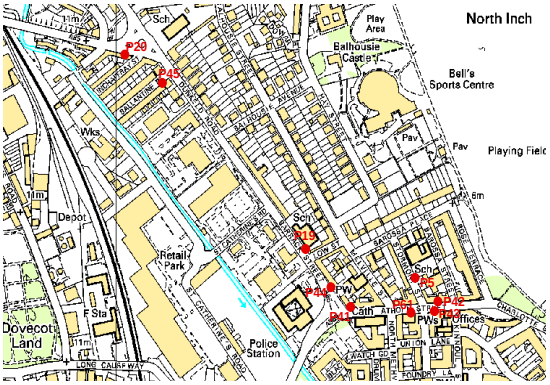
Glasgow Rd Area



Bridgend



Murray Crescent



North Centre Perth

Table 2.2a Details of Non- Automatic Monitoring Sites Perth

Site Address	Site Type	OS Grid Ref	Pollutants Monitored	In AQMA?	Relevant Exposure? *(Y/N with distance (m) to relevant exposure)*	Distance to kerb of nearest road *(N/A if not applicable)*	Worst-case Location?
42 Scott Street, Perth, PH1 5PH	R	NO117235	NO2	Y	Y(3)	2.5	Y
17 Speygate, Perth, PH2 8PJ	UC	NO120234	NO2	Y	Y(2.9)	2.05	Y
15 Murray Crescent, Perth, PH2 0HU	UB	NO105228	NO2	Y	Y(2.9)	2.05	N
8 Stormont Street, Perth, PH1 5NW	UC	NO116239	NO2	Y	Y(10)	1.7	Y
41 Mull Place, Perth, PH1 3DP	UB	NO105257	NO2	Y	Y(6)	1.7	N
257 Rannoch Road Roundabout, Perth, PH1 2DW	UC	NO089244	NO2	Y	Y(8.3)	2.1	Y
86/88 South Street, Perth, PH2 8PD	R	NO118234	NO2	Y	Y(1)	2.6	Y
9 Main Street, Bridgend, Perth, PH2 7HD	R	NO122239	NO2	Y	Y(1)	2.3	Y
St Ninian's School, Dunkeld Road, Perth, PH1 5RF	R	NO113241	NO2	Y	Y(3.4)	3.2	Y
2 Crieff Road, Perth, PH1 5RT	R	NO110243	NO2	Y	Y(1)	1.9	Y
28 York Place, Perth, PH2 8EH	R	NO111234	NO2	Y	Y(12)	2.4	Y
37 York Place, Perth, PH2 8EH	R	NO112235	NO2	Y	Y(8)	4.1	Y
104 South Street, Perth, PH2 8PA	R	NO117234	NO2	Y	Y(1)	2.4	Y
45-47 South Street, Perth, PH2 8PD	R	NO119234	NO2	Y	Y(5)	3.5	Y
135 South Street, Perth, PH2 8PA	R	NO117234	NO2	Y	Y(23)	4.6	Y
216 South Street, Perth, PH2 8NY	R	NO116234	NO2	Y	Y(5)	2.5	Y

10 County Place, Perth, PH2 8EE	R	NO115234	NO2	Y	Y(2)	3	Y
17 Princes Street, Perth, PH2 8NG	R	NO119234	NO2	Y	Y(1.5)	1.8	Y
51 Glasgow Road, Perth, PH2 0PE	R	NO107235	NO2	Y	Y(7.2)	2.6	Y
Riggs Road, Perth, PH1 1PR	R	NO108236	NO2	Y	Y(10)	1.9	Y
93-109 Main Street, Bridgend, Perth, PH2 7HE	R	NO122241	NO2	Y	Y(1)	7	Y
39 Main Street, Bridgend, Perth, PH2 7HD	R	NO122240	NO2	Y	Y(7)	2.1	Y
18 Main Street, Bridgend, Perth, PH2 7HB	R	NO122239	NO2	Y	Y(18)	2.4	Y
76 Atholl Street, Perth, PH1 5NL	R	NO114239	NO2	Y	Y(1)	2.5	Y
26-28 Atholl Street, Perth, PH1 6NP	K	NO116239	NO2	Y	Y(2)	0.3	Y
17 Atholl Street, Perth, PH1 5NH	R	NO116239	NO2	Y	Y(2)	3	Y
22 Barrack Street, Perth, PH1 5RD	K	NO114239	NO2	Y	Y(2.7)	0.3	Y
Ballantine Place, Perth, PH1 5RD	UC	N0110243	NO2	Y	Y(4)	1.7	Y
204A Crieff Road, Perth, PH1 2PE	R	N0093248	NO2	Y	Y(11.5)	2	Y
East Huntingtower, Perth, PH1 3JJ	R	NO083248	NO2	Y	Y(5.5)	1.8	Y
30 Edinburgh Road, Perth, PH2 8BX	R	NO083248	NO2	Y	N(37)	2.5	Y
2 West Bridge Street, Perth, PH2 7HA	R	NO122239	NO2	Y	Y12.5)	3.7	Y
Real Time Monitor adjacent to 176 High Street, Perth,PH1	R	NO115239	NO2	Y	Y(20.4)	4.8	Y
Real Time Monitor, Atholl Street, Perth, PH1 5NH	R	NO117235	NO2	Y	Y(22.3)	2.3	Y
84 Dundee Road, Perth, PH2 7BA	R	NO125229	NO2	Y	Y(1)	1.7	Y

30 Dundee Road, Perth, PH2 7AQ	R	NO124232	NO2	Y	Y(1.5)	1.4	Y
The Lodge, Isla Road, Bridgend, PH2 7HG	R	NO122241	NO2	Y	Y(1)	1.4	Y
5-7 Charlotte Street, Perth, PH1 5LW	R	NO119238	NO2	Y	Y(3.3)	2	Y
1 Atholl Street, Perth, PH1 5NH	R	NO116239	NO2	Y	Y(1)	2.3	Y
2 Atholl Street, Perth, PH1 5NP	R	NO116239	NO2	Y	Y(2.5)	0.8	Y
United Free Church of Scotland, Kinnoull Street, Perth, PH1 5EZ	R	NO116239	NO2	Y	Y(3)	2.6	Y
Leith Buildings, 28 Dunkeld Road, Perth, PH1 5AJ	R	NO110244	NO2	Y	Y(5.1)	2.1	Y
134-140 Dunkeld Road, Perth, PH1 5AS	R	NO106249	NO2	Y	Y(7.8)	1.5	Y
82 Crieff Road, Perth PH1 2RP	R	NO103240	NO2	Y	Y(1)	2.4	Y
2 Friarton Road, Perth, PH2 8DE	R	NO117812	NO2	Y	Y(4.5)	2.0	Y
202 Glasgow Road Perth, PH2 0NA	R	NO101602	NO2	Y	Y(5.5)	1.5	Y
59 South Methven Street, Perth, PH1 5NX	R	NO115492	NO2	Y	Y(0)	3.2	Y
22 North Methven Street, Perth, PH1 5PN	R	NO115412	NO2	Y	Y(0)	3	Y

Table 2.2b Details of Non- Automatic Monitoring Sites Dunkeld

Site Address	Site Type	OS Grid Ref	Pollutants Monitored	In AQMA?	Relevant Exposure? *(Y/N with distance (m) to relevant exposure)*	Distance to kerb of nearest road *(N/A if not applicable)*	Worst-case Location?
1 Atholl Street, Dunkeld, PH8 0AH	R	NO026654	NO2	N	Y(0)	2.25	Y
14 Atholl Street, Dunkeld, PH8 0AR	R	NO026744	NO2	N	Y(0)	2	Y

Table 2.2c Details of Non- Automatic Monitoring Sites Kinross

Site Address	Site Type	OS Grid Ref	Pollutants Monitored	In AQMA?	Relevant Exposure? *(Y/N with distance (m) to relevant exposure)*	Distance to kerb of nearest road *(N/A if not applicable)*	Worst-case Location?
124 High Street, Kinross, KY13 8DE	R	NO119200	NO2	N	Y(0.5)	1.3	Y
76 High Street, Kinross, KY13 8JA	R	NO119360	NO2	N	Y(0)	2	Y

Table 2.2d Details of Non- Automatic Monitoring Sites Auchterarder

Site Address	Site Type	OS Grid Ref	Pollutants Monitored	In AQMA?	Relevant Exposure? *(Y/N with distance (m) to relevant exposure)*	Distance to kerb of nearest road *(N/A if not applicable)*	Worst-case Location?
66 High Street, Auchterarder, PH3 1BN	R	NN945691	NO2	N	Y(1.7)	0.5	Y
176 High Street, Auchterarder, PH3 1AS	R	NN942671	NO2	N	Y(3.0)	0.5	Y

Table 2.2e Details of Non- Automatic Monitoring Sites Crieff (Note at the time of monitoring an AQMA in Crieff was not yet declared)

Site Address	Site Type	OS Grid Ref	Pollutants Monitored	In AQMA?	Relevant Exposure? *(Y/N with distance (m) to relevant exposure)*	Distance to kerb of nearest road *(N/A if not applicable)*	Worst-case Location?
7 West High Street, Crieff, PH7 3AF	UC	NN866215	NO2	N	Y(10)	0.4	N
39, High Street, Crieff, PH7 3HT	UC	NN865215	NO2	N	Y(18)	1.2	N
62, High Street, Crieff, PH7 3BS	UC	NN865215	NO2	N	Y(1)	1	Y
9 East High Street, Crieff, PH7 3AF	UC	NN866215	NO2	N	Y(5)	0.3	Y
19 West High Street, Crieff, PH7 4AU	UC	NN862992	NO2	N	Y(0)	2.5	Y
43 High Street, Crieff, PH7 3HT	UC	NN866672	NO2	N	Y(0)	1.4	Y
10/12 West Street, Crieff, PH7 4DL	UC	NN863192	NO2	N	Y(0)	2	Y
9 Comrie Street, Crieff, PH7 4AX	UC	NN862692	NO2	N	Y(0)	2.7	Y
1 Lodge Street, Crieff, PH7 4AX	UC	NN862202	NO2	N	Y(0)	2.2	Y
RTM Crieff, St James Square, Crieff, PH7 4AX	UC	NN863602	NO2	N	Y(9.5)	5.3	N
Hollybush Road, Crieff, PH7 3QD	UB	NN870302	NO2	N	Y(25)	25.0	N

2.1.3 Nitrogen Dioxide (NO_2)

Automatic Monitoring Data

Table 2.3 Results of Automatic Monitoring for NO_2: Comparison with Annual Mean Objective

Site ID	Site Type	Within AQMA?	Valid Data Capture 2013 % [b]	Annual Mean Concentration μg/m^3				
				2009*[c]	2010* [c]	2011* [c]	2012* [c]	2013 [c]
Perth 1	Roadside	Yes	94	25	30	27	26	22
Perth 2	Roadside	Yes	99	**56**	**56**	**57**	**54**	**48**
Crieff	Roadside	No	94	N/A	30	34	23	26

In bold, exceedance of the NO_2 annual mean AQS objective of 40μg/m^3

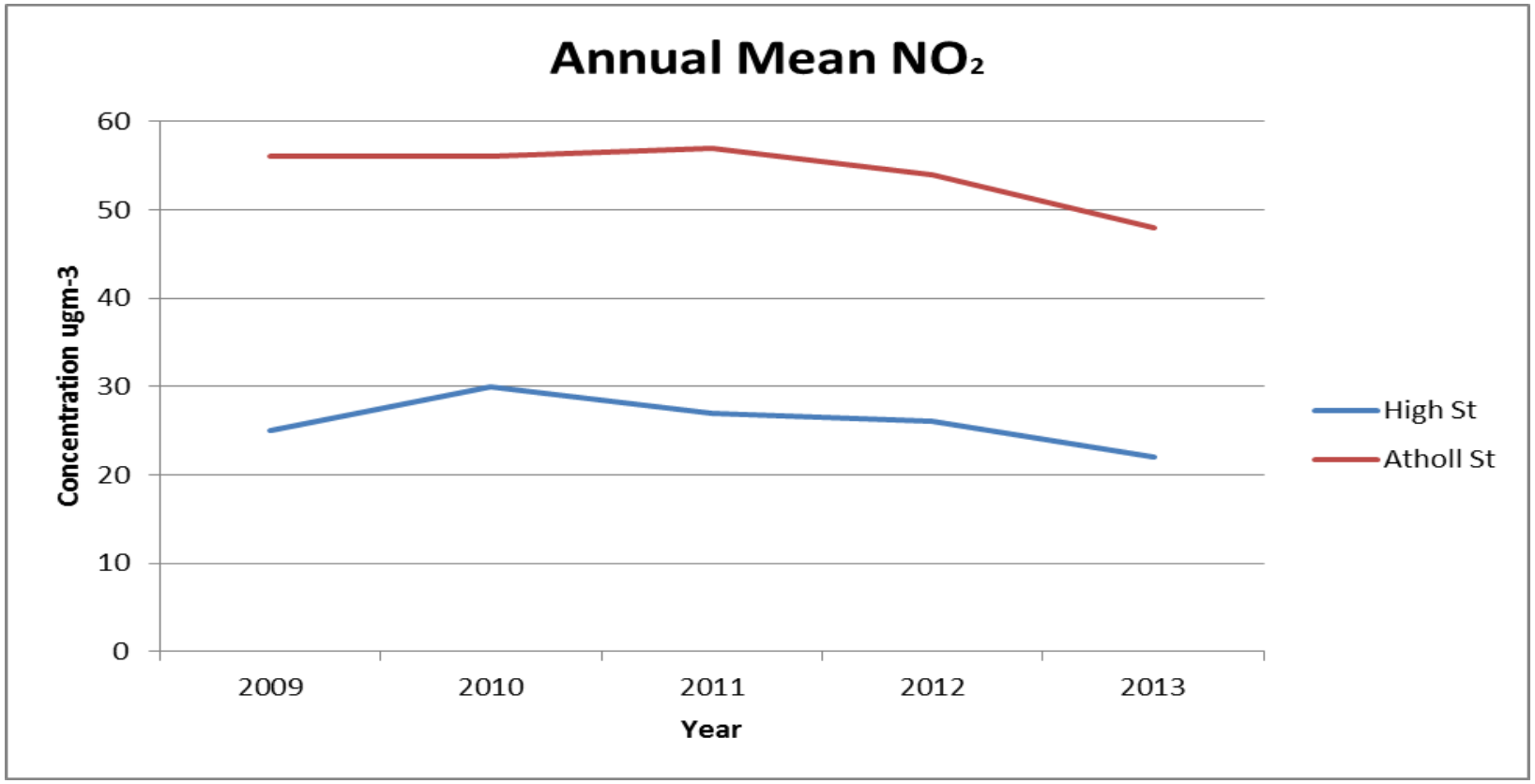
[a] i.e. data capture for the monitoring period, in cases where monitoring was only carried out for part of the year

[b] i.e. data capture for the full calendar year (e.g. if monitoring was carried out for six months the maximum data capture for the full calendar year would be 50%)

[c] Means should be "annualised" as in Box 3.2 of TG(09) (http://laqm.defra.gov.uk/technical-guidance/index.html?d=page=38), if valid data capture is less than 75%

* Annual mean concentrations for previous years are optional

Figure 2.3 Trends in Annual Mean NO_2 Concentrations Measured at Automatic Monitoring Sites



A trend chart providing NO_2 annual mean results over the past 5 years

Table 2.4 Results of Automatic Monitoring for NO_2: Comparison with 1-hour Mean Objective

Site ID	Site Type	Within AQMA?	Valid Data Capture 2013 % [b]	Number of Exceedances of Hourly Mean (200 μg/m^3)				
				2009	2010	2011	2012	2013
Perth1	Roadside	Yes	94	0	0	2	0	0
Perth 2	Roadside	Yes	99	3	10	17	25	13
Crieff	Roadside	No	94	N/A	N/A	0	0	0

In bold, exceedence of the NO_2 hourly mean AQS objective (200μg/m^3 – not to be exceeded more than 18 times per year)

[a] i.e. data capture for the monitoring period, in cases where monitoring was only carried out for part of the year

[b] i.e. data capture for the full calendar year (e.g. if monitoring was carried out for six months the maximum data capture for the full calendar year would be 50%)

[c] If the data capture for full calendar year is less than 90%, include the 99.8th percentile of hourly means in brackets

Diffusion Tube Monitoring Data

Table 2.5 Results of NO_2 Diffusion Tubes 2013

In bold, exceedence of the NO_2 annual mean AQS objective of 40µg/m^3

Underlined, annual mean > 60µg/m^3, indicating a potential exceedence of the NO_2 hourly mean AQS objective

[a] Means should be "annualised" as in Box 3.2 of TG(09)(http://laqm.defra.gov.uk/technical-guidance/index.html?d=page=38), if full calendar year data capture is less than 75%

[b] If an exceedence is measured at a monitoring site not representative of public exposure, NO_2 concentration at the nearest relevant exposure should be estimated based on the "NO_2 fall-off with distance" calculator (http://laqm.defra.gov.uk/tools-monitoring-data/no2-falloff.html), and results should be discussed in a specific section. The procedure is also explained in Box 2.3 of Technical Guidance LAQM.TG(09) (http://laqm.defra.gov.uk/technical-guidance/index.html?d=page=30).

Table 2.5a Results of NO_2 Diffusion Tubes 2013 Perth

Site ID	Location	Site Type	Within AQMA?	Triplicate or Collocated Tube	Data Capture 2013 (Number of Months or %)	Data with less than 9 months has been annualised (Y/N)	Confirm if data has been distance corrected (Y/N)	Annual mean concentration (Bias Adjustment factor = 0.98)
								2013 ($\mu g/m^3$)
P1	42 Scott Street	R	Y	Triplicate	100	N/A	N	**41** (37 - 46)
P2	17 Speygate	UC	Y	N/A	100	N/A	N	22 (20 - 25)
P3	15 Murray Crescent	UB	Y	N/A	100	N/A	N	18 (16 - 20)
P5	8 Stormont Street	UC	Y	N/A	100	N/A	N	20 (18 - 22)
P6	41 Mull Place	UB	Y	N/A	92	N/A	N	13 (11 - 14)
P7	257 Rannoch Road	UC	Y	N/A	100	N/A	N	19 (17 - 21)
P13	86 South Street	R	Y	N/A	100	N/A	N	35 (32 - 40)
P19	Dunkeld Road	R	Y	N/A	92	N/A	N	32 (29 - 36)
P20	2 Crieff Road	R	Y	N/A	100	N/A	N	28 (25 - 32)
P28	28 York Place	R	Y	N/A	100	N/A	N	**44 (39 - 49)**
P29	37 York Place	R	Y	N/A	100	N/A	N	39 (35 - 43)
P30	104 South Street	R	Y	Triplicate	100	N/A	N	37 (33 - 41)
P31	45-47 South Street	R	Y	N/A	100	N/A	N	30 (27 - 33)

Site ID	Location	Site Type	Within AQMA?	Triplicate or Collocated Tube	Data Capture 2013 (Number of Months or %)	Data with less than 9 months has been annualised (Y/N)	Confirm if data has been distance corrected (Y/N)	Annual mean concentration (Bias Adjustment factor = 0.98)
								2013 (μg/m^3)
P32	135 South Street	R	Y	N/A	100	N/A	N	36 (32 - 41)
P33	216 South Street	R	Y	N/A	100	N/A	N	38 (35 - 43)
P34	10 County Place	R	Y	N/A	100	N/A	N	**46 (41 - 52)**
P35	17 Princes Street	R	Y	N/A	100	N/A	N	27 (24 - 30)
P36	51 Glasgow Road	R	Y	N/A	100	N/A	N	33 (30 - 37)
P37	Riggs Road	R	Y	N/A	92	N/A	N	30 (27 - 34)
P38	93 Main Street, Bridgend	R	Y	N/A	100	N/A	N	31 (28 - 35)
P39	39 Main Street, Bridgend	R	Y	N/A	100	N/A	N	**46 (42 - 52)**
P40	18 Main Street, Bridgend	R	Y	N/A	100	N/A	N	**44 (39 - 49)**
P41	76 Atholl Street	R	Y	N/A	100	N/A	N	**47 (42 - 53)**
P42	26-28 Atholl Street	K	Y	N/A	100	N/A	N	**47 (42 - 52)**
P43	17 Atholl Street	R	Y	Triplicate	97	N/A	N	**51 (46 - 58)**
P44	22 Barrack Street	K	Y	N/A	100	N/A	N	**43 (39 - 48)**
P45	Ballantine Place	UC	Y	N/A	100	N/A	N	23 (21 - 26)

Site ID	Location	Site Type	Within AQMA?	Triplicate or Collocated Tube	Data Capture 2013 (Number of Months or %)	Data with less than 9 months has been annualised (Y/N)	Confirm if data has been distance corrected (Y/N)	Annual mean concentration (Bias Adjustment factor = 0.98)
								2013 (μg/m^3)
P46	204 Crieff Road	R	Y	N/A	100	N/A	N	33 (30 - 37)
P47	5 East Huntingtower	R	N	N/A	100	N/A	N	28 (25 - 32)
P48	30 Edinburgh Road	R	Y	N/A	100	N/A	N	25 (22 - 28)
P51	2 West Bridge Street	R	Y	N/A	100	N/A	N	30 (27 - 33)
P62	84 Dundee Road	R	Y	N/A	100	N/A	N	33 (30 - 37)
P63	30 Dundee Road	R	Y	N/A	92	N/A	N	39 (35 - 44)
P64	Isla Road	R	Y	N/A	100	N/A	N	**45** (40 - 51)
P65	5 Charlotte Street	R	Y	N/A	92	N/A	N	33 (30 - 37)
P67	1 Atholl Street	R	Y	N/A	92	N/A	N	36 (32 - 40)
P68	2 Atholl Street	R	Y	N/A	100	N/A	N	30 (27 - 34)
P69	Church, Kinnoull Street	R	Y	N/A	100	N/A	N	34 (31 - 39)
P70	28 Dunkeld Road	R	Y	N/A	100	N/A	N	30 (27 - 33)
P71	134 Dunkeld Road	R	Y	N/A	92	N/A	N	18 (16 - 21)
P72	82 Crieff Road	R	Y	N/A	100	N/A	N	37 (33 - 41)

Site ID	Location	Site Type	Within AQMA?	Triplicate or Collocated Tube	Data Capture 2013 (Number of Months or %)	Data with less than 9 months has been annualised (Y/N)	Confirm if data has been distance corrected (Y/N)	Annual mean concentration (Bias Adjustment factor = 0.98)
								2013 (μg/m^3)
P79	17 Main Street, Bridgend	R	Y	Triplicate	97	N/A	N	**42 (38 - 48)**
P86	2 Friarton Road	R	Y	N/A	42	Y	N	28 (26 - 32)
P88	202 Glasgow Road	R	Y	N/A	42	Y	N	**40 (36 - 45)**
P89	59 South Methven Street	R	Y	N/A	42	Y	N	39 (35 - 43)
P90	22 North Methven Sreett	R	Y	N/A	42	Y	N	33 (29 - 37)

Table 2.5b Results of NO_2 Diffusion Tubes 2013 Dunkeld

Site ID	Location	Site Type	Within AQMA?	Triplicate or Collocated Tube	Data Capture 2013 (Number of Months or %)	Data with less than 9 months has been annualised (Y/N)	Confirm if data has been distance corrected (Y/N)	Annual mean concentration (Bias Adjustment factor = 0.98)
								2013 (μg/m^3)
P84	1 Atholl Street	R	N	N/A	100	N	N	22 (19 - 24)
P85	14 Atholl Street	R	N	N/A	100	N	N	20 (18 – 23)

Table 2.5c Results of NO_2 Diffusion Tubes 2013 Auchterarder

Site ID	Location	Site Type	Within AQMA?	Triplicate or Collocated Tube	Data Capture 2013 (Number of Months or %)	Data with less than 9 months has been annualised (Y/N)	Confirm if data has been distance corrected (Y/N)	Annual mean concentration (Bias Adjustment factor = 0.98)
								2013 ($\mu g/m^3$)
P82	66 High Street	R	N	N/A	100	N	N	28 (25 - 32)
P83	176 High Street	R	N	N/A	100	N	N	23 (21 – 26)

Table 2.5d Results of NO_2 Diffusion Tubes 2013 Kinross

Site ID	Location	Site Type	Within AQMA ?	Triplicate or Collocated Tube	Data Capture 2013 (Number of Months or %)	Data with less than 9 months has been annualised (Y/N)	Confirm if data has been distance corrected (Y/N)	Annual mean concentration (Bias Adjustment factor = 0.98)
								2013 ($\mu g/m^3$)
P80	124 High Street, Kinross	R	N	N/A	100	N	N	19 (17 - 22)
P81	76 High Street	R	N	N/A	100	N	N	26 (24 – 29)

Table 2.5e Results of NO_2 Diffusion Tubes 2013 Crieff

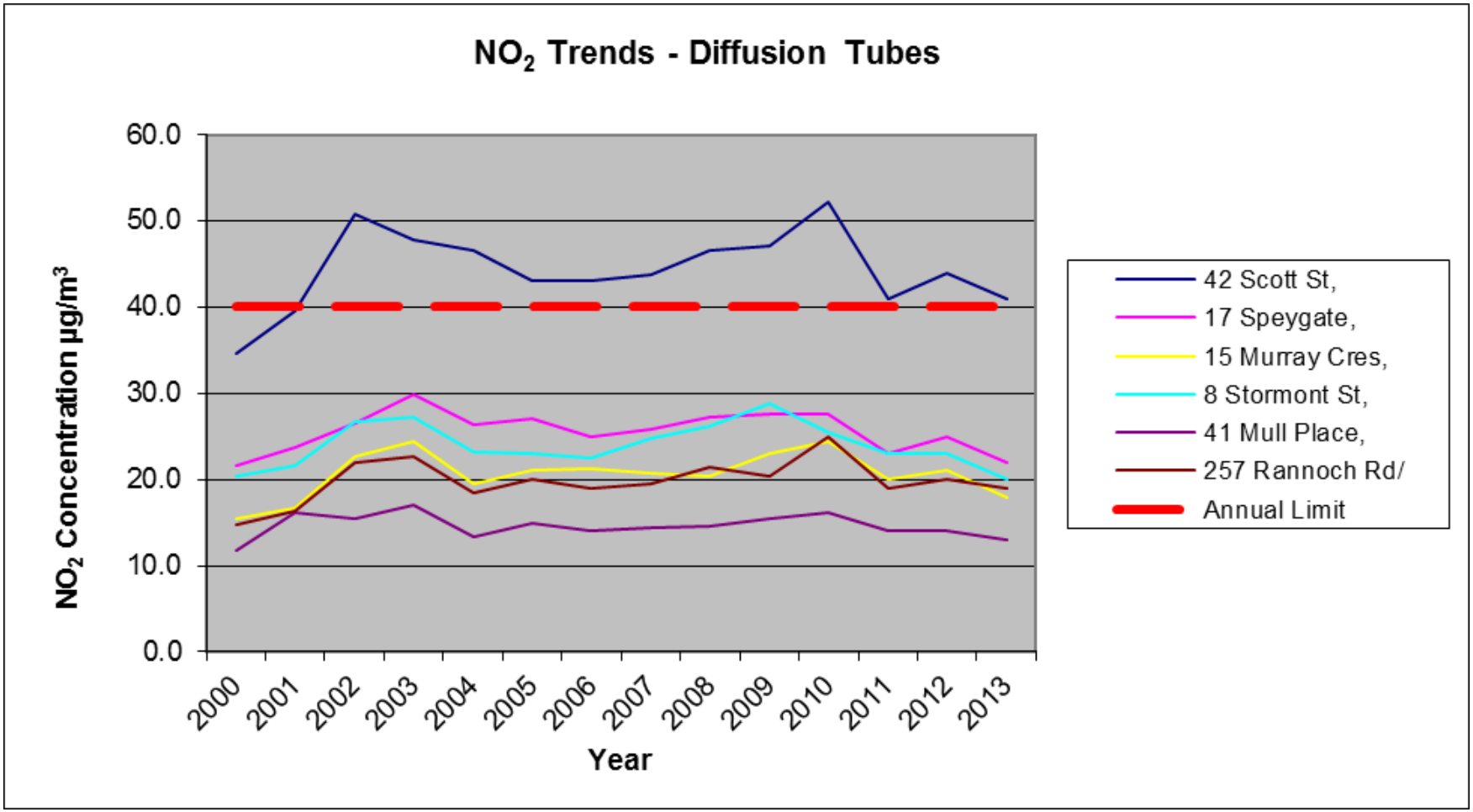
Site ID	Location	Site Type	Within AQMA?	Triplicate or Collocated Tube	Data Capture 2013 (Number of Months or %)	Data with less than 9 months has been annualised (Y/N)	Confirm if data has been distance corrected (Y/N)	Annual mean concentration (Bias Adjustment factor = 0.98)
								2013 (μg/m^3)
P55	7 West High Street	R	N	N/A	100	N/A	N	**47 (42 - 53)**
P56	39, High Street	R	N	N/A	100	N/A	N	33 (30 - 38)
P57	62, High Street	R	N	N/A	100	N/A	N	29 (26 - 33)
P58	9 East High Street	R	N	N/A	100	N/A	N	**41 (37 - 46)**
P73	19 West High Street	R	N	N/A	100	N/A	N	**41 (37 - 46)**
P74	43 High Street	R	N	N/A	92	N/A	N	31 (28 - 35)
P87	Background Hollybush	R	N	N/A	58	N/A	N	8 (7 - 9)
P76	10/12 West High Street	R	N	N/A	92	N/A	N	39 (35 - 44)
P77	9 Comrie Street	R	N	N/A	100	N/A	N	22 (20 - 25)
P78	1 Lodge Street	R	N	N/A	100	N/A	N	26 (23 - 29)

In bold, exceedence of the NO_2 annual mean AQS objective of 40μg/m^3

Underlined, annual mean > 60μg/m^3, indicating a potential exceedence of the NO_2 hourly mean AQS objective

[a] Means should be "annualised" as in Box 3.2 of TG(09) (http://laqm.defra.gov.uk/technical-guidance/index.html?d=page=38), if full calendar year data capture is less than 75%

Figure 2.4 Trends in Annual Mean Nitrogen Dioxide Concentrations Measured at Perth Diffusion Tube Monitoring Sites



2.1.4 Particulate Matter (PM_{10})

Table 2.6 Results of Automatic Monitoring for PM_{10}: Comparison with Annual Mean Objective

Site ID	Site Type	Within AQMA?	Valid Data Capture 2013 %[b]	Confirm Gravimetric Equivalent (Y or NA)	Annual Mean Concentration μg/m^3				
					2009	2010	2011	2012	2013
Perth1	Roadside	Y	94	Y	16	19	19	15	16
Perth2	Roadside	Y	96	Y	**21**	**24**	**25**	**21**	**22**
Perth3	UB	Y	77	Y	N/A	N/A	N/A	8	10
Crieff	Roadside	No	92	Y	N/A	17	**19**	16	**20**

In bold, exceedence of the PM_{10} annual mean AQS objective of 18μg/m^3

[a] i.e. data capture for the monitoring period, in cases where monitoring was only carried out for part of the year

[b] i.e. data capture for the full calendar year (e.g. if monitoring was carried out for six months the maximum data capture for the full calendar year would be 50%)

[c] Means should be "annualised" as in Box 3.2 of TG(09) (http://laqm.defra.gov.uk/technical-guidance/index.html?d=page=38), if valid data capture is less than 75%

* Annual mean concentrations for previous years are optional

Figure 2.5 Trends in Annual Mean PM_{10} Concentrations Measured at Automatic Monitoring Sites

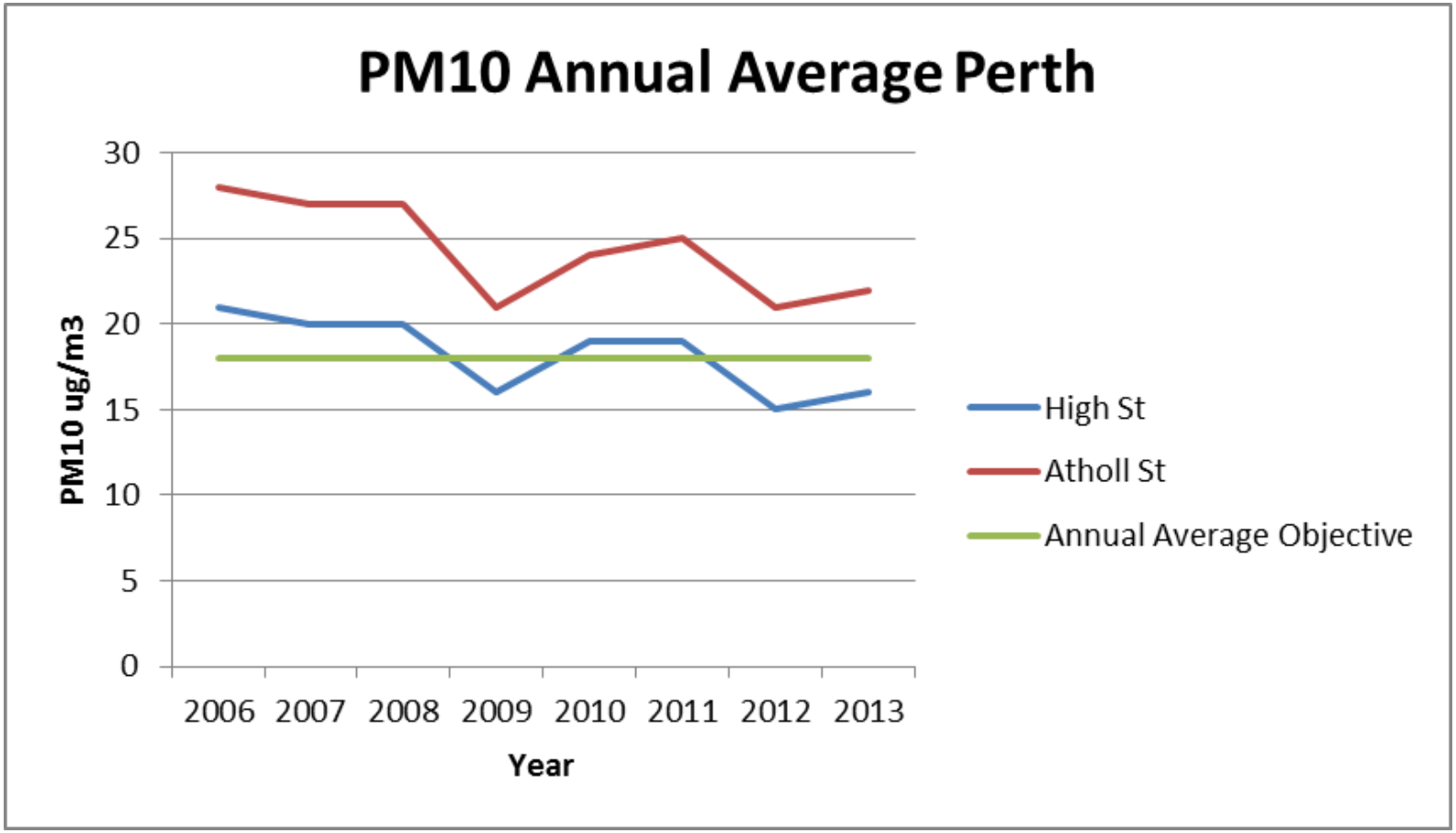


Table 2.7 Results of Automatic Monitoring for PM_{10}: Comparison with 24-hour Mean Objective

Site ID	Site Type	Within AQMA?	Valid Data Capture for monitoring Period %[a]	Valid Data Capture 2013 %[b]	Confirm Gravimetric Equivalent	Number of Exceedances of 24-Hour Mean (50 μg/m^3)				
						2009	2010	2011	2012	2013
Perth1	Roadside	Y		94	Y	2	3	3	2	0
Perth2	Roadside	Y		96	Y	3	12	17	11	7
Perth3	UB	Y		77	Y	N/A	N/A	N/A	0	0
Crieff	Roadside	N		92	Y	N/A	0	0	1	0

In bold, exceedence of the PM_{10} daily mean AQS objective (50μg/m^3 – not to be exceeded more than 7 times per year)

[a] i.e. data capture for the monitoring period, in cases where monitoring was only carried out for part of the year

[b] i.e. data capture for the full calendar year (e.g. if monitoring was carried out for six months the maximum data capture for the full calendar year would be 50%)

[c] if data capture for full calendar year is less than 90%, include the 98.1th percentile of 24-hour means in brackets

* Number of exceedences for previous years is optional

2.1.5 Sulphur Dioxide (SO_2)

Pollutant not required to be monitored.

2.1.6 Benzene

Pollutant not required to be monitored

2.1.7 Other Pollutants Monitored

No other pollutants require to be monitored

2.1.8 Summary of Compliance with AQS Objectives

Perth & Kinross Council has examined the results from monitoring in the area.

Concentrations within the AQMAs still exceed the objectives for NO2 and PM10 in Perth and Crieff and the AQMAs should remain.

Concentrations outside of the AQMAs are all below the objectives at relevant locations, therefore there is no need to proceed to a Detailed Assessment.

3 New Local Developments

3.1 Road Traffic Sources

There are no newly identified road traffic sources.

3.2 Other Transport Sources

There are no new transport sources

3.3 Industrial Sources

SEPA have confirmed that there were no new or altered processes which would have a significant impact on local air quality, however 2 poultry farms; Ladyston near Auchterader and Mains of Innerpeffray near Crieff, have surrender their permits.

3.4 Commercial and Domestic Sources

Biomass boilers are assessed at the planning stage and none were predicted to significantly impact on local air quality after mitigation.

3.5 New Developments with Fugitive or Uncontrolled Sources

There is no new Fugitive or uncontrolled sources in the area

Perth and Kinross Council confirms that there are no new or newly identified local developments which may have an impact on air quality within the Local Authority area.

Perth and Kinross Council confirms that all the following have been considered:

- **Road traffic sources**
- **Other transport sources**
- **Industrial sources**
- **Commercial and domestic sources**
- **New developments with fugitive or uncontrolled sources.**

4 Local / Regional Air Quality Strategy

Perth & Kinross Council declared the whole of Perth an Air Quality Management Area in May 2006 and our Air Quality Action Plan was approved by Scottish Government and adopted by the Council in 2009. However Perth & Kinross Council had started to implement some of the measures within our AQAP before it was actually adopted by the Council, measures such as Park and Ride Schemes, Healthy Living Campaign, Considering Air Quality in Planning Decisions, School Travel Plans and Car and Lift Share Schemes. Perth and Kinross Council have continued with these measures in 2010 and have made progress on others such as the Freight Consolidation Centre in conjunction with TACTRAN and fitting particulate traps to school buses and refuse vehicles and these projects are ongoing.

5 Planning Applications

12/01960/FLL for the installation of 2x 99kW biomass boilers at Rattray Primary School showed no issues here.

12/02205/FLL for farm based anaerobic digester with a 6 metre stack sited 700 metres from the closest farm workers houses. Using the supplied NOx data from the manufacturer and the nomograms in TG.09, no exceedances were predicted.

13/00132/FLL for an 800kW biomass boiler was located at a remote location in Strathallan School and screening calculations subsequently indicated no issues.

13/00148/IPM for a mixed use development on the edge of Crieff was supported by an air quality assessment. This was a simple DMRB screening assessment which the Environmental Health Team had issues with and predictions based on this showed unacceptable increases of NO_2 and PM_{10} along High St, Crieff therefore the applicant was asked to conduct a full dispersion model based on updated traffic assessment results.

13/00208/FLL for a 500kW biomass outside Crieff, the closest residential receptor was 650 metres away and screening calculations indicated no issues here.

13/00638/FLL for a 75 house development on the edge of the Perth AQMA was supported by an Air Quality Assessment which showed an imperceptible increase in NO_2 and PM_{10} concentrations.

13/00644/FLL for a biomass building with 2x 190kW boilers. This was to service recently approved poultry sheds (12/01246/FLL), therefore Environmental Health insisted on a cumulative assessment accounting for both these sources. A dispersion model was undertaken and no exceedances of any of the objectives were predicted.

13/00964/FLL for a 130kW biomass boiler near Forteviot which screening calculations predicted no issue.

13/01107/FLL for a 130kW biomass boiler near Pitlochry showed no issues upon completion of a screening assessment.

13/01083/FLL for 2x 40kW biomass boilers at Innerwick predicted no exceedances of any objectives.

13/010308/FLL for a 4MW biomass boiler at a distillery in Aberfeldy was accompanied by an air quality assessment. The assessment modelled the impacts arising from this boiler and predicted no issues here particularly when compared to the existing old oil fuelled boiler.

13/01666/FLL for a 198kW biomass boiler at a hotel in Alyth for which screening showed no issues.

13/01684/FLL included provision for a 55kW biomass boiler at Inveralmond Industrial Estate in Perth which is within the AQMA. There are no receptors near to this Industrial Estate and screening identified no issues.

13/01083/FLL for the installation of a 199kW biomass boiler identified no issues upon screening assessment.

13/01694/FLL included 3x 60kW biomass boilers in the service wing of Blair Castle, screening assessment showed no issues here.

13/01918/FLL was for the installation of a 199kW biomass boiler near Bankfoot, screening assessments showed no issues.

6 Air Quality Planning Policies

The Perth & Kinross Structure Plan, approved by Scottish Ministers in June 2003, is the key strategic land-use planning document which guides the development of Perth & Kinross to 2020.

The Structure Plan provides the framework for local plans which contain more detailed and site-specific policies. The Plan is based on three themes-

- Building Sustainable Communities
- Creating a Sustainable Economy
- Sustaining the Environment and Resources

Perth and Kinross has six Local Plans:

- Eastern Area
- Highland Area
- Kinross Area
- Perth Central
- Perth Area
- Strathearn Area

The Council under the new Planning Act has produced a Local Development Plan and a Main Issue Report (MIR) in October 2010. This document will cover the entire Council area and when adopted will replace the current Local Plans.

The MIR is the first stage in the process and will be followed by the production of the Proposed Local Development Plan. The MIR is not a decision making document but was produced to stimulate discussion on the key issues that the LDP will require to address. Issues such as Climate Change section 4.5 of the document and page 151 addresses proposed thoughts on direction of air quality policy www.pkc.gov.uk/mainissuesreport.

There is now a Proposed Local Development Plan for the whole area, The Environmental Health Team was consulted on this. It includes a section dealing with the effect of local developments on air quality.

The Structure Plan was replaced by a Strategic Development Plan which is called the TAYplan and this covers Angus, Dundee, part of the North East of Fife and Perth & Kinross (except those areas within the National Parks)

The Tayplan was accepted by Scottish Ministers in 2012.

The Environment Service are consultants for Perth and Kinross Planning Authority and the Service make recommendations with regards to air quality and dust issues.

7 Local Transport Plans and Strategies

Transport policy is governed by the National Transport Strategy (NTS), produced by the Scottish Government. This sets out the priorities that the Scottish Government has for transport as a whole across the country. Regional policy is set by Regional Transport Partnerships (RTPs). Perth & Kinross Council is a member of TACTRAN the RTP that covers the Angus, Dundee City, Stirling and Perth & Kinross Council areas. TACTRAN produce a Regional Transport Strategy (RTS) that covers a 15 year period and is refreshed every four years.

Local policies and strategies must take account of the NTS and the RTS as well as the Development Plans drawn up by the Planning Service that look at land use issues. Current policy issues that the Transport Planning team has been considering include the following.

- A possible third Tay Crossing
- Improvements to the A9/A85 junction at Newhouse Road, Perth
- The development of the Perth Western Edge
- Wider transport issues in Perth City
- The possible redevelopment of the Railway and Bus Stations in Perth
- The possibility of more Park and Ride Sites around Perth
- Improved rail services between Inverness, Perth and Edinburgh

These policies and strategies all have to be appraised and evaluated according to procedures set down by the Scottish Government's transport agency Transport Scotland. In order for any proposed scheme to qualify for Government money, then the appraisal process known as the Scottish Transport Appraisal Guidance (STAG) must be carried out. This sets out a very rigorous evidence based appraisal programme that should be followed before any proposed scheme can be taken forward towards the implementation stages.

The Environment Service AQ team is consulted throughout the appraisal programme procedure and has secured funding through our AQ budget for certain initiatives that are within our AQAP.

The Transport Planning team also tries to predict the future growth of traffic on the transport network using transport modelling software such as S - Paramics to determine where future bottlenecks might occur. This information is then used to help determine future strategies for transport within Perth and Kinross.

8 Climate Change Strategies

The Council signed up to Scotland's Climate Change Declaration (SCCD) in January 2007. In June 2008, the Council produced its first annual progress report on delivering the commitments made in the Declaration - Perth & Kinross Council: Scotland's Climate Change Declaration - Annual Report 2008. The Council has made progress on all seven commitments, particularly in relation to reducing greenhouse gas emissions from its own operations, through the Council's Carbon Management Strategy & Implementation Plan 2007-2017. This has been recognized by the Council achieving certification of the Carbon Trust Standard in January 2009.

The Council has also recently produced a Local Climate Impacts Profile (LCLIP) to increase the awareness of local climate change and adaptation that is likely to be required in Perth & Kinross. Perth & Kinross Council - LCLIP

9 Implementation of Action Plans

Table 9.1 Action Plan Progress

No.	Measure	Focus	Lead Authority	Planning Phase	Implementation Phase	Indicator	Target Annual Emission Reduction in the AQMA	Progress to Date	Progress in Last 12 Months	Estimated Completion Date	Comments Relating to Emission Reductions
1	Cross Tay Link	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 centre	PKC Tactran Transport Scotland		2009-ongoing to circa 2018	It is not possible at this stage to assign a quantitative indicator. We will report outputs of feasibility work/air quality assessments as they arise and update timescales as appropriate	High	STAG report and summary strategy paper finalised and public carried out 2011. Consultation and SEA Environmental Addendum published 2011. Council meeting held in 2012 'Shaping Perth's Future' Stage 2 DMRB Assessment & SEA have been undertaken. Work is also progressing on the A9 & A95 junction	The draft DMRB2 report is currently being reviewed. Major topographical survey work is currently being undertaken to inform the selection of the final preferred route and future detailed design of the scheme. The draft DMRB2 will be held until the Bertha Park Planning Application comes in as part of the spine road for this development will be a part of the Cross Tay route. Submission of a planning application for the Cross Tay is proposed for 2015	2018	
2	Integrate AQ into Regional Transport Strategy	Ensure that this AQAP is integrated into the delivery of the Regional Transport Strategy	PCK Tactran		2009/10 and as RTS is delivered	We will report annually on our meetings with Tactran, and provide a discussion as how the AQAP is influencing delivery of the RTS	Medium - High	AQ considerations are influencing RTS delivery, in past 5 years.	PKC and Tactran continue to work in conjunction to ensure AQ is considered in the RTS in projects such as freight consolidation, park and ride, liftshare, walking and cycling initiatives Regional Transport Strategy	Ongoing	

No.	Measure	Focus	Lead Authority	Planning Phase	Implementation Phase	Indicator	Target Annual Emission Reduction in the AQMA	Progress to Date	Progress in Last 12 Months	Estimated Completion Date	Comments Relating to Emission Reductions
3	Integrate AQ into Local Transport Strategy	Ensure that this AQAP is integrated into the delivery of the Local Transport Strategy. A new strategy was published 2010 and AQ is one of the Strategy objectives	PKC		LTS published 2010 ongoing implementation of the schemes	We will comment on specific air quality provisions contained in the LTS.	Medium - High	Transport Strategy for Perth **Shaping Perth's Transport Future** **Shaping Perth's Transport Future** 2011 and the wider region document published Regional Transport Strategy. The LTS preferred strategy is one of an integrated approach and air quality is one of the Strategy objectives. To work towards meeting national air quality standards and prevent further breach/exceedances and to reduce transport emissions which contribute to climate change, in line with National Guidance.	Environmental Health continues 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	Ongoing	
4	Park & Ride	Operate existing Park & Ride Schemes and maintain high levels of usage. We will carry out intermittent surveys to assess vehicles using the sites	PKC		2009-Ongoing	Annual usage statistics. A calculation of avoided Ox/PM10 will be provided Annually	Medium	The passenger waiting facility constructed at the Broxden P&R site for both P&R users and Megabus passengers, which is manned by Megabus staff, has been well received by the general public. Electric car charging points have been installed at Broxden and Kinross P&R sites and these were commissioned in summer 2013. Timetable was amended to reflect demand and fares revised: passengers now benefit by being able to use Stagecoach network tickets (Dayrider and Megarider)	The Broxden P&R bus service is operated by Stagecoach Perth. Monthly usage of P&R from April 2013 to March 2014 was just over 11,000 passengers per month Monday to Saturday.		Avoided NOx 21.1Kg/km Avoided PM_{10} 0.29kg/km

No.	Measure	Focus	Lead Authority	Planning Phase	Implementation Phase	Indicator	Target Annual Emission Reduction in the AQMA	Progress to Date	Progress in Last 12 Months	Estimated Completion Date	Comments Relating to Emission Reductions
		Investigate a new Park And Ride/Park and choose site at walnut Groove, Perth	Tactran PKC		2009- Ongoing to circa 2018 A feasibility study has been undertaken and detailed design work is in progress. More specific timescales are available in Tactran' s RTS delivery Plan	We will report outputs of feasibility work/detailed design and air quality assessments Led by Tactran as they arise and update timescales as appropriate	High	Tactran, in partnership with PKC, commissioned consultants to investigate opportunities for bus priority to serve the site and to undertake detailed design of the Park and Ride car park including access on to the trunk road. Preferred site lay out, land acquisition, public transport for serving the site and detailed design of the facility has been agreed	Preliminary work has commenced with a view to progressing a planning application	2018	
		Programme of improvements to existing Park And Ride sites (e.g. Better waiting areas, lighting etc.)	PKC		2009-Ongoing	Report of any improvements made, tied into occupancy rate	Small	A passenger waiting facility and 5 electric charging points have been installed at the Broxden Park and Ride.		Ongoing	
5	Bus Quality Improvements	Bus Strategy and Quality Bus Partnerships. PKC – Work with Tactran, operators and other relevant stakeholders to create a bus strategy for the region. support of these measures	Tactran PKC		2009- ongoing to 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	A number of corridor based improvements have been progressed involving PKC, Tactran and bus operators. These include Service 7, the Aviva Public Transport Initiative and enhancements on rural routes.	Further improvements made to bus stop and shelter facilities on the Perth-Blairgowrie corridor, including the construction of an improved bus interchange at Wellmeadow in Blairgowrie. Work to provide a new link road to Gleneagles Station progressing prior to the Ryder Cup, which will provide new opportunities for bus-rail interchange.	Ongoing	
		Tactran work in partnership with Councils, bus operators and other relevant stakeholders to identify and deliver improvements to the quality and accessibility of vehicles, services and associated facilities across the Region, particularly maximising funding and grant opportunities in support of these							Undertook the planning phase prior to the introduction of an innovative DRT scheme in West Kinross-shire.		

No.	Measure	Focus	Lead Authority	Planning Phase	Implementation Phase	Indicator	Target Annual Emission Reduction in the AQMA	Progress to Date	Progress in Last 12 Months	Estimated Completion Date	Comments Relating to Emission Reductions
		Ensure air quality is formally considered in future public transport procurement decisions(i.e. for subsidised public services, school buses, school taxis)	PKC		2009 then ongoing (as contracts are renewed)	Outcome of any procurement decisions. As cleaner vehicles come on stream, an annual calculation of the avoided NOx and PM10 will be provided	Medium	The consideration of air quality within the procurement decision is still under review, due to the pressure of the current economic climate. Although AQ is still not part of the procurement process, it has been noted that there is an improvement in fleet engine standards due to other Statutory requirements such as DGA.	No Progress	Ongoing	
6	Freight Improvements	Establish a Tactran – wide Freight Quality Partnership, 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. More specific timescales are available in Tactran's RTS delivery Plan/ capital and revenue programmes	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 FQP	2024	
		Development of a freight consolidation scheme or commercial delivery strategy	Tactran PKC		Feasibility work subject to funding, will be carried out in Years 1 and 2 of this AQAP	Initially we will report on feasibility work as and when it is carried out. If developed we could use the number of vehicle km avoided to calculate emission savings	Medium - High	Feasibility study was completed and report published in 2010 recommended a trial scheme. EU Interreg (LaMilo) and Scottish Government funding was approved in 2012. Tendering failed to identify a suitable private sector operator	An alternative approach based on encouraging the development of locally based business is being progressed An initial meeting to discuss the development of a consolidation centre by a local business as a business start-up has been held. A follow-up meeting is planned	2015	
7	Travel Planning	PKC Staff Travel Plan; including encouraging Flexible working, car/lift sharing/ alternative modes, salary sacrifice bicycle scheme	PKC		Initiated year 2 of this AQAP then ongoing	Activity data will be collected by survey to support the working of the PKC GTP. 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	Staff Travel Plan was launched in September 2010 and a staff travel plan summary leaflet was produced along with a staff travel Plan web page. Events such as Walk to Work Week and Family bike events in Perth Promoted via PKC staff intranet	Due to budget restraints, cuts were made in general sustainable transport budget. Therefore although the staff travel plan has been approved at SPR in 2010, no additional promotional work was carried out in 2013. The Lift share website and the Salary Sacrifice bike to work scheme are still continuing.	Ongoing	

No.	Measure	Focus	Lead Authority	Planning Phase	Implementation Phase	Indicator	Target Annual Emission Reduction in the AQMA	Progress to Date	Progress in Last 12 Months	Estimated Completion Date	Comments Relating to Emission Reductions
		We will work with regional partners to further encourage development and employee use of Green Travel Plans in our large employers within Perth& Kinross	Tactran (through the sustainable Travel Liaison Group) PKC		2009 the ongoing	Activity data will be sought from the main employers as to the journeys avoided from their GTPs. If this is provided will estimate 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 liftshare. 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 travelknowhow to support businesses developing and implementing travel plans	Ongoing	A Baseline is still being developed
		We will continue to support schools developing Green Travel Plans through our school co-ordinator and collect activity data to assess their use through our school co-ordinators	PKC		2009 then ongoing	Survey data will be requested from PKC schools as to the journeys avoided from their GTPs. We will estimate vehicle km avoided in the AQMA and report reduction in emissions of NOx and PM10	Medium	Grant funding was awarded in 2013 for the continued support for schools with green travel plans and funding has been sought for further measures in 2014.	In 2013 schools that had STPs was 96.34%. The official figures from Sustrans 'Hands up Survey' shows quite clearly that car usage has gone down in 2012 19.7% were driven to school in Perth & Kinross and in 2013 this went down to 18.9%	Ongoing	
		Regional/PKC car and Lift Share schemes- there is both a wider scheme, and one specific to PKC employees. We will improve use of the PKC scheme through our own GTP	Tactran PKC		2009 then ongoing	Activity data will be collected annually from both schemes and we will estimate vehicle km avoided in the AQMA and report reduction in emissions of NOx and PM10	Small - Medium	Promotion of liftshare scheme	Further promotion was undertaken of Liftshare including - PKC and PRI participation in national Liftshare week and leaflet promotion through employers	Ongoing	A baseline is still being developed
		Green Travel Plans for new developments. We will continue to seek travel plans from Large developments under existing planning arrangements	PKC		2009 then ongoing	Number of GTPs and estimation of effect specified in reporting year	Low	This is a continual process through planning development e.g. Murray Royal Hospital provided travel plans at the initial application stage	This is a continual process and PKC is working with MR Hospital to review their current travel plan this year	Ongoing	

No.	Measure	Focus	Lead Authority	Planning Phase	Implementation Phase	Indicator	Target Annual Emission Reduction in the AQMA	Progress to Date	Progress in Last 12 Months	Estimated Completion Date	Comments Relating to Emission Reductions
	Traffic Management	Keep "City Traffic Management Review" under continual review. Our Traffic and Environmental teams will liaise regularly to discuss the effect of component measures of the CCTMR on Air Quality	PKC		Ongoing as required	We will report annually on any changes to the CCTMR and how we anticipate this affecting air quality	Medium	20 Motes and 3 gateways have been installed and running, however problems have occurred. Data is now being collected but is not validated. The Mote project is also linked with Transport Scotland's TANNOISE Project. SG funding was obtained to invest in a new Stratos UTM Common database.	The Stratos (a new cloud based) UTM Common database is continuing to be implemented with our current system. The main link with UTC has been secured but is still trying to link RMS and Envirowatch.IT and Siemens are continually working on this but no timescale can be given for completion.	Ongoing	Due to problems with data collection and validation no baseline can be established
	Planning and Air Quality	Consider air quality as an issue for the Local Development Plan	PKC		2014-24	It is not possible to assign a quantitative indicator. We will report on delivery of the Local Development Plan, and provide evidence that air quality considerations have been formalised within it.	Medium	PKC Local Development Plan PDF [27Mb].was adopted on February 2014 to be reviewed every 5years. The LDP is to be consistent with the Strategic Development Plan- TAYplan	Environmental Health continue to ensure air quality is considered when assessing planning applications such as the proposed Cross Tay-Link and Bertha Park Development	Ongoing	
		Investigate development of supplementary planning guidance on Air Quality	PKC		2010-14	It is not possible to assign a quantitative indicator. We will report progress on development of new guidance, though it is explicitly linked to the LDP	Small	Draft Supplementary guidance on air quality had been developed, however this is now being reviewed	No Progress	Ongoing	
		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 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	Environmental Health made comment on 13 biomass applications in 2013-14. 1 was within AQMA 13/01684/FLL which included provision for 55KW biomass boiler at Inveralmond Industrial Estate There are no receptors near this Industrial estate and screening identified no issues	Ongoing	

No.	Measure	Focus	Lead Authority	Planning Phase	Implementation Phase	Indicator	Target Annual Emission Reduction in the AQMA	Progress to Date	Progress in Last 12 Months	Estimated Completion Date	Comments Relating to Emission Reductions
								Planning permission for Waste to energy facility 11/00788/AMM was refused on the ground of amenity on noise, odour and air quality. The appeal decision upheld the decision of refusal.	Planning application 13/00638/FLM for a 75 house development on the edge of the Perth AQMA was supported by an Air Quality Assessment which showed an imperceptible increase in NO_2 and PM_{10} concentrations resulting.		
	Procurement and Air Quality	Air quality will be formally considered in tender process 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 improvement	PKC		Fleet survey in year 1 of AQAP, then on going as tenders arise as part of the standard specification	If vehicles are replaced like for like, the number will be reported annually, with their Euro standard and that of the vehicle replaced. This will feed into an emissions calculation and the saving in NOx and PM_{10} will be reported annually. If additional vehicles bought, Euro Standards will be reported and an estimation of impact of specifying a more stringent standard will be reported	Small-Medium	PKC through funding have installed electric points at all council Operations depots 10 Euro 3 refuse vehicles have been fitted with Pirelli Feelpure diesel particulate systems reducing vehicle particulate emissions by up to 95% bringing them into line with Euro 4. PKC to date have purchased: 4 electric cars-Nissan Leafs;4 Hybrid transits;1 electric Peugeot Boxer and 1 electric minibus	PKC replaced 76 vehicles in 2013 with further reduced emissions: 6x Minibuses Euro 4 31x Cars Reduced Co2 12x Commercial under 3500kg Euro 5 24x over 3500kg Euro 5	Ongoing	Overall initiative will save around 112kg of harmful street side particulate Emissions Per Annum
	Eco –driver training	PKC will seek to expand the existing provision of eco-driver training utilising formed 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 CPC training package which will be delivered to all LGV drivers on an ongoing basis.	PKC		Expanded programme by 2011 then ongoing	PKC intend to assess drivers after they have completed the training. The outcomes of these assessment (i.e. the fuel saving per driver) will allow simple calculation of avoided emissions of NOx and PM_{10}	Small	4 Trainers have been trained PKC have now been licensed to deliver Drivers CPC Programme which was rolled out in September 2011. PKC won the tender to deliver CPC Training to Angus. PKC run an in house service LGV Training Centre. PKC have a qualified LGV driving instructor to deliver LGV training to staff.	PKC continues to deliver CPC Programme to PKC staff and Angus.	Ongoing	Due to limited resources and issues with the recording system, fuels record figures have not been progressed, due to inaccurate figures

No.	Measure	Focus	Lead Authority	Planning Phase	Implementation Phase	Indicator	Target Annual Emission Reduction in the AQMA	Progress to Date	Progress in Last 12 Months	Estimated Completion Date	Comments Relating to Emission Reductions
		The eco-module will also form 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			New fuel/fleet management system implemented by end 2015 depending on funding and available resources.		Small		PKC are currently looking at the tracking devise and system installed to provide us with both vehicle and driver behaviour and set up some targets for the future this will all depend on future funding and also available resources to analyse and produce reports. Are also looking to use individual vehicle CO2 emissions levels and have them recorded on our Fleet Management System thus will produce a council total each year.	Ongoing	The proposed new fuel management system will hopefully produce better information dependant on resources available for analysis
	Provision of Travel 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/develop strategy by 2011 Specific measures ongoing to circa 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	A web-based regional travel information database and journey planner (Tactran connect) developed in May 2010. Further developments have included provision of information for logistics sector/lorry drivers.	A review of branding, public awareness and modernisation of the website is in progress. Traveline Scotland in partnership with PKC has continued to develop their website and apps to provide enhanced public transport information Scotland-wide.	Ongoing	
	Signage	Investigate the potential of variable message signage linked to pollution monitoring systems	PKC		Feasibility work by 2011	We will report annually the findings of any feasibility work that is carried out and develop the measure further based on their findings	Medium	No Progress	No Progress		
	Alternative Modes	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 – 2009-10 Ongoing liaison/review	We will liaise with Tactran annually and report progress with individual measures implemented under the Strategy	Medium	Cycle training provided to staff and production of walking and cycling maps has been undertaken. Grant funding obtained 2013 for a variety of walking, cycling and travel planning initiatives. Tactran supported financially the provision of cycle lockers in Perth schools.	SG grant funding attained this year again for a number of walking/cycling initiatives including training and safety events PKC helps fund The IBike Project and Hand up Survey within Perth & Kinross Schools http://www.sustrans.org.uk	Ongoing	

No.	Measure	Focus	Lead Authority	Planning Phase	Implementation Phase	Indicator	Target Annual Emission Reduction in the AQMA	Progress to Date	Progress in Last 12 Months	Estimated Completion Date	Comments Relating to Emission Reductions
	Better access to public transport (note: access to services, not person access to individual buses)	Work with planning colleagues to assess provision of public transport at new and existing developments.	PKC		2009 - Ongoing	We will report on findings of reviews and any improvements made to the existing public transport network and on new developments that have given public transport facilities	Small	Improvement of operation of Service 11 which operates between Murray Royal and Perth City Centre has been completed, with the addition of two bus shelters along the route at Bridgend/Dundee Road and to support public transport access to major employers such as SSE and Aviva.	Working with Ryder Cup Europe on local transport access to both the Ryder Cup at Gleneagles and Junior Ryder Cup at Blairgowrie.		
	Idling Emission Reduction	Enforce Vehicle Idling Regulations	PKC		Feasibility study 2010	Number of vehicles subject to enforcement.	Small	No Progress	No Progress		
	Roadside Emission Testing	Authorised Personnel to carry out roadside testing	PKC initially		Feasibility study involving surrounding Local authorities By end 2010	Number of vehicles subject to enforcement	Small	No Progress	No Progress		
	LAQM Marketing	Enhance existing provisions of publicity materials and ensure they reach their target audience. Organise publicity initiatives in schools, large employers, public sector	PKC		Commence 2009-Ongoing	Publication of materials, events held website statistics	Small - Medium	PKC AQ website was ranked one of the top 5 (LA) websites in the UK by Air Quality Bulletin Magazine. The AQ website has had over 5,000hits over the year. PKC are constantly updating data and improving the site when possible. www.pkcairquality.org.uk/ SG funding was obtained in 2013 to carry out a social marketing campaign along one of our hotspot corridors at Scone- Bridgend.	Consultants JMP, PKC , Tactran and Stagecoach collaborated on a Social Marketing Campaign to encourage uptake of sustainable travel choices and developed “Perth on the Go” www.pkc.gov.uk/perthonthego. A travel guide was developed and distributed to over 4,000 households in the Scone, Gannochy, Kinnoull and Bridgend area. A leaflet providing vouchers (Free weekly Stagecoach Megarider bus ticket) and free car tyre check. 12% redemption on the free Megabus ticket was achieved and 18 people took up the free tyre check.	Ongoing	
									JMP & PKC carried out in-class school workshops covering AQ, journey planning using Tactranconnect and walkit.com, and on bus session (Stagecoach Hybrid bus) and a walk to school week. PKC intends to extend the campaign to other areas of Perth and Crieff, through further SG funding.		

No.	Measure	Focus	Lead Authority	Planning Phase	Implementation Phase	Indicator	Target Annual Emission Reduction in the AQMA	Progress to Date	Progress in Last 12 Months	Estimated Completion Date	Comments Relating to Emission Reductions
	LAQM Monitoring and Reporting	PKC will continue to monitor air pollution and will meet its statutory reporting requirements	PKC		Ongoing	Monitoring data will be provided in annual progress reports to track the overall effect of the AQAP	Small	2013 Progress Report Completed. RTM for background PM10 installed in North Muirton 2012-13	The 2011 dispersion modelling report for Perth City Centre is to be updated by our consultants Ricardo AEA. A Review of the AQAP is to be carried out once the fore-mentioned report is published late 2014.	Ongoing	

Conclusion

In line with the above the two main projects that were taken forward for 2013/14 were the Perth on the Go social marketing campaign and a feasibility study for a living wall.

The Perth on the Go campaign is to be extended next year to other areas within Perth City Centre such as North Muirton and Tulloch and to Crieff.

From the feasibility study, carried out by Christopher Palmer Associates, for a living wall it was determined not to processed due to the financial implication of installation and the difficulty in procuring a building or location, also the low return benefit to Air quality, it was decided not to proceed further with this initiative; as the living wall would only be for promoting Air Quality rather than making a reduction in Air Quality.

10 Conclusions and Proposed Actions

10.1 Conclusions from New Monitoring Data

Perth

Nitrogen Dioxide

Diffusion tube data captured within Perth AQMA show exceedances at 11 locations which is a decrease from the 19 exceedances measured last year. This ties in well with the decreases recorded at both High St and Atholl St, Perth which reduced from 26 µg/ m^3 to 22 µg/ m^3 and 54 µg/ m^3 to 48 µg/ m^3 respectively. The hourly exceedance also mirror this reduction with a big reduction from 25 to 13 in Atholl St, bring the breaches here back below the objective. There were no other short term NO_2 breaches in the area. This is thought to be due to local and national measures to improve air quality.

Particulates

PM_{10} annual mean shows a very slight increase of 1 µg/ m^3 at both High St and Atholl St to 16 µg/ m^3 and 22 µg/ m^3 respectively. The 24 hour mean level was only exceeded at Atholl St and this has reduced from 11 to 7 in 2013, short term PM_{10} levels here now comply with this objective.

Crieff

Nitrogen Dioxide

3 diffusion tubes are once again showing an exceedance of annual mean NO_2 objective, as was the case last year. The real time monitor had an increase from 23 µg/ m^3 to 26 µg/ m^3 but the 2012 levels were felt to be artificially low due to low data capture during the winter months.

Particulates

PM_{10} levels increased at the automatic monitor from 16 µg/ m^3 to 20 µg/ m^3 this is again more in line with the 2011 monitoring data which was 19 µg/ m^3 again possibly due to low data capture in winter 2012?.

Other Towns

Perth and Kinross Council also monitored NO_2 in Dunkled, Auchterarder and Kinross, in each case the annual mean was well below the objective.

10.2 Conclusions relating to New Local Developments

There are a number of large scale developments to the west of Perth including Almond Valley housing development for 1500 houses, Bertha Park development for up to 3500 houses and the new Cross Tay Link Road/Bridge which will join up to these developments. In addition there has been a scoping opinion request received for a biomass plant (incineration of brash) in the vicinity of these developments which will all require detailed consideration in due course.

Planning application 13/00148/IPM in Crieff for a mixed use development to the East of the town will require further consideration and a full dispersion model should follow in the next few months.

10.3 Other Conclusions

Short term levels of both NO_2 and PM_{10} are considerably down at Atholl St for 2013 compared to the previous years. NO_2 concentrations were down across Perth but the particularly large drop in exceedances of the short term objectives in PM_{10} and NO_2 at Atholl St is thought to be due to an optimisation of the Atholl St corridor traffic lights, allowing traffic to flow more freely here. Improvements were undertaken in consultation with the Roads Department as part of the AQAP

10.4 Proposed Actions

Monitoring is well established in Perth and Crieff for NO_2 and PM_{10}. Perth & Kinross Council have also begun monitoring in other towns within the area too. Monitoring was undertaken at Kinross, Dunkeld and Auchterarder and given that the annual mean measured at these towns was below 30 µg/ m^3 it is proposed to remove monitoring from some enable monitoring in other towns and villages. It is proposed that this will begin by removing the tubes from Dunkeld and putting a tube in both Ballinluig and Blairgowrie.

11 References

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Appendices

Appendix A: Quality Assurance / Quality Control (QA/QC) Data

Appendix B: Raw Diffusion Tube Data

Appendix A: QA:QC Data

Diffusion Tube Bias Adjustment Factors

Factor from Local Co-location Studies (if available)

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	1/1/13	31/01/2013	62.9	53.6	64.3	60	5.8	10	14.4	69	100	Good	Good
2	1/2/13	28/02/2013	64.8	62.2	60.2	62	2.3	4	5.7	74	100	Good	Good
3	1/3/13	31/03/2013	52.7	50.4	51.7	52	1.2	2	2.9	69	84	Good	Good
4	1/4/13	30/04/2013	45.7	49.4	44.7	47	2.5	5	6.2	37	100	Good	Good
5	1/5/13	31/05/2013	42	40.9	41.2	41	0.6	1	1.4	35	100	Good	Good
6	1/6/13	30/06/2013	44.9	42.9	45.6	44	1.4	3	3.5	34	100	Good	Good
7	1/7/13	31/07/2013	45.2	45.5	46	46	0.4	1	1.0	40	100	Good	Good
8	1/8/13	31/08/2013	43.8	47.2	48.5	47	2.4	5	6.0	43	100	Good	Good
9	1/9/13	30/09/2013	43	38.1	46	42	4.0	9	9.9	41	100	Good	Good
10	1/10/13	31/10/2013	49.1	47.4	47.3	48	1.0	2	2.5	43	100	Good	Good
11	1/11/13	30/11/2013	59	56.4	58.1	58	1.3	2	3.3	59	100	Good	Good
12	1/12/13	31/12/2013	50.4	53.6	48.7	51	2.5	5	6.2	39	100	Good	Good
13													

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

Overall survey --> Good precision | Good Overall DC

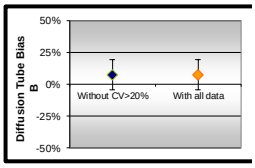
(Check average CV & DC from Accuracy calculations)

Site Name/ ID:	Atholl St

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 12 periods of data	
Bias factor A	0.98 (0.88 - 1.1)
Bias B	3% (-9% - 14%)
Diffusion Tubes Mean:	50 µgm^{-3}
Mean CV (Precision):	4
Automatic Mean:	49 µgm^{-3}
Data Capture for periods used:	99%
Adjusted Tubes Mean:	49 (44 - 55) µgm^{-3}

Accuracy (with 95% confidence interval) WITH ALL DATA	
Bias calculated using 12 periods of data	
Bias factor A	0.98 (0.88 - 1.1)
Bias B	3% (-9% - 14%)
Diffusion Tubes Mean:	50 µgm^{-3}
Mean CV (Precision):	4
Automatic Mean:	49 µgm^{-3}
Data Capture for periods used:	99%
Adjusted Tubes Mean:	49 (44 - 55) µgm^{-3}



Jaume Targa, for AEA

Atholl St Perth

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	1/1/13	31/01/2013	28	30.9	32.2	30	2.2	7	5.3	30	100	Good	Good
2	1/2/13	28/02/2013	31	33.1	33.6	33	1.4	4	3.4	33	100	Good	Good
3	1/3/13	31/03/2013	24.9	27.5	27.4	27	1.5	6	3.7	24	100	Good	Good
4	1/4/13	30/04/2013	18.6	21.3	22.8	21	2.1	10	5.3	21	77	Good	Good
5	1/5/13	31/05/2013	20.1	20.6	19.6	20	0.5	2	1.2	18	85	Good	Good
6	1/6/13	30/06/2013	16.8	18.6	16.6	17	1.1	6	2.7	14	100	Good	Good
7	1/7/13	31/07/2013	17.7	16.8	18.6	18	0.9	5	2.2	14	74	Good	or Data Captu
8	1/8/13	31/08/2013	19.4	18.6	18.1	19	0.7	4	1.6	15	99	Good	Good
9	1/9/13	30/09/2013	20.5	19.1	21.5	20	1.2	6	3.0	17	100	Good	Good
10	1/10/13	31/10/2013	26.2	26.7	24.3	26	1.3	5	3.1	21	100	Good	Good
11	1/11/13	30/11/2013	35.3	35.2	36.3	36	0.6	2	1.5	34	100	Good	Good
12	1/12/13	31/12/2013	26.1	25.9	24.9	26	0.6	3	1.6	22	100	Good	Good
13													

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

Overall survey --> Good precision | Good Overall DC

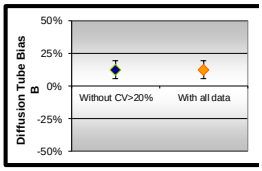
(Check average CV & DC from Accuracy calculations)

Site Name/ ID:	High St

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	0.91 (0.86 - 0.97)
Bias B	10% (3% - 17%)
Diffusion Tubes Mean:	25 µgm^{-3}
Mean CV (Precision):	5
Automatic Mean:	23 µgm^{-3}
Data Capture for periods used:	96%
Adjusted Tubes Mean:	23 (21 - 24) µgm^{-3}

Accuracy (with 95% confidence interval) WITH ALL DATA	
Bias calculated using 11 periods of data	
Bias factor A	0.91 (0.86 - 0.97)
Bias B	10% (3% - 17%)
Diffusion Tubes Mean:	25 µgm^{-3}
Mean CV (Precision):	5
Automatic Mean:	23 µgm^{-3}
Data Capture for periods used:	96%
Adjusted Tubes Mean:	23 (21 - 24) µgm^{-3}



Jaume Targa, for AEA
Version 04 - February 2011

High St Perth

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	1/1/13	31/01/2013	28.4	29.8	30.7	30	1.2	4	2.9	33	97	Good	Good
2	1/2/13	28/02/2013	28.6	30.1	29.1	29	0.8	3	1.9	31	94	Good	Good
3	1/3/13	31/03/2013	20.6	23.7	23.1	22	1.6	7	4.1	22	85	Good	Good
4	1/4/13	30/04/2013	19.8	19.4	19.2	19	0.3	2	0.8	22	99	Good	Good
5	1/5/13	31/05/2013	19.6	20.1	20.7	20	0.6	3	1.4	22	82	Good	Good
6	1/6/13	30/06/2013	20.2	18.4	18.5	19	1.0	5	2.5	17	91	Good	Good
7	1/7/13	31/07/2013	20.1	19.1	19	19	0.6	3	1.5	16	100	Good	Good
8	1/8/13	31/08/2013	19.4	22.3	21.7	21	1.5	7	3.8	20	94	Good	Good
9	1/9/13	30/09/2013	22.9	22.2	23.4	23	0.6	3	1.5	26	91	Good	Good
10	1/10/13	31/10/2013	22.7	24.1	25.2	24	1.3	5	3.1	26	99	Good	Good
11	1/11/13	30/11/2013	32.9	33.7	33.3	33	0.4	1	1.0	41	99	Good	Good
12	1/12/13	31/12/2013	25.9	23.8	22.4	24	1.8	7	4.4	33	99	Good	Good
13													

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

Overall survey --> Good precision | Good Overall DC

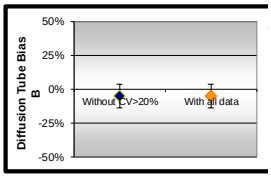
Site Name/ ID:	Crieff

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

(Check average CV & DC from Accuracy calculations)

Accuracy (with 95% confidence interval) without periods with CV larger than 20%	
Bias calculated using 12 periods of data	
Bias factor A	1.09 (0.99 - 1.2)
Bias B	-8% (-16% - 1%)
Diffusion Tubes Mean:	24 µgm^{-3}
Mean CV (Precision):	4
Automatic Mean:	26 µgm^{-3}
Data Capture for periods used:	94%
Adjusted Tubes Mean:	26 (23 - 28) µgm^{-3}

Accuracy (with 95% confidence interval) WITH ALL DATA	
Bias calculated using 12 periods of data	
Bias factor A	1.09 (0.99 - 1.2)
Bias B	-8% (-16% - 1%)
Diffusion Tubes Mean:	24 µgm^{-3}
Mean CV (Precision):	4
Automatic Mean:	26 µgm^{-3}
Data Capture for periods used:	94%
Adjusted Tubes Mean:	26 (23 - 28) µgm^{-3}



Jaume Targa, for AEA
Version 04 - February 2011

Crieff

Discussion of Choice of Factor to Use

The co-location studies gave factors of 0.91, 0.98 and 1.09 for High St, Atholl St and Crieff respectively. The factor given at http://laqm.defra.gov.uk/documents/Diffusion_Tube_Bias_Factors_v04_11_v6.xls was 0.78. Based upon advice given in Technical Guidance LAQM TG (09)), it was decided a local factor would be more appropriate. The middle value of the three was chosen which is similar to the value of 0.99 used last year.

PM Monitoring Adjustment

TEOM data used by Perth and Kinross Council for the 2 Perth monitors was corrected using the Volatile Correction Model by AEA using daily average purge measurements from the 26 FDMS sites in Central Scotland.

The Crieff monitor is a BAM and is corrected using a gravimetric factor of 0.83333 for Indicative Gravimetric Equivalent.

QA/QC of automatic monitoring

AEA carries out the QA/QC for the automatic monitors and they are calibrated annually and meet the criteria for national network.

QA/QC of diffusion tube monitoring

The Workplace Analysis Scheme for Proficiency (WASP) is an independent analytical performance testing scheme, operated by the Health and Safety Laboratory (HSL). WASP formed a key part of the former UK NO2 Network's QA/QC, and remains an important QA/QC exercise for laboratories supplying diffusion tubes to Local Authorities for use in the context of Local Air Quality Management (LAQM). The laboratory participants analyse four spiked tubes, and report the results to HSL. HSL assign a performance score to each laboratory's result, based on their deviation from the known mass of nitrite in the analyte.

The outcomes of these QA/QC schemes are evaluated on a regular basis against a set of pre-defined performance criteria. The Performance criteria are due to be changed, at present the criteria are based on the z-score method, however from April 2009; the criteria will be based upon the Rolling Performance Index (RPI) statistic.

Tayside Scientific Services takes part in this scheme and in each of the rounds were scored as 100% satisfactory except January to March 2013 which was 75%

Appendix B: Diffusion Tube Raw Data

Site No	Address	Jan-13	Feb-13	Mar-13	Apr-13	May-13	Jun-13	Jul-13	Aug-13	Sep-13	Oct-13	Nov-13	Dec-13
Perth 1 L	42 Scott St, Perth, PH1 5PH	47.9	41.3	53.2	45.6	33.5	33.4	33.6	30.4	384	43.4	48.1	36.3
Perth 1 C	42 Scott St, Perth, PH1 5PH	59.9	55.4	55.2	43.9	33.7	35.8	31.9	29.9	36.9	44.3	51.7	37.9
Perth 1 R	42 Scott St, Perth, PH1 5PH	48.4	55	51.4	43.3	32.6	34.5	35.1	29.2	34.9	45.4	47	35.7
Perth 2	17 Speygate, Perth, PH2 8PJ	29.8	31.4	26.8	17.8	16.3	16.4	16.3	18	21.6	26.4	33.4	21.3
Perth 3	15 Murray Cres, Perth, PH2 0HU	31.1	29.9	25.4	13.7	11.7	11.6	10.5	13	15.1	19.1	26.9	15.3
Perth 5	8 Stormont St, Perth, PH1 5NW	26.5	26.4	20.2	16.1	15.5	15.2	15.6	17.4	16.4	22.1	29.1	23.4
Perth 6	41 Mull Place, Perth, PH1 3DP	19.5	19.3	13.4	9.2	X	7.2	7.1	8.8	9.9	12	22.5	14.1
Perth 7	257 Rannoch Rd/Newhouse Road Roundabout, Per	29.9	28.9	25.9	19.2	12.4	14.3	11.9	11.5	16.5	22.1	24.8	17.1
Perth 13	86/88 South Street Perth PH2 8PD	42	43.8	36.7	33.3	27.3	32.3	31.3	34.3	32.6	36.3	46.9	35.2
Perth 19	St Ninian's School ,Dunkeld Rd, Perth, PH1 5RF	41.7	44	32.5	24.4	26.8	27.7	25.1	28.7	28.8	x	46.8	34.1
Perth 20	2 Crieff Road Perth PH1 5RT	42	38.1	29.1	28.7	22.5	22.8	20.9	21.2	26.1	29.4	35.2	30.6
P28	28 York Place Perth PH2 8EH	54.1	58	47	47.3	40.7	41.2	38.7	34.1	39.1	44.5	45.3	47.3
P29	37 York Place Perth PH2 8EH	44.6	53	50.9	44.4	32.9	32.8	28.9	27.7	36.7	39.4	44.5	38.1
P30 L	104 South St, Perth, PH2 8PA	44.3	49.9	36.9	34.7	32.5	31.3	32.8	30.1	31.1	38.5	52.6	39.3
P30 C	104 South St, Perth, PH2 8PA	44.7	49.8	39.2	33.1	33.7	33.6	32.8	33.8	32.3	41.1	47.1	40.2
P30 R	104 South St, Perth, PH2 8PA	42	48.3	33.6	31.6	31	28.5	27.8	34	34.7	37.8	47	37.1
P31	45-47 South St, Perth, PH2 8PD	38.2	41.5	39.1	26.8	24.1	25.5	22.8	21.6	26.4	31.8	38.3	27.6
P32	135 South St, Perth, PH2 8PA	43.4	48.3	45.7	36.6	32.1	31.6	29.6	28.8	32.1	38.7	45.5	30.5
P33	216 South Street Perth PH2 8NY	47	53.8	41.9	39.6	31.2	36.6	34.7	33.2	34	42.9	45.8	30.7
P34 L	10 County Place, Perth, PH2 8EE	52.3	54	48.5	49.1	38.9	46.6	44.6	44	45.4	40.5	50.6	51
P35	17 Princes St, Perth, PH2 8NG	33.4	37.5	30.6	24.6	21.1	19.9	21.3	23.5	23.4	27.8	41.8	26.1
P36	51 Glasgow Rd, Perth, PH2 0PE	41.5	44.4	36.4	34.1	26.5	28.6	25.6	25.9	28.5	36	44.7	33.5
P37	Riggs Rd, Perth, PH1 1PR	36.4	37.7	35.4	29.2	20.4	23.6	19.8	22.1	x	48.4	38.4	29
P38	93-109 Main St Bridgend, PH2 7HE	40.8	40	42.8	34.3	26.3	27.5	26.2	23.7	30.4	30.8	34	25.9
P39	39 Main St, Bridgend, PH2 7HD	58	57.5	63.8	52.5	40.2	41.6	40.3	36.1	41.9	51.4	49.3	35.9
P40	18 Main St, Bridgend, PH2 7HB	49.3	52.3	47.4	41	42.1	39.9	42.5	46.7	40.9	44.9	53.1	38.1
P41	76 Atholl St, Perth, PH1 5NL	60.9	68	64.9	49.1	39.7	42.1	38.9	36	43.6	48.6	51.3	30.3
P42	26-28 Atholl St, Perth, PH1 6NP	56.9	61.9	57.8	48.2	38.8	41	40.8	38.3	41.9	42.9	62.5	38.7
P43 L	17 Atholl St, Perth, PH1 5NH	61.4	64.1	55.4	52	42.6	48.5	50.3	50.5	45.8	56.1	58.4	51.4
P43 C	17 Atholl St, Perth, PH1 5NH	58.1	63	53.6	52.3	44.6	44.3	51.3	49.7	48.2	55.7	62.5	18.1
P43 R	17 Atholl St, Perth, PH1 5NH	53	61.7	54.8	50.9	45.3	46.2	46.7	51.9	47.9	45.9?	59	50.1
P44	22 Barrack St, Perth, PH1 5RD	59.3	57.9	58.4	46.6	32.2	35.5	31.1	29.8	41.5	45.6	47.9	39.6
P45	Ballantine Place, Perth PH1 5RR	37	37.6	29	23.7	17.9	17.8	14.7	7.3	17.4	25..2	33.8	20.2
P46	204 A Crieff Rd, Perth, PH1 2PE	43.9	34.8	43.6	34.7	24.4	30.6	29.2	25.1	31.6	36.4	39.5	32.1
P47	5 East Huntingtower, Perth, PH1 3JJ	40.9	39.3	33.3	26.9	22	25.2	23	22.3	25.2	35.6	29.6	22.9
P48	30 Edinburgh Rd, Perth, PH2 8BX	36.3	34.6	32.9	22.2	17.3	23.2	18.6	16.3	23.5	27	29.5	22.1
P49	Opp Wood'n Garden, Glencarse, PH2 7LX	28.3	27.7	35	23.5	16	22	19.9	18.2	23.2	25.7	25.8	20.1
P50	Linden Garden Centre, Glencarse, PH2 7LX	31.4	29.5	33.9	27.1	16.4	20.5	18.1	17.1	22.8	25.2	X	X
P51	2 West Bridge St, Bridgend, Perth, PH2 7HA	34.9	40.6	35.9	30.1	26.6	24.8	26.1	23.2	26.5	28.6	39.3	25.7
P54L	Real Time Monitor adjacent to 176 High St, Perth PH	28	31	24.9	18.6	20.1	16.8	17.7	19.4	20.5	26.2	35.3	26.1
P54C	Real Time Monitor adjacent to 176 High St, Perth PH	30.9	33.1	27.5	21.3	20.6	18.6	16.8	18.6	19.1	26.7	35.2	25.9
P54R	Real Time Monitor adjacent to 176 High St, Perth PH	32.2	33.6	27.4	22.8	19.6	16.6	18.6	18.1	21.5	24.3	36.3	24.9
P55	7 West High st, Crieff	61.6	58.4	61.2	47.5	38.7	44.3	40.5	37	48.3	48.5	54.1	36.4
P56	39, High St, Crieff	43	43.2	36.6	32	26.9	30.6	29.1	29.3	30.8	36.1	39.9	32.3
P57	The Highland Trading Company, 62, High St, Crieff	39.7	36.1	34.5	30.3	23.7	26.2	24.9	22.8	28.5	32.6	33.4	22.1
P58	9 East High St, Crieff	55.1	49.8	46.2	42.1	31.9	38.7	37.3	31.2	38.3	44.3	47.6	37.3
P61L	Atholl St, Perth real time monitor	62.9	64.8	52.7	45.7	42	44.9	45.2	43.8	43	49.1	59	50.4
P61C	Atholl St, Perth real time monitor	53.6	62.2	50.4	49.4	40.9	42.9	45.5	47.2	38.1	47.4	56.4	53.6
P61R	Atholl St, Perth real time monitor	64.3	60.2	51.7	44.7	41.2	45.6	46	48.5	46	47.3	58.1	48.7
P62	84 Dundee Rd, Perth PH2 7BA	47.4	47.1	44.6	34.8	23.6	28.2	28.9	25.4	31.4	31.4	36.9	24.9
P63	30 Dundee Rd, Perth PH2 7AQ	51	49.8	51.4	32.5	33.4	X	34.4	32.1	40.3	42.4	39.8	31.2
P64	The Lodge, Isla Rd, Bridgend, Perth PH2 7HG	0.3	96.6	54.1	41.5	39.7	38.3	44.8	44.8	43.2	53.4	57.6	36.8
P65	5-7 Charlotte Street, Perth PH1 5LW	40	44.2	45	35.8	25.2	31.1	X	23.9	31.1	36.5	32.6	29
P67	1 Atholl Street, Perth PH1 5NH	40.9	43.9	31.2	33.8	32.3	31.5	32.3	x	29.4	38.2	43.3	42.4
P68	2 Atholl Street, Perth PH1 5NP	34.8	42.5	29.6	23.4	25.9	23.1	26.8	25	27	33.7	44.6	33.6
P69	United Free Church of Scotland, Kinnoull Street, Pe	41.9	46.5	39.1	27.8	31.8	27.1	27.9	30.6	29.5	36.6	45.5	36.7
P70	Leith Buildings, 28 Dunkeld Rd, Perth PH1 5AJ	37.7	44.2	32	24.6	24.5	26.7	22.1	24.8	26.9	31.7	43.6	24
P71	134-140 Dunkeld Road, Perth PH1 5AS	28.7	27.4	23.3	16	11.5	12	X	10.7	16.2	19.9	24	15.9
P72	82 Crieff Road, Perth PH1 2RP	43.9	47.5	40.7	36.7	36	33	32.7	33.7	32.8	37.8	46.8	28.5
P73	CRIEFF - NEW 19 West High Street Crieff,PH7 4A	55	55	39.3	43.6	33.5	41.2	35.8	31.1	44.3	42.7	42.5	x
P74	CRIEFF - NEW 43 High Street Crieff,PH7 3HT	41	41.2	34.5	33	22.3	30.7	25.7	28	30.9	6.8?	36.7	24.3
P75L	Crieff RTM	28.4	28.6	20.6	19.8	19.6	20.2	20.1	19.4	22.9	22.7	32.9	25.9
P75C	Crieff RTM	29.8	30.1	23.7	19.4	20.1	18.4	19.1	22.3	22.2	24.1	33.7	23.8
P75R	Crieff RTM	30.7	29.1	23.1	19.2	20.7	18.5	19	21.7	23.4	25.2	33.3	22.4
P76	10/12 West High Street,Crieff	50.7	47.2	40.6	36.3	33.5	41	36	31.5	39.8	35.3	46	X
P77	9 Comrie Street, Crieff	31.4	29.3	29	24.4	18	21	16.8	14.5	20.9	23.5	21.4	18.9
P78	1 Lodge Street, Crieff	37.5	33.1	36	26	19.2	24.5	23.1	16.8	24.6	30	26.9	21.3
P79 L	17/19 Main Street Bridgend Perth PH2 7HD	53.4	49.3	61.7	47.6	35.9	41.3	34.6	30.7	42.3	46.2	41.5	X
P79 C	17/19 Main Street Bridgend Perth PH2 7HD	49	51	61.3	42.6	31.2	39.2	36.5	32.1	44.5	43.6	44.4	32.1
P79 R	17/19 Main Street Bridgend Perth PH2 7HD	50.6	50.6	59.8	45.2	31.7	37.9	37.5	31.6	42.9	56.1?	53.1?	33.1
P80	124 High St Kinross Central Café	26.8	26.3	21.4	19.8	17.9	16.2	18.4	17.9	19.4	20.2	29.5	1.8
P81	76 High St Kinross Opticians	33.6	35.8	28.5	22.2	22.3	24.4	21.3	23.8	24.9	25.9	35.2	23.8
P82	66 High St Auchterarder Ironmongers	36.9	38.9	38	25.8	18.3	24.7	20.4		26.3	27.5	34.8	24.7
P83	176 High St Auchterarder Lamppost	30.4	34.4	34.2	25.4	18.9	19.1	16.2	14.1	22.6	22.8	25.1	18.5
P84	1 Atholl St Dunkeld Ellas	28	28.1	21.9	19.5	17.6	16.3	16.6	18.1	18.4	25.4	25.9	30.1
P85	14 Atholl St Pet Shop/Fish Bar	27.7	28.7	25.1	19.7	16.9	17.9	16	15.3	16	22.9	23.3	21.2
P86	2 Friarton Road Perth Lamp post	41.4	40.1	32.9	24.8	22.4	23	20.8	20.7	27.6	31.8	37.3	25.6
P87	Crieff Background Hollybush Road Crieff	13.2	X	X	5.9	X	X	4		x	6.4	11.1	7.2
P88	202 Glasgow Road Perth Lamp post	50.5	57.2	52.6	41.5	31.3	33.2	29.1	30.5	38.8	39.5	51.4	32.7
P89	59 South Methven Street	45.5	51.1	38.7	33.6	34.2	32.4	32.8	33.2	32.1	40.8	56.4	41.8
P90	22 North Methven Street	42	40.5	35	31.5	26.5	26.2	24.5	26.2	27	62.1?	42.7	44.9