2013 Air Quality Progress Report for Armagh City and District Council

In fulfillment of the Environment (Northern Ireland) Order 2002 - Local Air Quality Management

April 2013

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Report Reference number	ArmaghPR2013
Date	April 2013

Executive Summary

Monitoring at 12 locations within Armagh City and District Council's area has demonstrated that there are 3 sites where NO_2 levels exceed the objective limit of 40ug/m^3. Based on the results for 2012, the council **will not** be revoking any of the current AQMA's.

No other pollutants were assessed to have an impact on air quality within the district at this time and therefore no AQMA's or detailed assessments are required for any other pollutants.

Armagh City and District Council has not seen any significant changes from any pollution sources since the last round of review and assessment and no other sources of pollution have been identified. Therefore the likely impact from such sources is negligible.

The next course of action to be taken by the council is to submit and AQMA Action Plan for the AQMA at Greenpark Terrace.

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1 Introduction

1.1 Description of Local Authority Area

Armagh City and District is located in the geographical heartland of Northern Ireland, a beautiful rural, historic area served by the main motorway network in Northern Ireland, with major road links to the business capitals of Belfast and Dublin. Armagh City and District does not have a high level of heavy industry. The majority of the local work force is employed in the delivery of services such as local government, education authority, health and social services, retail and agriculture. Although there are a number of quarries providing graded stone & gravel as well as road-stone coating. The greatest contribution to air quality pollution in the district is from road traffic. Particularly in the city centre where the road network is quickly reaching it's maximum capacity due to the increase in car ownership. Given the size of the rural hinterland surrounding the city of Armagh, public transport resources are stretched and the reliance on the motor car is greatly exacerbated. Armagh City is regarded as a route hub to the border with the Republic Of Ireland and is main through-route between mid-Ulster and the south east of Northern Ireland and hence has a traffic flow higher than that which could be created by local traffic alone. Particulate Matter (PM_{10}) and NO_2 would be considered as the pollutants most at risk of breaching the objective limits in Armagh as a result of road traffic. Armagh City and District Council has already declared an AQMA in January 2009 for NO_2 on Railway Street, Lonsdale Road, Mall West and Barrack Street. A new AQMA at Greenpark Terrace in Armagh was declared in January 2012. The Council is now in the process of delivering an Action Plan for this AQMA and will submit it to the DOENI in June 2013.

1.2 Purpose of Progress Report

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 Local Air Quality Management process.

They are not intended to be as detailed as Updating and Screening Assessment Reports, or to require as much effort. However, if the Progress Report identifies the risk of exceedence of an Air Quality Objective, the Local Authority (LA) 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 Northern Ireland** are set out in the Air Quality Regulations (Northern Ireland) 2003, Statutory Rules of Northern Ireland 2003, no. 342, and are shown in Table 1.1. This table shows the objectives in units of micrograms per cubic metre $\mu g/m^3$ (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 Local Air Quality Management in Northern Ireland.

Pollutant	Concentration	Measured as	Date to be achieved by
Benzene	16.25 $\mu g/m^3$	Running annual mean	31.12.2003
	3.25 $\mu g/m^3$	Running annual mean	31.12.2010
1,3-Butadiene	2.25 $\mu g/m^3$	Running annual mean	31.12.2003
Carbon monoxide	10.0 mg/m^3	Running 8-hour mean	31.12.2003
Lead	0.5 $\mu g/m^3$	Annual mean	31.12.2004
	0.25 $\mu g/m^3$	Annual mean	31.12.2008
Nitrogen dioxide	200 $\mu g/m^3$ not to be exceeded more than 18 times a year	1-hour mean	31.12.2005
	40 $\mu g/m^3$	Annual mean	31.12.2005
Particles (PM_{10}) (gravimetric)	50 $\mu g/m^3$, not to be exceeded more than 35 times a year	24-hour mean	31.12.2004
	40 $\mu g/m^3$	Annual mean	31.12.2004
Sulphur dioxide	350 $\mu g/m^3$, not to be exceeded more than 24 times a year	1-hour mean	31.12.2004
	125 $\mu g/m^3$, not to be exceeded more than 3 times a year	24-hour mean	31.12.2004
	266 $\mu g/m^3$, not to be exceeded more than 35 times a year	15-minute mean	31.12.2005

1.4 Summary of Previous Review and Assessments

Report Type	Date	Exceedences	Detailed Assessment Required	AQMA's Declared
Initial Review and Assessment	Jan 2001	None	No	None
Progress Report	April 2005	None	No	None
Updating & Screening Assessment	April 2006	None	No	None
Progress Report	April 2007	None	No	None
Detailed Assessment for NO_2	Nov 2007	None	No	None
Progress Report	April 2008	NO_2	No	Yes
Updating & Screening Assessment	April 2009	NO_2	No	In the previous year
Progress Report	May 2010	NO_2	Yes	None
Progress Report	May 2011	NO2	No	Yes
Updating and Screening Assessment	April 2012	NO2	No	Yes

Figure 1.1 Map of AQMA Boundaries (if applicable)

See Appendix C

2 New Monitoring Data

2.1 Summary of Monitoring Undertaken

2.1.1 Automatic Monitoring Sites

Armagh has one automatic monitoring station located in the district. This is at Lonsdale Road in Armagh City and monitors PM_{10} and NO_2 emissions. (This site is also a co-location site for NO_2 diffusion tubes). In September 2010 the PM10 analyser was upgraded to FDMS standard.

Table 2.1 Details of Automatic Monitoring Sites

Site Name	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 ?
Lonsdale Road	Roadside	H 876 458	PM_{10} & NO_2	Y	Y (20m)	3m	Y

Figure 2.1 Map(s) of Automatic Monitoring Sites (if applicable)

See Appendix C

2.1.2 Non-Automatic Monitoring

During 2012 Armagh City and District Council carried out monitoring of NO_2 by diffusion tubes at 12 sites within the district. The NO_2 diffusion tubes were prepared and analysed by Environmental Scientifics Group Limited (ESG). ESG Didcot was contracted to supply and analyse the diffusion tubes from the beginning of April 2010. This laboratory takes part in the NO_2 Network QA/QC Field Intercomparison survey. ESG's diffusion tubes are prepared by coating the grids in 50% TEA in Acetone. Analysis is carried out using a colorimetric technique.

The triplicate diffusion tubes at the Lonsdale Road site are co-located with an automatic NO_2 analyser. Details are given in Table 2.2.

Diffusion Tube Bias Adjustment Factors

The NO_2 diffusion tubes were prepared and analysed by Environmental Sciences Group (ESG) Didcot from the beginning of January 2012 for this monitoring year. This laboratory takes part in the NO_2 Network QA/QC Field Intercomparison survey. ESG's diffusion tubes are prepared by coating the grids in 50% TEA in Acetone. Armagh City and District Council obtained the appropriate bias factor from the DEFRA Website. http://laqm.defra.gov.uk/bias-adjustment-factors/national-bias.html A bias factor of **0.79** was taken from the drop down menus available on the excel spreadsheet matrix.

Factor from Local Co-location Studies (if available)

Armagh City and District Council did not use a Bias Factor from its local Co-location site at Lonsdale Road. Although a co-location factor was available, it was felt that the national bias factor was drawn from a greater range of sites and could therefore be considered overall more representative of the sites monitored in the borough.

Discussion of Choice of Factor to Use

Armagh City and District Council used the Bias Factor from the Defra Website. http://laqm.defra.gov.uk/bias-adjustment-factors/national-bias.html. This was calculated by using the matrix available on the site by selecting the appropriate laboratory, year of monitoring and significant methodology. Armagh City and District Council used a bias factor for 2012 (0.79)

QA/QC of diffusion tube monitoring

See Appendix A for Environmental Scientifics Group (ESG) WASP data

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Table 2.2 Details of Non- Automatic Monitoring Sites

Site Name	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 ?
Lonsdale Road (x3)	Roadside	H 876 458	NO_2	Y	Y (20m)	3m	Y
Mallview Terrace (x3)	Roadside	H 879 452	NO_2	Y	Y(<1m)	4m	Y
25 Railway St (x3)	Roadside	H 875 458	NO_2	Y	Y(<1m)	2.5m	Y
1 Barrack St	Roadside	H 879 450	NO_2	Y	Y(<1m)	2m	Y
11 Desert Lane	Urban Background	H 865 457	NO_2	N	Y(10)	2m	Y
1 Green Park Terrace (x3)	Roadside	H 873 447	NO_2	Y	Y(<1m)	2.5m	Y
20 Victoria St	Roadside	H 881 452	NO2	N	Y(<1m)	4.5m	Y
3 Barrack Hill	Roadside	H 881 451	NO2	N	Y(<1m)	2m	Y
Abbey Street*	Roadside	X 097547 Y 504892	NO2	N	Y(<1m)	4m	Y
Cathedral Terrace	Roadside	H 873 456	NO2	N	Y(<1m)	3m	Y
25 Greenfield Way	Urban Background	X 098837 Y 503618	NO2	No	Y (8m)	1m	Y
Dawson Street	Roadside	H 874 454	NO2	N	Y(<1m)	1m	Y

See Appendix C for Map(s) of Non-Automatic Monitoring Sites (if applicable)

2.2 Comparison of Monitoring Results with Air Quality Objectives

2.2.1 Nitrogen Dioxide

Automatic Monitoring Data – Nitrogen Dioxide (NO_2)

The NO_2 automatic monitoring site is located at Lonsdale Road in Armagh City. The site is on a main road which passes through the centre of Armagh. The inlet of the NO_2 monitor is located approx 3m from the kerbside. The nearest relevant exposure is approx 15-20 metres from the sampling site. Whilst monitoring results for this location have never exceeded the objective levels for NO2, the site is included within an AQMA as it is located between two other locations that have exceeded the objective limits. Lonsdale Road is joined at both ends by Railway Street and Mall West and therefore the action plan required to address these other AQMA areas would inevitably need to incorporate Lonsdale Road. The data capture for this site was 96% for 2012 and the NO_2 annual average is 27 $\mu g\ m^{-3}$.

Automatic Monitoring Data

See Tables 2.3 & 2.4 below.

Table 2.3 Results of Automatic Monitoring of Nitrogen Dioxide: Comparison with Annual Mean Objective

Site ID	Site Type	Within AQMA?	Valid Data Capture for period of monitoring %[a]	Valid Data Capture 2012 % [b]	Annual Mean Concentration µg/m^3				
					2008*[c]	2009*[c]	2010*[c]	2011*[c]	2012[c]
Lonsdale Road	Roadside	Y	96	100	26	N/A	26	26	27

[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), if monitoring was not carried out for the full year.
*Annual mean concentrations for previous years are optional.

Table 2.4 Results of Automatic Monitoring for Nitrogen Dioxide: Comparison with 1-hour mean Objective

Site ID	Site Type	Within AQMA?	Valid Data Capture for period of monitoring %[a]	Valid Data Capture 2012 % [b]	Number of Exceedences of Hourly Mean (200 µg/m^3)				
					2008*[c]	2009*[c]	2010*[c]	2011*[c]	2012[c]
Lonsdale Road	Roadside	Y	96	100	No Data	0	0	0	0

[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 period of valid data is less than 90%, include the 99.8th percentile of hourly means in brackets
*Number of exceedences for previous years are optional.

Diffusion Tube Monitoring Data

During 2012 Armagh City and District Council carried out monitoring of NO_2 with diffusion tubes at 12 sites within the city. The NO_2 diffusion tubes were prepared and analysed by Environmental Scientifics Group Limited (ESG). The tubes are prepared by coating the grids in a 50% v/v solution of the absorbent, triethanolamine (TEA) in Acetone. Analysis is carried out using a colorimetric technique.

One site at Lonsdale Road is co-located with an automatic NO_2 analyser. Details of the monitoring sites are given in Table 2.5.

Table 2.5 Results of Nitrogen Dioxide Diffusion Tubes in 2012

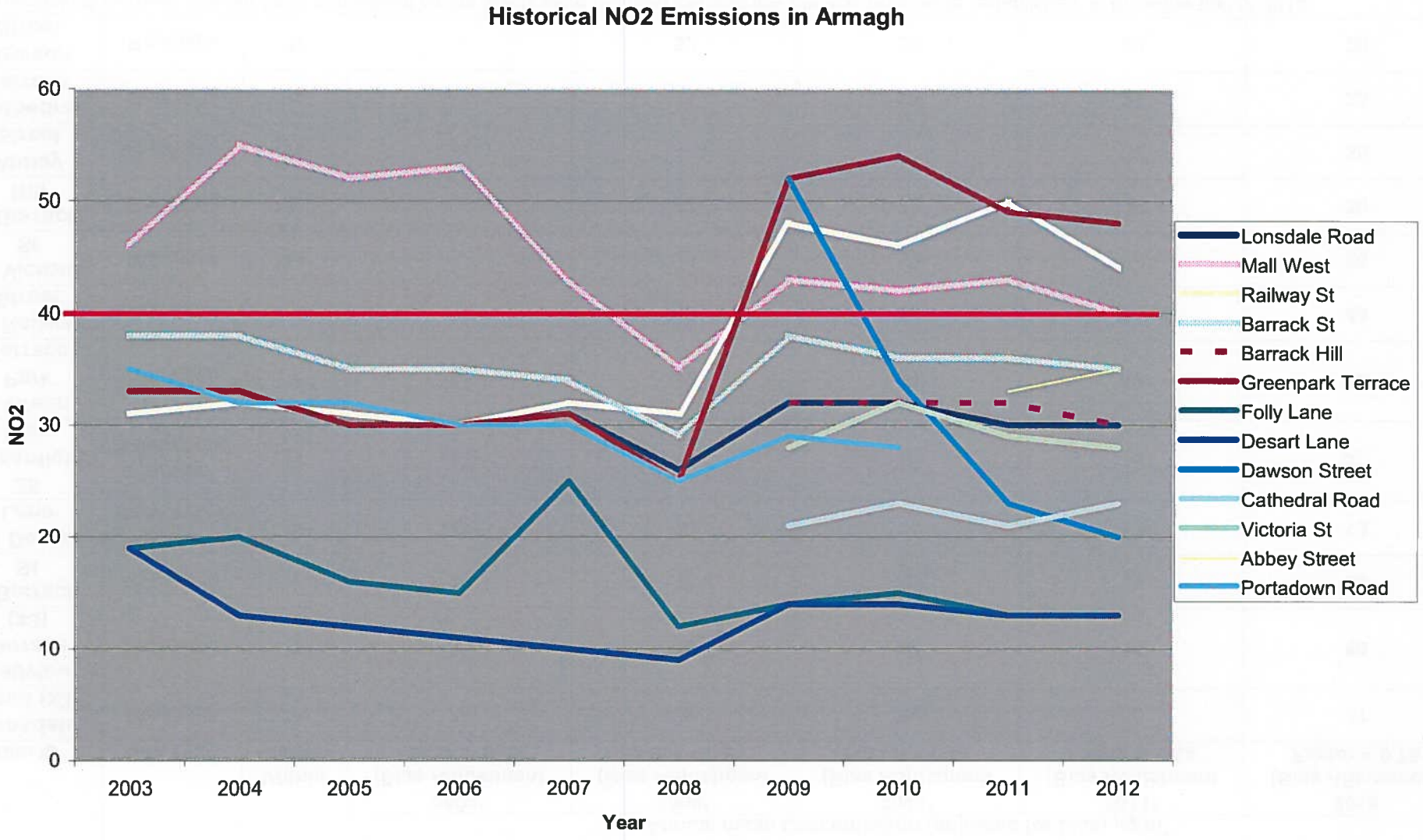
Site ID	Location	Site Type	Within AQMA?	Triplicate or Collocated Tube	Data Capture 2012 (Number of Months or %)	Data with less than 9 months has been annualised (Y/N)	Confirm if data has been distance corrected (Y/N)	Annual mean concentration (Bias Adjustment factor = 0.79
								2012 (µg/m^3)
1	Lonsdale Road (x3)	Roadside	Y	Triplicate and Collocated	100%	N/A	Y	31
2	Mallview Terrace (x3)	Roadside	Y	Triplicate	100%	N/A	Y	**40**
3	1 Barrack St	Roadside	Y	-	100%	N/A	Y	35
4	11 Desert Lane	Urban Background	N	-	100%	N/A	Y	13
5	25 Greenfield Way	Urban Background	N	-	100%	N**	Y	8**
6	1 Green Park Terrace	Roadside	Y	Triplicate	100%	N/A	Y	**48**
7	80 Railway Street	Roadside	Y	Triplicate	100%	N/A	Y	**44**
8	20 Victoria St	Roadside	N	-	100%	N/A	Y	28
9	3 Barrack Hill	Roadside	N	-	100%	N/A	Y	30
10	Abbey Street	Roadside	N	-	100%	N/A	Y	35
11	Cathedral Terrace	Roadside	N	-	100%	N/A	Y	23
12	Dawson Street	Roadside	N	-	100%	N/A	Y	20

[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), if monitoring was not carried out for the full year.
*Annual mean concentrations for previous years are optional.
**Greenfield Way result has not been annualised as the levels were deemed low and the site was only being 'established' in the latter half of 2012.

Table 2.6 Results of Nitrogen Dioxide Diffusion Tubes (2008 to 2012)

Site ID	Site Type	Within AQMA?	Annual mean concentration (adjusted for bias) µg/m^3				
			2008* (Bias Adjustment Factor = 0.62	2009* (Bias Adjustment Factor = 0.81	2010* (Bias Adjustment Factor = 0.81	2011* (Bias Adjustment Factor = 0.84	2012 (Bias Adjustment Factor = 0.79
Lonsdale Road (x3)	Roadside	Y	26	32	32	30	31
Mallview Terrace (x3)	Roadside	Y	35	**43**	**42**	**43**	**40**
1 Barrack St	Roadside	Y	29	38	36	36	35
11 Desert Lane	Urban Background	N	9	14	14	13	13
25 Greenfield Way	Urban Background	N	12	14	15	13	8**
1 Green Park Terrace	Roadside	Y	25	**52**	**54**	**49**	**48**
80 Railway Street	Roadside	Y	31	**48**	**46**	**50**	**44**
20 Victoria St	Roadside	N	-	28	32	28	28
3 Barrack Hill	Roadside	N	-	32	32	32	30
Abbey Street	Roadside	N	-	-	-	33	35
Cathedral Terrace	Roadside	N	-	21	23	21	23
Dawson Street	Roadside	N	-	**52**	34	23	20

**Greenfield Way result has not been annualised as the levels were deemed low and the site was only being 'established' in the latter half of 2012.


Historical NO2 Emissions in Armagh
NO2
60
50
40
30
20
10
0
2003
2004
2005
2006
2007
2008
2009
2010
2011
2012
Year
Lonsdale Road
Mall West
Railway St
Barrack St
Barrack Hill
Greenpark Terrace
Folly Lane
Desart Lane
Dawson Street
Cathedral Road
Victoria St
Abbey Street
Portadown Road

2.2.2 PM_{10}

The PM_{10} monitoring site is located at Lonsdale Road in Armagh City. The site is on a main road which passes through the centre of Armagh. The inlet of the PM_{10} monitor is located approx 3m from the kerbside. The nearest relevant exposure is approx 15-20 metres from the sampling site. The PM_{10} unit was upgraded to an FDMS inlet in September 2010. Whilst monitoring results for this location have never exceeded the objective levels for PM_{10}, the site is included within an AQMA as it is located between two other locations that have exceeded the objective limits. Lonsdale Road is joined at both ends by Railway Street and Mall West and therefore the action plan required to address these other AQMA areas needed to incorporate Lonsdale Road in to the AQMA. It must also be noted that the declaration of the AQMA was made as a result of NO_2 exceedences at Railway Street and Mall West. No AQMA has been declared for PM_{10} in Armagh at this date.

The data capture for this site was 80% for 2012 and the PM_{10} annual average is 16 $\mu g/m^3$.

Table 2.7 Results of Automatic Monitoring of PM_{10}: Comparison with Annual Mean Objective

Site ID	Site Type	Within AQMA?	Valid Data Capture for monitoring Period %[a]	Valid Data Capture 2011 %[b]	Confirm Gravimetric Equivalent (Y or NA)	Annual Mean Concentration µg/m^3				
						2008*[c]	2009*[c]	2010*[c]	2011*[c]	2012[c]
Lonsdale Road	Roadside	Y	80	100	Y	26	27	32	19	16

[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), if monitoring was not carried out for the full year.
* Optional

Table 2.8 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 2011 %[b]	Confirm Gravimetric Equivalent	Number of Exceedences of 24-Hour Mean (50 µg/m^3)				
						2008*	2009*	2010*	2011*	2012
Lonsdale Road	Roadside	Y	80	100	Y	10	17	49	15	1(27)[c]

[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 is less than 90%, include the 90th percentile of 24-hour means in brackets
* Optional

2.2.3 Sulphur Dioxide

N/A

2.2.4 Benzene

N/A

2.2.5 Other pollutants monitored

N/A

2.2.6 Summary of Compliance with AQS Objectives

Armagh City and District Council has examined the results from monitoring in the district.

Concentrations within the AQMA's still exceed the objective for Nitrogen Dioxide at Mall West, Railway Street and Greenpark Terrace in Armagh and the AQMA's should remain. Concentrations within the AQMA at Lonsdale Road and Barrack Street in Armagh have not exceeded the objective limit for Nitrogen Dioxide; however the AQMA will remain as these areas form part of an AQMA which has traffic and road link connections with Mall West and Railway Street. The involvement of these locations within the AQMA forms an important part of the Action Plan objectives.

Concentrations outside of the AQMA 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

3.2 Other Transport Sources

3.3 Industrial Sources

3.4 Commercial and Domestic Sources

3.5 New Developments with Fugitive or Uncontrolled Sources

Armagh City and District 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.

4 Local / Regional Air Quality Strategy

There are currently no Local or Regional Air Quality Strategies applicable to Armagh City and District Council. The Southern Group Air Quality Strategy came to an end in 2010. No further strategies are planned at this time.

5 Planning Applications

There were no planning applications submitted to The Northern Ireland Planning Service within the Armagh City and District Council area during 2012 which were deemed to have any impact on local air quality.

6 Air Quality Planning Policies

N/A

7 Local Transport Plans and Strategies

Regional Transportation Strategy

The Regional Transportation Strategy (RTS) for Northern Ireland 2002- 2012 identifies strategic transportation investment priorities and considers potential funding sources and affordability of planned initiatives. The RTS focuses on three geographic areas and one overlying Network. These are as follows:

- Belfast Metropolitan Area (BMA), containing the continuous area comprising Belfast City Council and the built-up areas within the Council areas of Carrickfergus, Castlereagh, Lisburn, Newtownabbey and North Down;
-
- Other Urban Areas (OUAs): collectively those towns described as main or local hubs in the RDS (including Dungannon) and other towns outside the BMA with a population greater than 5,000);

- Rural Area – the remainder of Northern Ireland; and

- Regional Strategic Transport Network (RSTN) comprising the complete rail network and all motorway and trunk road links (including the Key Transport Corridors and Link Corridors).

The RTS is a "daughter document" of the Regional Development Strategy (RDS), which sets out the spatial development framework for Northern Ireland up to 2025. Implementation of the Strategy will be through three Transport Plans covering the Regional Strategic Transport Network (RSTN), the Belfast Metropolitan Area (BMA), and the Sub-Regional Transport Plan (SRTP). Transport studies undertaken to support the RSTN Transport Plan will take due account of current and future cross-border inter-urban transport demands and the roles of the gateway cities and towns, including Armagh.

3.4 Regional Strategic Transport Network Transport Plan

The Regional Strategic Transport Network (RSTN) Transport Plan prepared by the Department for Regional Development (DRD) covers the complete rail network, five Key Transport Corridors (KTCs), four Link Corridors, the Belfast Metropolitan Transport Corridors and the remaining trunk network across Northern Ireland. The Plan is based on the guidance set out in the Regional Development Strategy (RDS) and the Regional Transportation Strategy (RTS), as described in Sections 3.2 and 3.3 of the RSTN Transport Plan.

The RSTN Transport Plan consists of proposals for transport schemes and measures for the maintenance, management and development of the RSTN until 2015. The RSTN Transport Plan also includes a number of measures for rail, bus, roads, walking and cycling.

3.5 Sub-Regional Transport Plan 2015

The Sub-Regional Transport Plan (SRTP) was prepared by the Department for Regional Development (DRD) and completed in 2007. The SRTP is based upon the guidance provided by the Regional Development Strategy (RDS) and the Regional Transportation Strategy (RTS). Proposed public transport measures for Armagh (within category of Other Urban Areas (OUA)) contained within the SRTP are as follows:

· Improved walk/cycle

· Improved local bus services

· Bus stop Improvement Strategy

· Bus based Park and Ride

· Increased parking at bus/rail station

· Taxi rank

· Transport Programme for People with Disabilities

Spatial Development Strategy for Northern Ireland

The Spatial Development Strategy (SDS) guides the physical development of the Region to 2025. The SDS will contribute to meeting a number of key regional challenges emerging from the significant local, national and international forces, which will drive change over the next 25 years, including:

Transport:

- Promote a change in travel culture and particularly manage the effects of a possible 100% growth in the number of vehicles by 2025;
- Contribute to the creation of a modern, sustainable, safe transportation system for the Region, meeting the travel needs of all groups in society;
- Accommodate the growing volume of freight moving to and from the regional gateways; and
- Strengthen the regional gateways to handle the increasing flow of people and goods in and out of the Region.

Environment:

- Accommodate future development growth while protecting and caring for the environment;
- Reduce the consumption of resources;
- Continue to maintain or, where needed, to improve the quality of air, water and land resources within the Region;
- Seek to maintain local landscape character and to conserve cultural assets; and
- Take particular care to sustain and, where required, to enhance the biodiversity of the Region, its natural habitats, high quality landscapes and built heritage.

Developing a Regional Transportation System

Creating an upgraded and integrated transport system, built around the Regional Strategic Transport Network of the key transport corridors with their main public transport services providing the framework for future development is recognised as one of the key assets to accommodate growth. Strategic planning guidelines relating to the development of a Regional Transport System (RTS) are as follows:

- **SPG-TRAN 1:** To develop a Regional Strategic Transport Network (RSTN), based on Key Transport Corridors (KTCs), to enhance accessibility to regional facilities and services. Two major roads within the District are identified in the RDS as part of the Key Transport Corridors in Northern Ireland: -
- A4 Dungannon - Fivemiletown Road: The South Western Corridor; and
- A5 Aughnacloy - Omagh Road: The Western Corridor.
- In addition, the A29 Cookstown to Moy Road is identified as part of one of three additional Link Corridors in the RTS.

- **SPG-TRAN 2:** To extend travel choice for all sections of the community by enhancing public transport. Including the strengthening of the regional bus network (including the promotion of public transport routes and Park and Ride schemes) and the regional rail system;

- **SPG-TRAN 3:** To integrate land use and transportation to provide a much better range of travel choices for all, and reduce the demand for travel; and

- **SPG-TRAN 4:** To change the regional travel culture and contribute to healthier lifestyles, such as giving greater priority to encouraging more walking and cycling.

8 Climate Change Strategies

N/A

9 Implementation of Action Plans

Armagh City and District Council is currently in the process of completing an Action Plan for the Greenpark Terrace AQMA currently in operation in Armagh City. Armagh City and District Council is currently engaged in the consultation process with their AQMA stakeholder committee members and will be producing the necessary Action Plans by the end of June 2013.

10 Conclusions and Proposed Actions

10.1 Conclusions from New Monitoring Data

Monitoring at 12 locations within Armagh City and District Council's area has demonstrated that there are 3 sites where NO_2 levels exceed the objective limit of 40ug/m^3. Based on the results for 2012, the council **will not** be revoking any of the current AQMA's.

No other pollutants were assessed to have an impact on air quality within the district at this time and therefore no AQMA's or detailed assessments are required for any other pollutants.

Armagh City and District Council has not seen any significant changes from any pollution sources since the last round of review and assessment and no other sources of pollution have been identified. Therefore the likely impact from such sources is negligible.

The next course of action to be taken by the council is to submit and AQMA Action Plan for the AQMA at Greenpark Terrace.

11 References

Local Air Quality Management Technical Guidance – LAQM.TG(09)

Appendices

Appendix A: QA/QC Data

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Appendix A: QA:QC Data

Diffusion Tube Bias Adjustment Factors

The NO_2 diffusion tubes were prepared and analysed by Environmental Sciences Group (ESG) Didcot from the beginning of January 2012. This laboratory takes part in the NO_2 Network QA/QC Field Intercomparison survey. ESG's diffusion tubes are prepared by coating the grids in 50% TEA in Acetone. Armagh City and District Council obtained the appropriate bias factor from the DEFRA Website. http://laqm.defra.gov.uk/bias-adjustment-factors/national-bias.html A bias factor of **0.79** was taken from the drop down menus available on the excel spreadsheet matrix.

Factor from Local Co-location Studies (if available)

Armagh City and District Council did not use a Bias Factor from its local Co-location site at Lonsdale Road. Although a co-location factor was available, it was felt that the national bias factor was drawn from a greater range of sites and could therefore be considered overall more representative of the sites monitored in the borough.

Discussion of Choice of Factor to Use

Armagh City and District Council used the Bias Factor from the Defra Website. http://laqm.defra.gov.uk/bias-adjustment-factors/national-bias.html. This was calculated by using the matrix available on the site by selecting the appropriate laboratory, year of monitoring and significant methodology. Armagh City and District Council used a bias factor for 2012 (0.79)

PM Monitoring Adjustment

All data sets for PM10 monitoring during 2011 were provided by AEAT. All monitoring data contained within this report has been adjusted and ratified by AEAT

Short-term to Long-term Data adjustment

N/A

QA/QC of automatic monitoring

The automatic monitoring site at Lonsdale Road is part of the AURN network of roadside sites. The AURN network is administered on behalf of DEFRA by Bureau Veritas. The QA/QC of data management is carried out by AEAT who visit the site to complete audits twice per year. Maintenance of the automatic monitoring equipment was carried out by Enviro Technology Ltd (ET) under contract from Southern Group Environmental Health Committee (SGEHC). ET perform site audits twice per year and are available for any urgent call outs with 24 hours notice. SGEHC facilitate the management of the monitoring site on behalf of Armagh City and District Council. Calibrations and minor maintenance is completed on a fortnightly basis by the air quality management officer at SGEHC acting as a Local Site Operator (LSO) under contract from Bureau Veritas.

QA/QC of diffusion tube monitoring

The Summary of Precision Results Nitrogen Dioxide Collocation Studies as displayed at Defra's website http://laqm.defra.gov.uk/documents/Tube_Precision_2013_version_03_13-Final.pdf (version 03/12) shows that Harwell Scientifics demonstrated 23 good precisions out of 26; and 3 poor precisions out of 26 collocation studies completed in 2012.

Table 1: Laboratory summary performance for WASP NO_2 PT rounds 111 - 118

The following table lists those UK laboratories undertaking LAQM activities that have participated in recent HSL WASP NO_2 PT rounds and the percentage (%) of results submitted which were subsequently determined to be **satisfactory** based upon a z-score of □□± 2 as defined above.

WASP Round	**WASP R111**	**WASP R112**	**WASP R113**	**WASP R114**	**WASP R115**	**WASP R116**	**WASP R117**	**WASP R118**
Round conducted in the period	October – December 2010	January - March 2011	April - June 2011	July - September 2011	October - December 2011	January – March 2012	April – June 2012	July – September 2012
Aberdeen Scientific Services	100 %	100 %	100 %	100 %	100 %	100 %	100 %	100 %
Bristol City Council [6]	100 %	100 %	100 %	100 %	100 %	-	-	-
Cardiff Scientific Services	75 %	100 %	100 %	100 %	75 %	100 %	100 %	100 %
Edinburgh Scientific Services	100 %	100 %	100 %	100 %	0 %	100 %	100 %	100 %
Environmental Services Group, Didcot (formerly Bureau Veritas Laboratories, Glasgow and Harwell Scientifics) [1] [2]	100 %	100 %	100 %	100 %	100 %	100 %	100 %	100 %
Exova (formerly Clyde Analytical)	100 %	100 %	100 %	0 %	75 %	0 %	0 %	100 %
Glasgow Scientific Services	100 %	100 %	100 %	100 %	100 %	100 %	50 %	100 %
Gradko International [2]	100 %	100 %	100 %	100 %	37.5 %	100 %	100 %	100 %
Kent Scientific Services	100 %	50 %	100 %	100 %	75 %	75 %	100 %	75 %
Kirklees MBC	0 %	100 %	0 %	0 %	50 %	100 %	100 %	75 %
Lambeth Scientific Services	100 %	50 %	25 %	100 %	25 %	75 %	100 %	0 %
Lancashire County Analysts [3]	100 %	75 %	-	-	-	-	-	-
Milton Keynes Council	100 %	100 %	75 %	100 %	100 %	100 %	100 %	75 %
Northampton Borough Council	100 %	100 %	100 %	100 %	100 %	100 %	100 %	100 %
Somerset Scientific Services [4]	-	-	-	-	100 %	100 %	100 %	100 %
South Yorkshire Air Quality Samplers	100 %	100 %	100 %	100 %	100 %	100 %	100 %	100 %
Staffordshire County Council	100 %	100 %	100 %	100 %	100 %	100 %	100 %	75 %
Tayside Scientific Services (formerly Dundee CC)	100 %	100 %	100 %	100 %	100 %	100 %	100 %	100 %
Walsall MBC [5]	100 %	-	-	-	-	-	-	-
West Yorkshire Analytical Services	100 %	75 %	75 %	100 %	100 %	75 %	75 %	50 %

[1] Bureau Veritas laboratory and Harwell Scientific now part of ESG Group.

[2] Participant subscribes to two sets of test samples (2 x 4 test samples) in each WASP PT round.

[3] No longer involved in NO_2 diffusion tube measurements from R113.

[4] New participant from R115.

[5] No longer involved in NO_2 diffusion tube measurements from R112.

[6] No longer involved in NO_2 diffusion tube measurements from R116.

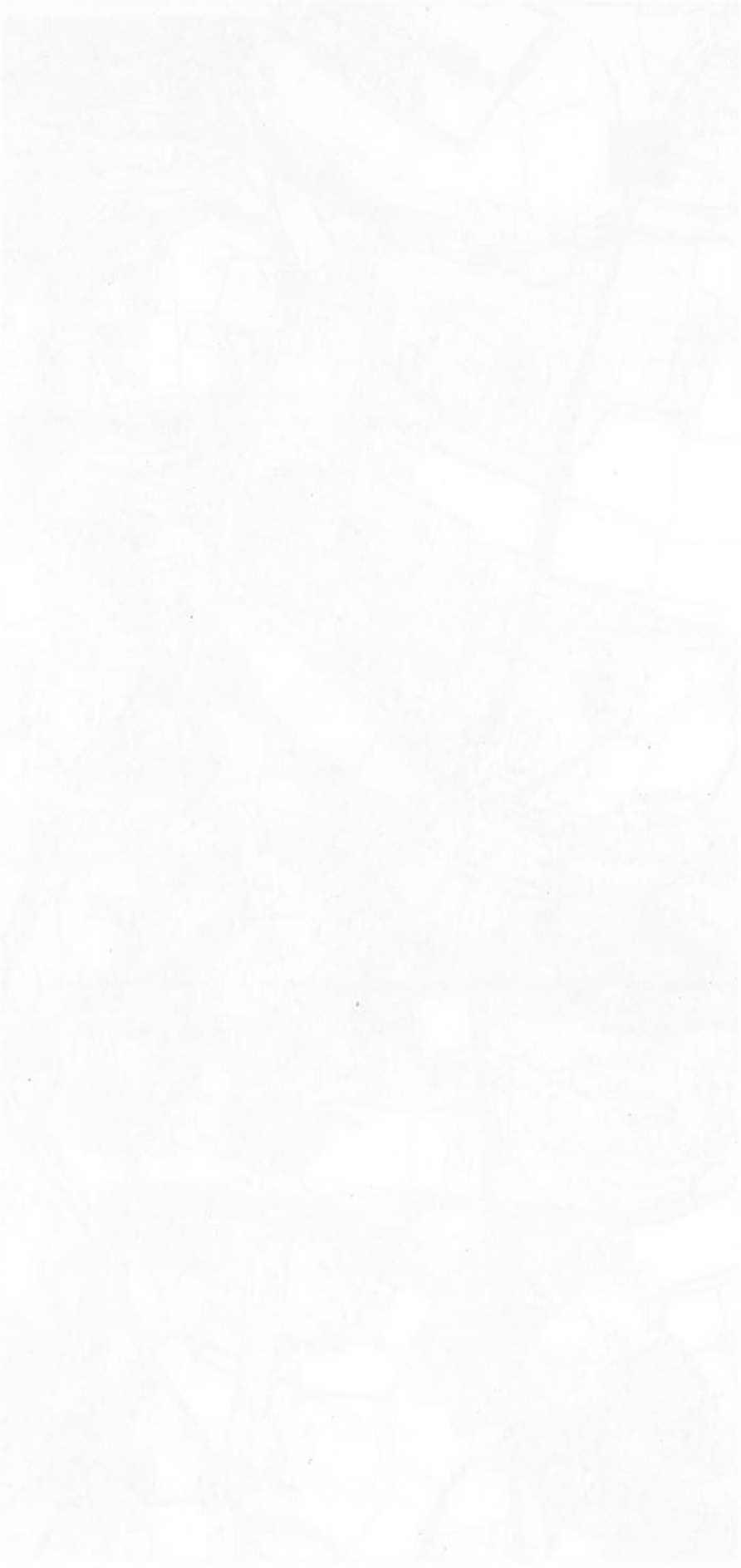
Appendix B – Diffusion Tube Site Maps

Title : Diffusion Tube Locations

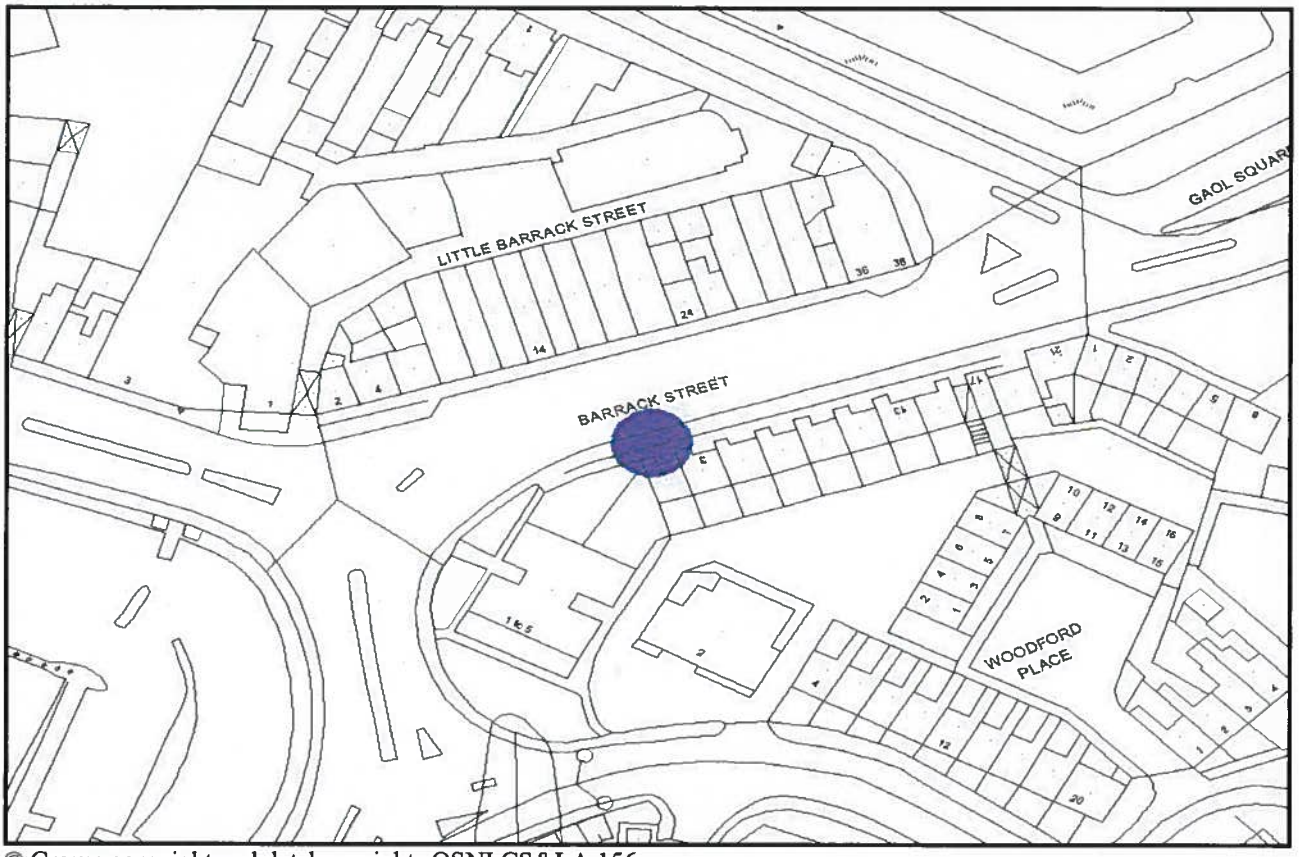
Scale : Not to Scale

29/04/2009

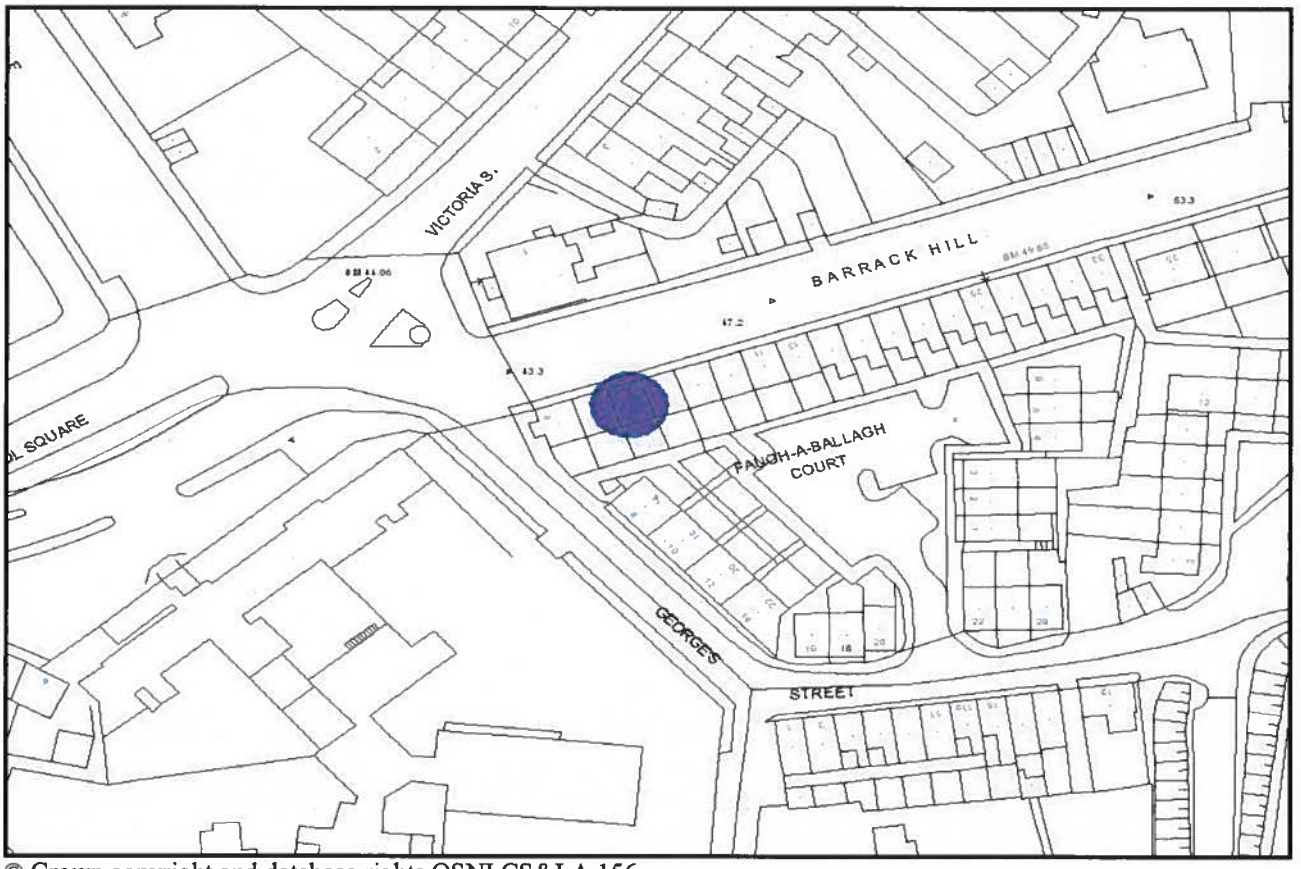
Armagh City and District Council...



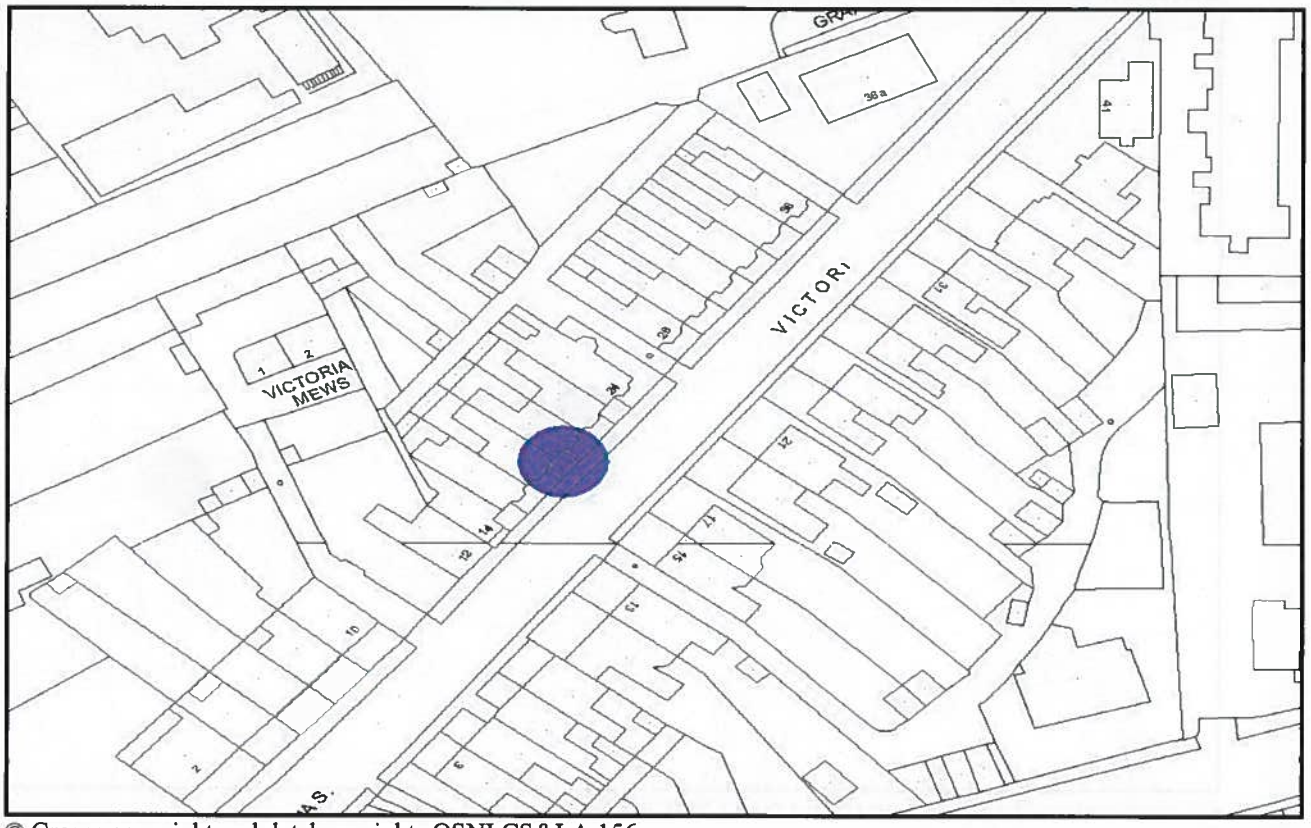
1 Barrack Street



3 Barrack Hill

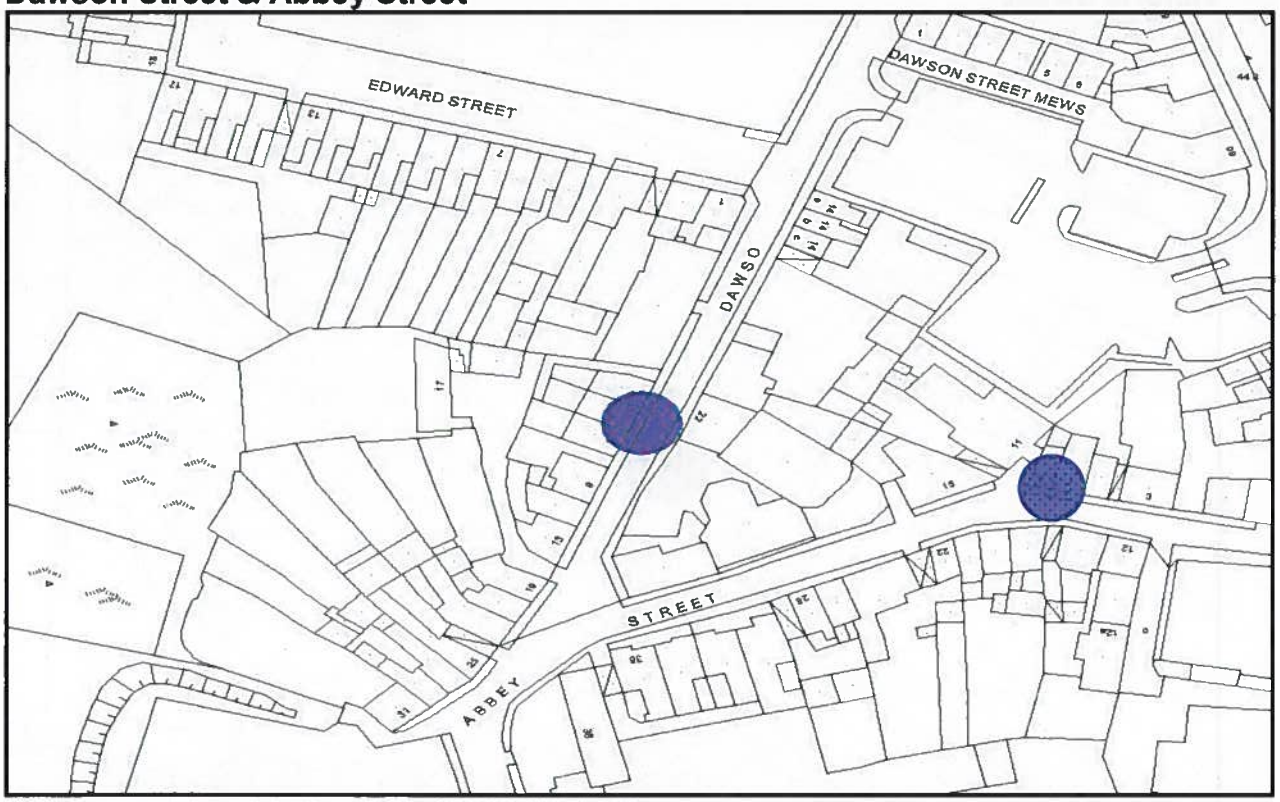


Victoria Street

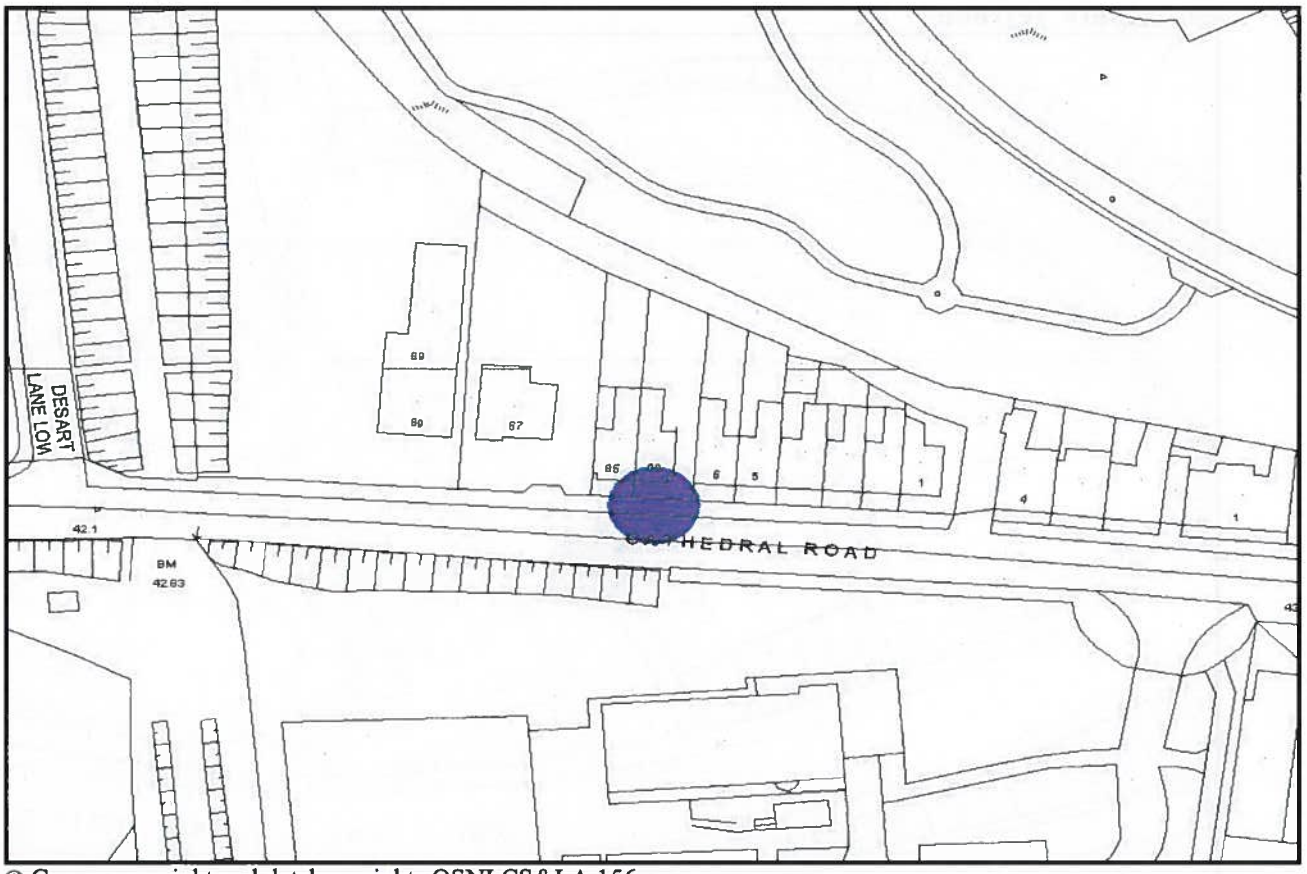


Greenpark Terrace

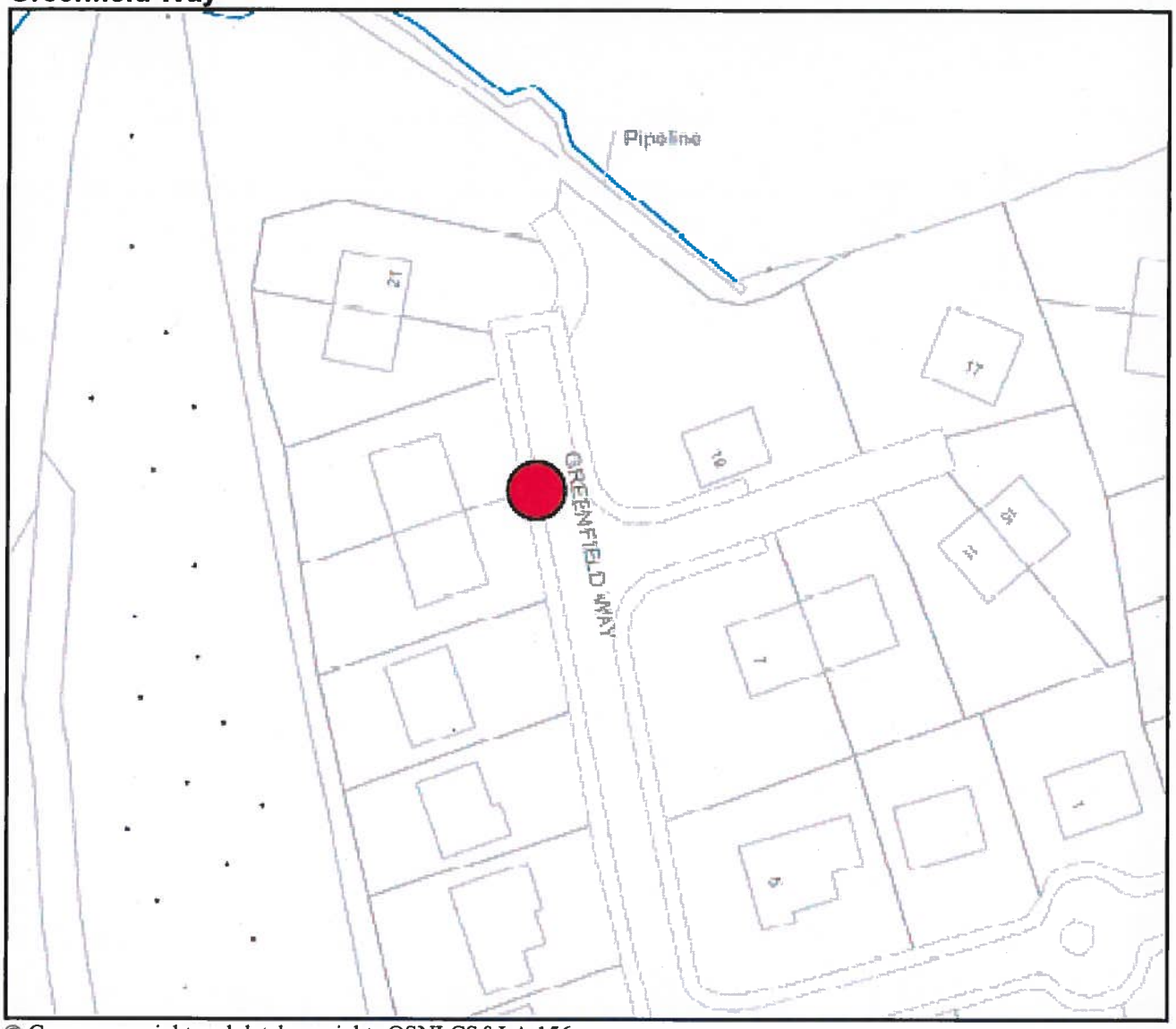
Dawson Street & Abbey Street



Cathedral Road



Greenfield Way



Appendix D

Diffusion Tube Monitoring Data 2012

NO2 DIFFUSION TUBE RESULTS 2012 (µg/m^3)												
	Barrack St	Desart Lane	Greenfield Way	Railway St	Mall West	Greenpark Terr	Lonsdale Road	Abbey St	Victoria St	Barrack Hill	Cathedral Terrace	Dawson St
JANUARY	48	23	-	67	49	67	45	49	40	44	29	27
FEBRUARY	44	19	-	63	60	63	48	48	40	48	24	25
MARCH	53	18	-	63	61	62	42	40	38	47	31	27
APRIL	40	14	-	50	46	64	36	55	39	33	34	22
MAY	41	12	-	43	45	48	30	33	29	32	35	19
JUNE	45	12	-	47	42	55	30	39	30	35	34	20
JULY	31	9	-	45	37	51	27	39	30	28	24	16
AUGUST	47	10	6	46	44	46	29	35	22	29	22	20
SEPTEMBER	36	11	8	63	52	52	36	42	35	35	24	30
OCTOBER	43	17	12	-	50	67	46	45	38	38	27	31
NOVEMBER	53	26	16	74	63	81	58	56	44	45	34	33
DECEMBER	45	19	-	49	52	68	50	51	41	41	26	33
AVERAGE	44	16	11	55	50	60	40	44	36	38	29	25
Adjusted Ave	35	13	8	**44**	**40**	**48**	31	35	28	30	23	20

Appendix E

Armagh Action Plan: Action Tables

Action Plan Proposals for Armagh City and District Council

To successfully develop and deliver an Action Plan it is essential that all relevant authorities as defined in the Air Quality Regulations (Northern Ireland) 2003 work in partnership with the Council to ensure that the required reduction in Nitrogen Dioxide is achieved. In particular, as the major source of pollution in this AQMA is transport-related those relevant authorities with responsibilities for transport have a very important role.

The Action Plan proposals are outlined in the following pages, including the impact and timescales for the proposals. In order to inform the action planning process an assessment of the cost and benefit of each proposal has been undertaken. The following table gives an indication of the scoring used. A simple multiplication of the cost and the beneficial impact gives an indication as to the cost effective score of the proposals.

Table 4.1 - Scoring used to assess and prioritise proposals

Costs		Beneficial Impact on Air Quality		Timescale*	
Score	£				Years
7	<100k	10	Highest	Short (S)	1 – 2
6	100 – 500k				
5	500k – 1 million				
4	1 – 10 million			Medium (M)	3 – 5
3	10 – 50 million				
2	50 – 100 million				
1	>100 million	1	Lowest	Long (L)	6+

*measures implemented already are denoted as " I ", otherwise denoted as ongoing - "O"

4.1 Specific Measures to Be Implemented within the AQMA

To ensure that the AQS objectives will be achieved within the AQMA, the following measures will be/are proposed to be implemented

ACTION	Lead Authority	Impact	Time scale	Status	Impact	Cost	Cost Effective score	Indicator	To be achieved
1. Investigate the efficiency of the traffic lights at the junctions of Barrack Street, Mall West and Newry Road and improve the timings of the lights to aid traffic flow.	DRD Roads Service (NI)	Less congestion and faster speeds at junctions leading to an overall reduction in NO_2 levels.	S	O	2	7	14	Roads Service to report back to AQMA Stakeholder Committee on possible efficiency measures. If implemented, changes will be assessed in the short term based on average queue lengths and number of journeys. Long Term reduction of NO2 in annual monitoring results	August 2012 On-Going
2. Investigate the efficiency of the roundabout at the junction of Mall West, Lonsdale Road, and to assess if other traffic control measures may be better suited to ease congestion	DRD Roads Service (NI)	Reduction in the overall level of traffic pollution on Mall West, Lonsdale Road and Railway Street. Co-ordinate efficient traffic flow in conjunction with lights at Barrack Street and Newry Road.	S	O	5	7	35	Roads Service to report back to AQMA Stakeholder Committee on possible efficiency measures. . If implemented, changes will be assessed in the short term based on average queue lengths and number of journeys. Long Term reduction of NO2 in annual monitoring results	August 2012 On-Going
3. To use vehicles, fuel and technology which optimize the balance of efficient operations, output emissions and environmental impact, with regulatory compliance as a minimum standard.	Translink	Reduction in the overall level of traffic pollution in the AQMA and reduction in the numbers of highly polluting vehicles on the roads	S	O	2	7	14	To achieve an average road fleet age of 8 years and a retirement age of 12 years for coaches and 18 years for buses by 2013	2013

ACTION	Lead Authority	Impact	Time scale	Status	Impact	Cost	Cost Effective score	Indicator	To be achieved
4 Air Pollution Monitoring.	Armagh City and District Council	Identification of long term trends in pollution and focus on areas of poor air quality	M	O	5	7	35	Long Term reduction of NO2 in annual monitoring results	On-Going
5. Investigate the feasibility of removing a number of the parking spaces on Mall West.	DRD Roads Service (NI)	Reduces pressure on vehicles using Mall West. Optimises traffic speeds and eradicates congestion on Mall West in both directions.	M	O	2	7	14	Number of Car Parking spaces reduced Long term reduction of NO2 in annual monitoring results	May 2012 On-Going
6. Investigate the feasibility of introducing a 'Pay & Display' system on Mall West	DRD Roads Service	Increased efficiency in traffic flow through the AQMA and town centre. Reduces congestion and encourages use of larger off-street car parks.	S	O	5	7	35	DRD to report back to AQMA stakeholder committee on possible measures	May 2012
7. Complete a traffic assessment of Armagh City Centre and carry out DMRB assessment of AQMA Junctions	Armagh City and District Council	Identification of long term trends in pollution and assesses requirement for improvements to road network	L	C	9	3	27	Long Term reduction of NO2 in annual monitoring results Reduced Traffic Flows (AADT) through Armagh City centre	April 2011

ACTION	Lead Authority	Impact	Time scale	Status	Impact	Cost	Cost Effective score	Indicator	To be achieved
8. Investigate the possibility of designating a number of free parking spaces on Mall West for electric/hybrid vehicles only.	DRD Roads Service	Promotes the use of more environmentally friendly vehicles and the follow on reduction in road traffic pollution in the AQMA and Town Centre.	S	O	1	7	7	DRD to report back to AQMA stakeholder committee on possible measures Long term reduction of NO2 in annual monitoring results	May 2012 On-Going
9. To investigate the possibility of creating a Low Emissions Zone within Armagh City Centre	Armagh City and District Council & DRD Roads Service (NI)	Allow access for vehicles that meet the latest euro emissions standards to designated area within city.	M/L	O	1	7	7	DRD to report back to AQMA stakeholder committee on possible measures	May 2012
10. Investigate the possibility of introducing a 'Park and Ride' scheme for shoppers and employees on the outskirts of Armagh	DRD Roads Service (NI) & Translink	Increases options for access to city centre and may reduce traffic congestion in Armagh overall. Helps to promote the benefits of public transport.	M	O	2	6	12	Percentage of parking spaces within Park and Ride facility being used on a daily basis Long term reduction of NO2 in annual monitoring results	On-Going On-Going

ACTION	Lead Authority	Impact	Time scale	Status	Impact	Cost	Cost Effective score	Indicator	To be achieved
11. Ensure potential air quality issues are assessed with new developments before problems arise through consultation with the Northern Ireland Planning Service	Armagh City and District Council	Reduces the possibility of further AQMA declarations and limits the degradation of air quality in future years.	L	O	2	7	14	Long term reduction of NO2 in annual monitoring results Number of consultations on planning application by Armagh City and District Council	On-Going On-Going
12. Air quality assessment of vehicle emissions	Armagh City and District Council	Reduction in the numbers of highly polluting vehicles on the roads	S	I	2	7	14	Annual initiative to check emissions and promote efficient driving Long Term reduction of NO2 in annual monitoring results	On-Going
13. Encourage the use of Staff Bicycles for short journeys within Armagh City	Armagh City and District Council	Reduction in pollution from Council vehicles	S	I	2	7	14	Increased use of existing bikes owned by council for short journeys in city. Long term reduction of NO2 in annual monitoring results	On-Going On-Going

ACTION	Lead Authority	Impact	Time scale	Status	Impact	Cost	Cost Effective score	Indicator	To be achieved
14. Investigate the use of alternative fuels where possible.	Armagh City and District Council	Reduction in pollution from Council vehicles	S	O	2	7	14	Report to be produced by Council on the viability of using alterative fuels for Council vehicles Long term reduction of NO2 in annual monitoring results	May 2012 On-Going
15. Vehicle upgrading/renewal programme to comply with EURO 5 emission standards	Armagh City and District Council	Reduction in pollution / noise from Council vehicles and increased fuel efficiency	S	O	2	7	14	Two new Bin Lorries purchased to replace two older models being removed from service Long term reduction of NO2 in annual monitoring results	December 2011 On-Going
16. Develop better travel planning amongst Council employees	Travelwise NI	Reduction in vehicle pollution from Council staff travelling to and from work.	S	O	2	7	14	Travel plan produced and implemented by Council	May 2012
17. Facilitate the development of Travel Plans for local schools and colleges	Travelwise NI	Reduction in pollution from vehicles used for school run	S	O	2	7	14	Number of ravel plans produced and implemented by Schools and Colleges through Travelwise NI	On-Going

ACTION	Lead Authority	Impact	Time scale	Status	Impact	Cost	Cost Effective score	Indicator	To be achieved
18. Sustainable Development.	Armagh City and District Council	General environmental impact. Inform policy makers. Increased awareness of sustainable development issues among a variety of stakeholders	M	O	5	7	35	Long Term reduction of NO2 in annual monitoring results	On-Going
19. Industrial Pollution Control	Armagh City and District Council	Reduced ambient pollution in local atmosphere	S	O	3	7	21	Long term reduction of NO2 in annual monitoring results Percentage of PPC programme completed by Armagh City and District Council	On-Going
20. Nuisance policy for dealing with burning of commercial and domestic waste	Armagh City and District Council	Reduced pollution from uncontrolled burning of commercial and domestic waste	S	O	1	7	7	Long Term reduction of NO2 in annual monitoring results	On-Going
21. Air Quality Awareness Promotion Campaign	Armagh City and District Council	Increase public awareness of Air Quality Management Area and general air pollution issues	S	O	2	7	14	Production of visual, verbal and written materials for dissemination to general public and/or highlighting air quality issues through various media	Annually as funding permits

5 Consultation

It is important for the success of the Action Plan to seek involvement from all local stakeholders including local residents, community groups and local businesses in order to share knowledge about the issues and hopefully gain support for the final measures proposed.

To date a number of meetings have been held with the Strategic Partners and other agencies in developing this action plan. Please see **Appendix 2** for details of these meetings

The following is a list of statutory and non-statutory consultees to which the draft Plan will be sent:

- The Secretary of State
- Department of the Environment / The Northern Ireland Environment Agency
- Department for Regional Development
- Southern Health and Social Care Trust
- Armagh City and District Council Councillors and Officers
- Neighbouring local authorities
- Local residents within and bordering the AQMA (Updating letter sent)
- Relevant local businesses, community groups and forums
- Other relevant local stakeholders

All comments from both statutory and non-statutory consultees received on the draft Action Plan will be considered and incorporated where appropriate into the final Action Plan. The Plan will now be presented to Armagh City and District Council for endorsement and subsequently placed on the Northern Ireland Air Quality website at http://www.airqualityni.co.uk/reports.