LANCASTER
CITY COUNCIL

Promoting City, Coast & Countryside

2016 Air Quality Annual Status Report (ASR) for Lancaster City Council

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

September 2016

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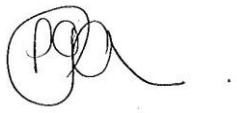
Signature	
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Overview of Air Quality in Our Area

Clean air is vital for our health and the environment and essential for making sure our town is a welcoming place for all to live and work now and in the future. Air pollution issues today do not tend to come from factory chimneys, but from the pollution we all generate and contribute to, particularly as we travel by car, van or truck.

Everyone therefore has a part to play in improving air quality, starting with the way we behave. Simple things like walking to work or school will benefit air quality as well as have knock-on benefits for your health and the environment. Think before you make a journey and ask yourself if it is necessary. Challenge yourself to see whether there is another way to meet your needs without adding to pollution or at least adding less. Local Authorities and the communities who live within them are key to improving the air we breathe. What we do locally can also benefit regional air quality and help meet air quality limit values and objectives as set out in European and UK law.

The Local Air Quality Management (LAQM) system, as set out in Part IV of the Environment Act 1995, 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 Action Plan setting out the measures it intends to put in place in pursuit of the objectives.

Air quality in Lancaster

The main air quality issues in Lancaster, as in many parts of the country are linked to emissions from road traffic. These emission continue to cause exceedance of air quality objectives for the pollutant nitrogen dioxide (NO_2) and contribute towards elevated levels of particulate (PM_{10} and $PM_{2.5}$). Exceedance of nitrogen dioxide levels has resulted in designation of three Air Quality Management Areas (AQMA's) located around the gyratory system in Lancaster City and at the main cross road junctions in Carnforth and Galgate (see Table 2.1 below for more information). Monitoring results over recent years have continued to confirm this position with no

clear indication that pollution levels are declining to meet objective levels despite local actions taken to reduce pollution levels and predicted reductions due to expected vehicle emission improvements.

Traffic in Lancaster City

Nitrogen dioxide levels at Dalton Square and Thurnham Street, Lancaster exceed the objective by around 75% (Levels currently monitored are around 70ug/m^3. The objective level is 40ug/m^3.)

In 2013 Lancaster City Council produced an air quality strategy for Lancaster (available at http://www.lancaster.gov.uk/environmental-health/environmental-protection/air-quality/air-quality-reviews-and-assessments) to provide a revitalised process towards air quality improvement. This particularly focused on enhanced and more defined working relationships with Lancashire County Council Highways and the County Council Public Health team.

The production of the strategy was also accompanied by steps to provide more detailed knowledge on the sources of pollution and to better understand what level of emission reductions are likely to be required to meet standards. This included setting up a link between the air quality stations in Lancaster and traffic signal management software, the installation of Automatic Number Plate Recognition (ANPR) cameras in Lancaster, undertaking a general traffic composition count (cars, taxis, buses etc..) in Lancaster and building an in-house pollution modelling facility. The installation of ANPR cameras was a Defra grant funded project (£30k award from the Air Quality

Grant Fund). The traffic composition count was undertaken in April 2015 and the remainder are in progress and all planned to be delivered during 2016/17.

Actions to improve air quality

The current air quality position is due to change as a consequence of three main actions:

- Firstly, a Transport Masterplan has been drafted by Lancashire County Council (see http://www.lancashire.gov.uk/council/strategies-policies-plans/roads-parking-and-travel/highways-and-transport-masterplans.aspx for more information). The City Council has been consulted on the proposals and improvements in air quality and the process to produce an effective air quality action plan are integral to the plan. Impact assessment as described in the Air Quality Strategy for Lancaster will be written into the plan and undertaken to ensure air quality improvement is a key plan implementation driver and is not lost amongst other competing priorities. The Transport Masterplan will also be supported by new local air quality planning guidance. The guidance aims to set basic air quality mitigation requirements for new development and set a new method of assessment to better account for contributory air quality impact. A Lancashire based guidance template has been produced and a regional launch is planned for October 2016. Locally (Lancaster) the guidance will initially be adopted as a Planning Advisory Note, but with the intention to adopt the guidance as a Supplementary Planning Guidance document during 2017/18. As an interim measure a Planning Advisory Note has also been produced and adopted in 2016 detailing requirements for the charging of electric vehicles available at : https://www.lancaster.gov.uk/planning/planning-policy/supplementary-planning-documents-spds and contained in Appendix G. As indicated the new air quality guidance is planned to be implemented across the Lancashire County area (each district adopting the guidance) recognising that transport issues are not limited to local boundaries and that standards may be better received if applied regionally.

- Secondly the M6/Heysham link road is under construction and is due to open at the end of October 2016 (see http://heyshamlink.lancashire.gov.uk/ for more information). The road is predicted to deliver traffic relief to all three of Lancaster's AQMAs. The opening of the new road will also see a ban on HGV's using the roads passing through the three AQMA (see http://heyshamlink.lancashire.gov.uk/news-and-progress/news/2016/hgv-ban-proposed-for-urban-areas-of-lancaster.aspx for more information). The most significant alleviation is predicted for Carnforth where a decrease in traffic approaching 20% is predicted. It is hoped that the AQMA in Carnforth can be revoked based on improvements delivered by the new road scheme. A set condition of the road development is also that further measures are put in place to preserve impact reductions delivered by the new road. These will all form part of the transport masterplan.

Canal Bridge

M6/Heysham link road near completion

Foundry Bridge

Morecambe Road

Carus Bridge

- In November 2015 a bid was made to provide improvements to buses to reduce emissions (involving the County Council, the City Council, Stagecoach and Greenurban Limited) under the Department of Transport, Clean Bus Technology Fund. This application was successful and a full bid award of £288,180 was granted. Procurement requirements have delayed implementation however delivery is now due in January 2017. This is anticipated to have an impact of reducing nitrogen oxide levels in the

Lancaster AQMA by up to 8%. The Council and its partners intend to make further bids in future years where suitable opportunities arise.

Air Quality and County Council Public Health

The Director of Public Health and Wellbeing report 2016 for Lancashire makes clear the need to tackle the wider determinants of health including promoting healthy living environments through for example cycling and walking paths whilst also making clear the need for sustainable behaviour change including tackling physical activity. It also outlines the need for telecare and harnessing digital technology whilst also joining up services in neighbourhoods. Combined these actions should reduce the level of road use and therefore ultimately reduce the levels of $PM_{2.5}$ emitted in Lancashire.

Within Lancashire County Council (LCC), Public Health supported by Public Health England are now taking a central role internally and with partners in District Councils, the NHS and the University of Lancaster to consider the best options to drive forward initiatives that will support the reduction in $PM_{2.5}$. In brief these incorporate pushing for the following actions within the county council:

Procurement

Purchasing the latest Euro 6 standard for all new fleet and replacing vehicles after just 10 years.

Low Emission Vehicles

150 additional electric vehicle charge points will soon be installed across the county for domestic vehicles. The County Council are also supporting district councils to apply for 'cleaner bus grants.'

Active Travel

The consultants Jacobs have been commissioned by the County Council to develop a Walking and Cycling strategy for Lancashire. This will enable us to

capitalise on national funding opportunities to reduce car use. We are also working with schools, the community and workplaces to encourage 'modeshift' and working with Blackburn Council to extend the national cycleway into East Lancashire which will provide walking and cycling routes for work and leisure for communities across the east of the county.

Transport Planning

The County Council already consult with air quality officers when developing transport plans. Future transport plans however are to be impact assessed for air quality from the outset. We are also working with the Lancashire Air Quality Officers Group to support the adoption of generic Air Quality Planning Policy/Guidance across the Lancashire sub-region.

Road Network Management

In relation to management of the road network, 20mph has been introduced in many residential areas in Lancashire to reduce accidents. This will have a small effect on reducing particulates. We also collect traffic count data to support district air quality modelling. An AQMA layer has recently been added to the mapping system enabling transport planners and network management to utilise this information when making decisions about the network. Training is also planned for 2017 for the network management team around how they can practically reduce the burden of poor air quality through their role. In built up areas with traffic signal junctions, minimisation of start stop of traffic flow is currently achieved by the use of Intelligent Traffic Systems mostly via signal control systems. This software controls signal timings which minimises overall traffic delay (reducing start and stops) in a road network.

Data

The PH Data team has recently calculated mortality ranking for Lancashire for $PM_{2.5}$ using Defra data. (see Appendix E). Further analysis of the existing data is necessary to clearly identify the areas where priority measures need to be considered. Initial analysis of CVD/Respiratory illness data related to AQMAs has also been carried out. Further work is needed to provide evidence of a direct correlation and to build the case for action across Lancashire.

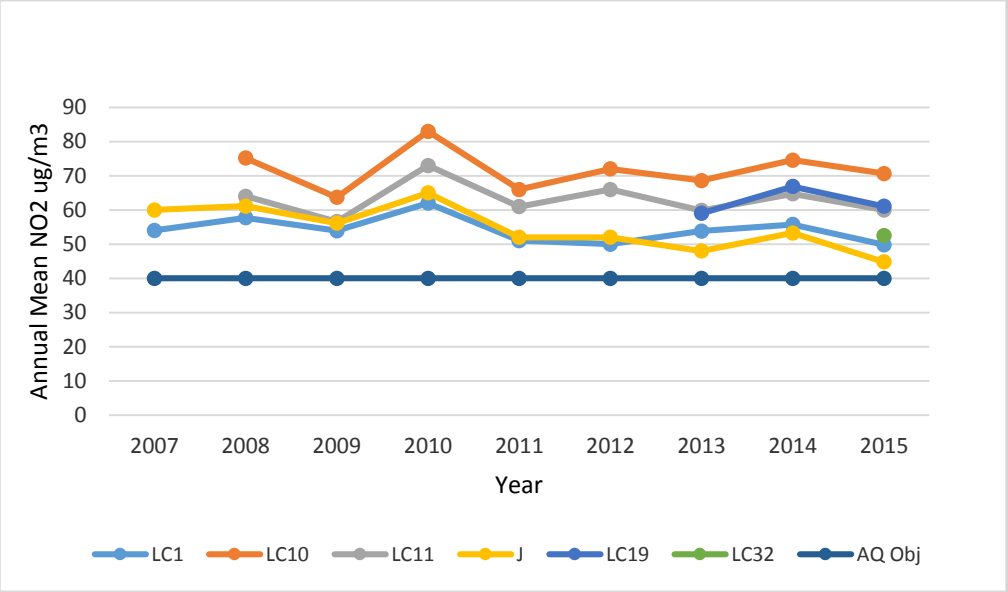
Research

We are supporting research carried out by Lancaster University to trial roadside vegetation strips in Lancaster as a means of reducing $PM_{2.5}$ and NO_2. Previous international research is inconclusive on this. Previous initial research by partners at Lancaster University found a 50-60% reduction in $PM_{2.5}$ in homes of those affected when veg strips were used. This research will add to the growing international evidence base and pave the way for a possible bigger trial across Lancashire.

Local Priorities and Challenges for coming year

Air Pollution levels in Lancaster remain above objective levels and monitoring results show no obvious indication of levels likely to meet the air quality objectives without new intervention (see Figure 1 below).

Figure 1 - Pollution levels (nitrogen dioxide) in Lancaster AQMA for highest six monitoring sites 2007-2015



Although actions are in progress to reduce pollution levels (e.g. grant funded bus emission reduction, travel plans, M6/Heysham link road etc..) and the introduction of newer vehicles are anticipated to lead to general improvement, the delivery of a robust and effective transport masterplan is the key to ensure future pollution levels are below health based standards.

The final revision of the transport Masterplan for Lancaster is due by the end of September 2016. However the delivery of the various components of the plan is not imminent and the larger proportion of actions are scheduled to follow a period of assessment following the opening of the M6/Heysham link road. The elements of the Masterplan also needs to be formally adopted and detailed to form the main air quality action plan for Lancaster. This plan will replace the existing air quality action plans for Lancaster and Carnforth and form the required plan for the Galgate AQMA. Work to deliver the Masterplan/Air Quality Action Plan is therefore in its infancy and will remain a top priority over the next 4 years.

As already mentioned, 2016/17 will see the opening of the M6/Heysham link road and the implementation and planning of other measures to provide needed traffic alleviation to the three AQMAs in Lancaster. Air quality monitoring carried out by the City council is ongoing in these three areas and will continue after the road opens to fully assess the anticipated air quality impact of the scheme and linked measures. This information through subsequent assessment will also inform the Transport Masterplan.

Defra has indicated that local authorities should have a role in reducing $PM_{2.5}$ particulate pollution however the degree of involvement should be determined at a local level in discussion with Public Health. Certain actions are in progress (see ‘Air Quality and County Council Public’ above) however to monitor the outcomes of these actions some local indicators are likely to be required. Air quality monitoring in Lancaster will therefore be reviewed in 2016/17 to consider monitoring needs for $PM_{2.5}$ and newly available monitoring technologies and methods. The Lancashire air quality group have similarly agreed to review available technology to monitor $PM_{2.5}$ to challenge existing practice and ensure regional monitoring provision is fit for purpose.

Guidance for new development has been produced in 2016 in partnership with the Low Emission Partnership (see http://www.lowemissionstrategies.org/). The introduction of approaches it contains for Lancaster and Lancashire will be a priority for the remainder of 2016 and 2017.

As those directly affected will be acutely aware, wet weather in November and December 2015 brought flooding to Lancaster. The Cable Street air quality station was affected by the flooding and has required repair. Unfortunately despite repairs to the station in Cable Street monitoring still is affected. Sufficient useable monitoring data from this station in 2016 is therefore not anticipated. We are working hard to ensure it is back operating as soon as possible.

Air Quality station at Cable Street, Lancaster

Finally consultation on the amendment of the Lancaster AQMA to include likely exceedance of the 1 hour objective for NO_2 commenced in August 2016 (see Appendix F for consultation document). The consultation is due to close on the 16 September 2016. Final amendment of the order is anticipated in October/November 2016.

How to get involved

Air quality impacts are not generally the result of single source but are as a result of a number of combined impacts. Small contributions to air pollution are therefore more important than they may seem, and need to be addressed if current issues are to be resolved. The principle 'look after the pennies and the pounds will look after themselves' comes to mind. Road traffic is an obvious example of an impact arising from numerous sources with control in the hands of each vehicle owner. The choices individuals (you) make are therefore crucial to improve air quality. The following are therefore some suggested actions which if adopted would significantly contribute to improving air quality in the Lancaster area:-

1) *Internet technology available today allows communication and transactions to take place without the need for personal travel. Where ever possible the use of technology can remove or reduce polluting emissions and also save you valuable time.*

2) *Where a journey is needed, choosing to walk or cycle means that you are not adding to pollution and has the added benefit of keeping you fit and healthy. Some good information and suggestions can be found at the following link*: *http://www.lancashire.gov.uk/roads-parking-and-travel/alternative-ways-to-travel.aspx*

3) *If you need a car, consider using or purchasing a lower emission vehicle such as an electric car. If an electric car does not currently meet your specific needs or is not a possibility, if you can, choose a smaller, more fuel efficient car. This will usually have significant emission benefits.*

4) *Take the bus or train if this is an option. The Council and its partners are working to improve the emissions from public transport. Information on public transport is available from http://www.traveline-northwest.co.uk/cms/content/lancashire.xhtml , https://www.stagecoachbus.com/about/cumbria-and-north-lancashire and other general information web sites such as http://www.nationalrail.co.uk/ .*

In addition to reducing the pollution you create you can also do things to reduce your exposure to air pollution. These are a few suggestions:-

Get out of your car

Not only will you be reducing pollution if you don't drive, you will reduce how much pollution you breathe as often sitting in traffic surrounded by vehicles exhausts can be the worst place to be.

Choose where you walk

Air pollution along main roads with buildings close to the road can be particularly high. If possible avoid walking along main roads, choose side roads. If you can't avoid them walk as far away from the kerb as possible – pollution levels usually decrease quickly the further you get away from them. If you need to cross the road, do this as quickly as you can, but don't get run over as this would defeat the objective! Watch out for your young children also. If they are in a pram don't forget that they can be even closer to vehicles exhaust!

Choose where you exercise

Don't run or cycle along busy roads if you can avoid them. Choose locations where traffic is lower or ideally where there is no traffic at all.

Get out of town

Not always an option, but if you can go out to places where the air is cleaner (the country or the coastal areas of Lancashire are great). But if you can, use public transport, walk or cycle so you don't add to the problem.

Avoid times when pollution is worst

If you can, don't travel when traffic is busiest as this will usually be when the pollution is at its worst. This will not be a favourite for many, but walking in the rain reduces the pollution we breathe in.

Wear a mask?

You could wear a mask, but if you do it needs to fit tightly or its effect will be small. Also, if you don't change it regularly and it becomes dirty it could even be worse for you.

Air pollution indoors?

Air pollution inside can be an issue as we often produce dust for activities such as DIY, cleaning and also some pollution from cooking and heating out homes. Ventilate you home and minimise obviously dusty or smoky activities. Obviously if you smoke this the first thing to stop doing.

Tell us what you think!

We would be really grateful for people to be involved in future consultation, particularly regarding actions we may take. If you are willing to participate please let us know using the contact details below. In your response please indicate

(i) Whether you would you like to get involved in future air quality pollution consultations? and,
(ii) Whether you would you like to get involved in other Lancaster City Council service consultations?

Please also provide your details below:

Email address : ……..

Contact Telephone Number : …….

Contact Address : ……..

Please note: Your personal details will be kept confidential and held in accordance with the Data Protection Act.

Please email your response comments to :-

airquality@lancaster.gov.uk

or send by post to:-

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1 Local Air Quality Management

This report provides an overview of air quality in the Lancaster City Council area during 2015. It fulfils the requirements of Local Air Quality Management (LAQM) as set out in Part IV of the Environment Act (1995) and the relevant Policy and Technical Guidance documents.

The LAQM process places an obligation on all local authorities to regularly review and assess air quality in their areas, and to determine whether or not the air quality objectives are likely to be achieved. Where an exceedance is considered likely the local authority must declare an Air Quality Management Area (AQMA) and prepare an Air Quality Action Plan (AQAP) setting out the measures it intends to put in place in pursuit of the objectives. This Annual Status Report (ASR) is an annual requirement showing the strategies employed by Lancaster City Council to improve air quality and any progress that has been made.

The statutory air quality objectives applicable to LAQM in England can be found in Table 1.1 in Annex D.

2 Actions to improve air quality

2.1 Air Quality Management Areas

Air Quality Management Areas (AQMAs) are declared when there is an exceedance or likely exceedance of an air quality objective. After declaration, the authority must prepare an Air Quality Action Plan (AQAP) within 12-18 months setting out measures it intends to put in place in pursuit of the objectives.

A summary of AQMAs declared by Lancaster City Council can be found in Table 2.1. Further information related to declared AQMAs, including maps of AQMA boundaries are available online at http://www.lancaster.gov.uk/air-quality/ . A national list of AQMA's is available at : http://uk-air.defra.gov.uk/aqma/list .

Consultation on the amendment of the Lancaster AQMA to include likely exceedance of the 1 hour objective for NO_2 commenced in August 2016 (see Appendix F for consultation document). Final amendment of the order is anticipated in October 2016.

Table 2.1 – Declared Air Quality Management Areas in Lancaster

AQMA Name	Pollutants and Air Quality Objectives	City / Town	One Line Description	Action Plan
City of Lancaster AQMA	Annual Mean Objective NO_2	Lancaster	Covers gyratory system in Lancaster city centre	Available at:- http://www.lancaster.gov.uk/environmental-health/environmental-protection/air-quality
Carnforth AQMA	Annual Mean Objective NO_2	Carnforth	Covers main cross road area in Carnforth	Available at:- http://www.lancaster.gov.uk/environmental-health/environmental-protection/air-quality
Galgate AQMA	Annual Mean Objective NO_2	Galgate	Covers main cross road area in Galgate	Action Plan to be delivered as part of Transport Masterplan. See :http://www.lancashire.gov.uk/council/strategies-policies-plans/roads-parking-and-travel/highways-and-transport-masterplans.aspx

NB All action plans are planned to be superceded by the plan incorporated in the Transport Masterplan for Lancaster.

2.2 Progress and Impact of Measures to address Air Quality in the Lancaster City Council area

Lancaster City Council has taken forward a number of measures during the current reporting year of 2015/16 in pursuit of improving local air quality. Details of all measures completed, in progress or planned are set out in Table 2.2 below. More detail on these measures can be found in their respective Action Plans, the Air Quality Strategy for Lancaster, and the draft Transport Master Plan for Lancaster. Key completed/in progress measures are:

- Delivery of Transport Master Plan for Lancaster incorporating the Air Quality Action Plan for the district/AQMA's (due September 2016)
- Delivery on charging point provision for electric vehicles for new development (planning guidance/planning advice note – see Appendix G)
- Delivery of local/regional air quality planning guidance (due 2016)
- Opening of M6/Heysham link road to provide alleviation to the three AQMA's (due October 2016)
- Travel planning arrangements in schools and larger new development
- Provision of cycling infrastructure and facilities particularly through the Cycling Demonstration Town programme and Sustainable Transport Fund initiatives
- Planning policy for former TDG site is Carnforth
- Provision of ANPR system in Lancaster
- Grant funding to reduce emissions from buses in Lancaster.

Progress on the following measures has been slower than expected due resourcing issues beyond the city council's control. The measures, although delayed, are all likely to be resolved within the period 2016/17:

- Linking air quality stations to traffic management system in Lancaster
- Procurement and delivery of emission reduction technology to buses through the Cleaner Bus Fund grant allocation.
- Adoption of transport Masterplan for Lancaster

The key actions and priorities for the coming year are :-

- Opening of Heysham M6 link road (which will impact on traffic through the three AQMA). This includes also the opening of Park and Ride bus service between M6 junction/Caton Road and Lancaster City centre.
- Reduction in bus emissions impacting on roads between Lancaster University and Heysham and particularly the Lancaster AQMA (through DfT Cleaner Bus Technology Grant - to be completed in 2017).
- Adoption of Transport Masterplan for Lancaster (due September 2016).
- Installation of ANPR traffic monitoring system in Lancaster centre (due 2016).
- Adoption of local air quality planning guidance. This will provide minimum air quality impact mitigation requirements for new traffic generating development. It will also seek new assessment/mitigation requirements for larger impacting developments (due October/November 2016).
- Working with Public Health and particularly to further consider response to address $PM_{2.5}$ pollution.
- Commencement of Work with the County Council to develop in detail the elements of the Transport Master Plan for Lancaster.

Longer term actions include the following:-

- Assessment and Implementation of Transport Masterplan for Lancaster and production of final Air Quality action Plan for Lancaster (2016-2020)
- Provision of road side electric charging points (grant funding has been obtained to provide 150 roadside charging points across Lancashire. 15 of these are likely to be located within the Lancaster district. Siting locations have been proposed. To be delivered 2017/18.

Table 2.2 - Progress on Measures to Improve Air Quality – Lancaster District

Measure No.	Measure	EU Category	EU Classification	Lead Authority	Planning Phase	Implementation Phase	Key Performance Indicator	Target Pollution Reduction in the AQMA	Progress to Date	Estimated Completion Date	Comments
1	Lancaster Transport Masterplan	Traffic Management	UTC, Congestion management, traffic reduction	Lancashire County Council	2015/16	2016 to 2024	M6/Heysham link Road, Lancaster Caton Road Park and Ride, Renumbering A6, Strategic Multiuser cycle network, Lancaster Reach express Public Transport service, reconfiguration of J33 of M6, Lancaster South Park and Ride, Lancaster Movement Strategy (incorporating Lancaster Centre network review and restraint measures). ULEV Strategy, Morecambe Movement Strategy, Morecambe to Lancaster Rail services, Heysham supporting development, Carnforth Town Centre Improvements, Carnforth Railway Station, Rural connections.	Plan aims to deliver air quality improvements to lead to general air quality improvement and revocation of three AQMA	Plan currently draft. Due for adoption September 2016	2024	Main plan/action plan to deliver air quality improvements. Masterplan to be adopted as Air Quality Action Plan Draft plan available at:- http://www.lancashire.gov.uk/council/strategies-policies-plans/roads-parking-and-travel/highways-and-transport-masterplans.aspx
2	Speed limits in residential areas	Traffic Management	Reduction of speed limits, 20mph zones	Lancashire County Council	-	2012-2014	-	-	Most residential areas designated 20mph zones	2014	Covers most residential areas in the Lancaster district

Measure No.	Measure	EU Category	EU Classification	Lead Authority	Planning Phase	Implementation Phase	Key Performance Indicator	Target Pollution Reduction in the AQMA	Progress to Date	Estimated Completion Date	Comments
3	Transport Masterplan for Lancaster	Traffic Management	Strategic highway improvements, Re-prioritising road space away from cars, inc Access management, Selective vehicle priority, bus priority, high vehicle occupancy lane	Lancashire County Council	Transport Masterplan for Lancaster	2015/16	2016 to 2024	To be determined	Plan aims to deliver air quality improvements to lead to general air quality improvement and revocation of three AQMA	Plan currently draft, Due for adoption September 2016	2024 http://www.lancashire.gov.uk/council/strategies-policies-plans/roads-parking-and-travel/highways-and-transport-masterplans.aspx
4	Lancaster Parking Strategy	Traffic Management	Emission based parking or permit charges	Lancaster City Council	2015-18	-	-	-	In preparation	2018	Item in current parking strategy but no significant implementation yet. More information available at: https://www.lancaster.gov.uk/parking/

Measure No.	Measure	EU Category	EU Classification	Lead Authority	Planning Phase	Implementation Phase	Key Performance Indicator	Target Pollution Reduction in the AQMA	Progress to Date	Estimated Completion Date	Comments
5	AQ Station traffic management link	Traffic Management	Other	Lancaster City Council and Lancashire County Council	2012/13	2013	-	Assist with traffic management measures in Lancaster AQMA	Works to AQ Stations completed to facilitate link (City Council). Link to management system awaited (County Council).	2017	*LCC's traffic* systems database was planned to be upgraded to receive real time information from Lancaster CC air quality monitoring stations to aid traffic management and reduce emissions. Unfortunately procurement and budget issues at the County Council have delayed delivery but the linking with Lancaster's air quality information is still with the scope of goals that the new UTMC which will be designed to facilitate. It is currently being planned to have new UTMC system operational during the financial period 2016/17.

Measure No.	Measure	EU Category	EU Classification	Lead Authority	Planning Phase	Implementation Phase	Key Performance Indicator	Target Pollution Reduction in the AQMA	Progress to Date	Estimated Completion Date	Comments
6	M6/Heysham Link Road	Traffic Management	Other	Lancashire County Council	Pre 2014	2014-16	-	A maximum 10ug/m^3 annual mean NO_2 reduction in Carnforth AQMA. Traffic reduction in range of 3-9% within the Lancaster AQMA and potential of up to 5ug/m^3 (annual mean NO_2) in Galgate AQMA	Road Under Construction	October 2016	More information available at: http://heyshamlink.lancashire.gov.uk/

Measure No.	Measure	EU Category	EU Classification	Lead Authority	Planning Phase	Implementation Phase	Key Performance Indicator	Target Pollution Reduction in the AQMA	Progress to Date	Estimated Completion Date	Comments
7	Travel Plans for new development	Promoting Travel Alternatives	Workplace Travel Planning	Lancashire County Council	-	ongoing	-	-	21 Plans at Dec 2014 Further 3 plans produced in 2015 for development references: D1/15/01342/OUT, D1/12/01109 and 13/00217/FUL (See https://planning.lancaster.gov.uk/online-applications/ for further information)	-	Lancaster County Council Sustainability Team was disassembled in 2015 due to County Council budget cuts. Transport planning function in relation to new development transferred to County Council Highways Team
8	Promoting home working	Promoting Travel Alternatives	Encourage / Facilitate home-working	Lancaster City Council and Lancashire County Council	-	ongoing	-	-	ongoing	-	-

Measure No.	Measure	EU Category	EU Classification	Lead Authority	Planning Phase	Implementation Phase	Key Performance Indicator	Target Pollution Reduction in the AQMA	Progress to Date	Estimated Completion Date	Comments
9	Lancashire Commuter Cycle Challenge and other events	Promoting Travel Alternatives	Intensive active travel campaign & infrastructure	Lancashire County Council	-	Yearly	-	-	The Lancashire Cycle Challenge ran again during 2015.	-	The following organisations with Sustainable Travel Roadshows : Feb 2015 Lancaster & Morecambe College, April 2015 White Cross Business Park, Oct 2015 Cumbria University These events usually consist of try a bike sessions and fun activities such as mini bikes, penny farthing, provision of maps and other info and options to sign up for a personal journey plan. For more information see :http://www.lovetoride.net/lancashire and map - Figure 6 Appendix C

Measure No.	Measure	EU Category	EU Classification	Lead Authority	Planning Phase	Implementation Phase	Key Performance Indicator	Target Pollution Reduction in the AQMA	Progress to Date	Estimated Completion Date	Comments
	School Travel Plans	Promoting Travel Alternatives	School Travel Plans	Lancashire County Council	-	2003-2011	-	-	66 Schools with travel plans	-	Most Schools utilized grant funding to provide cycle storage facilities
10	Cycling Demonstration Town	Promoting Travel Alternatives	Promotion of cycling	Lancashire County Council	-	2008-11	-	-	Completed	-	4 contra flow cycle lanes, 3 Toucan crossings, 7 on road cycle lanes, cycle links to canal tow path, cycling access to pedestrian areas, 12 crossing upgrades, new path links, 1176 cycle parking spaces, signage, workplace engagement, events (25.000 contacts),cycle training, schools engagement
11	Lancaster Rail Station Park and Ride	Promoting Travel Alternatives	Promote use of rail and inland waterways	-	-	-	-	-	ongoing	-	60 Fee payable spaces
12	Carnforth Rail Station Park and Ride	Promoting Travel Alternatives	Promote use of rail and inland waterways	-	-	-	-	-	ongoing	-	64 Fee charged spaces
13	Bare Lane Rail Station Park and ride	Promoting Travel Alternatives	Promote use of rail and inland waterways	-	-	-	-	-	ongoing	-	12 free spaces

Measure No.	Measure	EU Category	EU Classification	Lead Authority	Planning Phase	Implementation Phase	Key Performance Indicator	Target Pollution Reduction in the AQMA	Progress to Date	Estimated Completion Date	Comments
14	Morecambe Rail Station Park and ride	Promoting Travel Alternatives	Promote use of rail and inland waterways	-	-	-	-	-	ongoing	-	100 fee payable spaces but refundable with rail ticket purchase
15	Silverdale Rail Station Park and ride	Promoting Travel Alternatives	Promote use of rail and inland waterways	-	-	-	-	-	ongoing	-	3 free parking spaces
16	Wennington Rail Station Park and ride	Promoting Travel Alternatives	Promote use of rail and inland waterways	-	-	-	-	-	ongoing	-	7 free parking spaces
17	Information via web site	Promoting Travel Alternatives	Other	Lancashire County Council	-	-	-	-	ongoing	-	http://www.traveline-northwest.co.uk/cms/content/lancashire.xhtml http://www3.lancashire.gov.uk/corporate/web/index.asp?siteid=4404&pageid=19915 http://www.lancashire.gov.uk/roads-parking-and-travel/alternative-ways-to-travel.aspx http://www.lancashire.gov.uk/roads-parking-and-travel/public-transport.aspx

Measure No.	Measure	EU Category	EU Classification	Lead Authority	Planning Phase	Implementation Phase	Key Performance Indicator	Target Pollution Reduction in the AQMA	Progress to Date	Estimated Completion Date	Comments
18	Air Quality information	Public Information	via the Internet	Lancaster City Council	-	-	-	-	ongoing	-	http://www.lancaster.gov.uk/environmental-health/environmental-protection/air-quality
19	Burning of waste Fact sheet	Public Information	via leaflets	Lancaster City Council and	-	2014	-	-	ongoing	-	Available at: http://www.lancaster.gov.uk/environmental-health/environmental-protection/smoke-control
20	Direct Communication/Education	Public Information	Other	Lancaster City Council and Lancashire County Council	-	-	-	-	ongoing	-	General communication through Environmental Health role and through schools education programme via County Council
21	Cycle Hire	Transport Planning and Infrastructure	Public cycle hire scheme	Lancaster City Council	-	-	-	-	ongoing	-	More information available at: http://www.celebratingcycling.org//more_info.asp?current_id=234

Measure No.	Measure	EU Category	EU Classification	Lead Authority	Planning Phase	Implementation Phase	Key Performance Indicator	Target Pollution Reduction in the AQMA	Progress to Date	Estimated Completion Date	Comments
22	M6/Heysham link road conditional complimentary measures	Transport Planning and Infrastructure	Other	Lancashire County Council	Before summer 2016	2016-2026	-	-	Plan in preparation 2015/16	2026	Plan of measures to be submitted to prevent relief offered by new road being eroded. Plan to be submitted before link road is fully opened (Schedule 2, 10 requirements). See Transport Masterplan at http://www.lancashire.gov.uk/council/strategies-policies-plans/roads-parking-and-travel/highways-and-transport-masterplans.aspx for more information.

Measure No.	Measure	EU Category	EU Classification	Lead Authority	Planning Phase	Implementation Phase	Key Performance Indicator	Target Pollution Reduction in the AQMA	Progress to Date	Estimated Completion Date	Comments
23	Caton Road Park and Ride	Alternatives to private vehicle use	Bus based Park & Ride	Lancashire County Council	-	2014-16	-	-	Construction ongoing	2016	The Park and Ride site at Junction 34 of the M6 motorway must be completed and available for use before the link road is fully opened to vehicular traffic. The Park and Ride site is to be brought into use when available road space is created on Caton Road but not more than 1 month after the link road has been fully opened. Appropriate supportive priority measures for bus services linking the Park and Ride site to Lancaster City Centre must be implemented within 12 months of the link road being fully opened to traffic.
24	Shared Wheels Car Sharing	Alternatives to private vehicle use	Car & lift sharing schemes	Lancashire County Council	-	-	Members registered	-	4660 members registered in Lancashire area	-	See https://sharedwheels.liftshare.com/ for further information

Measure No.	Measure	EU Category	EU Classification	Lead Authority	Planning Phase	Implementation Phase	Key Performance Indicator	Target Pollution Reduction in the AQMA	Progress to Date	Estimated Completion Date	Comments
25	Lancaster Community Car Club	Alternatives to private vehicle use	Car Clubs	Lancaster Community Car Club –Community Interest Company	-	2010	-	-	-	-	See http://www.lancar.org.uk/book-a-car/ for further information
26	Sustainable Transport Fund Grants	Alternatives to private vehicle use	Other	Lancashire County Council	-	-	-	-	13 further schemes in Lancaster during 2014/15. Over 100 businesses engaged and 50 grants provided over the period of the scheme.	2015	Main transport rout between Lancaster and Preston targeted including Lancaster centre. Grants awarded for cycle storage, changing facilities and for pool bikes. Scheme ended April 2015
27	Local Transport Plan	Policy Guidance and Development Control	Other policy	Lancashire County Council	-	2011-21	-	-	-	2021	Plan available at: http://www.lancashire.gov.uk/council/strategies-policies-plans/roads-parking-and-travel/local-transport-plan.aspx

Measure No.	Measure	EU Category	EU Classification	Lead Authority	Planning Phase	Implementation Phase	Key Performance Indicator	Target Pollution Reduction in the AQMA	Progress to Date	Estimated Completion Date	Comments
28	Local air quality planning guidance	Policy Guidance and Development Control	Regional Groups Co-ordinating programmes to develop Area wide Strategies to reduce emissions and improve air quality	Lancaster City Council	2015/16	2016/17	-	-	Guidance produced. - Launch Workshop planned for October 2016	2017	Templates also produced for regional adoption
29	Lancashire Public Health Team AQ Coordination	Policy Guidance and Development Control	Regional Groups Co-ordinating programmes to develop Area wide Strategies to reduce emissions and improve air quality	Lancashire County Council	2015/16	2016	-	-	Initial meeting Dec 2015	-	Public Heath team at the County council are looking to coordinate roles of stakeholders at County Council to improve air quality (see overview above)
30	Lancaster Air Quality Strategy	Policy Guidance and Development Control	Other policy	Lancaster City Council	-	2015-26	-	-	Approach detailed in Strategy to be adopted in Transport Masterplan for Lancaster	2026	Available at: http://www.lancaster.gov.uk/environmental-health/environmental-protection/air-quality/air-quality-reviews-and-assessments

Measure No.	Measure	EU Category	EU Classification	Lead Authority	Planning Phase	Implementation Phase	Key Performance Indicator	Target Pollution Reduction in the AQMA	Progress to Date	Estimated Completion Date	Comments
31	Planning Policy - Lancaster City Council	Policy Guidance and Development Control	Other policy	Lancaster City Council	-	2014	-	-	Policy D37	-	To ensure new exposure to poor AQ is prevented and to minimise emissions from new development Available at: http://www.lancaster.gov.uk/planning/local-plan/local-planning-policy/adopted-documents/development-management-dpd/ Policy to be reviewed in 2016/17 in light of pending planning guidance (item 28 above) i.e. to ensure policy supports guidance.
32	Guidance on electric vehicle charging point requirements for new development	Policy Guidance and Development Control	Other policy	Lancaster City Council	2015	2016	-	-	Guidance adopted as Planning Advisory Note	February 2016	Guidance available at: https://www.lancaster.gov.uk/planning/planning-policy/supplementary-planning-documents-spds and Appendix G

Measure No.	Measure	EU Category	EU Classification	Lead Authority	Planning Phase	Implementation Phase	Key Performance Indicator	Target Pollution Reduction in the AQMA	Progress to Date	Estimated Completion Date	Comments
33	Planning Policy – Carnforth former TDG site	Policy Guidance and Development Control	Other policy	Lancaster City Council	-	2012	-	-	Policy active	-	Planning Policy to direct use of former TDG Haulage site in Carnforth to reduce impact of site on Carnforth AQMA See 2014 Progress report for more information :Available at: http://www.lancaster.gov.uk/environmental-health/environmental-protection/air-quality/air-quality-reviews-and-assessments

Measure No.	Measure	EU Category	EU Classification	Lead Authority	Planning Phase	Implementation Phase	Key Performance Indicator	Target Pollution Reduction in the AQMA	Progress to Date	Estimated Completion Date	Comments
34	M6/Heysham Link Road – Traffic Regulation Order	Freight and Delivery Management	Route Management Plans/ Strategic routing strategy for HGV's	Lancashire County Council	-	2016	-	See item 6 above	-	2016	HGV traffic to use J34 Link Road http://heyshamlink.lancashire.gov.uk/ The link road must not be fully opened to vehicular traffic until the undertaker has completed statutory consultation upon a proposal to make a traffic regulation order prohibiting HGVs from roads forming part of the A6 in central Lancaster and along the A589 Morecambe Road east of the link road, except for access
35	Clean bus technology fund grant	Vehicle Fleet Efficiency	Promoting Low Emission Public Transport	Lancashire County Council with Lancaster City Council and Stagecoach	2015	2016/17	NOx emissions from buses reduced by over 90%	8% reduction in NOx levels in Lancaster AQMA	£288150 Grant to tackle 17 buses providing most frequent bus services through Lancaster	2017	More information available at: https://www.gov.uk/government/collections/clean-bus-technology-fund

Measure No.	Measure	EU Category	EU Classification	Lead Authority	Planning Phase	Implementation Phase	Key Performance Indicator	Target Pollution Reduction in the AQMA	Progress to Date	Estimated Completion Date	Comments
36	Modernisation of local bus fleet (Carnforth)	Vehicle Fleet Efficiency	Promoting Low Emission Public Transport	Lancaster City Council	2010/17	-	-	-	-	-	Following Cleaner Bus Technology Fund success in 2015, further potential bid in 2016 if scheme is available See 2014 Progress report for further information. Available at: http://www.lancaster.gov.uk/environmental-health/environmental-protection/air-quality/air-quality-reviews-and-assessments
37	ULEV Cities/Fleet OLEV Grant applications	Vehicle Fleet Efficiency	Other	Lancashire County Council with Lancaster City Council	2015	-	-	-	Grant bids not successful	-	-
38	Lancaster City Council carbon reduction commitment	Promoting Low Emission Plant	Public Procurement of stationary combustion sources	Lancaster City Council	-	ongoing	34% reduction in carbon emissions by 2020 (3.4% annual target)	-	ongoing	-	Further information at: https://www.lancaster.gov.uk/sustainable-living/climate-change/responding-climate-change/

Measure No.	Measure	EU Category	EU Classification	Lead Authority	Planning Phase	Implementation Phase	Key Performance Indicator	Target Pollution Reduction in the AQMA	Progress to Date	Estimated Completion Date	Comments
39	Provision of roadside electric charging points for electric vehicles	Promoting Low Emission Transport	Procuring alternative Refuelling infrastructure to promote Low Emission Vehicles, EV recharging, Gas fuel recharging	Lancashire County Council Highways	2015/16	2017/18	-	-	Grant monies awarded for 150 points across Lancashire	2018	-

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

Local Authorities are expected under Chapter 7 of Policy Guidance LAQM.PG (16) to work towards reducing emissions and/or concentrations of pollutant $PM_{2.5}$. There is clear evidence that particulate matter ($PM_{2.5}$) has a significant impact on human health, including premature mortality, allergic reactions, and cardiovascular diseases.

Lancaster City Council is working to address $PM_{2.5}$ through existing and proposed actions to reduce emissions. Many of the measures used to reduce emissions impact on nitrogen dioxide emissions also impact on particulate pollution (PM_{10} and $PM_{2.5}$). For example measures that replace vehicle trips with cycling or walking will reduce all these pollutants and traffic alleviation provided by the M6/Heysham link road will reduce pollutant emissions for both nitrogen dioxide and particulates in key areas. $PM_{2.5}$ reduction measures are therefore similar to measures contained in the existing action plans and include:-

- Cycling and walking measures
- Traffic alleviation through new link road
- Measures contained in the transport Masterplan for Lancaster.
- Travel Planning
- Car Share/Car Clubs
- Requirements for new developments (policy and guidance driven)
- Promoting use of Ultra Low Emission Vehicles

It is however proposed (as suggested in guidance) that action in relation to $PM_{2.5}$ monitoring and reduction actions are reviewed with the County Council Public Health Team in 2016/17 to consider whether any specific additional actions are required. Current actions are detailed in the ‘Overview’ section (see p.8 above) of this document. Monitoring and targets will be reviewed in 2016/17.

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

3.1 Summary of Monitoring Undertaken

3.1.1 Automatic Monitoring Sites

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

Lancaster City Council undertook automatic (continuous) monitoring at the Dalton Square, Lancaster and Cable Street, Lancaster monitoring sites during 2015. Table A.1 in Appendix A shows the details of the sites. National monitoring results are available at http://uk-air.defra.gov.uk/ .

Maps showing the location of the automatic monitoring sites are provided in Appendix A. Further details on how the monitors are calibrated and how the data has been adjusted are included in Appendix C.

3.1.2 Non-Automatic Monitoring Sites

Lancaster City Council undertook non- automatic (passive) monitoring of NO_2 at 52 diffusion tube sites during 2015. Table A.2 in Appendix A shows the details of the sites. A number of new sites were introduced in 2015 at Caton Road, St Leonards Gate, and China Street, Lancaster.

Maps showing the location of the monitoring sites are provided at : https://localview.lancaster.gov.uk/LocalViewWeb/Sites/AirQualityMonitors/. Further details on Quality Assurance/Quality Control (QA/QC) and bias adjustment for the diffusion tubes are included in Appendix C.

3.2 Individual pollutants

The air quality monitoring results presented in this section are, where relevant, adjusted for bias. Further details on adjustments are provided in Tables C.4, C.5 and C.6 in Appendix C.

3.2.1 Nitrogen Dioxide (NO_2)

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

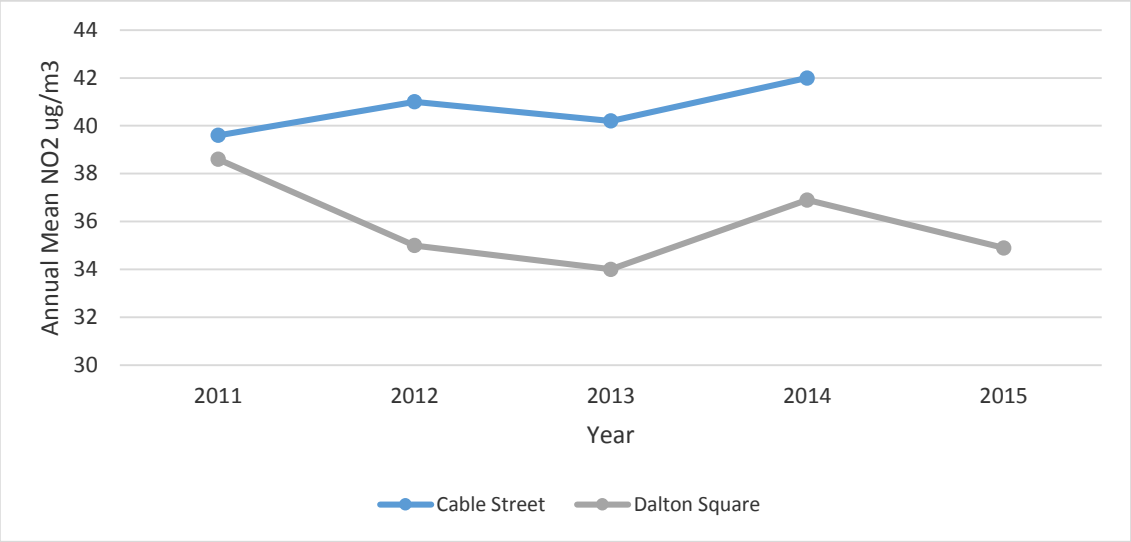
For diffusion tubes, the full 2015 dataset of monthly mean values is provided in Appendix B.

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

The data as shown in Figure 2 below shows no obvious trend with levels remaining relatively consistent of the past 5 years with levels around the annual mean objective level (40ug/m^3) at both Cable Street and Dalton Square sites. There was no monitored exceedance of the hourly NO_2 objective at either conmtinuous automatic

monitoring site. A detailed report is available at http://www.lancaster.gov.uk/air-quality/ .

Figure 2 - Annual Mean NO_2 at the two continuous automatic monitoring sites in Lancaster



Results from diffison tubes in 2015 were generally slightly lower than 2014 but overall show similar results to previous years with only tubes located within AQMA indicating exceedance of objective levels (annual and hourly exceedances of NO_2 objectives in Lancaster AQMA and annual mean objective exceedances in Galgate and Carnforth AQMA). Exceedance of the hourly mean objective was indicated as a number of sites in the Lancaster AQMA (see Figure 1 above) indicated by annual mean NO_2 levels being above 60ug/m^3 (see http://uk-air.defra.gov.uk/reports/cat18/0806261511_TG_NO2relationship_report_draft1.pdf). All locations monitored are generally indicative of relevant exposure (see table A.2 below for more information).

The two sites located outside AQMA which indicated potential for exceedance of the annual mean objectiive level for NO_2 in 2014 (tube LC28 located at Newton Terrace on Caton Road, Lancaster indicated at level of 45ug/m^3 and tube LC26 at Scotforth Road, Lancaster indicated a level of 41ug/m^3) showed levels just below the 40ug/m3 objective in 2015. Additional tube placed at Newton Terrace on Caton Road also did not indicate exceedance in 2015*.

* Note: The local diffusion tube bias adjustment factor used for 2015 was higher than the national factor and therefore monitoring results are considered to be conservative i.e. if national factor was used results overall would be lower than reported.

It should be noted that both location should be beneficially affected by the opening of the M6/Heysham link road in 2016 and therefore levels may decrease after 2016. Monitoring will continue in these two locations post link road opening to further assess whether AQMA designation is warranted and also the impact of the new road at these locations.

Conclusion

From an assessment of the monitoring results there is no intention to create any new AQMA's or revoke any existing AQMAs at this time within the Lancaster area. The main areas of concern persist to be within the three existing AQMA, although areas at Scotforth Road and Caton Road, Lancaster will be closely monitored over coming years.

3.2.2 Particulate Matter (PM_{10})

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

Table A.6 in Appendix A compares the ratified continuous monitored PM_{10} daily mean concentrations for the past 5 years with the air quality objective of 50µg/m^3, not to be exceeded more than 35 times per year.

Conclusion

There were no monitored exceedances of PM_{10} objectives although levels monitoired at the Cable Street site in Lancaster were significantly elevated in comparison with background levels. Despite PM_{10} objectives being met, particulate pollution is considered to be a none threshold pollutant and therefore pollutant level reduction is still an important priority for Lancaster City Council.

List of Appendices

Appendix A: Monitoring Results

Appendix B: Full Monthly NO_2 Diffusion Tube Results

Appendix C: Supporting Technical Information/QA-QC for Air Quality Monitoring Data/Cycle Challenge Companies

Appendix D: Summary of Air Quality Objectives in England

Appendix E Ranking of PHOF mortality indicators for Lancashire Local Authorities

Appendix F Lancaster AQMA amendment consultation document

Appendix G Planning Advisory note for charging facilities for electric vehicles at new developments

Appendix A: Monitoring Results

Table A.1 – Details of Automatic Monitoring Sites

Site ID	Site Name	Site Type	X OS Grid Reference	Y OS Grid Reference	Inlet Height (m)	Pollutants Monitored	In AQMA?	Monitoring Technique	Relevant Exposure? (Y/N with distance (m) from monitoring site to relevant exposure)	Distance to Kerb of Nearest Road (m) (N/A if not applicable)	Does this Location Represent Worst-Case Exposure?
AN1	Cable Street	Roadside	347684	461963	2.0	NO_2	Y	APNA-370 NO_x analyser	Y(0.4m)	4	Y
APM1	Cable Street	Roadside	347684	461963	2.0	PM_{10}	Y	PM_{10} – TEOM 1400a	Y(0.4m)	4	Y
AN2	Dalton Square	Roadside	347852	461611	2.0	NO_2	Y	APNA-360 NO_x analyser	Y – 0m (Dalton Square is a sitting area)	3.5	N

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

(2) N/A if not applicable.

Figure 3 - Map showing location (red marker) of Cable Street, Lancaster air quality monitoring station (monitors AN1 and APM1) and now closed Water Street station (blue marker) - (transparent grey area is the Lancaster AQMA)

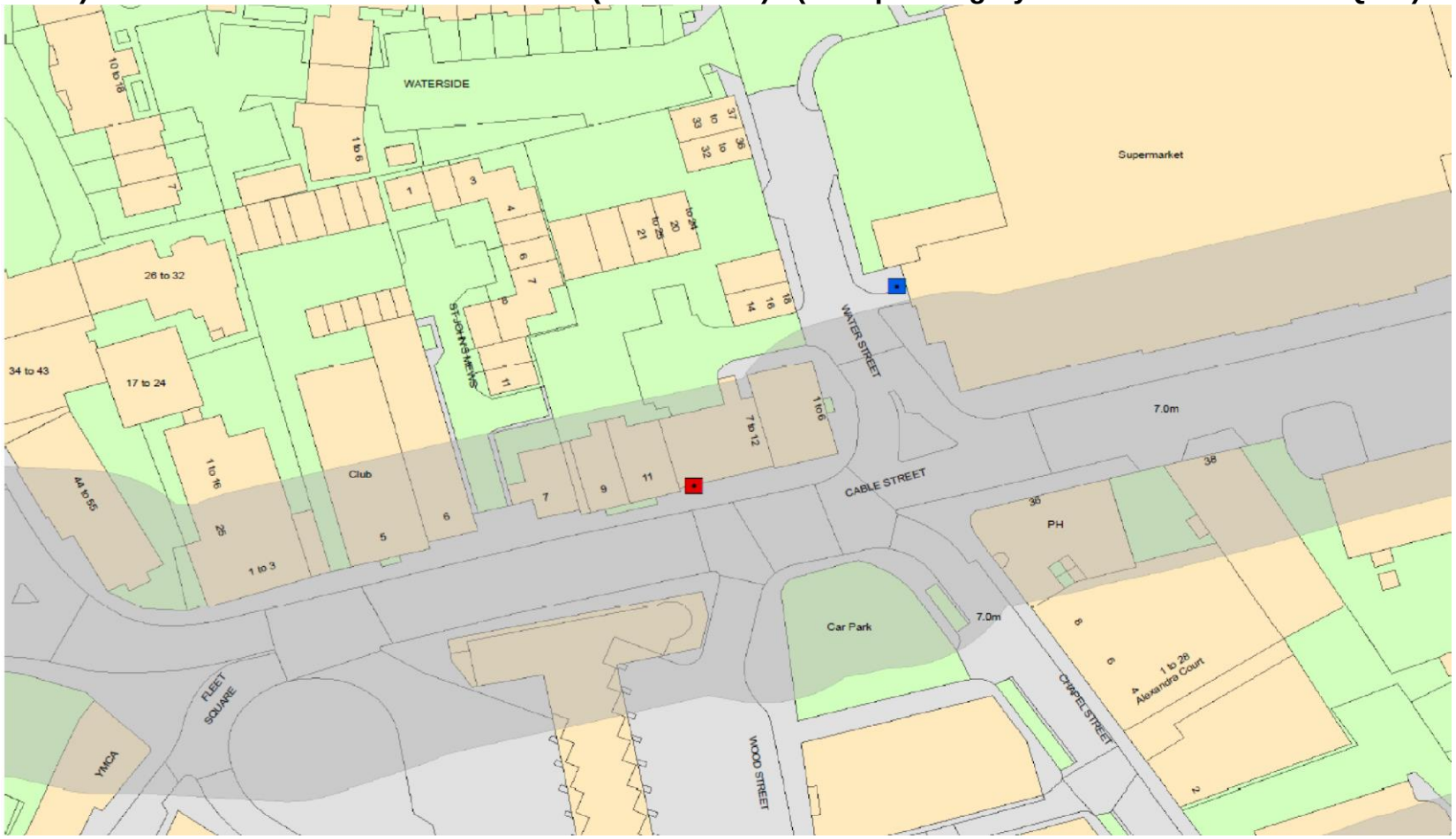


Figure 4 - Map Showing Location (red marker) of Dalton Square Lancaster Air Quality Automatic Monitoring Station (analyser AN2) (transparent grey area is the Lancaster AQMA)

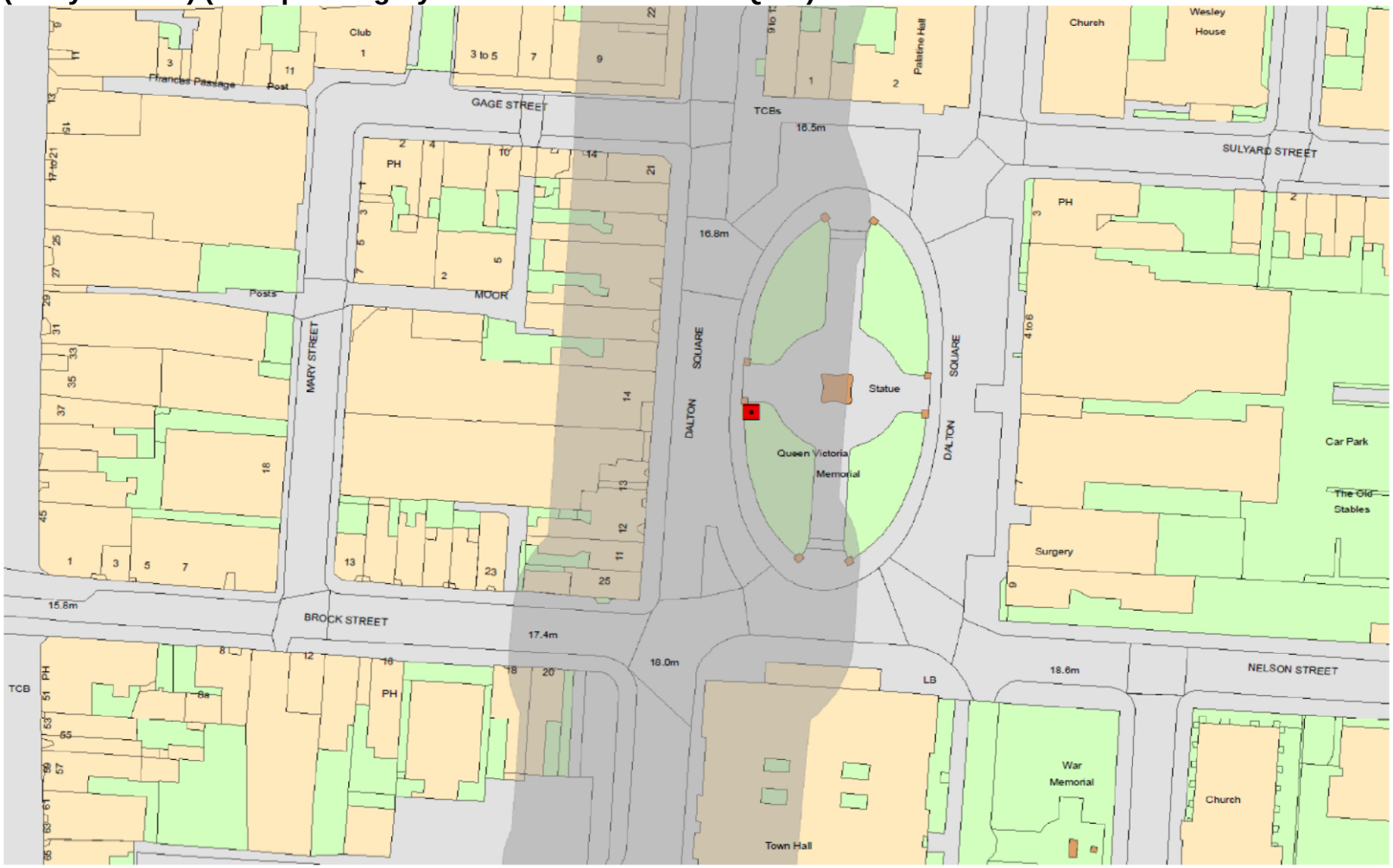


Table A.2 – Details of Non-Automatic Monitoring Sites (sites shown in grey no longer operating)

Site ID	Site Name	Site Type	OS Grid Ref		Site Height (m)	Pollutants Monitored	In AQMA?	Distance to Relevant Exposure (m)	Distance (m) to kerb of nearest road *(N/A if not applicable)*	Worst-case Location (exposure)?
			X	Y						
LC1	Lancaster 1	Roadside	347853	461682	3.5	NO_2	Y	2.5	2.5	Y
LC2	Lancaster 2	Urban Background	347906	461202	*3.5*	NO_2	N	N/A	N/A	N/A
LC3	Lancaster 3	Intermediate	347791	461498	*3*	NO_2	N	N/A	0	N/A
LC4	Lancaster 4	Urban Background	347517	461714	3.5	NO_2	N	N/A	1.5	N/A
LC5	Lancaster 5	Roadside	347847	462448	3	NO_2	Y	0.2	2.5	Y
LC6	Lancaster 6	Roadside	348075	462037	*4*	NO_2	N	0.2	2.7	Y
LC7	Lancaster 7	Roadside	347824	461906	3.5	NO_2	Y	0.2	2.3	Y
LC8	Lancaster 8	Roadside	347792	461858	3.5	NO_2	Y	0.2	1.7	Y
LC9	Lancaster 9	Roadside	347808	461563	3	NO_2	N	0.2	2.7	Y
LC10	Lancaster 10	Roadside	347834	461594	3	NO_2	Y	0.2	3.3	Y
LC11	Lancaster 11	Roadside	347823	461406	3	NO_2	Y	0.2	3.1	Y
LC12	Lancaster 12	Roadside	347619	461508	*3*	NO_2	Y	0.2	1.8	N
LC13	Lancaster 13	Roadside	347582	461593	3	NO_2	Y	0.2	2.4	Y
LC14	Lancaster 14	Roadside	347684	461389	3	NO_2	Y	0.2	2.2	Y
MC1	Morecambe 1	Roadside	345258	463674	*2*	NO_2	N	N/A	2.2	N/A
MC2	Morecambe 2	Urban Background	345237	463483	*3*	NO_2	N	N/A	2.5	N/A
MC3	Morecambe 3	Roadside	343570	464326	*3.5*	NO_2	N	0.2	5.5	Y
A	Lancaster A	Kerbside	347579	462450	3	NO_2	Y	N/A	0.3	Y
B1*	Lancaster B1	Roadside	347852	461610	2	NO_2	Y	N/A	3.3	N
B2*	Lancaster B2	Roadside	347852	461610	2	NO_2	Y	N/A	3.3	N
B3*	Lancaster B3	Roadside	347852	461610	2	NO_2	Y	N/A	3.3	N
B*	Lancaster B	Roadside	*347601*	*462200*	*3*	NO_2	*Y*	0.2	*15*	*N*
C*	Lancaster C	*Urban Centre*	*347715*	*461997*	*3*	NO_2	*N*	*N/A*	*26*	*N*
C1*	Lancaster C1	Roadside	347684	461963	2	NO_2	Y	0.4	3.7	Y
D*	Lancaster D	Urban Centre	347715	461997	*3*	NO_2	N	N/A	26	N

Site ID	Site Name	Site Type	OS Grid Ref		Site Height (m)	Pollutants Monitored	In AQMA ?	Distance to Relevant Exposure (m)	Distance (m) to kerb of nearest road *(N/A if not applicable)*	Worst-case Location?
			X	Y						
D1*	Lancaster D1	Roadside	347684	461963	2	NO_2	Y	0.4	3.7	Y
E*	Lancaster E	Urban Centre	347715	461997	*3*	NO_2	N	N/A	26	N
E1*	Lancaster E1	Roadside	347684	461963	2	NO_2	Y	0.4	3.7	Y
F	Lancaster F	Suburban	349600	464222	*2*	NO_2	N	0.2	20	N
G	Lancaster G	Roadside	348199	462353	*3.5*	NO_2	Y	0.2	9.2	N
H	Lancaster H	Roadside	347860	461127	3	NO_2	N	0.2	9	Y
I	Lancaster I	Roadside	347909	462015	3	NO_2	Y	0.2	3.5	Y
J	Lancaster J	Roadside	347852	461909	3	NO_2	Y	0.2	1.9	Y
K	Lancaster K	Roadside	347852	461791	3	NO_2	Y	0.2	4.4	Y
L	Lancaster L	Roadside	347612	461523	2.5	NO_2	Y	0.2	1.5	Y
M	Lancaster M	Roadside	347517	461714	*2.5*	NO_2	Y	0.3	2.4	Y
N	Lancaster N	Roadside	347686	461960	*3*	NO_2	Y	0.2	3.5	Y
O	Carnforth O	Roadside	349906	470624	3	NO_2	Y	0.2	1.4	Y
P	Lancaster P	Roadside	345759	463163	*2.5*	NO_2	N	0.2	22	N
Q	Lancaster Q	Roadside	347665	461447	3	NO_2	Y	0.2	2	Y
R	Lancaster R	Suburban	349694	464299	*2*	NO_2	N	0.2	48	Y
S	Lancaster S	Roadside	349835	470463	*2*	NO_2	Y	0.2	3.9	Y
T	Lancaster T	Roadside	347588	461958	*3*	NO_2	Y	0.2	3	Y
U	Carnforth U	Roadside	349899	470613	*3.0*	NO_2	Y	0.2	2.6	Y
V	Galgate V	Roadside	348359	455352	3.0	NO_2	Y	0.2	1.6	Y
W	Galgate W	Roadside	348372	455381	*3.0*	NO_2	Y	0.2	2.5	Y
X	Galgate X	Roadside	348388	455564	*2.5*	NO_2	N	0.2	5.5	Y
Y	Galgate Y	Roadside	348352	455249	*3.0*	NO_2	Y	0.2	3.0	N
Z	Galgate Z	Roadside	348345	455273	2.5	NO_2	Y	0.2	2.3	Y
ZA	Galgate ZA	Roadside	348351	455381	3.5	NO_2	Y	0.2	1.0	Y
ZB	Galgate ZB	Roadside	348386	455471	2.0	NO_2	N	0.2	2.0	N
ZC	Galgate ZC	Roadside	348375	455391	3.0	NO_2	Y	0.4	2.3	Y
CF1	Carnforth CF1	Roadside	349871	470525	2.0	NO_2	Y	0.2	5.9	N
CF2	Carnforth CF2	Roadside	349934	470605	3.5	NO_2	Y	0.2	2.3	Y

CF3	Carnforth CF3	Roadside	349853	470615	3.5	NO_2	Y	0.2	2.0	N
CF4	Carnforth CF4	Roadside	349890	470628	3.0	NO_2	Y	0.4	2.5	Y
CF5	Carnforth CF5	Roadside	349963	470618	3.0	NO_2	Y	0.2	1.8	Y
CF6	Carnforth CF6	Roadside	350000	470667	3.5	NO_2	Y	0.2	2.6	Y
CF7	Carnforth CF7	Roadside	349613	470225	2.5	NO_2	N	0.2	5.9	N
T1	Torrisholme T1	Roadside	345631	463693	3.5	NO_2	N	0.2	2.4	N
T2	Torrisholme T2	Roadside	345598	463685	*3.5*	NO_2	N	0.2	2.4	N
T3	Torrisholme T3	Roadside	345586	463698	*3.0*	NO_2	N	0.2	4.3	Y
T4	Torrisholme T4	Roadside	345613	463705	*4.0*	NO_2	N	0.2	5.3	Y
T5	Torrisholme T5	Roadside	345642	463715	*3.0*	NO_2	N	0.2	6.7	N
T6	Torrisholme T6	Roadside	345688	463715	*3.0*	NO_2	N	0.2	2.8	Y
T7	Torrisholme T7	Roadside	345522	463676	*3.0*	NO_2	N	0.2	11.1	N
LC15	Lancaster 15	Roadside	348199	462361	5	NO_2	Y	0.2	4.9	Y
LC16	Lancaster 16	Roadside	348269	462222	2	NO_2	N	0	4.6	Y
LC17	Lancaster 17	Roadside	347792	461577	3.5	NO_2	N	0.2	2.3	N
LC18	Lancaster 18	Roadside	347784	461565	3.5	NO_2	N	0.2	2.4	N
LC19	Lancaster 19	Roadside	347502	461841	3	NO_2	Y	0.5	1.6	Y
LC20	Lancaster 20	Roadside	347515	461835	3	NO_2	Y	0.4	1.6	N
LC21	Lancaster 21	Roadside	347627	461895	3	NO_2	N	0.3	1.5	N
LC22	Lancaster 22	Roadside	347928	461025	3	NO_2	N	0.2	7.2	Y
LC23	Lancaster 23	Roadside	347948	460893	3	NO_2	N	0.2	5	Y
LC24	Lancaster 24	Roadside	347974	460514	3	NO_2	N	0.2	2.8	Y
LC25	Lancaster 25	Roadside	348084	459844	3	NO_2	N	0.2	5.3	Y
LC26	Lancaster 26	Roadside	347990	459418	3	NO_2	N	0.2	5.5	Y
LC27	Lancaster 27	Roadside	347989	459396	3	NO_2	N	0.2	6.5	Y
BLS 1	Bolton-le-Sands 1	Roadside	348594	468500	3	NO_2	N	0.2	4	Y
H1	Heysham 1	Roadside	341964	463273	2.5	NO_2	N	0.5	2.5	Y
CF8	Carnforth CF8	Roadside	349568	470044	3	NO_2	N	0.2	4.5	Y
LC28	Lancaster 28	Roadside	348517	463243	2.5	NO_2	N	0.2	6	Y
W1	Warton 1	Roadside	349420	472092	3	NO_2	N	0.2	1.4	Y
W2	Warton 2	Roadside	349843	472218	3	NO_2	N	0.2	1.0	Y
W3	Warton 3	Roadside	349897	472490	3	NO_2	N	0.2	3.7	Y
LC29	Lancaster 29	Roadside	348527	463270	2.5	NO_2	N	0.2	5.3	Y
LC30	Lancaster 30	Roadside	348114	462071	2.5	NO_2	N	0.2	6.5	Y
LC31	Lancaster 31	Roadside	348114	462071	3	NO_2	N	0.4	3	Y
LC32	Lancaster 32	Roadside	347511	461744	3.5	NO_2	Y	0.3	2	N

(1) * - Monitoring co-located with a continuous analyser

(2) 0 if the monitoring site is at a location of exposure (e.g. installed on/adjacent to the façade of a residential property).

(3) N/A if not applicable. - A map showing the location of all diffusion tube monitoring sites (past and present) is available at: : https://localview.lancaster.gov.uk/LocalViewWeb/Sites/AirQualityMonitors/

Table A.3 – Annual Mean NO_2 Monitoring Results

Site ID	Site Type	Within AQMA?	Valid Data Capture for period of monitoring %[a]	Valid Data Capture 2015 % [b]	Annual Mean Concentration μg/m³				
					2011	2012	2013	2014	2015
AN1 - Cable St	Roadside	Y	-	-	39.6	**41.0**	**40.2**	**42.0[c] (39.7)[d]**	**-**
AN2 - Dalton Sq	Roadside	Y	-	94.6	38.6	35.0	34.0	36.9	34.9

Notes: Exceedences of the NO_2 annual mean objective of 40μg/m3 are shown in **bold and shaded boxes**.

NO_2 annual means exceeding 60μg/m³, indicating a potential exceedence of the NO_2 1-hour mean objective are shown in **bold and underlined.**

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

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

(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%. See Appendix C for details.

(d) Period mean value

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

Site ID	Site Type	Within AQMA?	Valid Data Capture for period of monitoring %[a]	Valid Data Capture 2015 %[b]	Number of Exceedences of Hourly Mean (200 μg/m³)				
					2011	2012[c]	2013	2014[c]	2015
AN1 - Cable St	Roadside	Y	-	-	0	0 (109.1ug/m³)	0	0 (119.5ug/m³)	-
AN2 - Dalton Sq	Roadside	Y	-	94.6	1	0	0	0	0

Notes: Exceedences of the NO_2 1-hour mean objective (200μg/m³ not to be exceeded more than 18 times/year) are shown in **bold and shaded boxes.**

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

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

(c) If the period of valid data is less than 90%, the 99.8th percentile of 1-hour means is provided in brackets.

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

Site ID	Site Type	Within AQMA?	Valid Data Capture for monitoring Period %[a]	Valid Data Capture 2014 %[b]	Annual Mean Concentration μg/m^3 [c]				
					2011	2012	2013	2014	2015
APM1 - Cable Street	Roadside	Y	-	80.1	25.8 (25.7[c])	23.7	27	21.1	24.6

Notes: Exceedences of the PM_{10} annual mean objective of 40μg/m^3 are shown in **bold and shaded boxes.**

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

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

(c) All means have been "annualised" as per Technical Guidance LAQM.TG (16), valid data capture for the full calendar year is less than 75%. See Appendix C for details.

(d) Adjustments to reference method carried out using the Volatile Correction Model (VCM) tool. For 2014 FDMS sites used : Leeds Centre AURN, Salford Eccles AURN and the average of the remaining sites with range. The site specific temperature and pressure were used within the VCM.

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

Site ID	Site Type	Within AQMA?	Valid Data Capture for monitoring Period %[a]	Valid Data Capture 2015 %[b]	Number of Exceedences of 24-Hour Mean (50 μg/m³)[c]				
					2011	2012	2013	2014	2015
APM1 - Cable Street	Roadside	Y	-	80.1	19(41.9)[c]	11	20	9(35.2)[c]	9(38.9)[c]

Notes: Exceedences of the PM_{10} 24-hour mean objective (50μg/m³ not to be exceeded more than 35 times/year) are shown in **bold and shaded boxes.**

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

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

(c) If the period of valid data is less than 90%, the 90.4th percentile of 24-hour means is provided in brackets.

Table A.7 Results of Nitrogen Dioxide Diffusion Tubes - 2009 to 2015 (sites showing an exceedance of the annual mean objective are shown in bold and shaded boxes. Sites indicating the potential for exceedance of the 1 hour objective for nitrogen dioxide are shown in bold and underlined)

Site ID	Site Type	Within AQMA?	Annual mean concentration (adjusted for bias) µg/m^3						
			2009 (Bias Adjustment Factor = 0.841)	2010 (Bias Adjustment Factor = 0.982)	2011 (Bias Adjustment Factor = 0.869)	2012 (Bias Adjustment Factor = 0.926)	2013 (Bias Adjustment Factor = 0.918)	2014 (Bias Adjustment Factor = 1.034)	2015 (Bias Adjustment Factor = 1.030)
LC1	Roadside	Y	**54**	**62**	**51**	**50**	**54**	**56**	**50**
LC2	Urban Background	N	23	27	22	23	-	-	-
LC4	Urban Background	N	20	23	19	19	17	18	16
LC5	Roadside	Y	38	**47**	39	39	39	**47**	**42**
LC6	Roadside	N	31	39	32	32	32	-	-
LC7	Roadside	Y	35	**43**	37	37	35	37	35
LC8	Roadside	Y	35	**45**	35	36	35	37	34
LC9	Roadside	Y	**44**	**43**	37	**42**	**40**	**41**	39
LC10	Roadside	Y	**64**	**83**	**66**	**72**	**69**	**75**	**71**
LC11	Roadside	Y	**57**	**73**	**61**	**66**	**60**	**65**	**60**
LC12	Roadside	Y	**40**	**45**	38	38	-	-	-
LC13	Roadside	Y	**44**	**48**	**41**	**43**	**42**	**43**	**41**
LC14	Roadside	Y	35	**42**	35	35	33	38	35
MC3	Roadside	N	-	**-**	27	26	24	-	-
A	Kerbside	Y	**40**	**50**	39	**40**	36	39	35
B1	Roadside	Y	-	26	35	33	33	36	35
B2	Roadside	Y	-	26	36	34	33	37	36
B3	Roadside	Y	-	30	37	35	34	37	37
C	*Urban Centre*	N	31	33	-	**-**	**-**	-	-
C1	Roadside	Y	-	-	**40**	**43**	**42**	**44**	39
D	*Urban Centre*	N	32	34	**-**	**-**	**-**	-	-

Site ID	Site Type	Within AQMA?	Annual mean concentration (adjusted for bias) µg/m³						
			2009 (Bias Adjustment Factor = 0.841)	2010 (Bias Adjustment Factor = 0.982)	2011 (Bias Adjustment Factor = 0.869)	2012 (Bias Adjustment Factor = 0.926)	2013 (Bias Adjustment Factor = 0.918)	2014 (Bias Adjustment Factor = 1.034)	2015 (Bias Adjustment Factor = 1.030)
D1	Roadside	Y	-	-	**42**	**42**	**40**	**45**	**41**
E	*Urban Centre*	N	31	33	-	-	-	-	-
E1	Roadside	Y	-	-	**41**	**42**	**41**	**46**	**41**
G	Roadside	Y	33	39	35	35	-	-	-
H	Roadside	N	31	**40**	30	33	34	34	32
I	Roadside	Y	**41**	**48**	**40**	37	38	**42**	37
J	Roadside	Y	**56**	**65**	**52**	**52**	**48**	**53**	**45**
K	Roadside	Y	**43**	**54**	**45**	**43**	**43**	**47**	**42**
L	Roadside	Y	**43**	**52**	**42**	**42**	**43**	**48**	**43**
M	Roadside	Y	**40**	**45**	38	38	-	-	-
N	Roadside	Y	**42**	**51**	-	-	-	-	-
O	Roadside	Y	**40**	**51**	39	**41**	**42**	**46**	**41**
Q	Roadside	Y	33	**45**	36	34	39	**45**	39
S	Roadside	Y	33	35	30	30	31	-	-
T	Roadside	Y	28	34	25	25	-	-	-
U	Roadside	Y	39	**43**	37	36	37		-
V	Roadside	Y	**43**	**49**	**43**	**43**	**41**	**45**	**46**
W	Roadside	Y	37	**45**	-	-	-	-	-
X	Roadside	N	28	33	-	-	-	-	-
Y	Roadside	Y	38	**46**	36	38	-	-	-
Z	Roadside	Y	**42**	**51**	**41**	**43**	**41**	**44**	**43**
ZA	Roadside	Y	31	36	29	29	29	34	30
ZB	Roadside	N	28	35	26	28	29	32	27
ZC	Roadside	Y	37	**50**	37	**40**	39	**44**	39

CF1	Roadside	Y	32	38	29	32	32	36	34
CF2	Roadside	Y	**40**	**48**	**42**	**42**	**42**	**43**	**41**
CF3	Roadside	Y	34	**40**	34	31	31	40	38
CF4	Roadside	Y	39	**46**	36	34	38	**42**	39
CF5	Roadside	Y	34	**40**	32	33	39	**45**	39
CF6	Roadside	Y	33	39	33	30	32	38	36
CF7	Roadside	N	32	36	30	30	30	34	33
T1	Roadside	N	34	**41**	37	37	33	38	34
T2	Roadside	N	32	**41**	35	34	-	-	-
T3	Roadside	N	27	37	29	30	28	-	-
T4	Roadside	N	25	31	26	26	-	-	-
T5	Roadside	N	24	32	27	26	-	-	-
T6	Roadside	N	-	-	29	28	24	-	-
T7	Roadside	N	-	-	23	24	27	-	
LC15	Roadside	Y	-	-	-	-	35	**43**	38
LC16	Roadside	N	-	-	-	-	20	24	27
LC17	Roadside	N	-	-	-	-	30	39	36
LC18	Roadside	N	-	-	-	-	35	35	32
LC19	Roadside	Y	-	-	-	-	**59**	**67**	**61**
LC20	Roadside	Y	-	-	-	-	**45**	**55**	45
LC21	Roadside	N					-	39	33
LC22	Roadside	N	-	-	-	-	28	31	27
LC23	Roadside	N	-	-	-	-	31	39	35
LC24	Roadside	N	-	-	-	-	30	32	33
LC25	Roadside	N	-	-	-	-	29	27	24
LC26	Roadside	N	-	-	-	-	36	**41**	38
LC27	Roadside	N	-	-	-	-	29	35	31
BLS 1	Roadside	N	-	-	-	-	31	37	34
H1	Roadside	N	-	-	-	-	24	28	25
CF8	Roadside	N	-	-	-	-	33	38	36
LC28	Roadside	N	-	-	-	-	-	**45**	39
W1	Roadside	N	-	-	-	-	-	20	18
W2	Roadside	N	-	-	-	-	-	22	16
W3	Roadside	N	-	-	-	-	-	23	21
LC29	Roadside	N	-	-	-	-	-	-	38
LC30	Roadside	N	-	-	-	-	-	-	32
LC31	Roadside	N	-	-	-	-	-	-	36

LC32	Roadside	Y	-	-	-	-	-	-	**53**

Results shown in red have data capture less than 75%

Appendix B: Full Monthly Diffusion Tube Results for 2015

Table B.1 – NO_2 Monthly Diffusion Tube Results - 2015

Null Result | suspect | possible suspect | tube gone

NITROGEN DIOXIDE MONTHLY RESULTS 2015 (ug/m^3) – applied bias correction factor 1.030

SITE	GRADKO TUBES												AV	
	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	Raw	Bias-Adjusted
L/C1	39.60	59.22	53.76	48.47	41.66	42.31	41.34	46.74	61.55	59.02	39.56	47.13	48.4	49.8
L/C4	20.78	20.40	18.89	16.87	9.54	10.08	10.76	13.82	15.79	23.62	12.82	18.24	16.0	16.4
L/C5	49.24	41.20	41.31	44.94	35.32	34.55	33.75	37.18	47.52	58.73	34.28	33.02	40.9	42.1
L/C6														
L/C7	32.74	43.01	34.50	35.20	27.69	26.02	28.06	31.28	37.32	44.52	33.34	31.45	33.8	34.8
L/C8	33.65	36.44	32.06	34.23	28.10	30.06	27.29	30.54	37.68	42.82	32.40	31.66	33.1	34.1
L/C9	39.69	43.79	42.09	37.15	32.24	32.39	32.71	34.43	38.27	40.46	46.15		38.1	39.3
L/C10	75.54	75.62	71.38	67.22	55.76	67.66	68.86	74.22	79.44	76.96	59.62	50.64	68.6	70.6
L/C11	58.52	68.75	56.28	61.80	54.83	56.47	52.53	52.12	69.15	65.83	56.43	46.24	58.2	60.0
L/C13		52.17	46.30	41.84	40.56	41.55	36.86	40.28	34.15	40.57	37.14	29.68	40.1	41.3
L/C14		33.04	41.50	38.77	28.49	26.85	27.08	31.86	40.09	39.73		29.12	33.7	34.7
M/C 3														
A	36.74	40.19	35.72	35.29	30.56	34.05	30.16	37.46	41.59	45.55	30.09	28.86	35.5	36.6
B1	36.36	39.53	39.26	34.34	26.27	28.64	32.13	30.76	26.62	39.80	33.91	36.81	33.7	34.7
B2	42.11	38.33	37.75	33.52	29.27	27.85		30.82	31.37	34.97	26.98	36.87	33.6	34.6
B3	39.85	39.44	40.67	37.99	29.65	31.05	30.75	33.41	32.32	33.14	32.26	33.56	34.5	35.5

C1	42.75	45.00	45.52	41.66	33.67	30.07	31.13	36.54	44.81	46.00	29.87	31.42	38.2	39.3
D1	48.58	38.40	43.43	43.26		33.88	35.34	38.58	41.29	45.10	35.57	32.37	39.6	40.8
E1	46.84	41.61	40.81	42.52	33.10	36.80	34.39	37.83	45.92	53.44	34.15	31.82	39.9	41.1
G														
H	32.19	35.28	33.41	33.41	20.55	25.12	25.72	27.59	37.11	46.38	28.49	29.13	31.2	32.1
I	32.58	33.37	41.52	39.06	30.93	30.26	34.21	36.08	37.76	43.63	34.02	41.38	36.2	37.3
J	42.66	49.73	44.35	49.59	36.85	41.15	42.67	47.74	26.07	57.96	43.97	39.20	43.5	44.8
K	41.07	37.60	52.33	44.26	37.18	36.74	43.10	35.38	44.10	50.48	29.47	41.14	41.1	42.3
L		45.92	48.11	46.24	40.70	39.68	39.65	43.78	40.29	42.16	32.31	39.42	41.7	42.9
O	45.30	44.43	43.32	44.70	33.68	33.32	36.56	36.80	42.55	48.78	35.57	32.03	39.8	40.9
Q	48.60	40.59	34.48	38.53	33.28	28.39	29.82	32.45	39.49	41.39	42.64	41.85	37.6	38.8
S														
U														
V	45.74	57.23	47.71	51.82	40.87	41.74	40.02	41.06	42.52	44.49	42.45	35.61	44.3	45.6
Y														
Z	46.49	39.70	54.84	46.84	45.61	34.56	38.06	39.10	40.38	47.49	34.63	35.07	41.9	43.2
ZA	29.56	32.05	30.11	28.28	22.72	25.36	27.09	25.44	32.68	39.42	24.11	30.10	28.9	29.8
ZB	19.46	28.69	32.19	31.31	20.92	19.70	21.96	25.09	27.18	31.57		28.36	26.0	26.8
ZC	36.53	44.78	45.31	43.35	31.35	19.80	34.46	35.84	41.13	49.09		37.31	38.1	39.2
cf1	33.28	36.77	35.16	41.26	29.45	27.86	34.86	29.99	32.06	37.42	26.99	27.06	32.7	33.7
cf2	33.75	41.48	39.98	34.27	40.67	35.82	51.64	40.77	43.00	41.27	43.79	35.69	40.2	41.4
cf3	51.51	35.40	57.42	47.13	26.74	25.00	29.77	29.28	34.20	37.52	31.97	31.07	36.4	37.5
cf4	36.31	43.61	42.61	38.23	28.89	31.27	36.26	36.21	39.60	44.78	37.06	36.94	37.6	38.8
cf5	43.93	44.33	37.37	41.34	28.08	31.17	36.45	32.87	42.27	44.85	34.04	32.38	37.4	38.5
cf6	35.22	38.68	39.20	37.03	26.57	25.03	35.62	35.48	35.43	41.00	36.11	32.81	34.8	35.9
cf7	35.39	34.79	40.29	37.13	30.57	25.76	32.51	29.06	33.27	34.39	26.27	26.42	32.2	33.1
T1	33.35	43.63	34.08	33.76	29.87	29.38	31.80	28.26	33.15	35.52	23.74	37.47	32.8	33.8
T2														
T3														
T4														
T5														
T6														
T7														
LC15	39.04	42.58	42.33	41.15	35.36	29.86	31.20	31.60	36.50	40.57	37.02	35.66	36.9	38.0

LC16	26.32	28.29	23.44										26.0	26.8
LC17	40.67	46.09	40.65	38.47	28.79	33.45	29.95	30.16	32.73	42.26	28.86	33.13	35.4	36.5
LC18	34.71	34.77	33.98	31.82	20.80	22.87	26.50	26.76	33.69	39.04	32.79	30.64	30.7	31.6
LC19	64.82	71.46	66.58	66.09	58.35	45.02	52.85	61.08	58.99	58.01	57.24	51.10	59.3	61.1
LC20	45.26	49.50	53.05	46.63	34.87	37.64	39.53	46.69	45.97	48.73	40.44	36.04	43.7	45.0
LC21	37.15	39.55	36.29	33.16	25.28	22.91	24.59	28.38	30.53	39.81		34.69	32.0	33.0
LC22	30.82	33.55	32.04	24.61	17.87	19.4	23.31	13.42	27.07	34.10	26.75	28.19	25.9	26.7
LC23	39.63	37.44	34.41	37.41	29.43	27.47	31.41	32.73	33.75	41.01	27.70	31.96	33.7	34.7
LC24	31.85	35.23	34.72	38.42	27.42	24.46	28.07	29.63	30.45	36.31	32.23	27.62	32.0	33.0
LC25	25.96	30.25	25.68	25.36	15.73	18.22	19.64	20.87	22.16	31.17	17.83	25.91	23.2	23.9
LC26	49.42	41.59	40.56	39.07	29.08	29.21	36.37	35.69	34.48	41.90	36.17	31.87	37.1	38.2
LC27	36.98	37.08	32.23	33.75	25.15	23.26	25.07	30.31	25.73	39.71	25.56	29.56	30.4	31.3
BLS1	29.93	35.99	36.8	35.17	29.40	29.39	35.96	32.13	33.13	38.09	30.43	29.90	33.0	34.0
H1	20.23	29.52	29.77	28.64	17.89	18.44	17.09	22.25	23.32	34.59	22.83	28.60	24.4	25.2
CF8	31.53	35.54	36.67		34.90	28.59	33.11	35.15	34.53	43.39	34.04	35.79	34.8	35.9
LC28	44.16	43.57	44.56	43.41	34.66	33.08	36.55	36.87	37.69	44.19	26.14	30.38	37.9	39.1
W1	16.93	19.59	17.26										17.9	18.5
W2	14.89	17.36	15.16										15.8	16.3
W3	18.69	21.64	21.02										20.5	21.1
LC29				43.14	34.26	26.45	34.66	37.13	46.35	40.88	37.38	34.61	37.2	38.3
LC30				33.31	25.78	25.22	27.01	30.43	42.64	35.21	27.60	30.35	30.8	31.8
LC31				40.31	27.45	29.55	34.42	30.18	49.19		34.83	36.25	35.3	36.3
LC32				55.95		40.76	42.19	48.05	59.89	58.47	49.52	52.98	51.0	52.5

(1) See Appendix C for details on bias adjustment

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

Automatic Monitoring Sites

The Council currently has two operational automatic air monitoring stations, one located at Cable Street, Lancaster, the other at Dalton Square, Lancaster. The Cable Street station monitors both nitrogen dioxide (NO_2) and particulate matter (PM_{10}). The Dalton Square site monitors nitrogen dioxide only. The two stations commenced monitoring in 2011 and both currently (2016) remain operational.

Equipment at the two sites is (2 No. APNA 360/370 NO_2 analysers and 1No. TEOM PM_{10} particulate monitor) are maintained and serviced by Horiba Instruments Limited, servicing being undertaken twice a year. Routine calibration is undertaken by Lancaster City Council on a monthly basis. The sites are not independently audited. Data validation and ratification for the two sites is undertaken annually by Air Quality Consultants Limited.

Figure 5 - Gradko Accreditation Certificate and Schedule (for provision and analysis of NO_2 diffusion tubes used in Lancaster)

United Kingdom Accreditation Service

ACCREDITATION CERTIFICATE

UKAS
UNITED KINGDOM ACCREDITATION SERVICE

TESTING LABORATORY
No. 2187

Gradko International Ltd

is accredited in accordance with the recognised International Standard ISO/IEC 17025:2005 - General Requirements for the competence of testing and calibration laboratories.

This accreditation demonstrates technical competence for a defined scope as detailed in and at the locations specified in the schedule to this certificate, and the operation of a laboratory quality management system (refer joint ISO-ILAC-IAF Communiqué dated January 2009).

The schedule to this certificate is an essential accreditation document and from time to time may be revised and reissued by the United Kingdom Accreditation Service. The most recent issue of the schedule of accreditation, which bears the same accreditation number as this certificate, is available from the UKAS website www.ukas.com.

This accreditation is subject to continuing conformity with United Kingdom Accreditation Service requirements. The absence of a schedule on the UKAS website indicates that the accreditation is no longer in force.

Accreditation Manager, United Kingdom Accreditation Service

Initial Accreditation date
31 January 2001

This certificate issued on
04 November 2014

UKAS is appointed as the sole national accreditation body for the UK by The Accreditation Regulations 2009 (SI No 3155/2009) and operates under a Memorandum of Understanding (MoU) with the Department for Business, Innovation and Skills (BIS).

Schedule of Accreditation

issued by

United Kingdom Accreditation Service

2 Pine Trees, Chertsey Lane, Staines-upon-Thames, TW18 3HR, UK

UKAS TESTING

2187

Accredited to ISO/IEC 17025:2005

Gradko International Ltd (Trading as Gradko Environmental)

Issue No: 019 **Issue date:** 04 September 2015

St Martins House
77 Wales Street
Winchester
Hampshire
SO23 0RH

Contact: Mr A Poole
Tel: +44 (0)1962 860331
Fax: +44 (0)1962 841339
E-Mail: diffusion@gradko.co.uk
Website: www.gradko.co.uk

Testing performed at the above address only

DETAIL OF ACCREDITATION

Materials/Products tested	Type of test/Properties measured/Range of measurement	Standard specifications/ Equipment/Techniques used
ATMOSPHERIC POLLUTANTS Collected on diffusion (sorbent) tubes and monitors	Chemical Tests	Documented In-House Methods
	Ammonia	GLM 8 by Ion Chromatography
	Benzene Toluene Ethyl benzene Xylene	GLM 4 by Thermal Desorption/ FID Gas Chromatography
	Hydrogen chloride Nitrogen dioxide Sulphur dioxide Hydrogen fluoride	GLM 3 by Ion Chromatography
	Hydrogen sulphide	GLM 5 by Colorimetric determination (UV Spectrophotometry)
	Ozone	GLM 2 by Ion Chromatography
	Nitrogen Dioxide	GLM 7 by Colorimetric determination (UV Spectrophotometry)
	Nitrogen Dioxide (as Nitrite)	GLM 9 by continuous flow colorimetric analyser
	Sulphur dioxide	GLM 1 by Ion Chromatography
	Formaldehyde	GLM 18 by HPLC

Assessment Manager: LB

Page 1 of 2

UKAS TESTING 2187 Accredited to ISO/IEC 17025:2005	**Schedule of Accreditation** **issued by** **United Kingdom Accreditation Service** 2 Pine Trees, Chertsey Lane, Staines-upon-Thames, TW18 3HR, UK **Gradko International Ltd** **(Trading as Gradko Environmental)** **Issue No:** 019 **Issue date:** 04 September 2015
Testing performed at main address only	

Materials/Products tested	Type of test/Properties measured/Range of measurement	Standard specifications/ Equipment/Techniques used
ATMOSPHERIC POLLUTANTS Collected on diffusion (sorbent) tubes and monitors (cont'd)	Chemical Tests (cont'd)	
Flexible Scope encompassing Volatile Organic Compounds to in-house validation criteria	Volatile Organic Compounds including: Benzene 1,3-Butadiene 1,2-Dichloro(Z)ethene, Ethylbenzene Indane Naphthalene Styrene Tetrachloroethylene Toluene Trichloroethylene 1,2,3-Trimethylbenzene 1,2,4-Trimethylbenzene 1,3,5-Trimethylbenzene p-Xylene o-Xylene **The laboratory holds a flexible scope of accreditation for these tests.** **Please contact the laboratory for details of the individual compounds they can analyse using this method.**	GLM 13 by Thermal Desorption GC-Mass Spectrometry
END		

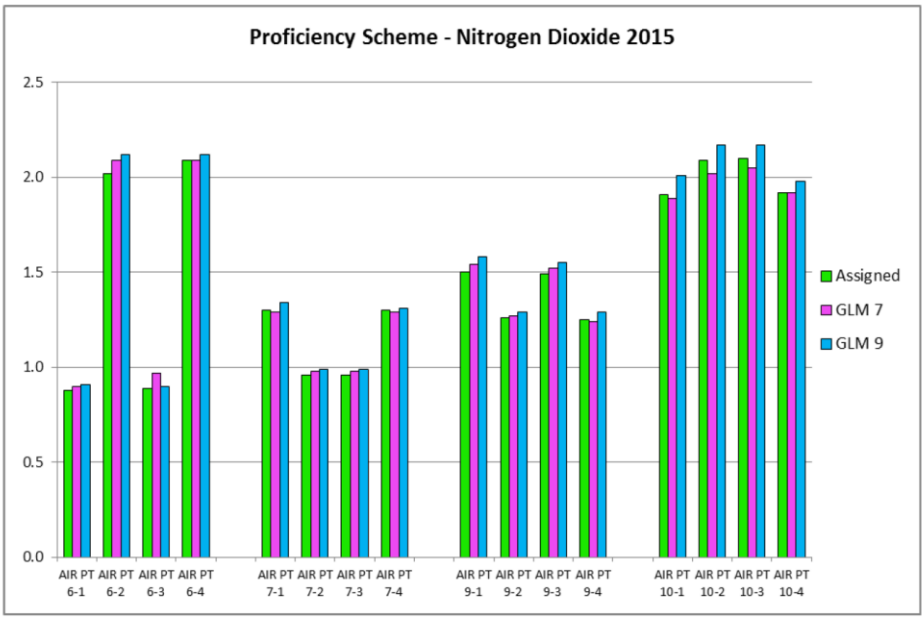
Table C.2 - Gradko NO_2 proficiency scheme results 2015

(A division of Gradko International Ltd.)
St. Martins House, 77 Wales Street Winchester, Hampshire SO23 0RH
tel.: 01962 860331 fax: 01962 841339 email:diffusion@gradko.com

AIR PT Nitrogen Dioxide Proficiency Scheme Results 2015

Methods: GLM 7 – Camspec M550 Spectrophotometer, GLM 9 – QuAAtro Continuous Flow analyser

Date	Round	Assigned value	Camspec M550 - GLM 7			QuAAtro - GLM 9		
			Measured concentration	z-Score	% Bias	Measured concentration	z-Score	% Bias
Feb-15	AIR PT 6-1	0.88	0.90	0.28	2.3%	0.91	0.41	3.4%
Feb-15	AIR PT 6-2	2.02	2.09	0.46	3.5%	2.12	0.66	5.0%
Feb-15	AIR PT 6-3	0.89	0.97	-0.30	-2.2%	0.90	0.15	1.1%
Feb-15	AIR PT 6-4	2.09	2.09	0.00	0.0%	2.12	0.19	1.4%
May-15	AIR PT 7-1	1.30	1.29	-0.10	-0.8%	1.34	0.41	3.1%
May-15	AIR PT 7-2	0.96	0.98	0.28	2.1%	0.99	0.42	3.1%
May-15	AIR PT 7-3	0.96	0.98	0.28	2.1%	0.99	0.42	3.1%
May-15	AIR PT 7-4	1.30	1.29	-0.10	-0.8%	1.31	0.10	0.8%
Aug-15	AIR PT 9-1	1.50	1.54	0.4	2.7%	1.58	0.71	5.3%
Aug-15	AIR PT 9-2	1.26	1.27	0.1	0.8%	1.29	0.32	2.4%
Aug-15	AIR PT 9-3	1.49	1.52	0.27	2.0%	1.55	0.54	4.0%
Aug-15	AIR PT 9-4	1.25	1.24	-0.11	-0.8%	1.29	0.43	3.2%
Nov-15	AIR PT 10-1	1.91	1.89	-0.14	-1.0%	2.01	0.7	5.2%
Nov-15	AIR PT 10-2	2.09	2.02	-0.45	-3.3%	2.17	0.51	3.8%
Nov-15	AIR PT 10-3	2.10	2.05	-0.32	-2.4%	2.17	0.44	3.3%
Nov-15	AIR PT 10-4	1.92	1.92	0.0	0.0%	1.98	0.42	3.1%



December 2015

Tables C.3 and C.4 Data submitted for national diffusion tube bias correction database

Diffusion Tube Collocation Data Questionnaire For Local Authorities

Please Read the "Notes" sheet and then fill in the white boxes of this questionnaire
Should you require assistance, email nick.martin@npl.co.uk or phone 020 8943 7088

	Date form filled in	Name of Local Authority	Your name	Phone number	Contact email
Your Details	5th July 2016	Lancaster City Council	Suzanne Hodgson	0117 974 1086	suzannehodgson@aqconsultants.co.uk

	Distance from kerb (m)	Site type (e.g. roadside, background). Definitions of site types are given on the "Notes" sheet	Distance from diffusion tube(s) to continuous analyser inlet (m) (this should be less than 1m from the analyser inlet)	Location (site name or a brief description)	Grid Reference of Site (if available)
Site Details	**3.3**	Roadisde	0.15	Dalton Square	347852, 461611

	Prepared by	Analysed by	Example results sheet attached? (please attach a results sheet provided by the analysis laboratory)	Preparation method (e.g. 50% TEA in acetone; 50% TEA in water)	How are diffusion tubes deployed? (e.g. with a clip, spacer, shelter box, just tape)
Diffusion Tube Details	Gradko International Ltd.	Gradko International Ltd.		20% TEA in water	clip inside head/inlet cage

	Analyser type	QA/QC (e.g. local or network)
Continuous Analyser Details	Horiba APNA-370 chemiluminescence	Local

Data from the Automatic Analyser (Matching Individual Diffusion Tube Periods)

Period	Start Date (dd/mm/yy)	End Date (dd/mm/yy)	% Data Capture	Ratified / Provisional	NOx (if available) (ug/m^3)	Nitrogen Dioxide (ug/m^3)
1	06/01/2015	04/02/2015	100	Ratified		43.66566005
2	04/02/2015	04/03/2015	100	Ratified		39.29375337
3	04/03/2015	01/04/2015	100	Ratified		36.20278424
4	01/04/2015	30/04/2015	100	Ratified		37.14323024
5	30/04/2015	27/05/2015	100	Ratified		27.54989697
6	27/05/2015	02/07/2015	77.86790267	Ratified		29.82886262
7	02/07/2015	30/07/2015	73.47242921	Ratified		24.67221372
8	30/07/2015	26/08/2015	100	Ratified		28.68059897
9	26/08/2015	30/09/2015	100	Ratified		31.05295769
10	30/09/2015	28/10/2015	100	Ratified		40.6214851
11	28/10/2015	02/12/2015	99.88081049	Ratified		37.50564327
12	02/12/2015	07/01/2016	88.52838934	Ratified		35.3866095
13						

Please express NOx as NO_2 (e.g. ppb x 1.913) or alternatively note the approach / units here:

When you are identifying the automatic monitoring periods that match your diffusion tube exposure periods, please be as precise as possible. It is not, however, necessary to match start times to the exact hour that you put out your tubes.

Individual Period (monthly) Mean Nitrogen Dioxide Data from the Diffusion Tubes (ug/m^3)

Period		Tube 1	Tube 2 (if available)	Tube 3 (if available)	Tube 4 (if available)
1		36.36	42.11	39.85	
2		39.53	38.33	39.44	
3		39.26	37.75	40.67	
4		34.34	33.52	37.99	
5		26.27	29.27	29.65	
6		28.64	27.85	31.05	
7		32.13		30.75	
8		30.76	30.82	33.41	
9		26.62	31.37	32.32	
10		39.8	34.97	33.14	
11		33.91	26.98	32.26	
12		36.81	36.87	33.56	
13					

	Are the concentrations stated in ug/m^3?	Did the diffusion tube supply or analysis method change during the monitoring period? When, from what, to what?	Were there any significant problems with the continuous analyser during the monitoring period?	Are there any other relevant issues with your data?
Other Information	Yes	No	No	No

Please Return Completed Questionnaires to: nick.martin@npl.co.uk
This questionaire is now maintained and distributed by the National Physical Laboratory on behalf of Defra and the DAs

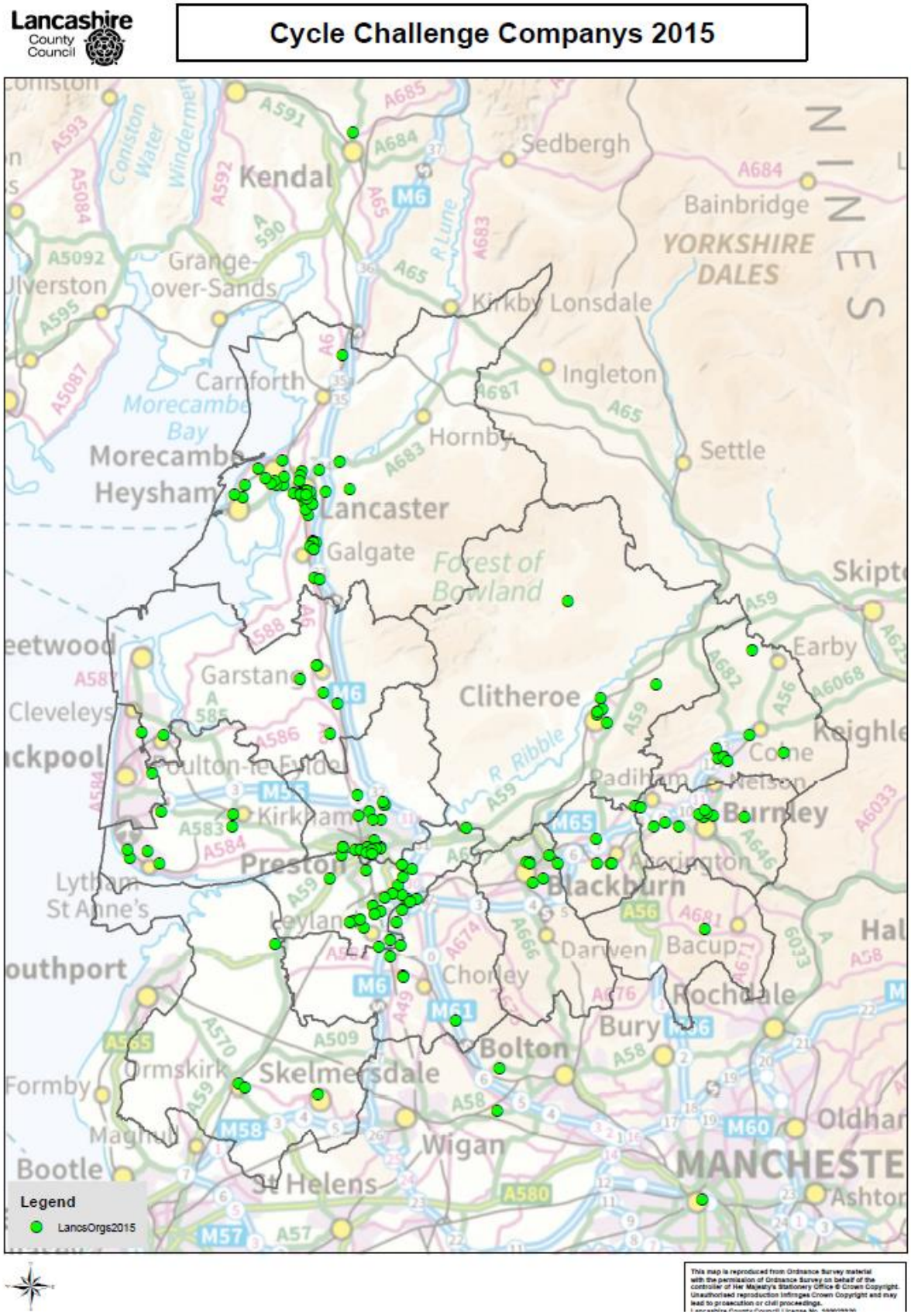
Table C.5 Collected NO_2 diffusion tube bias adjustment factors for 2011-2015

Tube/Supplier Analyst	Method	2011	2011	2012	2012	2013	2013	2014	2014	2015
Local Factors		*Cable St*	*Dalton Sq*	*Cable St*	*Dalton Sq*	*Cable St*	*Dalton Sq*	*Cable St*	*Dalton Sq*	*Dalton Sq*
Gradko 2011 - 2014	20% TEA in water	0.844	0.929	0.907	0.973	0.907	0.941	0.936	1.034	1.030
National Factors										
Gradko (national factors) 2011 – 2015 (from sheet V09_15-Final)*	20% TEA in water	0.90		0.97		0.95		0.92		0.91

* National bias adjustment factors available at : http://laqm.defra.gov.uk/bias-adjustment-factors/national-bias.html

NB Dalton Square Bias Correction factor was used to bias correct Lancaster diffusion tube results in 2015. This was used in isolation as results indicated an unidentified analyser fault (normally an average of the two local sites has been previously used). Using the national bias factor results in tube results being slightly lower, but would not affect exceedances other that reported in Section 3.2.1 above. The bias correction factor selected represents the highest factor scenario.

Figure 6 – Map showing locations of companies participating in the Cycle Challenge Scheme



Appendix D: Summary of Air Quality Objectives in England

Table 1.1

Pollutant	Air Quality Objective[1]	
	Concentration	**Measured as**
Nitrogen dioxide (NO_2)	200 µg/m^3 not to be exceeded more than 18 times a year	1-hour mean
	40 µg/m^3	Annual mean
Particulate Matter (PM_{10})	50 µg/m^3, not to be exceeded more than 35 times a year	24-hour mean
	40 µg/m^3	Annual mean
Sulphur dioxide (SO_2)	350 µg/m^3, not to be exceeded more than 24 times a year	1-hour mean
	125 µg/m^3, not to be exceeded more than 3 times a year	24-hour mean
	266 µg/m^3, not to be exceeded more than 35 times a year	15-minute mean

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

Appendix E - Ranking of PHOF mortality indicators for Lancashire Local Authorities

ENGLAND		NORTH WEST		Burnley		Chorley		Fylde		Hyndburn		Lancaster	
Indicator in PHOF	**Mortality rate, per 100,000**	**Indicator in PHOF**	**Mortality rate, per 100,000**	**Indicator in PHOF**	**Mortality rate, per 100,000**	**Indicator in PHOF**	**Mortality rate, per 100,000**	**Indicator in PHOF**	**Mortality rate, per 100,000**	**Indicator in PHOF**	**Mortality rate, per 100,000**	**Indicator in PHOF**	**Mortality rate, per 100,000**
Preventable mortality (4.03)	182.7	Preventable mortality (4.03)	223.6	Preventable mortality (4.03)	266.1	Preventable mortality (4.03)	181.3	Preventable mortality (4.03)	175.2	Preventable mortality (4.03)	257.8	Preventable mortality (4.03)	228.7
Preventable cancer in the <75s (4.05ii)	83.0	Preventable cancer in the <75s (4.05ii)	96.3	Preventable cancer in the <75s (4.05ii)	120.5	Communicable diseases (4.08)	91.6	Preventable cancer in the <75s (4.05ii)	82.1	Preventable cancer in the <75s (4.05ii)	110.1	Preventable cancer in the <75s (4.05ii)	102.8
Communicable diseases (4.08)	63.2	Communicable diseases (4.08)	71.3	Communicable diseases (4.08)	92.6	Preventable cancer in the <75s (4.05ii)	80.8	Communicable diseases (4.08)	63.7	Communicable diseases (4.08)	78.7	Communicable diseases (4.08)	67.3
Mortality attributable to PM2.5 (3.01) (2013)	**51.9**	Preventable CVD <75s (4.04ii)	59.4	Preventable CVD <75s (4.04ii)	75.4	Preventable CVD <75s (4.04ii)	49.7	Preventable CVD <75s (4.04ii)	43.3	Preventable CVD <75s (4.04ii)	67.3	Preventable CVD <75s (4.04ii)	61.6
Preventable CVD <75s (4.04ii)	49.2	**Mortality attributable to PM2.5 (3.01) (2013)**	**50.1**	**Mortality attributable to PM2.5 (3.01) (2013)**	**52.3**	**Mortality attributable to PM2.5 (3.01) (2013)**	**48.4**	**Mortality attributable to PM2.5 (3.01) (2013)**	**38.8**	**Mortality attributable to PM2.5 (3.01) (2013)**	**55.3**	**Mortality attributable to PM2.5 (3.01) (2013)**	**41.7**
Preventable Respiratory disease <75s (4.07ii)	17.8	Preventable Respiratory disease <75s (4.07ii)	23.8	Preventable Liver disease <75s (4.06ii)	30.9	Preventable Respiratory disease <75s (4.07ii)	18.9	Preventable Liver disease <75s (4.06ii)	17.5	Preventable Respiratory disease <75s (4.07ii)	33.8	Preventable Respiratory disease <75s (4.07ii)	23.3
Preventable Liver disease <75s (4.06ii)	15.7	Preventable Liver disease <75s (4.06ii)	22.3	Preventable Respiratory disease <75s (4.07ii)	28.8	Preventable Liver disease <75s (4.06ii)	18.0	Preventable Respiratory disease <75s (4.07ii)	12.0	Preventable Liver disease <75s (4.06ii)	30.0	Preventable Liver disease <75s (4.06ii)	20.3
Suicide (4.10)	8.9	Suicide (4.10)	10.3	Suicide (4.10)	10.1	Suicide (4.10)		Suicide (4.10)	10.6	Suicide (4.10)	14.6	Suicide (4.10)	10.5

Ranking of PHOF mortality indicators for Lancashire Local Authorities

Pendle		Preston		Ribble Valley		Rossendale		South Ribble		West Lancashire		Wyre	
Indicator in PHOF	**Mortality rate, per 100,000**	**Indicator in PHOF**	**Mortality rate, per 100,000**	**Indicator in PHOF**	**Mortality rate, per 100,000**	**Indicator in PHOF**	**Mortality rate, per 100,000**	**Indicator in PHOF**	**Mortality rate, per 100,000**	**Indicator in PHOF**	**Mortality rate, per 100,000**	**Indicator in PHOF**	**Mortality rate, per 100,000**
Preventable mortality (4.03)	205.8	Preventable mortality (4.03)	241.6	Preventable mortality (4.03)	152.8	Preventable mortality (4.03)	210.5	Preventable mortality (4.03)	175.7	Preventable mortality (4.03)	183.5	Preventable mortality (4.03)	197.1
Preventable cancer in the <75s (4.05ii)	84.4	Preventable cancer in the <75s (4.05ii)	103.6	Preventable cancer in the <75s (4.05ii)	73.4	Communicable diseases (4.08)	89.9	Preventable cancer in the <75s (4.05ii)	80.7	Preventable cancer in the <75s (4.05ii)	88.5	Preventable cancer in the <75s (4.05ii)	90.8
Communicable diseases (4.08)	72.3	Communicable diseases (4.08)	101.1	Communicable diseases (4.08)	68.8	Preventable cancer in the <75s (4.05ii)	85.5	Communicable diseases (4.08)	74.5	Communicable diseases (4.08)	74.3	Communicable diseases (4.08)	64.3
Preventable CVD <75s (4.04ii)	61.1	Preventable CVD <75s (4.04ii)	63.4	Preventable CVD <75s (4.04ii)	43.2	Preventable CVD <75s (4.04ii)	64.8	**Mortality attributable to PM2.5 (3.01) (2013)**	**43.0**	**Mortality attributable to PM2.5 (3.01) (2013)**	**50.1**	Preventable CVD <75s (4.04ii)	57.7
Mortality attributable to PM2.5 (3.01) (2013)	**45.9**	**Mortality attributable to PM2.5 (3.01) (2013)**	**49.9**	**Mortality attributable to PM2.5 (3.01) (2013)**	**36.1**	**Mortality attributable to PM2.5 (3.01) (2013)**	**46.6**	Preventable CVD <75s (4.04ii)	42.8	Preventable CVD <75s (4.04ii)	46.8	**Mortality attributable to PM2.5 (3.01) (2013)**	**38.6**
Preventable Respiratory disease <75s (4.07ii)	20.4	Preventable Liver disease <75s (4.06ii)	28.7	Preventable Liver disease <75s (4.06ii)		Preventable Respiratory disease <75s (4.07ii)	23.8	Preventable Respiratory disease <75s (4.07ii)	20.1	Preventable Respiratory disease <75s (4.07ii)	20.1	Preventable Liver disease <75s (4.06ii)	20.1
Preventable Liver disease <75s (4.06ii)	16.6	Preventable Respiratory disease <75s (4.07ii)	26.4	Preventable Respiratory disease <75s (4.07ii)		Preventable Liver disease <75s (4.06ii)	18.6	Preventable Liver disease <75s (4.06ii)	15.3	Preventable Liver disease <75s (4.06ii)	15.4	Preventable Respiratory disease <75s (4.07ii)	16.7
Suicide (4.10)	12.3	Suicide (4.10)	16.7	Suicide (4.10)		Suicide (4.10)		Suicide (4.10)	12.1	Suicide (4.10)	8.6	Suicide (4.10)	9.3

Lancashire CC	
Indicator in PHOF	**Mortality rate, per 100,000**
Preventable mortality (4.03)	206.0
Preventable cancer in the <75s (4.05ii)	91.9
Communicable diseases (4.08)	76.7
Preventable CVD <75s (4.04ii)	55.8
Mortality attributable to PM2.5 (3.01) (2013)	**45.7**
Preventable Respiratory disease <75s (4.07ii)	21.2
Preventable Liver disease <75s (4.06ii)	20.4
Suicide (4.10)	10.7

Mortality attributable to PM2.5 (3.01) time period is 2013 and for all other mortality indicators the time period is 2012-14

Source: PHE for PHOF and NHS HSCIC for 2011-13 mortality rate to calculate mortality attributable to PM2.5 (attributable deaths per 100,000 pa) based on the methodology from Department for Environment, Food and Rural Affairs Understanding air pollution in your area, A guide for Directors of Public Health February 2015

This crude estimate is in fact likely to underestimate the effect of pollution somewhat, as the attributable deaths used in the 3.01 indicator and in the recent PHE report are for the over 25s. Nonetheless, the approach produced a clear and simple estimate.

Background to calculating mortality attributable to PM2.5 (PHOF 3.01)

The most basic assessment possible is to rank the local mortality attributed to air pollution (particulate matter) against local mortality due to other sources of disease. The PHOF Data Tool contains most of the data required to do this, although some minor manipulation is required using local population data. The key to conducting the ranking is to convert the 3.01 indicator as found in the PHOF Data Tool or in the recent PHE update2 into the same statistical units as the other mortality indicators in the PHOF that is mortality per 100,000 population per year. **A crude conversion is simple: multiply the 3.01 indicator by the mortality rate per 100,000 population. This crude estimate is in fact likely to underestimate the effect of pollution somewhat, as the attributable deaths used in the 3.01 indicator and in the recent PHE report are for the over 25s** (Source: Department for Environment, Food and Rural Affairs Understanding air pollution in your area A guide for Directors of Public Health February 2015)

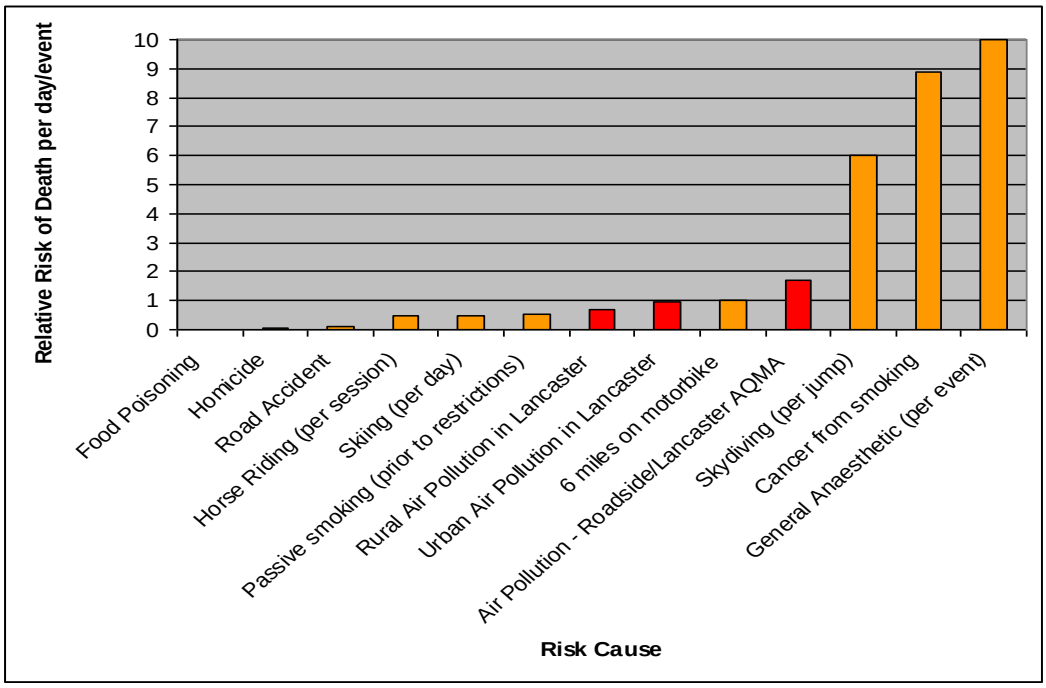
Appendix F – Lancaster AQMA amendment document

Air your views on Lancaster's Air Quality

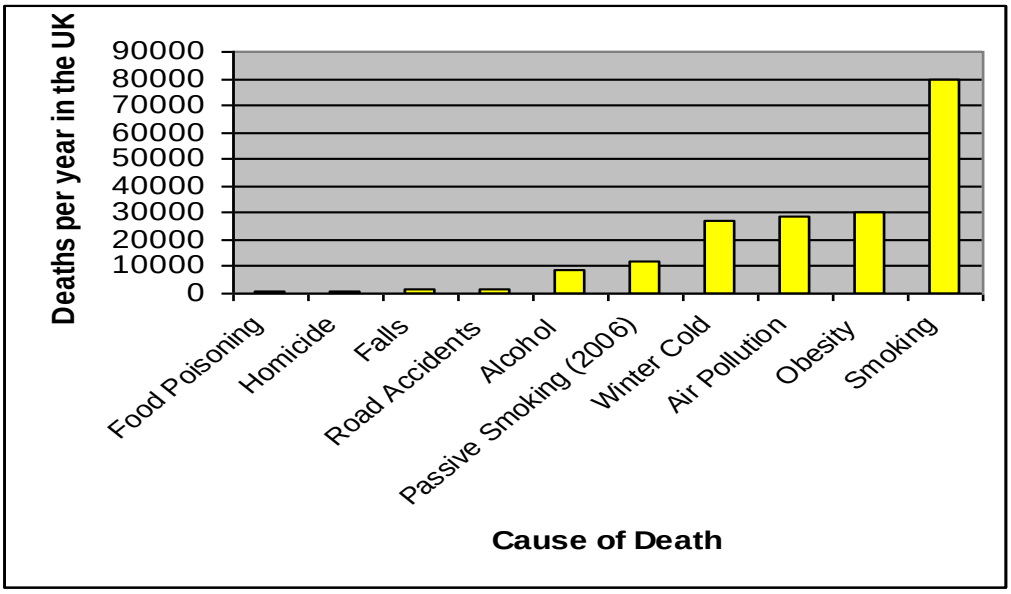
Lancaster City Council has been monitoring air quality in Lancaster for over 10 years. Unfortunately air pollution has not decreased as much as expected. In fact since 2004 levels for one pollutant are much higher than anticipated. As a result we need to amend the Air Quality Management Area to ensure this issue is recognised (please see Appendix 1 attachment below for more information).

How does this impact you?

Air pollution is an important issue in Lancaster as it can impact on local resident's health. The main issue is pollution from road traffic and it is estimated that the health impact within the Lancaster Air Quality Management Area is approximately three times that for people in the rural areas of Lancaster. The table below shows risk of death from air pollution in relation to various activities (relative risk of death per day or event)



Air pollution is one of the key causes of death alongside smoking and obesity (demonstrated in below table of approx. numbers of deaths in the UK from various causes*). However, the impact is usually due to exposure over a long period of time therefore we all need to take preventative action now.



It is therefore important for us all do something now to reduce the effects over time. This is why we want to make you more aware of the issue, seek your opinion and ultimately to see if we collectively change things.

This consultation is a step towards raising awareness of the issues and help us to find out if there is any interest and support for action. Action to improve air quality is planned in main through the draft Transport Masterplan for Lancaster. This is due to be adopted in September 2016 (see http://www.lancashire.gov.uk/council/strategies-policies-plans/roads-parking-and-travel/highways-and-transport-masterplans/lancaster-district-highways-and-transport-masterplan-draft.aspx)

Further technical detail for the consultation is provided in attachments and more information on Lancaster City Council's overall approach to air pollution can be found in the Air Quality Strategy for Lancaster available at : http://www.lancaster.gov.uk/environmental-health/environmental-protection/air-quality/air-quality-reviews-and-assessments

What can you do to help?

Please give us your views on this important issue by providing comments to the questions below or providing general comments. Please email or post your comments to the addresses provided below.

There are some simple things that you can do to help reduce air quality pollution visit our web site at: http://www.lancaster.gov.uk/environmental-health/environmental-protection/air-quality/ to find out more.

You need to be aware that Lancaster City Council can in most instances only act to inform and encourage action. As air quality issues in Lancaster are traffic related, the County Council has the largest acting role.

Consultation on a proposal to amend the City of Lancaster Air Quality Management Area No.1 Order 2004 to include the likely to exceed the 1 hour air quality objective for nitrogen dioxide (as specified in the Air Quality (England) Regulations 2000 (as amended). Please see Appendices 1 and 2 for more information.

We would appreciate it if you could spare five minutes to provide your views on the proposed amendment. If you can also complete the below questionnaire or provide comments at the following link https://www.surveymonkey.co.uk/r/AQMA

Please note the questions below have been provided as a guide, however, if you would prefer to make a general comment, please feel free to do so.

Your views on proposed amendment

Q1. Based on increased levels of pollution in the City of Lancaster Air Quality Management Area No.1, do you agree with the proposed amendment of the 2004 document (Order)?
.....**Yes/No**

Q2. If you have answered 'No' to question 1, please provide your reasons :-
……
……
……
……
……
……

Q3. If you agree and have answered 'Yes' to question 1 above, but wish to make an additional comment, please do so here :-
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Other Comments

Q4. Please make any other comments on air pollution.
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Other Information

Q6 Would you like the council to provide more information to residents about anything specifically in relation to air quality?
.....
.....
.....
.....

Future Air Quality Consultations

Q7. We would be really grateful for people to be involved in future consultation, particularly regarding actions we may take. If you are willing to participate in this please provide your contact details below :-

Would you like to get involved in future air quality pollution consultations? **Yes/No**

Would you like to get involved in other Lancaster City Council service consultations? **Yes/No**

Please provide your details below:

Email address : ……..

Contact Telephone Number : …….

Contact Address : ……..
…….
…….
Please note: Your personal details will be kept confidential and held in accordance with the Data Protection Act.

Please email your comments to :-
airquality@lancaster.gov.uk

or send by post to:-

FAO Paul Cartmell,
Senior Environmental Health Officer,
Lancaster City Council,
Morecambe Town Hall,
Marine Road,
Morecambe
LA4 5AF

All responses should be submitted by the 16 September 2016.

Thank you for taking the time to give us your views.

Appendix 1

Consultation Summary

The existing City of Lancaster Air Quality Management Area No.1 (available at: http://www.lancaster.gov.uk/environmental-health/environmental-protection/air-quality/lancaster-air-quality-management-area-aqma/) is designated due to the likely exceedance of the annual mean objective for nitrogen dioxide in this location. Monitoring undertaken within the Air Quality Management Area since designation has indicated exceedance not only of the annual mean objective but the likely exceedance of the 1 hour mean objective for nitrogen dioxide also. This document therefore forms the consultation on a proposal to amend the City of Lancaster Air Quality Management Area No.1 Order 2004 to include the likely exceedance of the 1 hour objective for nitrogen dioxide in addition to exceedance of the annual mean objective.

Evidence supporting a proposed amendment to the City of Lancaster Air Quality Management Area No.1 Order 2004

In 2012 an Updating and Screening Assessment report was submitted to Defra by Lancaster City Council as part of requirements under the Local Air Quality Management regime (report available at : http://www.lancaster.gov.uk/environmental-health/environmental-protection/air-quality/air-quality-downloads-links/).

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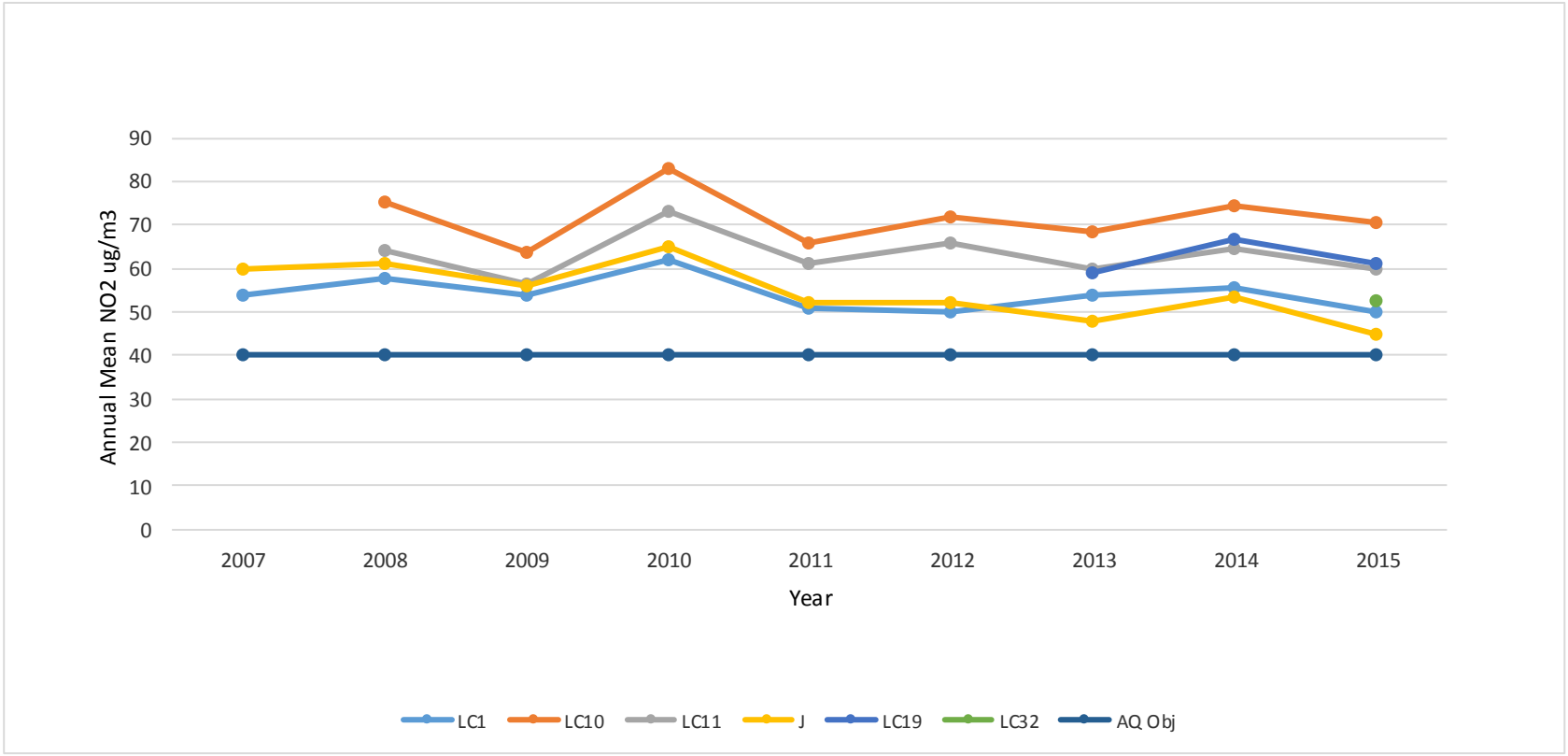
The report proposed the amendment of the City of Lancaster Air Quality Management Area No.1 Order 2004 (available at : http://www.lancaster.gov.uk/environmental-health/environmental-protection/air-quality/lancaster-air-quality-management-area-aqma/) 'the Order', to include an additional measure (the 1 hour objective for nitrogen dioxide). The existing Order was made for the potential breach of the annual mean nitrogen dioxide objective only. Details of the two objectives for nitrogen dioxide are contained in Appendix 2 below.

The proposal put forward to amend the order is based on diffusion tube nitrogen dioxide monitoring data obtained from four monitoring sites within the Lancaster Air Quality Management Area over five years. Monitoring data obtained indicates (see Figure 1 below) that nitrogen dioxide levels are sufficiently and persistently high to also indicate the likely exceedance of the 1 hour objective for nitrogen dioxide. This is indicated because annual mean levels have been monitored above 60ug/m^3 on a number of occasions over the past 9 years and research has concluded that "Local authorities should continue to use the threshold of 60 μg/m^3 NO_2 as the trigger for considering a likely exceedence of the hourly mean nitrogen dioxide objective." (see: Analysis of the relationship between annual mean nitrogen dioxide concentration and exceedences of the 1-hour mean AQS Objective. AEA Energy and Environment - May 2008 available at https://uk-air.defra.gov.uk/assets/documents/reports/cat06/**1hr**_NO2_rpt_Final_b.pdf for further information.)

Figure 1 – Diffusion Tube air quality monitoring results from four sites within the Lancaster Air Quality Management Area 2007 - 2015



Three maps showing the locations of the six monitoring sites shown in Figure 1 above are shown in Figures 2, 3 4,5 and 6 below. The Air Quality Management Area is shown in grey.

Figure 2 Map showing location of monitoring site J (Lancaster AQMA shown in grey)

Figure 3 Map showing location of monitoring site LC11 (Lancaster AQMA shown in grey)

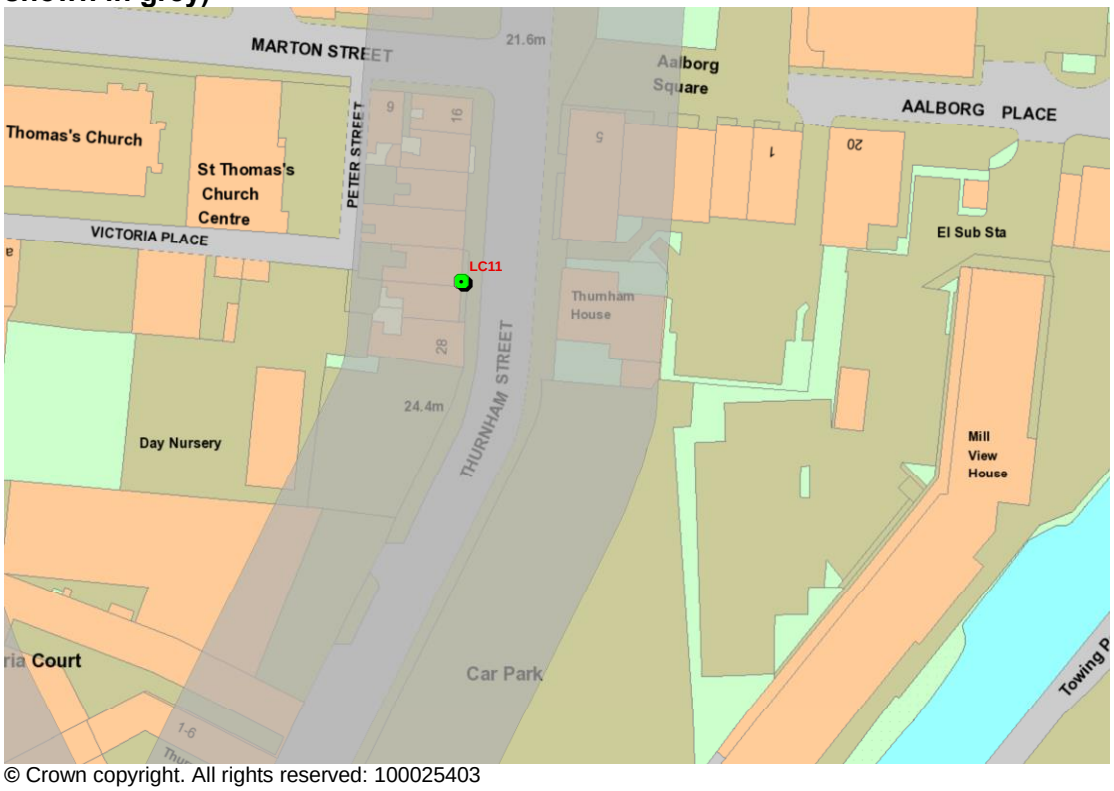


Figure 4 Map showing location of monitoring sites LC1 and LC10 (Lancaster AQMA shown in grey)

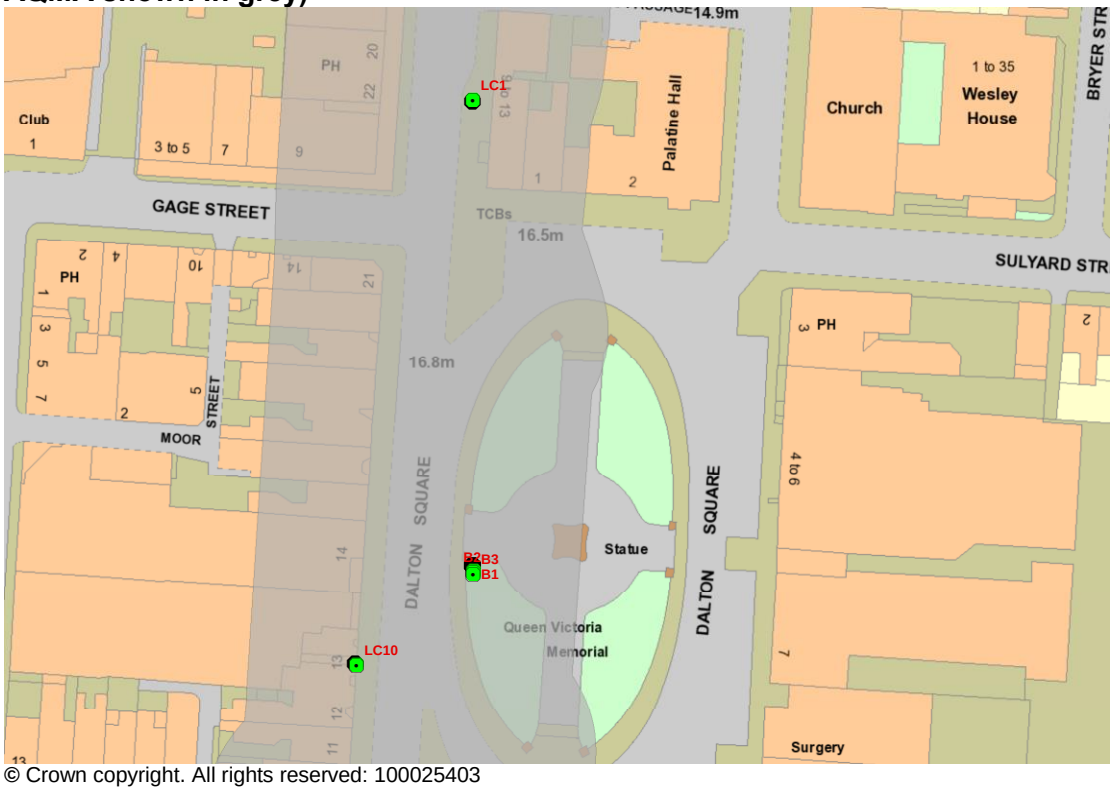


Figure 5 Map showing location of monitoring sites LC32 (Lancaster AQMA shown in grey)

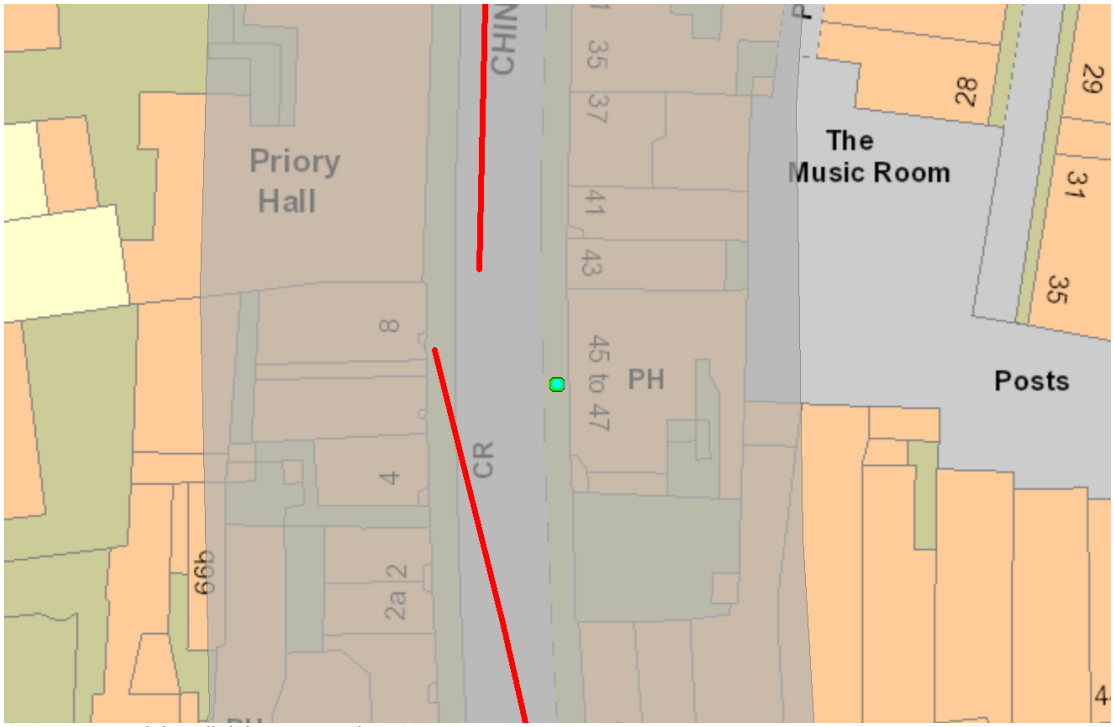
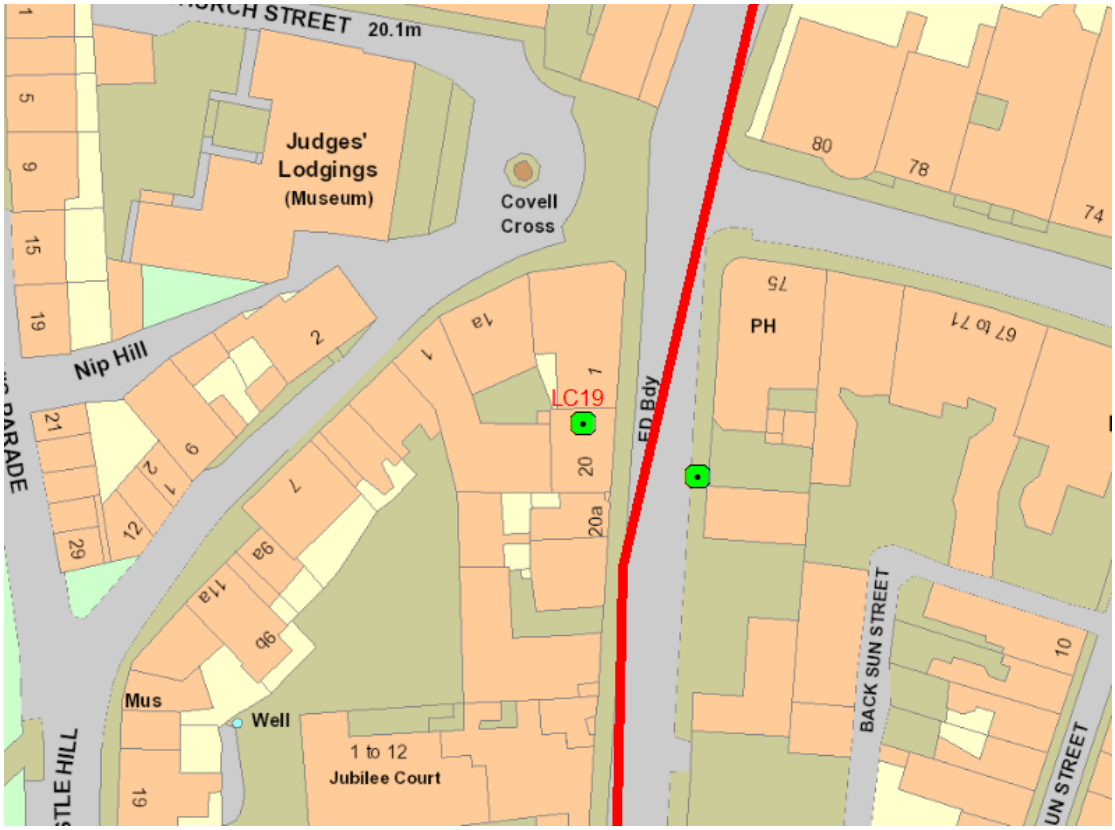


Figure 6 Map showing location of monitoring sites LC19 (Lancaster AQMA shown in grey)



On submission of this data and proposal to amend the Air Quality Management Area to Defra as part of the 2012 Updating and Screening Assessment, Defra's reply in their 'Updating and Screening Assessment Appraisal Report' found the following :-

> *"At four existing sites within the Lancaster AQMA the annual mean nitrogen dioxide level exceeded 60 µg/m3, and the Council therefore intend to amend the AQMA order for Lancaster to include likely exceedance of the 1 hour objective for nitrogen dioxide, and this seems appropriate."*

Consultation Proposal

The City of Lancaster Air Quality Management Area No.1 Order 2004 is amended to include the likely exceedance of the 1 hour objective for nitrogen dioxide.

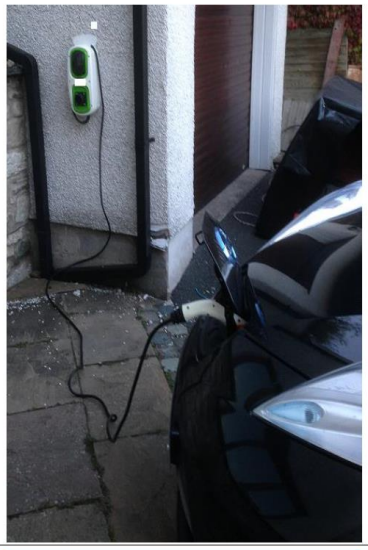
Requirement for Consultation

In accordance with Local Air Quality Management Policy Guidance PG (16) and consultation with the LAQM help desk, there is now no requirement for further assessment or any strict requirement to consult. Consultation is however recommended as best practice the sole requirement on the amendment proposal (see - Local Air Quality Management Policy Guidance PG (16) – Defra 2016 available at: http://laqm.defra.gov.uk/supporting-guidance.html). This document forms the consultation.

Appendix G – Planning Advisory Note – Electric Vehicle Charging

Provision of Electric Vehicle Charging Points for New Development

Guidance for Developers



LANCASTER CITY COUNCIL

Promoting City, Coast & Countryside

Planning Advice Note

February 2016

1. Introduction

1.1 Lancaster City Council adopted its Development Management Development Plan Document (DPD) in December 2014 which forms a key part of the local development plan for Lancaster District. The Development Management DPD sets out a series of generic planning policies which will be used by the City Council to determine planning applications. The policies contained within the DPD are applicable to all types of development across the district. This Planning Advisory Note (PAN) has been prepared to supplement the Development Management DPD and specifically relates to all types of development that generates road traffic.

1.2 As part of the Development Management DPD consideration is given to key design principles and environmental requirements which are set out in a range of planning policies including Policy DM20 (Enhancing Accessibility and Transport Linkages), Policy DM23 (Transport Efficiency and Travel Plans), Policy DM35 (Key Design Principles), Policy DM36 (Sustainable Design), Policy DM37 (Air Quality Management and Pollution) and DM41 (New Residential Design).

1.3 In particular these policies encourage that new development should seek to deliver high standards of sustainable design. Opportunities to minimise the adverse impacts on the environment is a key thread of the Development Management DPD with all development encouraged to minimise impacts on air quality.

1.4 The use of electric vehicles is an important measure in reducing emissions locally and therefore the provision of necessary infrastructure which promote the use of such vehicles is essential. Growth in the uptake of plug-in vehicles is also steadily growing and therefore it is important that new development seeks to encourage continued growth and respond to such change. Figure 1 below highlights the level of growth which has been seen in the use of electric vehicles across the UK since 2011.

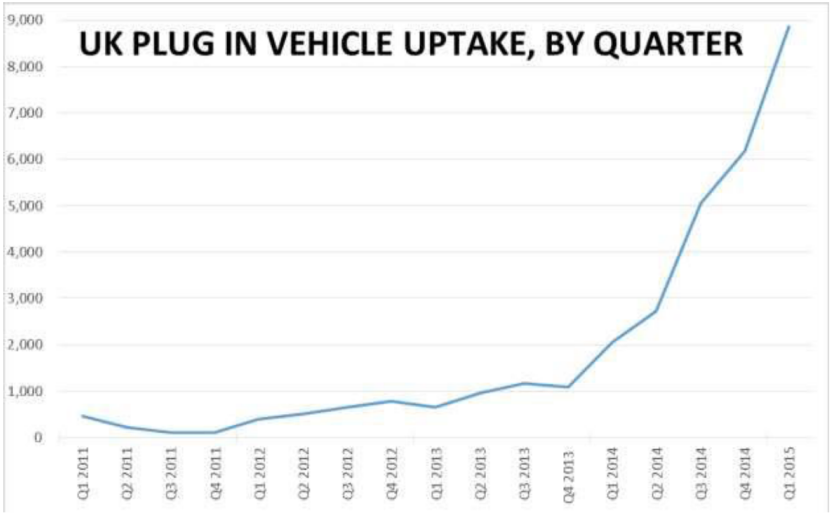


Figure 1: UK Plug-in Vehicle Uptake (by Quarter)
Source OLEV Presentation to IAPSC June 2015 http://www.iapsc.org.uk/assets/document/0615_N_Short.pdf

1.5 This PAN provides information and advice to developers on how opportunities for the use of electronic vehicles can be maximised, particularly through the provision of necessary infrastructure in new development such as electric charging points. The PAN supports the provision of such infrastructure as part of both residential and commercial development.

2. Planning Policy Context

National Planning Policy Framework (NPPF)

2.1 The National Planning Policy Framework (NPPF) was published by the Government in March 2012 and sets national planning policy for England.

2.2 Paragraph 35 of the states that plans should protect and exploit opportunities for the use of sustainable transport modes for the movement of goods or people and suggests a number of means to achieve this. In particular paragraph 35 states that developments should be *'designed where practical to incorporate facilities for charging and plug-in and other ultra-low emission vehicles'.*

2.3 Further support is provided under paragraph 124 of the Framework which states that planning policies should sustain compliance with, and contribute towards, EU limit values or national objectives for pollutants, taking into account the presence of Air Quality Management Areas and the cumulative impacts on air quality from individual sites in local areas.

Lancaster District Transport Masterplan

2.4 Lancaster County Council are in the process of preparing a Highways and Transport Masterplan for the district. The draft Masterplan was published in the late spring 2015 with the finalised document due for adoption in May 2016.

2.5 The Transport Masterplan is seeking to promote a generational shift toward the use of sustainable modes of transport and reducing the reliance on private vehicles for day-to-day journeys. The reduction in such trips will seek to reduce traffic levels, improvement highway safety and improve the local environment through improved air pollution.

2.6 A key element of the Transport Masterplan is the increasing role of ultra-low emission vehicles (ULEVs) within the district. Following the adoption of the Masterplan the County Council intend to commission further assessment work on how ULEVs can be promoted in the district and it is clear that the provision of key infrastructure (such as charging points) will be critical in growing the role of ULEVs.

Local Development Plan

2.7 As previously mentioned opportunities for reducing impacts on air quality are supported through a number of policies within the Development Management DPD. Policy DM37 in particular relates to air quality management and pollution. The supporting text to the policy states that the City Council will seek to ensure that proposals for all new development, regardless of location, will not have an unacceptable negative impact on air quality and will not further exacerbate air quality in Air Quality Management Areas.

3. Planning and Technical Design Issues

3.1 Lancaster City Council is committed to supporting measures that will reduce emissions from vehicles. This is clearly stated with the Council's Corporate Plan. It is also a measure specifically supported by Lancashire County Council via the Highways and Transport Masterplan.

3.2 The provision of electric charging points is obviously not the only measure that can be taken to help reduce emissions, and it is the City Council's intention to introduce more comprehensive guidance covering a wider range of measures and approaches in the near future as it prepares a new local development plan.

3.3 In order to promote a greater role for plug-in vehicles the City Council will support development proposals which seek to encourage the use of electric vehicles. To assist understanding on how this could be achieved in new development the table below sets out how infrastructure could be provided in new development.

Provision of Parking Bays & Charging Points for ULEV in New Development (including Conversions)	
Houses[1]	One charging point per house with garage or driveway
Flats (<50 units)[2]	One parking bay marked out for use by electric vehicles only, together with charging infrastructure and cabling.
Flats (>50 units)[2]	Further dedicated charging bays totalling 2% of the total provision.
Other Development (<50 Bays)[2]	One parking bay marked out for use by electric vehicles only, together with charging infrastructure and cabling.
Other Development (>50 Bays)[2]	Further dedicated charging bays totalling 2% of the total provision.
Phasing	Standard provision (as set out above) could be supplemented by the installation of groundwork / passive wiring at the commencement of development in order to enable further installation to match demand.

Table 1: Recommended approach toward promoting ULEVs within new development proposals.
(1) Recommended installation of 16A or higher Type 2 charger (minimum requirement standard 3 pin 13A charger), (2) dedicated free standing weatherproof chargers

3.4 It should be noted that where charging facilities are shared (for example through the development of flats) that any provision of infrastructure should also include arrangements for the future operation and maintenance of the facility.

4. Further Information and Advice

4.1 For further information on this issue please visit Lancaster City Council's website at the following address http://www.lancaster.gov.uk/air-quality/ or please contact the Environmental Health Team via email at environmentalhealth@lancaster.gov.uk.

Glossary of Terms

Abbreviation	Description
AQAP	Air Quality Action Plan - A detailed description of measures, outcomes, achievement dates and implementation methods, showing how the LA intends to achieve air quality limit values'
AQMA	Air Quality Management Area – An area where air pollutant concentrations exceed / are likely to exceed the relevant air quality objectives. AQMAs are declared for specific pollutants and objectives
ANPR	Automatic Number Plate Recognition
ASR	Air quality Annual Status Report
AURN	Automatic Urban and Rural Network (UK air quality monitoring network)
Defra	Department for Environment, Food and Rural Affairs
DfT	Department for Transport
DMRB	Design Manual for Roads and Bridges – Air quality screening tool produced by Highways England
FDMS	Filter Dynamics Measurement System
LAQM	Local Air Quality Management
NO_2	Nitrogen Dioxide
NO_x	Nitrogen Oxides
OLEV	Office for Low Emission Vehicles
PM_{10}	Airborne particulate matter with an aerodynamic diameter of 10µm (micrometres or microns) or less
$PM_{2.5}$	Airborne particulate matter with an aerodynamic diameter of 2.5µm or less
QA/QC	Quality Assurance and Quality Control
SO_2	Sulphur Dioxide
ULEV	Ultra Low Emission Vehicle

References

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Lancaster City Council (2010), Draft Air Quality Action Plan for Carnforth, Final Draft, March 2010*

Lancaster City Council (March 2004) Air Quality Management Area (Lancaster)(No.1) Order 2004. *****

Lancaster City Council (April 2007) Air Quality Management Area (Carnforth)(No.1) Order 2007 *****

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LCC, 2013, The Air Quality Strategy for Lancaster, Lancaster City Council, November 2013*

LCC, 2013, LAQM Progress Report and Action Plan Update, September 2013*

LCC, 2016, LAQM Annual Status Report 2015, January 2016*

LCC, 2016, Provision of Electric Vehicle Charging Points for New development – Guidance for Developers February 2016, available at : https://www.lancaster.gov.uk/planning/planning-policy/supplementary-planning-documents-spds

Internet links

http://laqm.defra.gov.uk/review-and-assessment/review-and-assessment.html

http://www.environment-agency.gov.uk

http://www.lancaster.gov.uk/environmental-health/environmental-protection/air-quality/air-quality-reviews-and-assessments

http://www.lancaster.gov.uk/environmental-health/environmental-protection/air-quality/air-pollution-measurement-and-monitoring

***** Access to the Council's air quality reports is provided on the Council's website (link provided above).