Carrickfergus Borough Council
LAQM Progress Report 2013

Bureau Veritas Air Quality

October 2013

Move Forward with Confidence

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Document Control Sheet

Issue/Revision	Issue 1	Issue 2
Remarks	Draft	Final
Date	October 2013	October 2013
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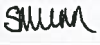
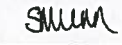
Signature		
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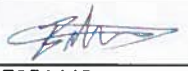
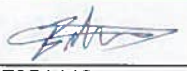
Signature		
Project number	7351442	7351442
File reference	2899	2899

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Report Reference number	APR2013
Date	October 2013

Executive Summary

Part III of the Environment (Northern Ireland) Order 2002 places a statutory duty on local authorities to review and assess the air quality within their area and take account of Government Guidance when undertaking such work. This Annual Progress Report is a requirement of the Fifth Round of Review and Assessment and is a requirement for all local authorities. The Report has been undertaken in accordance with the Technical Guidance LAQM.TG (09) and associated tools (as updated in 2010).

This Annual Progress Report considers all new monitoring data and assesses the data against the Air Quality Strategy objectives. It also considers any changes that may have an impact on air quality.

Updated monitoring showed that there were no exceedences of the Air Quality Objectives at any of the monitoring locations within the Borough. The passive monitoring undertaken has shown an increase from the 2011 concentrations.

Carrickfergus Borough Council have reviewed local developments in the Borough and have confirmed that there are none which are likely to impact upon air quality which have not previously be assessed. It has been noted that there are several proposed new roads as part of the Belfast Metropolitan Area Plan. These road schemes will be assessed in further detail in the next Updating and Screening Assessment.

The proposed actions arising from the 2013 Annual Progress Report are as follows:

- Continue NO_2 diffusion tube and continous monitoring in the borough to identify future changes in pollutant concentrations;
- Assess the air quality impact of the proposed road schemes in the next Updating and Screening Assessment; and
- Proceed to a Progress Report in 2014.

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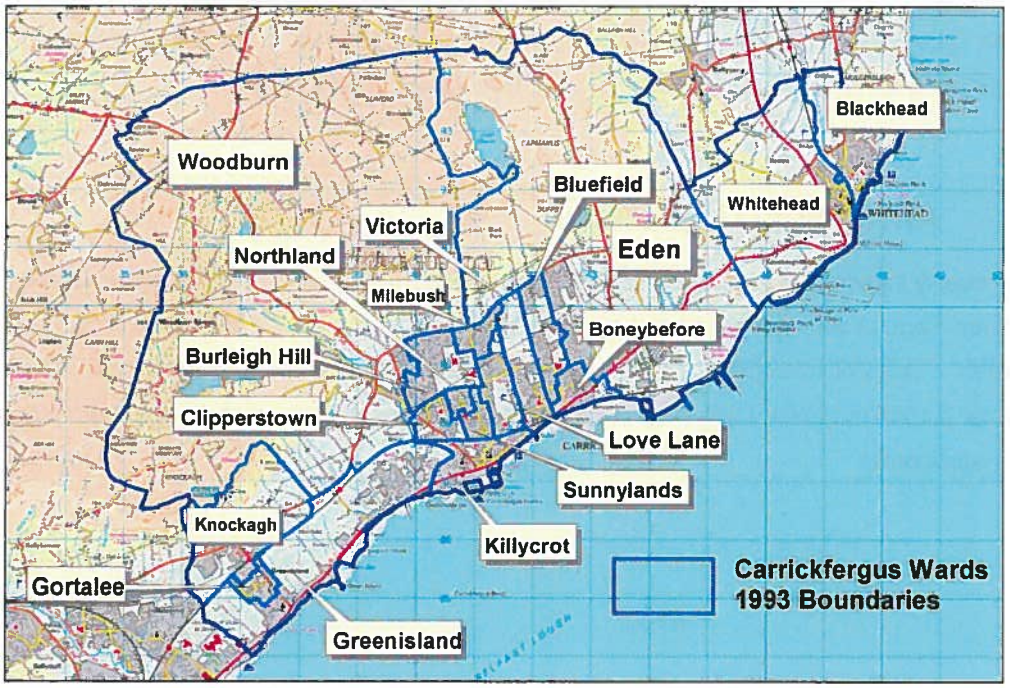
1 Introduction

1.1 Description of Local Authority Area

The Borough of Carrickfergus is located on the Northern shore of Belfast Lough, stretching from Greenisland in the southwest to Whitehead in the east. The main settlements in the area are located along a low lying coastal strip. Further inland the ground rises to a height of 275 metres at Knockagh which forms part of the southernmost reaches of the Antrim Plateau. The Borough takes in a total area of 31.67 square miles and has a population of around 40,000.

One of the major air pollutant sources in the borough is from road traffic, particularly along the A2 which is the main road to and from Belfast. The key industrial source in the area is AES Kilroot Power Station. A number of homes in the area continue to burn solid fuel although this number has declined over the years due to the arrival of Phoenix piped natural gas and subsequent Northern Ireland Housing Executive home improvement schemes.

Figure 1-1 Carrickfergus Wards



1.2 Purpose of Progress Report

This report fulfils the requirements of the Local Air Quality Management (LAQM) process as set out in Part IV of the Environment Act (1995), the Air Quality Strategy for England, Scotland, Wales and Northern Ireland 2007 and the relevant Policy and Technical Guidance documents. The LAQM process places an obligation on all local authorities to regularly review and assess air quality in their areas, and to determine whether or not the air quality objectives are likely to be achieved. Where exceedences are considered likely, the local authority must then declare an 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.

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

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

1.3 Air Quality Objectives

The air quality objectives applicable to LAQM **in Northern Ireland** are set out in the Air Quality Standards Regulations (Northern Ireland) 2010 are shown in Table 1.1. This table shows the objectives in units of microgrammes per cubic metre $\mu g/m^3$ (milligrammes per cubic metre, mg/m^3 for carbon monoxide) with the number of exceedences in each year that are permitted (where applicable).

Table 1-1 Air Quality Objectives included in Regulations for the purpose of LAQM in Northern Ireland

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

1.4 Summary of Previous Review and Assessments

Monitoring of nitrogen dioxide (NO_2) using diffusion tubes has been carried out in Carrickfergus since March 1997. Real time monitoring of sulphur dioxide (SO_2) and PM_{10} commenced in July 2002 at the Rosebrook Avenue site but decommissioning of the Air Quality Monitoring Station took place in 2011 after results indicated that objectives for NO_2 and SO_2 were unlikely to be exceeded at this location.

The First Stage Air Quality Review and Assessment completed in February 2001 concluded that the pollutants indicated in the following table namely, NO_2 from roads and industrial sources, SO_2 from industrial and domestic sources and PM_{10} from industrial and domestic sources, should be examined during the second stage review.

Table 1-2 Conclusions from 1st Stage of Air Quality Review and Assessment

Pollutant	Exceedence Road Sources	Exceedence Industrial Sources	Exceedence Domestic Sources	Progress to Second Stage Review	Progress to Third Stage Review	Progress to Fourth Stage Review
Carbon Monoxide	None	None	None	No	No	No
Benzene	None	None	None	No	No	No
1,3 Butadiene	None	None	None	No	No	No
Lead	None	None	None	No	No	No
Nitrogen Dioxide	Yes	Yes	None	Yes	No	No
Sulphur Dioxide	None	Yes	Yes	Yes	Yes	No
PM_{10}	Yes	None	Yes	Yes	Yes	Yes

The Second Stage Assessment completed in February 2002 excluded SO_2 and PM_{10} from industrial sources and NO_2 from industrial and road sources.

Third Stage Review and Assessment concentrated on the assessment of the remaining pollutants namely PM_{10} from domestic sources and road sources and SO_2 from domestic sources. Modelling of these pollutants excluded PM_{10} from road sources and SO_2 from

domestic sources, but predicted exceedances for PM_{10} from domestic sources in both Carrickfergus town and Greenisland and resulted in the declaration of two AQMAs, as shown in Figures 1.2 and 1.3.

Figure 1-2 Carrickfergus AQMA

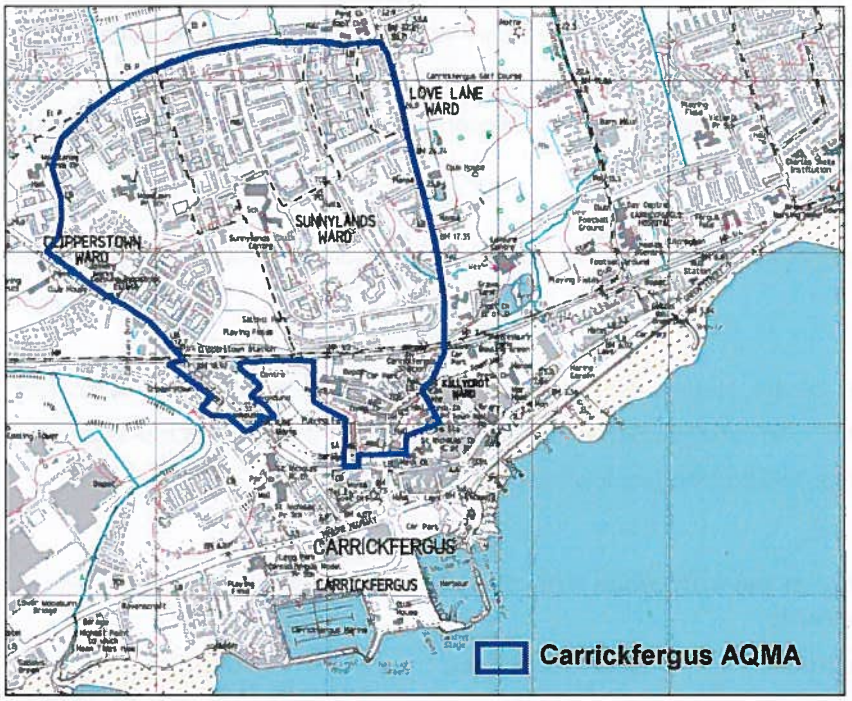
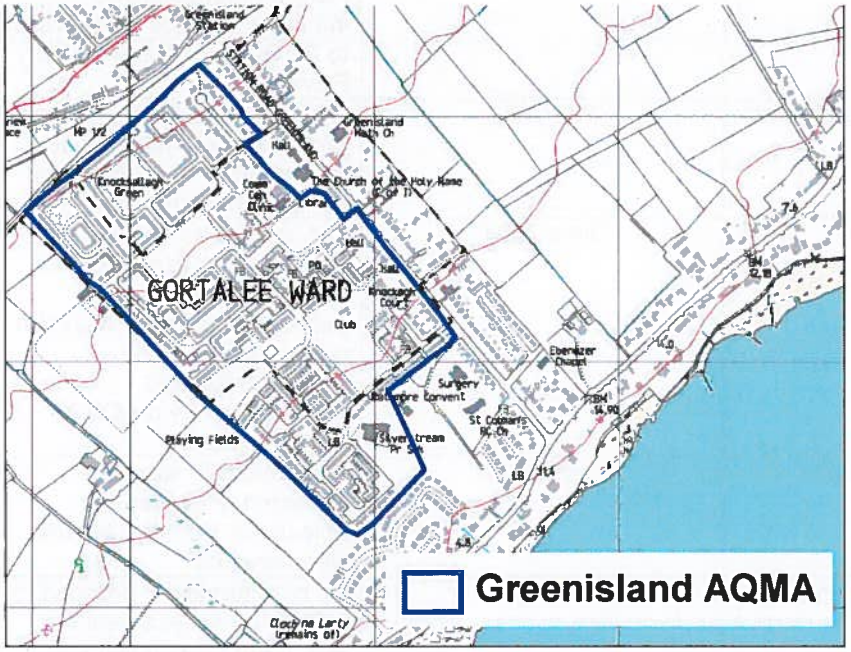


Figure 1-3 Greenisland AQMA



Fourth Stage Review and Assessment was commenced at the end of 2004 with an update of fuel use survey information within the AQMAs and was completed by the autumn of 2005.

The conclusions from the 'Air Quality Review and Assessment Stage 4 - Detailed Modelling for Domestic Fuel Combustion' indicated that PM_{10} and SO_2 emissions arising from domestic fuel combustion in Carrickfergus Borough Council are not predicted to cause an exceedence of the PM_{10} objectives at relevant receptors within the assessed areas. This has been confirmed by the monitoring data collected. Netcen who carried out the fourth stage modelling recommended,

"Carrickfergus Borough Council may wish to consider revocation of the AQMA on the basis of these results"

As a consequence of the Netcen recommendation and its subsequent appraisal and acceptance by U.W.E, Carrickfergus Borough Council has revoked the two AQMAs for PM_{10} from domestic sources, in Carrickfergus town and Greenisland.

Table 1-3 Summary of the outcomes from the previous rounds of review and assessments

Previous Assessment	Date completed	Outcome
1st Stage Air Quality Review and Assessment	Feb 2001	NO_2 for roads and industrial sources, SO_2 for industrial and domestic sources and PM_{10} for domestic and industrial sources to progress to 2nd Stage of the Air Quality Review
2nd Stage Air Quality Review and Assessment	Feb 2002	SO_2 and PM_{10} from sources and NO_2 from industrial and road sources to be excluded from 3rd Stage Review
3rd Stage Review and Assessment	June 2004	Concentrated on PM_{10} from domestic and road sources. Modelling predicted exceedences from PM_{10} from domestic sources in Carrickfergus and Greenisland. Two AQMAs were declared.
4th Stage Review and Assessment	July 2005	PM_{10} and SO_2 were not predicted to exceed the objectives. Both the AQMAs were revoked.
Update and Screening Assessment 2006	Oct 2006	No requirement to proceed to a Detailed Assessment for any of the 7 key pollutants.

Local Air Quality Management Progress Report	Sept 2007	No requirement to proceed to a Detailed Assessment for any of the 7 key pollutants.
Update and Screening Assessment 2008	April 2009	Detailed Assessment required for NO_2 at Minorca Place, Carrick. PM_{10} to be considered at the same location.
Progress Report 2009	April 2010	
LAQM Detailed Assessment for NO_2 and PM_{10}	February 2011	All AQS objectives for NO_2 and PM_{10} likely to be met at relevant receptor locations. Additional NO_2 monitoring recommended at relevant receptor locations (building facades).
Progress Report 2010	February 2011	No further detailed assessments required for any pollutants
Local Air Quality Management Progress Report	April 2011	No further detailed assessments required for any pollutants
Updating and Screening Assessment 2012	March 2013	No further detailed assessments required for any pollutants.

2 New Monitoring Data

2.1 Summary of Monitoring Undertaken

2.1.1 Automatic Monitoring Sites

Carrickfergus Borough Council did not carry out automatic monitoring for any pollutants in 2012.

Decommissioning of the monitoring station at Rosebrook Avenue took place in 2011 after results indicated that objectives for NO_2 and SO_2 were unlikely to be exceeded at the site.

2.1.2 Non-Automatic Monitoring Sites

Carrickfergus Borough Council undertook non-automatic monitoring using diffusion tubes at 12 sites in 2012. Monitoring locations remain unchanged from those reported in the 2012 USA.

The monitoring sites were chosen to represent roadside locations along the busiest roads in the Borough namely the A2 Shore Road (AADT 27,020 vehicles per day) and B90 (15,000 vehicles per day) Upper Road. With one Urban Background site located in Greenisland.

Monitoring sites are selected to provide data on locations that appear to be representative of likely residential exposure and, where possible, are close to the nearest receptor to the road of interest.

Data capture at all locations was greater than 75% therefore no annualisation was required.

Diffusion tubes in 2012 were prepared and analysed by Gradko International Ltd. The tube preparation method is 20% TEA in Water. Gradko International Ltd participates in the Workplace Analysis Scheme for Proficiency (WASP) for NO_2 diffusion tube analysis. This provides strict performance criteria for participating laboratories to meet, thereby ensuring NO_2 concentrations reported are of a high calibre. WASP data rounds 116 through to 119 (January to December 2012) Gradko International Ltd have scored 100%, meaning that all of resulted submitted are deemed to be satisfactory based upon the z-score of $< \pm 2$.

A bias adjustment factor has been applied to the data, which is an estimate of the difference between diffusion tube concentrations and continuous monitoring, the latter assumed to be a more accurate method of monitoring. The technical guidance LAQM.TG (09) provides guidance with regard to the application of a bias adjustment factor to correct diffusion tubes.

Triplicate co-location studies can be used to determine a local bias factor based on the comparison of diffusion tube results with data from NO_x / NO_2 continuous analysers. Alternatively, the national database of diffusion tube co-location surveys provides bias factors for the relevant laboratory and preparation method.

Carrickfergus Borough Council does not operate a continuous analyser, therefore a local bias correction factor cannot be calculated. The national bias adjustment factor for the laboratory and tube preparation is 0.97.

For previous data, years 2009 to 2011, the bias adjustment factors have been taken from the Council's previous LAQM annual reports. The factors used were 0.83 (2009), 0.83 (2010) and 0.90 (2011).

Figure 2-1 Map of Non-Automatic Monitoring Sites

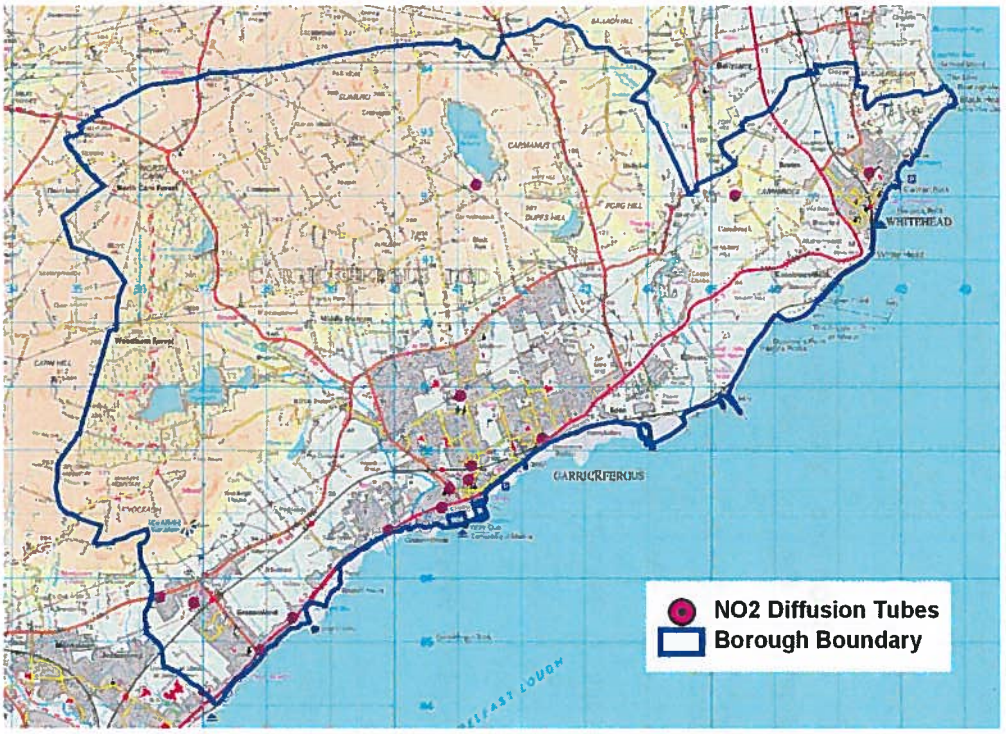


Table 2-1 Details of Non- Automatic Monitoring Sites

Site Name	Site Type	X OS Grid Ref	Y OS Grid Ref	Pollutants Monitored	In AQMA?	Is monitoring collocated with a Continuous Analyser (Y/N)	Relevant Exposure? *(Y/N with distance (m) to relevant exposure)*	Distance to kerb of nearest road *(N/A if not applicable)*	Does this location represent worst-case exposure?
(Site 1) 32 Mullaghmore Park Greenisland	Urban backgrd.	336901	385621	NO_2	N	N	Y (30m)	3m	N
(Site 2) College North Road Carrickfergus	Roadside	341147	388596	NO_2	N	N	Y (1m)	1m	Y
(Site 3) Railway Station, Fergus Avenue Carrickfergus	Roadside	341204	387692	NO_2	N	N	Y (15m)	15m	Y
(Site 4) 93 Belfast Road Carrickfergus	Roadside	339911	386741	NO_2	N	N	Y (1m)	1m	Y
(Site 5) Islandmagee Road, Whitehead	Roadside	347309	392433	NO_2	N	N	Y (1m)	2m	Y
(Site 6) Model PS Belfast Road, Carrickfergus	Roadside	340781	387100	NO_2	N	N	Y (1m)	1m	Y

Site Name	Site Type	X OS Grid Ref	Y OS Grid Ref	Pollutants Monitored	In AQMA?	Is monitoring collocated with a Continuous Analyser (Y/N)	Relevant Exposure? *(Y/N with distance (m) to relevant exposure)*	Distance to kerb of nearest road *(N/A if not applicable)*	Does this location represent worst-case exposure?
(Site 8) 42 Albert Road, Carrickfergus	Roadside	341186	387558	NO_2	N	N	Y (1m)	1m	Y
(Site 9) 27 Upper Road, Greenisland	Roadside	336386	385717	NO_2	N	N	Y (1m)	1m	Y
(Site 10) 59 Shore Road, Greenisland	Roadside	337969	384916	NO_2	N	N	Y (1m)	1m	Y
(Site 12) 186 Shore Road, Greenisland	Roadside	338411	385380	NO_2	N	N	Y (1m)	1m	Y
(Site 13) Victoria Road/Larne Road junction	Roadside	342354	388216	NO_2	N	N	Y (1m)	1m	Y
(Site 14) Minorca Place	Roadside	340897	387381	NO_2	N	N	Y (1m)	1m	Y

2.2 Comparison of Monitoring Results with Air Quality Objectives

2.2.1 Nitrogen Dioxide (NO_2)

There are two Air Quality Objectives for nitrogen dioxide, namely:

- the annual mean of 40µg/m^3, and
- the 1-hour mean of 200µg/m^3 not to be exceeded more than 18 times a year.

Diffusion Tube Monitoring Data

The nitrogen dioxide diffusion tube data are summarised in Table 2.5. The full dataset (monthly mean values) are included in Appendix A.

There were no locations in Carrickfergus Borough Council where the NO_2 annual mean Air Quality Objective of 40µg/m^3 was exceeded during 2012.

Table 2-2 Results of NO_2 Diffusion Tubes 2012

Location	Site Type	Within AQMA?	Triplicate or Co-located Tube	Full Calendar Year Data Capture 2012 (Number of Months or %)	2012 Annual Mean Concentration (µg/m^3) - Bias Adjustment factor = 0.97
(Site 1) 32 Mullaghmore Park Greenisland	Urban backgrd.	N	N	11	10.7
(Site 2) College North Road Carrickfergus	Roadside	N	N	12	21.6
(Site 3) Railway Station, Fergus Avenue Carrickfergus	Roadside	N	N	12	15.0
(Site 4) 93 Belfast Road Carrickfergus	Roadside	N	N	11	28.7
(Site 5) Islandmagee Road, Whitehead	Roadside	N	N	12	14.1
(Site 6) Model PS Belfast Road, Carrickfergus	Roadside	N	Duplicate	12	35.5
(Site 8) 42 Albert Road, Carrickfergus	Roadside	N	N	12	24.3
(Site 9) 27 Upper Road, Greenisland	Roadside	N	N	12	25.0
(Site 10) 59 Shore Road, Greenisland	Roadside	N	Duplicate	12	28.9
(Site 12) 186 Shore Road, Greenisland	Roadside	N	N	12	29.5

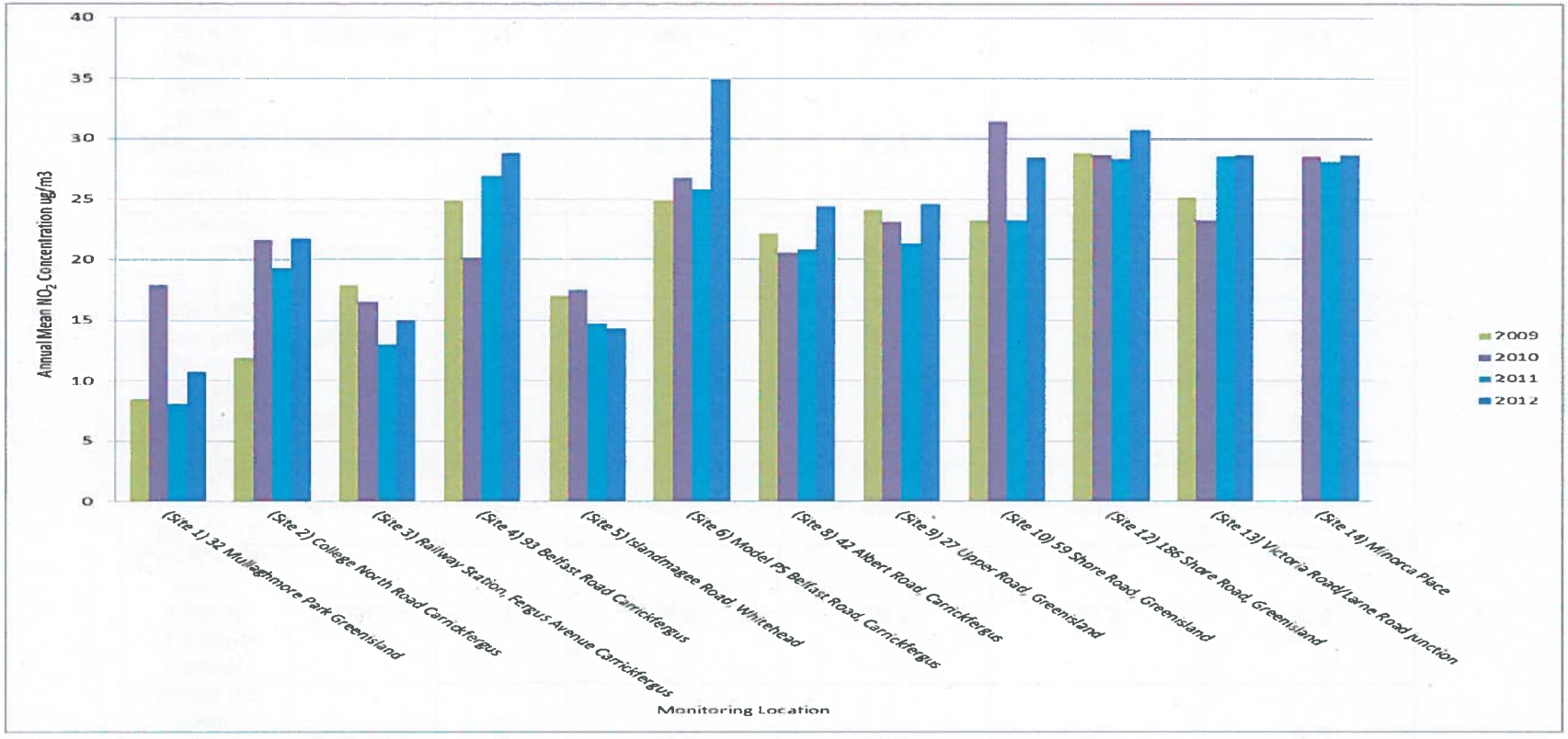
Location	Site Type	Within AQMA?	Triplicate or Co-located Tube	Full Calendar Year Data Capture 2012 (Number of Months or %)	2012 Annual Mean Concentration (µg/m^3) - Bias Adjustment factor = 0.97
(Site 13) Victoria Road/Larne Road junction	Roadside	N	N	12	28.8
(Site 14) Minorca Place	Roadside	N	N	11	28.9

Table 2-3 Results of NO_2 Diffusion Tubes (2008 to 2012)

Site ID	Site Type	Within AQMA?	Annual Mean Concentration (µg/m^3) - Adjusted for Bias			
			2009 (Bias Adjustment Factor = 0.83)	2010 (Bias Adjustment Factor = 0.83)	2011 (Bias Adjustment Factor = 0.90)	2012 (Bias Adjustment Factor = 0.97)
(Site 1) 32 Mullaghmore Park Greenisland	Urban backgrd.	N	8.5	17.9	8.1	10.7
(Site 2) College North Road Carrickfergus	Roadside	N	11.9	21.6	19.3	21.6
(Site 3) Railway Station, Fergus Avenue Carrickfergus	Roadside	N	17.9	16.5	13.0	15.0
(Site 4) 93 Belfast Road Carrickfergus	Roadside	N	24.9	20.1	26.9	28.7

Site ID	Site Type	Within AQMA?	Annual Mean Concentration (µg/m^3) - Adjusted for Bias			
			2009 (Bias Adjustment Factor = 0.83)	2010 (Bias Adjustment Factor = 0.83)	2011 (Bias Adjustment Factor = 0.90)	2012 (Bias Adjustment Factor = 0.97)
(Site 5) Islandmagee Road, Whitehead	Roadside	N	17.0	17.5	14.7	14.1
(Site 6) Model PS Belfast Road, Carrickfergus	Roadside	N	24.9	26.8	25.8	35.5
(Site 8) 42 Albert Road, Carrickfergus	Roadside	N	22.1	20.5	20.8	24.3
(Site 9) 27 Upper Road, Greenisland	Roadside	N	24.1	23.1	21.3	25.0
(Site 10) 59 Shore Road, Greenisland	Roadside	N	23.2	31.4	23.2	28.9
(Site 12) 186 Shore Road, Greenisland	Roadside	N	28.8	28.6	28.3	29.5
(Site 13) Victoria Road/Larne Road junction	Roadside	N	25.2	23.2	28.5	28.8
(Site 14) Minorca Place	Roadside	N	N/A	28.5	28.1	28.9

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



The above figure shows the annual mean NO_2 concentrations at the diffusion tube locations from 2009 through to 2012. There has been an increase in annual mean concentration seen across the majority of the monitoring sites from 2011. There are no monitoring sites within the Borough where the annual mean objective was exceeded.

2.2.2 PM_{10}

Carrickfergus Borough Council did not undertake any monitoring of PM_{10} in 2012.

2.2.1 Sulphur Dioxide

Carrickfergus Borough Council did not undertake any monitoring of SO_2 in 2012.

2.2.1 Benzene

Carrickfergus Borough Council did not undertake any monitoring of Benzene in 2012.

2.2.2 Summary of Compliance with AQS Objectives

The updated monitoring for 2012 shows that the AQS Objectives continue to be met at all monitoring locations across the Borough.

Carrickfergus Borough Council has examined the results from monitoring in the Borough. Concentrations are all below the objectives, therefore there is no need to proceed to a Detailed Assessment.

3 New Local Developments

3.1 Road Traffic Sources

LAQM requires local authorities to consider the following:

- Narrow congested streets with residential properties close to the kerb
- Busy streets where people may spend one hour or more close to traffic
- Roads with a high flow of buses and/or HGVs
- Junctions
- New roads constructed since the last Updating and Screening Assessment
- Roads with significantly changed traffic flows
- Bus or coach stations

Carrickfergus Borough Council confirms that there are no new/newly identified road traffic sources in the borough.

3.2 Other Transport Sources

LAQM requires local authorities to consider the following:

- Airports
- Locations where diesel or stream trains are regularly stationary for periods of 15 minutes or more, with relevant exposure within 15m
- Locations with a large number of movements of diesel locomotives and long term relevant exposure within 30m
- Shipping ports

Carrickfergus Borough Council confirms that there are no new/newly identified non-road transport sources in the borough.

3.3 Industrial Sources

LAQM requires local authorities to consider the following:

- Industrial Installations: new or proposed
- Industrial installations: existing where emissions have increased substantially or relevant exposure introduced
- Major fuel storage depots

- Petrol stations
- Poultry farms

Carrickfergus Borough Council confirms that there are no new/newly identified industrial sources in the borough

3.4 Commercial and Domestic Sources

LAQM requires local authorities to consider the following:

- Biomass combustion plant – individual installations
- Areas where the combined impact of several biomass combustion sources may be relevant
- Areas where domestic solid fuel burning may be relevant

Carrickfergus Borough Council confirms that there are no new/newly identified commercial or domestic sources in the borough.

3.5 New Developments with Fugitive or Uncontrolled Sources

LAQM requires local authorities to consider the following:

- Landfill sites
- Quarries
- Unmade haulage roads on industrial sites
- Waste transfer stations
- Any other potential sources of fugitive particulate emissions

Carrickfergus Borough Council confirms that there are no new/newly identified fugitive or uncontrolled sources in the borough.

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

Carrickfergus Borough Council confirms that all the following have been considered:

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

4 Local / Regional Air Quality Strategy

Carrickfergus Borough Council does not have a specific local or regional air quality strategy. Regarding air pollution, Carrickfergus Borough Council acts in accordance with the Environment (Northern Ireland) Order 2002.

5 Planning Applications

The Belfast Metropolitan Area Plan 2015 contains a proposal for the widening of the A2 Shore Road (Marine Highway). The road is currently a four-lane highway, except for the section between the University of Ulster at Jordanstown and Island Park. The Belfast Metropolitan Transport Plan proposed that this section be widened to four lanes.

The plan also includes proposals for three road schemes in Carrickfergus:

- Carrickfergus Spine Road;
- Victoria Road, and
- Sloefield Road.

These roads will be required to support development proposals within Carrickfergus.

Further information on these new roads will be presented in the next Updating and Screening Assessment.

6 Air Quality Planning Policies

Carrickfergus Borough Council's planning policies are defined in the Belfast Metropolitan Area Plan 2015. Carrickfergus has its own section in this document (Part 4 Volume 4). Elements of this plan will have a positive impact on air quality although it is not specifically stated as being for the purpose of Air Quality improvement. For example, in the town centre of Carrickfergus it is planned to increase pedestrian priority areas and expand the Park and Ride at Carrickfergus Railway station to reduce the numbers of cars in the town centre will improve Air Quality.

7 Local Transport Plans and Strategies

Carrickfergus does not currently have a Local Transport Plan in place. Local transport has been integrated into the afore-mentioned Belfast Metropolitan Area Plan 2015. These include the following:

- The Plan identifies an area south of Trooperslane settlement as a potential location for a Park and Ride site due to its close proximity to the railway station. It is anticipated integration with the rail network will provide a further public transport option;
- Improvement of up to 50% of rail services between Carrickfergus and Belfast;
- Introduction of an Intelligent Transport System (ITS) solutions including variable message signs in conjunction with parking provision;
- Route management system along the A2;
- Development of an integrated network of Quality Walking Routes and cycle routes, including improved links to the bus and rail station; and
- Improvements to the local bus routes and bus priority measures at key junctions.

8 Climate Change Strategies

Carrickfergus does not currently have a climate change strategy. The Council has developed a Sustainable Development Audit and Action Plan 'Living as if we intend to stay here' (2010) which includes air quality aims. The main aim is to '*enhance air quality*' (in the borough). Air quality is also mentioned with respect to transport stating that '*consideration could be given how energy used for staff travel can be decreased*', as improvement in air quality is expected to arise from this initiative.

9 Implementation of Action Plans

The two previously declared AQMAs in Carrickfergus have been revoked; therefore no action plans are required.

10 Conclusions and Proposed Actions

10.1 Conclusions from New Monitoring Data

The review of 2012 monitoring data found all monitoring locations had concentrations that remained within the AQS Objective levels. The diffusion tube sites showed good data capture for 2012, with no annualisation required. The annual mean concentration at all sites has shown an increase from the 2011 data.

10.2 Conclusions relating to New Local Developments

Carrickfergus Borough Council have reviewed new local developments and have found none that are likely to impact upon air quality which have not previously been assessed.

The new road schemes proposed as part of the Belfast Metropolitan Area Plan (2015) will be assessed in the next Updating and Screening Assessment.

10.3 Proposed Actions

Proposed actions arising from the 2013 Annual Progress Report are as follows:

- Continue NO_2 diffusion tube and continous monitoring in the Borough to identify future changes in pollutant concentrations;
- Assess the air quality impact of the proposed road schemes in the next Updating and Screening Assessment; and
- Proceed to a Progress Report in 2014.

11 References

- Local Air Quality Management Technical Guidance LAQM.TG(09). February 2009. Published by Defra in partnership with the Scottish Government, Welsh Assembly Government and Department of the Environment Northern Ireland
- Carrickfergus Borough Council 2012 Updating and Screening Assessment
- Carrckfergus Borough Council 2011 Annual Progress Report
- DOE Northern Ireland Planning Portal – Belfast Metropolitan Area Plan (2015) Borough Proposals: Carrickfergus Transportation

Appendices

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

Appendix A: QA:QC Data

Diffusion Tube Bias Adjustment Factors

The diffusion tubes are supplied and analysed by Gradko International Ltd utilising the 20% Triethanolamine (TEA) in water preparation method. The bias adjustment factor for 2012 is 0.97 (based on 34 studies, version 07_13) as derived from the national bias adjustment calculator.

Short-term to Long-term Data adjustment

Data capture was over 75% at all monitoring sites in 2012, therefore no annualisation was required.

QA/QC of Diffusion Tube Monitoring

Gradko International Ltd is a UKAS accredited laboratory and participates in the Workplace Analysis Scheme for Proficiency (WASP) for NO_2 diffusion tube analysis and the Annual Field Inter-Comparison Exercise. These provide strict performance criteria for participating laboratories to meet, thereby ensuring NO_2 concentrations reported are of a high calibre. The lab follows the procedures set out in the Harmonisation Practical Guidance. In the latest available WASP results, rounds 116 through to 119 (January to December 2012) Gradko International Ltd have scored 100%. The percentage score reflects the results deemed to be satisfactory based upon the z-score of $< \pm 2$. The tube precision for the NO_2 Annual Field Inter-comparison at Marylebone Road was rated as 'Good'.

Bureau Veritas Air Quality **Carrickfergus Borough Council**

Monthly NO_2 Concentrations – Diffusion Tube Sites

Site	Jan	Feb	Mar	April	May	June	July	Aug	Sept	October	Nov	Dec
1	24.7	31.7	30.8	21.5	22.9	24.9	21.7	22.4	19.7	30.5	27.0	31.5
2	14.1	16.8	14.0	7.2	8.3	8.6	6.5		6.8	10.2	13.0	16.1
3	36.3	38.2	35.4	28.1	24.7	22.8	23.2	19.4	31.8	37.0	29.1	36.2
3.1	37.2	33.1	34.2	31.3	28.2	23.1	15.8	17.3	29.9	32.5	31.7	37.8
4	34.5	37.6	39.0	25.4	29.8	30.6	26.2	28.5	26.9	15.8	33.5	36.6
5	27.6	40.9	41.1	17.5		26.6	24.8	28.6	27.8	28.7	30.8	31.3
6	32.8	39.6	45.0	35.7	41.3	40.4	31.7	33.2	25.7	44.6	29.7	43.2
6.1	39.7	33.4	40.3	39.0	45.2	48.1	27.2	28.5	27.0	41.9	29.7	36.3
7	26.4	35.0	35.0	35.0	28.4	27.5	23.5	22.0	24.4	33.2	37.9	
8	23.3	33.2	34.1	21.4	26.9	25.6	19.4	20.7	18.1	23.3	23.6	30.9
9	19.6	22.6	21.0	9.7	10.9	12.3	11.3	13.3	11.0	15.3	19.6	19.0
10	18.6	28.3	31.6	21.4	21.7	20.4	19.0	19.4	14.9	21.0	20.9	29.9
12	30.8	48.6	43.6	22.3	18.9	22.6	23.9	20.8	29.5	31.5	30.7	33.0
14	18.7	19.4	20.6	9.5	11.4	11.3	10.3	12.3	5.9	13.1	14.6	27.8