Carrickfergus Borough

2012 Air Quality Updating and Screening Assessment for Carrickfergus Borough Council

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

March 2013

Carrickfergus Borough

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Executive Summary

Part IV of the Environment Act 1995 and the Environment (NI) 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 Updating and Screening Assessment (USA) 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 Updating and Screening Assessment 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 there were no exceedences of the Air Quality Objectives within or outside of existing AQMAs during 2011.

The biomass installation at the Carrickfergus Leisure Centre has been assessed and conclusions made that there will be no need to proceed to Detailed Assessment.

Proposed actions from this report are as follows:

- Proceed to 2013 Annual Progress Report

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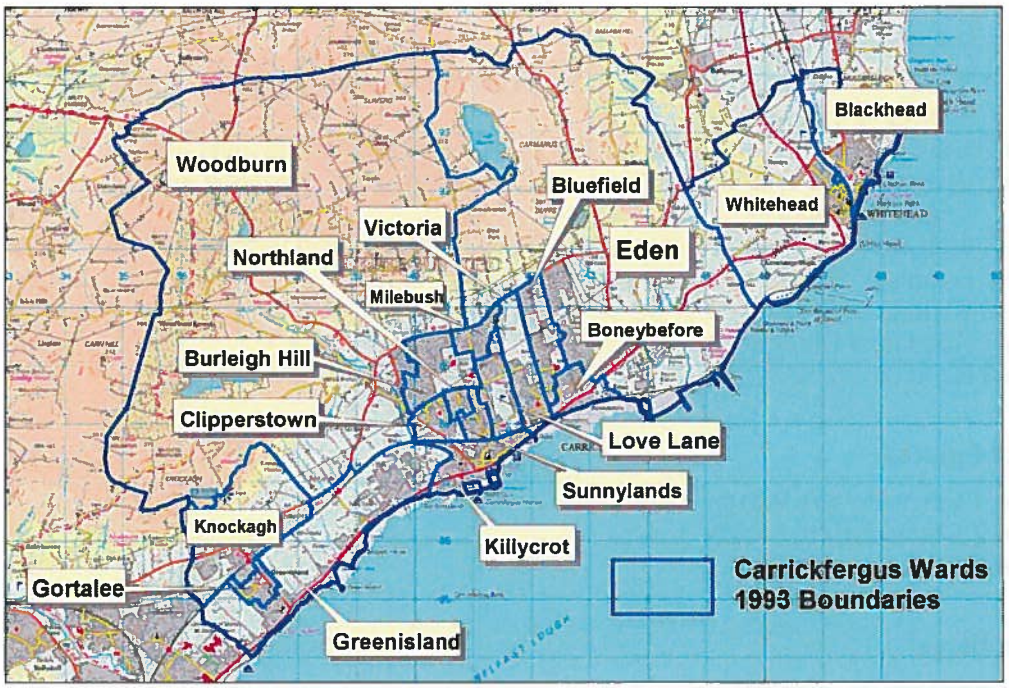
1 Introduction

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 Carrickfergus Wards



1.2 Purpose of 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) and the Environment (NI) Order 2002, the Air Quality Strategy (AQS) 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.

The objective of this Updating and Screening Assessment is to identify any matters that have changed which may lead to risk of an air quality objective being exceeded. A checklist approach and screening tools are used to identify significant new sources or changes and whether there is a need for a Detailed Assessment. The USA report should provide an update of any outstanding information requested previously in Review and Assessment reports.

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. This table shows the objectives in units of micrograms per cubic metre $\mu g/m^3$ (milligrammes per cubic metre, mg/m^3 for carbon monoxide) with the number of exceedences in each year that are permitted (where applicable).

Table 1 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
Particles (PM_{10}) (gravimetric)	50 $\mu g/m^3$, not to be exceeded more than 35 times a year	24-hour mean	31.12.2004
	40 $\mu g/m^3$	Annual mean	31.12.2004
Sulphur dioxide	350 $\mu g/m^3$, not to be exceeded more than 24 times a year	1-hour mean	31.12.2004
	125 $\mu g/m^3$, not to be exceeded more than 3 times a year	24-hour mean	31.12.2004
	266 $\mu g/m^3$, not to be exceeded more than 35 times a year	15-minute mean	31.12.2005

1.4 Summary of Previous Review and Assessments

Air quality monitoring of NO_2 using diffusion tubes has been ongoing in Carrickfergus Borough since March 1997. Real time monitoring of SO_2 and PM_{10} commenced in July 2002 at the Councils 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 the site.

The First Stage Air Quality Review and Assessment completed 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 2 Conclusions from 1st Stage of Air Quality Review and Assessment

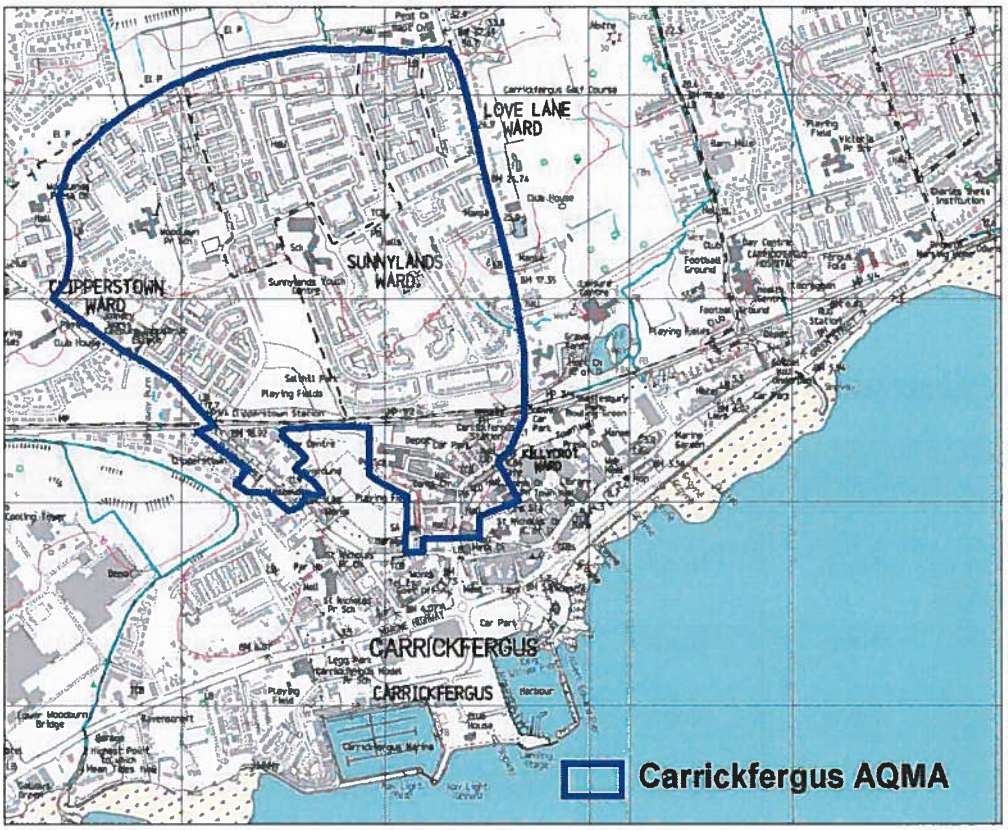
Pollutant	Exceedance Road Sources	Exceedance Industrial Sources	Exceedance Domestic Sources	Progress to Second Stage Review	Progress to Third Stage Review	Progress to Fourth Stage Review
Carbon Monoxide	None	None	None	No	No	No
Benzene	None	None	None	No	No	No
1,3 Butadiene	None	None	None	No	No	No
Lead	None	None	None	No	No	No
Nitrogen Dioxide	Yes	Yes	None	Yes	No	No
Sulphur Dioxide	None	Yes	Yes	Yes	Yes	No
PM10	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 Air Quality Management Areas.

Figure 2 Carrickfergus AQMA



Fourth Stage Review and Assessment was commenced at the end of 2004 with an updating 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 exceedance 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"

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

Figure 3 Greenisland AQMA

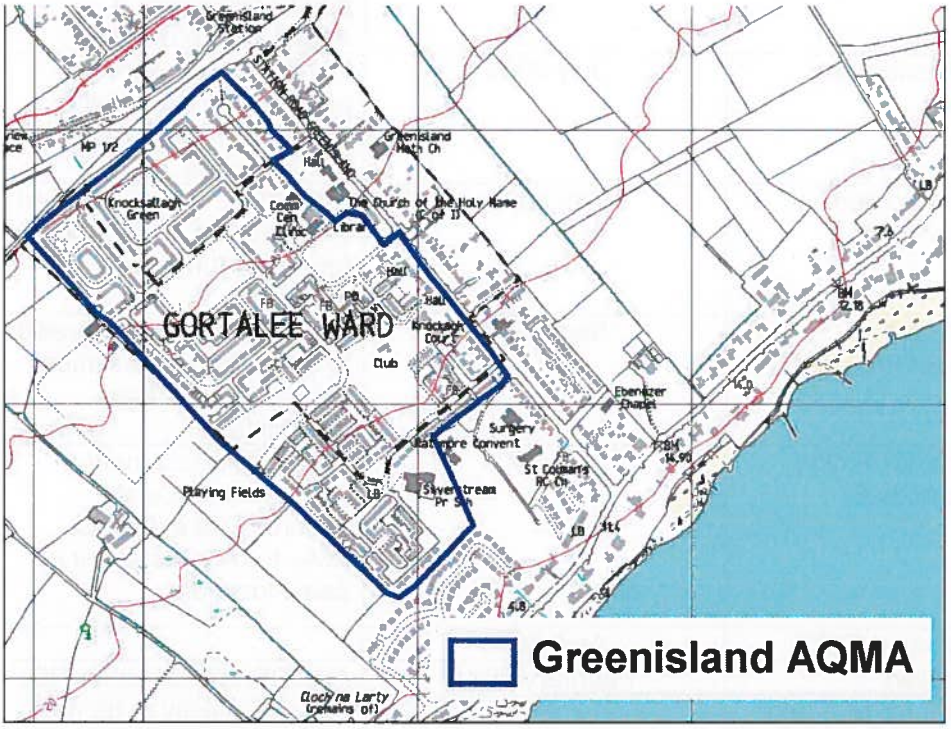

Table 3 Summary of the outcomes from the previous rounds of review and assessments

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. 2 AQMAs were declared.
4th Stage Review and Assessment	July 2005	PM_{10} and SO_2 were not predicted to exceed the objectives. The 2 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 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

2 New Monitoring Data

2.1 Summary of Monitoring Undertaken

2.1.1 Non-Automatic Monitoring

Carrickfergus Borough Council has been using passive diffusion tubes to monitor nitrogen dioxide levels throughout the district since 1997. Up until April 2011 the tubes used were supplied, prepared and analysed by Eurofins (UKAS accredited). However, having considered WASP performance results for Eurofins the decision was taken to change supplier and hence Gradko were engaged to supply Carrickfergus Borough Council's passive diffusion tubes. The preparation method remained unchanged. Quality assurance and quality control measures for the diffusion tubes are set out in Appendix 1. Gradko follows all procedures as set out in the Practical Guidance document.

The monitoring sites are chosen to represent kerbside 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, together with an urban and rural site.

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.

Carrickfergus exposed diffusion tubes at 14 sites in 2011. However, this reduced to 12 sites mid-year.

Two sites with no relevant exposure were closed in April 2011:
Site 11- Loughmourne Lough Road
Site 13 - 28 Bentra Road

In addition, a further two sites were converted from single tube to duplicate tube sites in April 2011:
Site 3 - 59 Shore Road,
Site 5 – Model PS Belfast Road.

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Table 4 Map of Non-Automatic Monitoring Sites (NO2 diffusion tubes only)

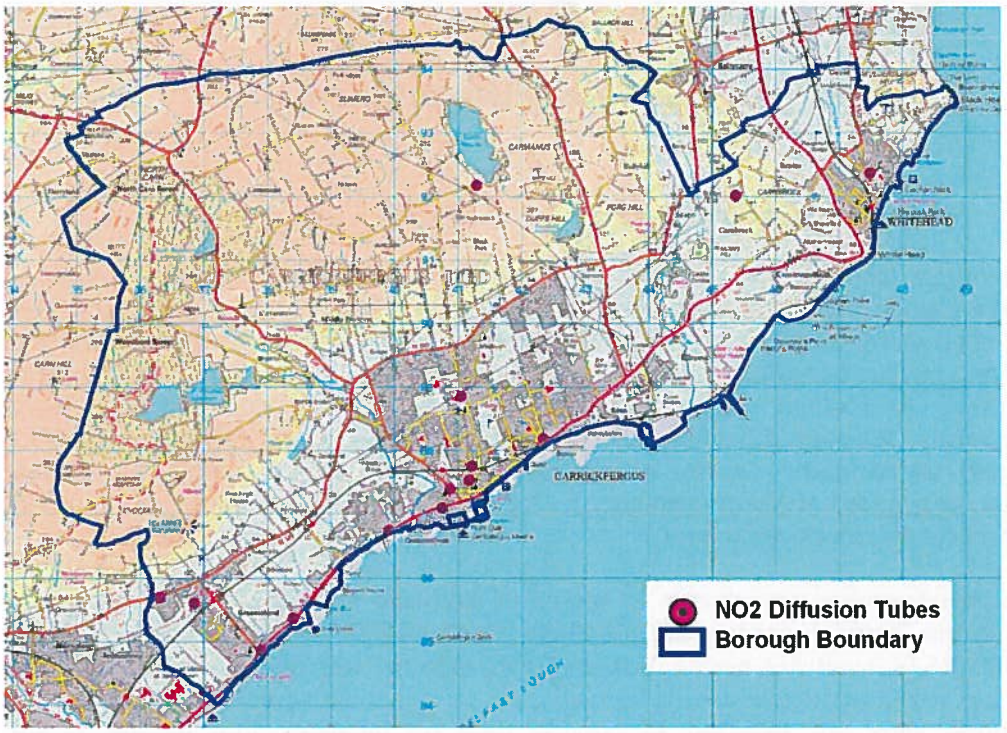

Table 5 Details of Non-Automatic Monitoring Sites

Site Name	Site Type	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)	Worst-case Location?
(Site 1) 32 Mullaghmore Park Greenisland	Urban backgrd.	336901	385621	NO_2	N	N	Y (30m)	3m	N
(Site 2) College North Road Carrickfergus	Urban backgrd.	341147	388596	NO_2	N	N	Y (1m)	1m	Y
(Site 3) Railway Station, Fergus Avenue Carrickfergus	Urban backgrd.	341204	387692	NO_2	N	N	Y (15m)	15m	Y
(Site 4) 93 Belfast Road Carrickfergus	Urban backgrd.	339911	386741	NO_2	N	N	Y (1m)	1m	Y
(Site 5) Islandmagee Road, Whitehead	Urban backgrd.	347309	392433	NO_2	N	N	Y (1m)	2m	Y

Site Name	Site Type	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)	Worst-case Location?
(Site 6) Model PS Belfast Road, Carrickfergus	Urban backgrd.	340781	387100	NO_2	N	N	Y (1m)	1m	Y
(Site 7) Lough Road, Loughmourne	Rural	341252	391956	NO_2	N	N	N	N/A	N
(Site 8) 42 Albert Road, Carrickfergus	Urban backgrd	341186	387558	NO_2	N	N	Y (1m)	1m	Y
(Site 9) 27 Upper Road, Greenisland	Urban backgrd.	336386	385717	NO_2	N	N	Y (1m)	1m	Y
(Site 10) 59 Shore Road, Greenisland	Urban backgrd.	337969	384916	NO_2	N	N	Y (1m)	1m	Y
(Site 11) 28 Bentra Road, Whitehead	Rural	345357	391988	NO_2	N	N	N	N/A	N

Site Name	Site Type	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)	Worst-case Location?
(Site 12) 186 Shore Road, Greenisland	Urban backgrd.	338411	385380	NO_2	N	N	Y (1m)	1m	Y
(Site 13) Victoria Road/Larne Road junction	Urban backgrd.	342354	388216	NO_2	N	N	Y (1m)	1m	Y
(Site 14) Minorca Place	Urban backgrd.	340897	387381	NO_2	N	N	Y (1m)	1m	Y

2.2 Comparison of Monitoring Results with AQ Objectives

2.2.1 Nitrogen Dioxide

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.

Automatic Monitoring Data

Carrickfergus Borough Council does not currently undertake any automatic monitoring.

Diffusion Tube Monitoring Data

The results for diffusion tube monitoring in 2011, in Table 6, show there were no exceedences of the NO_2 annual mean objective.

However, this conclusion is based on 9 months' data due to the change in analytical laboratory. Based on previous LAQM reporting it is anticipated Carrickfergus would continue to meet the objective with a full 12 months' reported data.

The full data set is provided in the Appendix.

Table 6 Results of Nitrogen Dioxide Diffusion Tube Monitoring 2011

Location	Within AQMA?	Triplicate or Collocated Tube	Data Capture 2011 (Number of Months or %)	Data with less than 9 months has been annualised (Y/N)	Confirm if data has been distance corrected (Y/N)	Annual mean concentration (Bias Adjustment factor =0.90) 2011 (µg/m^3)
27 Upper Road	N	-	9 months	N	N	21.3
32 Mullaghmore Road	N	-	9 months	N	N	8.1
59 Shore Road	N	Duplicate	9 months	N	N	23.2
186 Shore Road	N	-	9 months	N	N	28.3
93 Belfast Road	N	-	8 months	N	N	26.9
Model PS Belfast Road	N	Duplicate	9 months	N	N	25.8
Junction Minorca Place- Tesco	N	-	8 months	Y [c]	N	28.1
42 Albert Road	N	-	9 months	N	N	20.8
Railway Station, Fergus Ave	N	-	9 months	N	N	13
Carrickfergus College North Road	N	-	9 months	N [c]	N	19.3

Location	Within AQMA?	Triplicate or Collocated Tube	Data Capture 2011 (Number of Months or %)	Data with less than 9 months has been annualised (Y/N)	Confirm if data has been distance corrected (Y/N)	Annual mean concentration (Bias Adjustment factor =0.90) 2011 (µg/m^3)
Lougmourne Lough Road	*N*		*3 months*	*Y*[c]	N	-
Victoria Road	N	-	9 months	N	N	28.5
W/head Island 28 Bentra Road	*N*		*2 months*	*Y*[c]	N	*23.6*
W/head Island Magee Road	N	-	8 months	Y[c]	N	14.7

Sites shown in italics were closed during 2011. Closed sites were annualised; details in Appendix A and Eurofins bias correction factor applied (0.84). Continued sites were also annualised if less than 9 months data were available.

[a] i.e. data capture for the monitoring period, in cases where monitoring was only carried out for part of the year.
[b] i.e. data capture for the full calendar year (e.g. if monitoring was carried out for six months the maximum data capture for the full calendar year would be 50%.)
[c] Means should be "annualised" as in Box 3.2 of TG(09), if monitoring was not carried out for the full year.
*Annual mean concentrations for previous years are optional.

The diffusion tube results for the three year period 2009 – 2011 are shown in Table 7. These show Carrickfergus has continued to meet the NO_2 annual mean objective in recent years.

Table 7 Results of Nitrogen Dioxide Diffusion Tubes 2009 – 2011

Site ID	Location	Within AQMA? (Rep of public exposure)	Data Capture for monitoring period[a] %	Data Capture for full calendar year 2011[b] %	Annual mean concentrations (µg/m^3) Bias Adjusted		
					2009	2010	2011
2	32 Mullaghmore Pk	N (Y)	100	75	8.5	17.9	8.1
10	Carrick College	N (Y)	100	75	11.9	21.6	19.3
9	Railway Stn, Fergus	N (Y)	100	75	17.9	16.5	13.0
5	93 Belfast Rd	N (Y)	100	75	24.9	20.1	26.9
14	Islandmagee Rd	N (Y)	89	67	17.0	17.5	14.7
6	Model PS	N (Y)	100	75	24.9	26.8	25.8
11*	Lough Rd	N (N)	100	33	5.6	11.6	17.6
8	42 Albert Rd	N (Y)	100	75	22.1	20.5	20.8
1	27 Upper Rd	N (Y)	100	75	24.1	23.1	21.3
3	59 Shore Rd	N (Y)	100	75	23.2	31.4	23.2
13*	28 Bentra Rd	N (N)	67	17	8.4	9.2	23.6
4	186 Shore Rd	N (Y)	100	75	28.8	28.6	28.3
12	Victoria Rd	N (Y)	100	75	25.2	23.2	28.5
7	Minorca Place	N (Y)	89	67	N/A	28.5	28.1

*Site closed

2.2.2 PM_{10}

Carrickfergus Borough Council does not currently undertake monitoring for PM10.

2.2.3 Sulphur Dioxide

Carrickfergus Borough Council does not currently undertake monitoring for Sulphur Dioxide.

2.2.4 Benzene

Carrickfergus Borough Council does not currently undertake monitoring for Benzene.

2.2.5 Other pollutants monitored

Carrickfergus Borough Council does not currently undertake monitoring for any further pollutants.

2.2.6 Summary of Compliance with AQS Objectives

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

3 Road Traffic Sources

3.1 Narrow Congested Streets with Residential Properties Close to the Kerb

Carrickfergus Borough Council confirms that there are no new/newly identified congested streets with a flow above 5,000 vehicles per day and residential properties close to the kerb, that have not been adequately considered in previous rounds of Review and Assessment.

3.2 Busy Streets Where People May Spend 1-hour or More Close to Traffic

Carrickfergus Borough Council confirms that there are no new/newly identified busy streets where people may spend 1 hour or more close to traffic.

3.3 Roads with a High Flow of Buses and/or HGVs.

Carrickfergus Borough Council confirms that there are no new/newly identified roads with high flows of buses/HDVs.

3.4 Junctions

Carrickfergus Borough Council confirms that there are no new/newly identified busy junctions/busy roads.

3.5 New Roads Constructed or Proposed Since the Last Round of Review and Assessment

The only major proposed road/road improvements relating to the Carrickfergus Borough Council area is the widening of the A2 at Shore Road, Greenisland from Seapark to Jordanstown (which is within the Newtownabbey Borough Council area). The scheme is part of the Department of Regional Development Roads Service Strategic Road Improvements Programme and as such does not go through the normal planning process, but has instead gone through the Department's statutory procedures. For this scheme this involved the publication of a draft Direction Order in March 2007 and consultation with all statutory consultees. Following a public enquiry the Direction Order was made in October 2008.

As part of the statutory procedures an Environmental Impact Assessment was conducted and an Environmental Statement was produced in March 2007. This statement included an air quality assessment. The assessment can be accessed at;

http://www.drdni.gov.uk/index/roadimprovements/schemes/a2_shore_road_greenisland.htm

The assessment includes 2010 AQ objectives and both NO_2 and PM_{10} have been considered. In section 14.4 of the assessment it states that "the results indicate there will be no significant effect on either local or regional air quality as a result of the proposed scheme. Local air quality pollutant concentrations would remain within the relevant air quality standards and are actually forecasted to marginally decrease from existing levels in the proposed year of the scheme opening. Moreover, there would be fewer properties in proximity to the proposed dual carriageway, than along the existing A2 and hence the strategic reassigning to the proposed dual carriageway from the existing Shore Road, there would be a net benefit with improved air quality for the majority of properties between Station Road and Seapark. In terms of regional air quality, generally there would be an overall significant reduction in concentrations from existing levels."

On 14th February 2012 the Minister for Regional Development announced that after several years of a delay (due to lack of funding), the scheme was now going to proceed to the procurement stage. Subject to the procurement process being

successfully completed, it is anticipated that the construction phase could start in early 2013 and is likely to take around 2 years to complete.

Carrickfergus Borough Council has assessed new/proposed roads meeting the criteria in Section A.5 of Box 5.3 in TG(09), and concluded that it will not be necessary to proceed to a Detailed Assessment.

3.6 Roads with Significantly Changed Traffic Flows

Carrickfergus Borough Council confirms that there are no new/newly identified roads with significantly changed traffic flows.

3.7 Bus and Coach Stations

Carrickfergus Borough Council confirms that there are no relevant bus stations in the Local Authority area.

4 Other Transport Sources

4.1 Airports

Carrickfergus Borough Council confirms that there are no airports in the Local Authority area.

4.2 Railways (Diesel and Steam Trains)

4.2.1 Stationary Trains

Carrickfergus Borough Council confirms that there are no locations where diesel or steam trains are regularly stationary for periods of 15 minutes or more, with potential for relevant exposure within 15m.

4.2.2 Moving Trains

Carrickfergus Borough Council confirms that there are no locations with a large number of movements of diesel locomotives, and potential long-term relevant exposure within 30m.

4.3 Ports (Shipping)

Carrickfergus Borough Council confirms that there are no ports or shipping that meet the specified criteria within the Local Authority area.

5 Industrial Sources

5.1 Industrial Installations

5.1.1 New or Proposed Installations for which an Air Quality Assessment has been Carried Out

Carrickfergus Borough Council confirms that there are no new or proposed industrial installations for which planning approval has been granted within its area.

5.1.2 Existing Installations where Emissions have Increased Substantially or New Relevant Exposure has been Introduced

Carrickfergus Borough Council confirms that there are no industrial installations with substantially increased emissions or new relevant exposure in their vicinity within its area or nearby in a neighbouring authority.

5.1.3 New or Significantly Changed Installations with No Previous Air Quality Assessment

Carrickfergus Borough Council confirms that there are no new or proposed industrial installations for which planning approval has been granted within its area or nearby in a neighbouring authority.

5.2 Major Fuel (Petrol) Storage Depots

There are no major fuel (petrol) storage depots within the Local Authority area.

5.3 Petrol Stations

Carrickfergus Borough Council confirms that there are no petrol stations meeting the specified criteria.

5.4 Poultry Farms

Carrickfergus Borough Council confirms that there are no poultry farms meeting the specified criteria.

6 Commercial and Domestic Sources

6.1 Biomass Combustion – Individual Installations

Carrickfergus Borough Council has identified a biomass boiler installation at Carrickfergus Leisure Centre which has not been assessed for air quality. In order to screen the proposed stack for air quality impacts, the biomass screening tool[1] on the LAQM website has been used. The stack release information is shown in Table 8.

Table 8 Biomass stack information, Carrick Fergus Leisure Centre

Stack information	
Diameter (m)	0.20
Stack height (m)	9
Output (Kw)	100
Fuel	wood pellets
PM_{10} emission rate (g/s)	0.0002
NOx emission rate (g/s)	0.0039
Grid reference (X&Y)	155126 - 542734

Building heights have been considered in this assessment; the boiler house which the stack is attached to is lower than the stack height of 9 m.

Results from the biomass calculator have shown the stack would be permissible at 9m. The target emission rate from the biomass calculator of 0.191g/s for NOx and 0.0449g/s for PM_{10} is well above the g/s emission rate from the stack for either pollutant. This information will be provided back to the planning department in order to allow them to make an informed decision.

Screen shots from the biomass tool are shown in Appendix D.

Carrickfergus Borough Council have assessed the biomass plant and determined

[1] http://laqm.defra.gov.uk/review-and-assessment/tools/emissions.html#biomass

there will be no exceedences of the air quality objectives with a stack height of 9m. It will not be necessary to carry out a Detailed Assessment.

6.2 Biomass Combustion – Combined Impacts

Carrickfergus Borough Council confirms that there are no biomass combustion plant in the Local Authority area.

6.3 Domestic Solid-Fuel Burning

Carrickfergus Borough Council confirms that there are no areas of significant domestic fuel use in the Local Authority area.

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7 Fugitive or Uncontrolled Sources

Carrickfergus Borough Council confirms that there are no potential sources of fugitive particulate matter emissions in the Local Authority area.

8 Conclusions and Proposed Actions

8.1 Conclusions from New Monitoring Data

Carrickfergus Borough Council has monitored NO_2 using passive diffusion tubes. The results show there were no exceedences of the Air Quality Strategy (AQS) objective. Therefore, there is no need to proceed with a Detailed Assessment.

8.2 Conclusions from Assessment of Sources

Carrickfergus Brough Council has not identified any new or newly planned developments within the borough that may have an impact on air quality.

8.3 Proposed Actions

Proposed actions for Carrickfergus Borough Council are:

- Continue to monitor pollution levels in the borough to ensure continuing compliance to the AQS objectives.
- Proceed to an Annual Progress Report in 2013.

9 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
- Local Air Quality Management Policy Guidance LAQM.PG(09). February 2009. Published by Defra in partnership with the Scottish Government, Welsh Assembly Government and Department of the Environment Northern Ireland
- A2 Shore Road Greenisland Environmental Statement. September 2006. Published by Roads Service, Department for Regional Development.
- Carrickfergus Borough Council 2011 LAQM Annual Progress Report
- Carrickfergus Borough Council 2010 LAQM Annual Progress Report
- Carrickfergus Borough Council 2009 LAQM Updating Screening and Assessment
- Carrickfergus Borough Council 2008 LAQM Annual Progress Report
- Carrickfergus Borough Council 2007 LAQM Annual Progress Report

Appendices

Appendix A: QA/QC Data

Appendix B: Biomass data

Appendix A: QA:QC Data

Factor from Local Co-location Studies

Carrickfergus does not have a continuous monitor and therefore no co-location study to derive a local bias correction factor.

Diffusion Tube Bias Adjustment Factors

Carrickfergus Borough Council currently uses Gradko to supply and analyse Nitrogen Dioxide diffusion tubes. Previously Carrickfergus BC used Eurofins to analyse their diffusion tubes. The method of tube preparation has remained 20% TEA in Water. Results obtained from diffusion tubes need to be corrected by applying an adjustment factor which takes into account the tendency for diffusion tubes from particular suppliers to over or under read concentrations when compared to real-time monitoring. For the year 2011 the bias adjustment factor for Gradko and is 0.9. Multiplying the measured annual concentration by the adjustment factor carries out correction for bias.

Discussion of Choice of Factor to Use

As Carrickfergus Borough Council has no means of automatically monitoring nitrogen dioxide concentrations, and has not carried out a diffusion tube co-location study, the bias adjustment factor for Gradko Nitrogen dioxide passive diffusion tubes has been used and verified by email from Gradko All bias correction factors were derived from the Diffusion_Tube_Bias_Factors v09_12.xls spreadsheet available from the LAQM website.

Sites which continued after the change in laboratory the default bias factor for Gradko was used. The two sites which closed used tubes prepared and analysed by Eurofins and for these the Environmental Sciences Group – Glasgow national bias correction figure was used.

QA/QC of diffusion tube monitoring

Gradko Ltd participated in both the WASP scheme and in the Marylebone Road Intercomparison during 2011.

Wasp performance

Having checked the document 'WASP – Annual Performance Criteria for NO_2 Diffusion Tubes' used in Local Air Quality Management (LAQM), 2008 onwards, and Summary of Laboratory Performance in Rounds 112-115 it can be seen that Gradko's performance for the year 2011 has been maintained from previous years.

Annualisation of Short-term data

Annualisation was carried out following the procedure given in TG(09) Box 3.2. Due to the change in laboratory the annualisation was performed on the greater number of months available; in most instances this was the tubes provided by Gradko. Sites which were closed in April 2011 had a maximum 3 months available data; and would have to be annualised; one month's data from site Bentra Road was removed from the data set as an outlier. A summary of the affected monitoring sites, the AURN urban background sites used and the derived annualisation factors are given in the table below:

Monitoring location	Uncorrected diffusion tube concentration	Belfast Centre annualisation factor	Derry annualisation factor	Average annualisation factor
Loughmourne Lough Road	32.1	0.711	0.597	0.654
28 Bentra Road	40.1	0.755	0.646	0.701
93 Belfast Road	24.9	1.156	1.249	1.202
Minorca Place junction	25.6	1.172	1.274	1.223
Islandmagee Road	14.2	1.103	1.206	1.155

Supplier	Eurofins			Gradko									Eurofins	Gradko
Site	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec	Raw Average Concentration	
1	51.20	45.50	18.10	27.08	24.51	25.57	14.69	23.57	21.47	27.93	22.52	25.80	38.3	23.7
2	37.80	44.40	44.40	16.28	8.10	5.11	4.90	7.31	7.45	10.29	11.05	10.79	**42.2**	9.0
3	38.70	18.10	34.70	29.76	21.16	30.20	21.41	25.65	23.72	30.91	21.65	29.94	30.5	26.0
3	*	*	*	28.03	21.19	32.53	22.07	27.68	19.89	24.33	22.24	31.05	*	25.4
4	20.10	32.00	32.00	37.42	24.20	32.30	27.30	31.20	25.40	37.27	30.42	37.74	28.0	31.5
5	40.40	40.70	40.70	-	24.67	31.85	23.19		28.74	32.49	30.80	27.35	*	22.1
6	*	*	*	40.92	26.58	38.53	20.31	33.56	21.82	25.34	18.46	25.25	**40.6**	27.9
6	-	25	25.00	40.34	27.99	32.88	35.20	29.07	20.41	28.56	23.19	27.90	25.0	29.5
7	13.1	-	-	-	22.81	29.08	24.11	28.66	20.78	27.11	21.01	31.03	13.1	25.6
8	54.20	53.20	53.20	31.36	21.83	27.44	9.78	19.25	21.70	27.65	26.10	23.27	53.5	23.2
9		38.80	8.50	18.16	13.55	13.80	8.16	10.65	12.51	17.07	20.32	15.50	23.7	14.4
10	38.80	23.00	23.00	44.40	14.02	22.13	22.08	21.21	15.35	19.40	24.71	9.76	28.3	21.5
11	17.50	39.40	39.40	-	-	-	-	-	-	-	-		32.1	-
12	27.10	38.10	38.10	15.96	-	15.93	11.42	11.88	13.74	14.42	19.43	10.66	34.4	31.6
13	9.20	40.10	40.10	-	-	-	-	-	-	-	-	-	40.1	-
14	-	12.70	12.70	16.28	8.10	5.11	4.90	7.31	7.45	10.29	11.05	10.79	12.7	14.2

Appendix B: Biomass Data

Biomass calculator results: PM_{10}

Review and Assessment Tool for PM_{10} from biomass combustion stacks

The maximum emissions of PM_{10} in g/s from biomass combustion source emissions are calculated for your given stack details. Greater emission rates may result in exceedence of the 24 hour objective for PM10 in England, Wales and Northern Ireland or the annual mean objective in Scotland.

Enter required information in Cream Cells
Resulting Emission in Red Bold

Building height	5	m
Stack diameter	0.2	m
Stack height	9	m
Location (Scotland, Rest of UK)	Rest of UK	
PM_{10} Annual mean background concentration (include roadside contribution at relevant receptors)	12.6	$\mu g/m^3$
Calculated Effective stack height	6.7	m
Target Emission Rate	0.0449	g/s

If the maximum stack emission rate is less than the target above then it is not likely that the most stringent objective for PM_{10} will be exceeded

Biomass calculator results: NO_2

Review and Assessment Tool for oxides of nitrogen emissions from biomass combustion stacks Annual mean NO_2 objective		
The target emissions of NO_x in g/s from biomass combustion source emissions are calculated for your given stack details. Greater emission rates may result in exceedence of the annual mean objective for NO_2		
Enter required information in Cream Cells Resulting Emission in Red Bold		
Building height	5	m
Stack diameter	0.2	m
Stack height	9	m
Location {Scotland, Rest of UK}	Rest of UK	
NO_2 Annual mean background concentration (include roadside contribution at relevant receptors)	11.9	$\mu g/m^3$
Calculated Effective stack height	6.7	m
Target Emission Rate	0.191	g/s
If the maximum stack emission rate is less than the target above then it is not likely that the annual mean limit value for NO_2 will be exceeded		