2014 Air Quality Progress Report
Isle of Wight Council

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

April 2014

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Executive Summary

Isle of Wight Council have kept air quality under review since the Updating and Screening Assessment 2012. A Progress Report was submitted in 2013, which indicated that there was unlikely to be any exceedences of statutory air quality standards on the Isle of Wight.

Officers in Environmental Health have a routine of reviewing on a weekly basis all applications for planning consent registered with the Local Planning Authority. In this way, developments with the potential to compromise air quality have been identified and assessed.

This Progress Report identifies those aspects that have changed since the Updating and Screening Assessment 2012 and 2013 Progress Report. The report concentrates on the progress on implementing local air quality management and achieving or maintaining concentrations below the air quality objectives. These aims are demonstrated by reporting on updated monitoring data and new local developments that might affect air quality.

The Progress Report provides a summary of all available monitoring data, indicating monitored pollutants and specific locations on the Isle of Wight. It concludes that air quality objectives were not exceeded in 2013. Isle of Wight Council will not therefore be required to undertake any Detailed Assessments of air quality in 2014. Isle of Wight Council will carry out a further LAQM Updating and Screening Assessment in 2015 for the 2014 data.

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1 Introduction

1.1 Description of Local Authority Area

Isle of Wight Council is a Unitary Authority which covers the whole of the Isle of Wight. The Isle of Wight is an island off the south coast of England. There are urban areas at Newport, Ryde, Cowes, Freshwater and Ventnor, and the south-east coastal strip between Sandown and Shanklin. However, the majority of the Island is rural in character.

Tourism is a major contributor to the Island economy. It is estimated that the population is approximately double during the holiday season, with a large influx of visitors.

There are various industrial installations that are Permitted under the Environmental Permitting (England and Wales) Regulations 2010 (as amended). However, the main source of air pollution is road traffic.

1.2 Purpose of Report

This report fulfils the requirements of the Local Air Quality Management 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.

The objective of this Progress Report is to identify any matters that have changed which may lead to risk of an air quality objective being exceeded

1.3 Air Quality Objectives

The air quality objectives applicable to LAQM **in England** are set out in the Air Quality (England) Regulations 2000 (SI 928), The Air Quality (England) (Amendment) Regulations 2002 (SI 3043), and are shown in Table 1.1. This table shows the objectives in units of micrograms per cubic metre $\mu g/m^3$ (milligrammes per cubic metre, mg/m^3 for carbon monoxide) with the number of exceedences in each year that are permitted (where applicable).

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

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
	5.00 $\mu g/m^3$	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

1.4.1 First Round Air Quality Review

The first round of the review in 2000 gave results that indicated that it was not necessary to proceed to a Detailed Assessment, as the specified pollutants were predicted to be below the Air Quality Objectives.

1.4.2 Second Round Updating and Screening Assessment 2004

During the second round, the Updating and Screening report 2004 identified that there was a possibility that, for two of the pollutants, concentrations may exceed the Objectives in specific areas.

A Detailed Assessment was carried out in 2004, examining two pollutants. Since the first round of assessment, a new housing estate had been built close to the petrol storage depot at Kingston, East Cowes. Computer modelling was therefore carried out, to predict benzene concentrations in the area. This was supplemented by diffusion tube monitoring for a short period. The results of the monitoring were reported in an Air Quality Progress Report in 2005. The modelling, together with the diffusion tube results, showed that the benzene concentration in air close to the site was very unlikely to exceed the Objective. There was therefore no need to declare an Air Quality Management Area for Benzene.

In addition, the modelling for sulphur dioxide emissions from the three cross-Solent ferry terminals also showed that there would be no exceedences of the short-term Objective for SO2.

1.4.3 Third Round Updating and Screening Assessment 2006

During the third round, in 2006, it was identified that, at two of the sites (Fairlee Road and Lake Hill) there is a possibility that the Air Quality Objective for Nitrogen dioxide may be exceeded.

It was therefore decided to increase the number of diffusion tubes placed at the two sites, to monitor nitrogen oxides. Diffusion tubes are not as exact as they could be, so there was some doubt about the actual concentrations measured. Using three tubes at each site gives a more reliable result.

1.4.4 Detailed Assessment for Nitrogen Dioxide 2007

This was carried out using additional monitoring, using diffusion tubes. The 2007 Detailed Assessment Report concluded that there were unlikely to be exceedences of the guideline standard for Nitrogen dioxide at either of the two sites referred to above.

1.4.5 Progress report 2008.

Reported on changes, and concluded that the air quality standards were unlikely to be exceeded.

1.4.6 Fourth Round Updating and Screening Assessment 2009

This concluded that the air quality guidelines were unlikely to be exceeded, and that there is therefore no requirement to proceed to a Detailed Review.

1.4.7 Progress Report 2010

This reported the results of additional diffusion tube monitoring of Nox at a second site on Fairlee Road, Newport. The results confirmed the adjusted results from the original monitoring site, that exceedences of NO2 limits are unlikely.

Other changes reported were also assessed as being unlikely to result in exceedences of the air quality standards.

1.4.8 Progress Report 2011

This reported on certain planning developments, and continuing monitoring of NO2 at two sites. It concluded that the changes were assessed as unlikely to result in exceedences of the air quality standards.

1.4.9 Fifth Round Updating and Screening Assessment 2012

This concluded that the air quality guidelines were unlikely to be exceeded, and that there is therefore no requirement to proceed to a Detailed Review.

1.4.10 Progress Report 2013

This reported on certain planning developments, and continuing monitoring of NO2 at two sites. It concluded that the changes were assessed as unlikely to result in exceedences of the air quality standards.

1.4.11 Conclusion

As a result of previous assessments and Progress Reports, no Air Quality Management Areas have been declared on the Isle of Wight.

2 New Monitoring Data

2.1 Summary of Monitoring Undertaken

2.1.1 Automatic Monitoring Sites

There are no automatic monitoring sites on the Isle of Wight.

2.1.2 Non-Automatic Monitoring Sites

There are two sites on the Isle of Wight where NO2 is monitored by diffusion tubes. IOW4 is at Newport and has been maintained since the beginning of monitoring in 2000, and therefore provides an estimate of changes year on year.

IOW10 is at Lake, on the main road between Sandown and Shanklin. It has replaced a site (IOW8) which had been identified as having no relevant exposure.

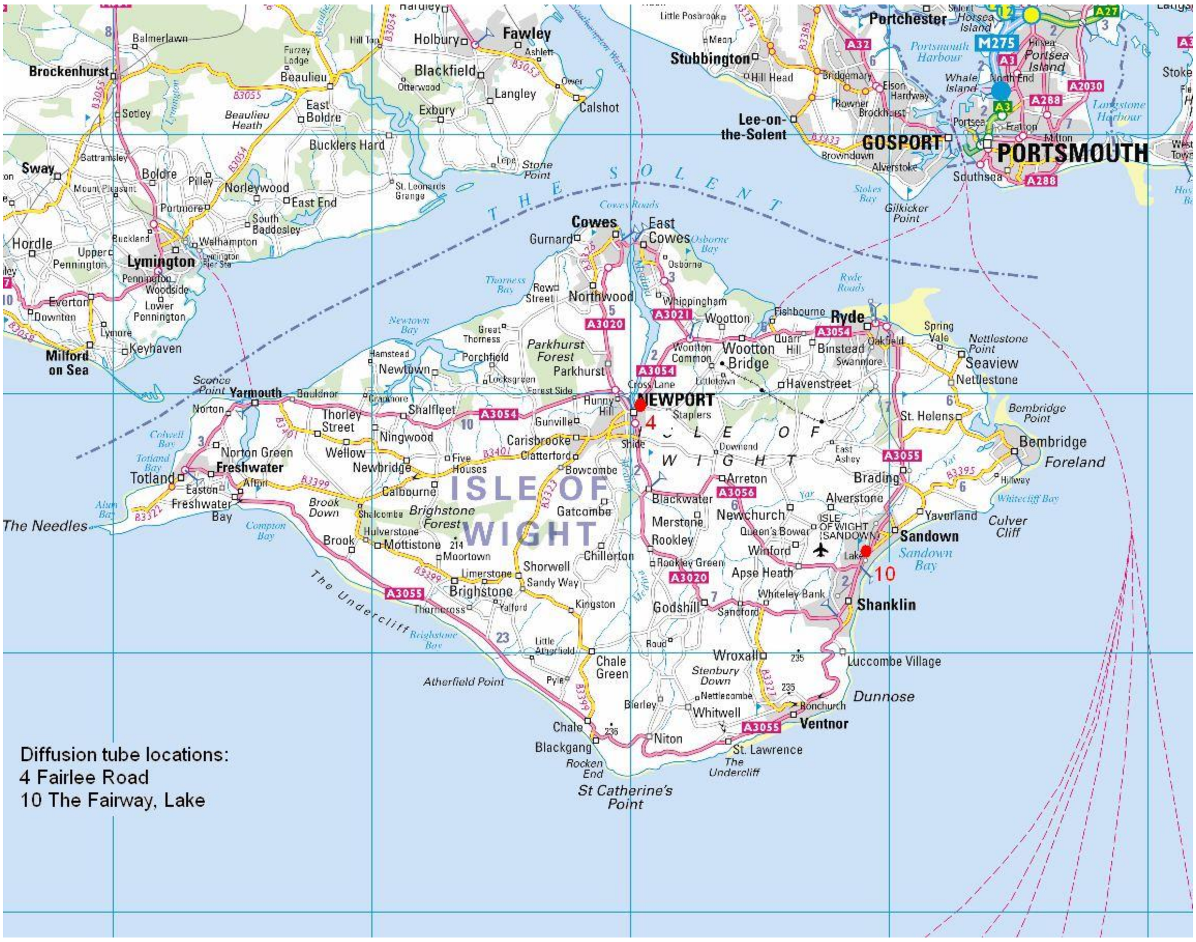
The laboratory used by Isle of Wight Council is the same as in previous years (Bureau Veritas ESGLtd. – Gradco 50% TEA in acetone).

The laboratory in Didcot is listed in the table of the WASP rounds 105 – 113 as having a score of 100%.

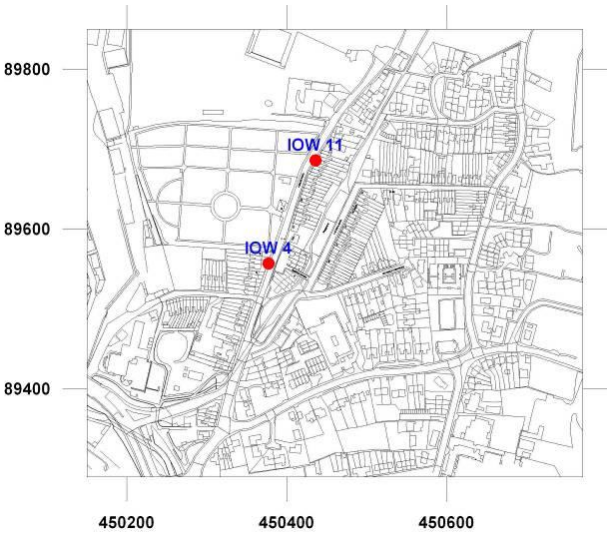
The bias adjustment factor used is the national bias adjustment factor for Gradko 50% TEA in acetone. This is 0.93 (for 2013).

Figure 2.2 Map of Non-Automatic Monitoring Sites

2.1.3 Map 1 General map

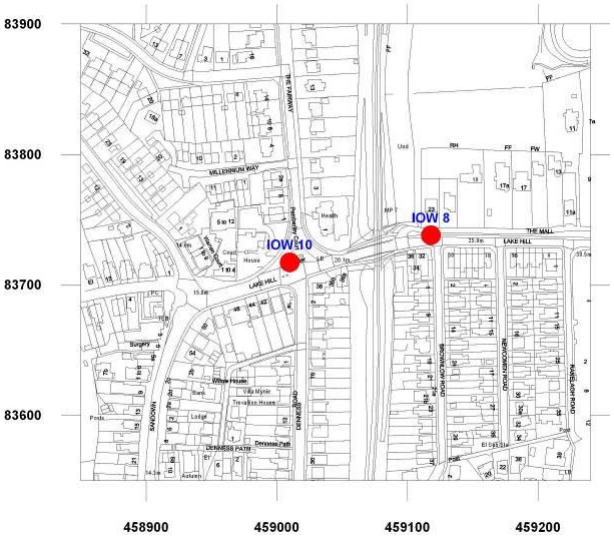


2.1.4 Map 2 Fairlee Road, Newport



IOW11 is no longer in use.

2.1.5 Map 3 Lake



IOW8 is no longer in use.

Table 2.2 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?
IOW4	Kerbside	450377	089557	NO_2	N	N	N (11m)	0 m	Y
IOW10	Kerbside	459008	083715	NO_2	N	N	N (23 m)	2 m	Y

2.2 Comparison of Monitoring Results with AQ Objectives

The only monitoring carried out routinely is of Nitrogen dioxide.

2.2.1 Nitrogen Dioxide

Monitoring using diffusion tubes continues at two sites. A short period of monitoring at a site near to IOW4 (IOW11) confirmed that the monitoring at IOW4 gives representative results.

IOW4 is attached to a lamp-post on the kerb. Fairlee Road is the main route between Newport and Ryde, and also forms the main route from the vehicle ferry terminals at Fishbourne and East Cowes and destinations to the West and South of Newport. Three tubes are exposed at this site.The nearest relevant public exposure is at the façade of the dwelling-house 51 Fairlee Road, set back about 11m from the kerb. The results show an increase in NO2 levels, which may be attributable to the increase in traffic in that area. However there is a significant fall in HGV.

AADFYear	CarsTaxis	LightGoodsVehicles	AllHGVs	AllMotorVehicles
2007	17126	2491	745	21187
2008	15795	2441	506	19577
2009	15748	2436	471	19504
2010	15978	2491	656	19895
2011	15881	2558	638	19901
2012	17493	2784	423	21343
2013	17454	2881	420	21405

Table 2.3 Department of Transport traffic data for IW4 location - www.dft.gov.uk/traffic-counts/

IOW10 is attached to a lamp-post on the triangular green on the junction of Lake Hill, Sandown Road and The Fairway. The nearest relevant public exposure is at The Old Manor House public house, and dwellings at 1 Denness Road and 38 and 40 Sandown Road. It is also likely to be representative of levels at other locations along Sandown Road and Lake Hill, where there is relevant exposure. One tube is located at this site. The results also show an increase in NO2 level which may be attributable to the increase in traffic including HGVs.

AADFYear	CarsTaxis	LightGoodsVehicles	AllHGVs	AllMotorVehicles
2007	12288	1969	183	15084
2008	12459	2083	189	15376
2009	12645	2193	185	15672
2010	12557	2241	188	15613
2011	12758	2532	193	16130
2012	12569	2853	197	16300
2013	12571	2644	195	16150

Table 2.4 Department of Transport traffic data for IW10 locations www.dft.gov.uk/traffic-counts/

Diffusion Tube Monitoring Data

See the tables below.

Table 2.5 Results of Nitrogen Dioxide Diffusion Tubes in 2013

Site ID	Location	Site Type	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 = 0.93) 2013 (μg/m^3)
IOW4	Lamppost outside 51 Fairlee Road, Newport	Kerbside	N	Triplicate	12 months	N/A	See column to the right	52.8 (kerbside) 31.8 (corrected for distance)
IOW10	Lamppost on the green at Lake Hill / The Fairway, Lake	Kerbside	N	Single tube	12 months	N/A	N	26.68

Table 2.6 Results of Nitrogen Dioxide Diffusion Tubes (2007 to 2013)

Site ID	Site Type	Within AQMA?	Annual mean concentration (adjusted for bias) μg/m^3						
			2007 (Bias Adjustment Factor = 0.99)	2008 (Bias Adjustment Factor = 0.94)	2009 (Bias Adjustment Factor = 0.97)	2010 (Bias Adjustment Factor = 1.03)	2011 (Bias Adjustment Factor = 0.93	2012 (Bias Adjustment Factor = 0.93	2013 (Bias Adjustment Factor = 0.93
IOW4	Kerbside	N	33.47	41.55	42.96	58.42	45.77	47.81	52.8
IOW10	Kerbside	N	24.05	24.43	23.23	30.64	24.58	21.83	26.68

Note: The figures in the table above are the kerbside results. Bias adjustment factors in this table are the national bias adjustment factors for the year in question. Some reports in previous years used bias adjustment factors for the year before, and therefore may

not correspond to those used here. This report is submitted in April 2011, using this year's bias adjustment value. The value of 0.93 was therefore used.

Table 2.7 Results for IOW4 corrected for distance (2007 to 2013)

Site ID	Site Type	Within AQMA?	Annual mean concentration (adjusted for bias) μg/m^3						
			2007 (Bias Adjustment Factor = 0.88)	2008 (Bias Adjustment Factor = 1.05)	2009 (Bias Adjustment Factor = 0.99)	2010 (Bias Adjustment Factor = 0.93)	2011 (Bias Adjustment Factor = 0.93)	2012 (Bias Adjustment Factor = 0.93)	2013 (Bias Adjustment Factor = 0.93)
IOW4	Kerbside	N	22.8	24.4	24.4	29.8	27.8	23.8	31.8

Distance-corrected values for IOW10 are not given, as the uncorrected values are below the limit.

This calculator allows you to predict the annual mean NO_2 concentration for a locati ("receptor") that is close to a monitoring site, but nearer or further the kerb than the monitor. The next sheet shows your results on a graph.

-

Enter data into the yellow cells

Step 1	**How far from the KERB was your measurement made (in metres)?**	(Note 1)	**0.5**	metres
Step 2	**How far from the KERB is your receptor (in metres)?**	(Note 1)	**11**	metres
Step 3	**What is the local annual mean background NO_2 concentration (in $\mu g/m^3$)?**	(Note 2)	**14.335635**	$\mu g/m^3$
Step 4	**What is your measured annual mean NO_2 concentration (in $\mu g/m^3$)?**	(Note 2)	**52.8**	$\mu g/m^3$
Result	**The predicted annual mean NO_2 concentration (in $\mu g/m^3$) at your receptor**	(Note 3)	**31.8**	$\mu g/m^3$

Note 1: In some cases the term "kerb" may be taken to be the edge of the trafficked road - see the FAQ at http://laqm2.defra.gov.uk/FAQs/Monitoring/Location/index.htm for further details. Distances should be measured horizontally from the kerb and assumes that the monitor and receptor have similar elevations. Each distance should be greater than 0.1m and less than 50m (In practice, using a value of 0.1m when the monitor is closer to the kerb than this is likely to be reasonable). The receptor is the location for which you wish to make your prediction. The monitor can either be closer to the kerb than the receptor, or further from the kerb than the receptor. The closer the monitor and the receptor are to each other, the more reliable the prediction will be. When your receptor is further from the kerb than your monitor, it is recommended that the receptor and monitor should be within 20m of each other. When your receptor is closer to the kerb than your monitor, it is recommended that the receptor and monitor should be within 10m of each other.

Note 2: The measurement and the background must be for the same year. The background concentration could come from the national maps published at www.airquality.co.uk, or alternatively from a nearby monitor in a background location.

Note 3: The calculator follows the procedure set out in Box 2.3 of LAQM TG(09). The results will have a greater uncertainty than the measured data. More confidence can be placed in results where the distance between the monitor and the receptor is small than where it is large.

Issue 4: 25/01/11. Created by Dr Ben Marner; Approved by Prof Duncan Laxen. Contact: benmarner@aqconsultants.co.uk

Figure 2.4 Trends in Annual Mean Nitrogen Dioxide in concentrations (in μg/m3) measured at Diffusion Tube Monitoring Sites between 2007 and 2013.

2.2.2 PM_{10}

PM_{10} is not currently monitored on the Isle of Wight. There have been no new combustion, quarrying or construction activities on the Isle of Wight which would cause significant rises in PM_{10} levels. Department of Transport screening models are used with traffic count data to identify where there may be exceedences which then require actual air quality monitoring. PM_{10} level have been found to be significantly below the Air Quality objectives. For example the annual PM_{10} levels for the NOx tube location IW4 (Fairlee Road, Newport) is predicted as being 21μg/m3 using 2013 data.

2.2.3 Sulphur Dioxide

Sulphur Dioxide SO_2 is not monitored on the Isle of Wight. There are no coal or heavy fuel oil combustion processes which would significantly increase in SO_2 pollution levels. The 2005 detailed assessment of the shipping ports predicted that exceedences were not likely and that the impact of the ship emissions upon local receptors was not significant. There have been no significant increases in activity to require a re-assessment.

2.2.4 Benzene

Benzene is not monitored on the Isle of Wight. The East Cowes petrol storage depot was identified during the first round of review and assessment, as a new housing estate had been built adjacent to the site. Dispersion modelling for benzene supplemented with benzene diffusion tube monitoring for a short period (The results of which were reported in the 2005 Progress Report), identified that exceedences of the benzene objective were unlikely at the worse case receptors. There was therefore no need to declare an Air Quality Management Area for benzene.

As there have been no significant changes to the site in terms of either exposure or emissions since the 2004 Detailed Assessment, there is no need to reassess the depot again in this report.

2.2.5 Other pollutants monitored

No other pollutants are monitored.

2.2.6 Summary of Compliance with AQS Objectives

Isle of Wight Council has examined the results from monitoring in the Unitary Authority area. 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

Isle of Wight 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

Isle of Wight 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.

Isle of Wight Council confirms that there are no new/newly identified roads with high flows of buses/HGVs.

3.4 Junctions

Isle of Wight 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

Isle of Wight Council confirms that there are no new/newly Constructed or Proposed Since the Last Round of Review and Assessment

3.6 Roads with Significantly Changed Traffic Flows

Isle of Wight Council confirms that there are no new/newly identified roads with significantly changed traffic flows, and concluded that it will not be necessary to proceed to a Detailed Assessment.

3.7 Bus and Coach Stations

Isle of Wight Council confirms that there are no relevant bus stations in the Local Authority area.

4 Other Transport Sources

4.1 Airports

Two airfields for light aircraft (Bembridge and Sandown) have previously been assessed as having no significant impact on air quality.

Isle of Wight Council confirms that there are no airports in the Local Authority area.

4.2 Railways (Diesel and Steam Trains)

4.2.1 Stationary Trains

Isle of Wight 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

Isle of Wight 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)

Sulphur dioxide emissions from the cross-Solent ferries has previously been the subject of a Detailed Assessment. This demonstrated that emissions from the ferries at all three ports (Yarmouth, East Cowes and Fishbourne) are not resulting in exceedences of air quality standards. Since that Detailed Assessment there have been no changes in the ferry fleets, and any alterations to timetables have not affected emission rates.

Isle of Wight 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

Planning applications

Isle of Wight Council has assessed new/proposed industrial installations, and concluded that it will not be necessary to proceed to a Detailed Assessment.

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

Isle of Wight 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

Isle of Wight 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 is a major fuel (petrol) storage depot within the Local Authority area, but this has been considered in previous reports. There have been no changes, and therefore it is not necessary to proceed to a further detailed assessment.

5.3 Petrol Stations

Isle of Wight Council confirms that there are no petrol stations meeting the specified criteria**.**

5.4 Poultry Farms

Isle of Wight Council confirms that there are no poultry farms meeting the specified criteria.

6 Commercial and Domestic Sources

6.1 Biomass Combustion – Individual Installations

Isle of Wight Council has assessed biomass combustion plant, and concluded that it will not be necessary to proceed to a Detailed Assessment.

6.2 Biomass Combustion – Combined Impacts

Isle of Wight Council is not aware of any large-scale conversion to small domestic or commercial biomass plant. Such plant is excluded from the planning process by Permitted Development rules, making it unlikely that the Local Authority will get to know about any significant areas of cumulative small biomass plant.

Isle of Wight Council has assessed the biomass combustion plant, and concluded that it will not be necessary to proceed to a Detailed Assessment.

6.3 Domestic Solid-Fuel Burning

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

7 Fugitive or Uncontrolled Sources

Isle of Wight Council confirms that there are no new potential sources of fugitive particulate matter emissions in the Local Authority area.

8 Conclusions and Proposed Actions

8.1 Conclusions from New Monitoring Data

Monitoring data for 2013 has demonstrated an increase in NO_2 concentrations in comparison to 2012.

Isle of Wight Council concludes that there is unlikely to be exceedences of the air quality standard for Nitrogen dioxide, and therefore no need to progress to a Detailed Assessment.

However, the situation will be kept under review, and monitoring will continue. Results will be reported annually.

8.2 Conclusions from Assessment of Sources

Having assessed new sources since the 2012 Updating and Screening Assessment, Isle of Wight Council is satisfied that there are unlikely to be exceedences of the Air Quality Standards, and that it is will not be necessary to proceed to a Detailed Review.

8.3 Proposed Actions

Isle of Wight Council Environmental Health will continue to liaise with Isle of Wight Council Planning Services to identify new potentially polluting developments as they arise. Any Air Quality Assessments deemed to be necessary will be asked for at the Planning stage.

Isle of Wight Council will continue to carry out the monitoring programme for Nitrogen dioxide using diffusion tubes.

9 References

Isle of Wight Council, Round 1 Review and Assessment (Stage's I to III)

Isle of Wight Council, Updating and Screening Assessment, 2004.

Isle of Wight Council, Detailed Assessment, 2004.

Isle of Wight Council, Air Quality Progress Report, 2005.

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Defra, Part IV of the Environmental Act 1995 Local Air Quality Management Technical Guidance LAQM.TG(09), 2009.

UK Air Quality Archive, Nitrogen Dioxide Fall Off With Distance Calculator Issue 4. http://laqm.defra.gov.uk/tools-monitoring-data/no2-falloff.html

UK Air Quality Archive, Estimated Background Air Pollution Maps for 2008 and Projections for Other Years. http://laqm.defra.gov.uk/review-and-assessment/tools/background-maps.html

National bias adjustment factors, September 2011. http://laqm.defra.gov.uk/bias-adjustment-factors/national-bias.html

Appendix A: QA:QC Data

Diffusion Tube Bias Adjustment Factors

Bias adjustment is effectively a calculated factor which shows whether diffusion tubes are over or under reading ambient concentrations and therefore allows for a correction to be made.

As there is no local automatic monitoring, Isle of Wight Council uses a national factor as given on the review and assessment help desk website[1] for Bureau Veritas (Gradko 50% TEA in acetone).

Factor from Local Co-location Studies (if available)

As the council does not carry out any continuous monitoring on the Island the national bias adjustment factor for Bureau Veritas (Gradko 50% TEA in acetone) has instead been used. The factors used in this assessment are as follows:

2000 - 1.2
2001 - 1.45
2002 - 1.27
2003 - 1.11
2004 - 1.1
2005 - 1.1
2006 - 1.01
2007 - 0.98
2008 - 0.93
2009 - 0.97
2010 - 1.03
2011 – 0.93

Discussion of Choice of Factor to Use

The Council has used the national factor for Bureau Veritas (Gradko 50% TEA acetone) as no local continuous monitoring is carried out.

PM Monitoring Adjustment

The Council does not carry out any local monitoring for PM_{10}.

Short-term to Long-term Data adjustment

This has not been necessary for the three years covered by this report.

QA/QC of automatic monitoring

No automatic monitoring is carried out on the Island.

QA/QC of diffusion tube monitoring

The Workplace Analysis Scheme for Proficiency (WASP) is an independent analytical performance testing scheme, operated by the Health and Safety Laboratory (HSL). WASP formed a key part of the former UK NO_2 Network's QA/QC, and remains an important QA/QC exercise for laboratories supplying diffusion tubes to Local Authorities for use in their Local Air Quality Management work.

Defra and the Devolved Administrations advise that diffusion tubes used for LAQM should be obtained from laboratories that have demonstrated satisfactory performance in the WASP scheme.

Out of a rating of GOOD, ACCEPETABLE, WARNING AND FAILURE, the results for 2008 show that Bureau Veritas (Gradko) were rated as GOOD. This is classified as follows:

GOOD: Results obtained by the participating laboratory, Bureau Veritas (Gradko 50% TEA in acetone) are on average within 13% of the assigned value. This equates to an RPI of 169 or less.

I attach a copy of a report on methodology and QA / QC from Environmental Scientific Group Ltd., Didcot (Appendix B). This report is copyright Environmental Scientifics Group Ltd., Unit 12, Moorbrook, Southmead Industrial Estate, Didcot, Oxfordshire, OX11 7HP and may not be reproduced without their consent.

Figure A1 Table of precision of diffusion tubes

Checking Precision and Accuracy of Triplicate Tubes

AEA Energy & Environment
From the AEA group

Diffusion Tubes Measurements										Automatic Method		Data Quality Check	
Period	Start Date dd/mm/yyyy	End Date dd/mm/yyyy	Tube 1 μgm^{-3}	Tube 2 μgm^{-3}	Tube 3 μgm^{-3}	Triplicate Mean	Standard Deviation	Coefficient of Variation (CV)	95% CI of mean	Period Mean	Data Capture (% DC)	Tubes Precision Check	Automatic Monitor Data
1	05/01/2011	02/02/2011	56.8	60.5	56.5	58	2.2	4	5.5			Good	
2	02/02/2011	02/02/2011	57.7	60.8	63.0	61	2.7	4	6.6			Good	
3	02/02/2011	31/03/2011	57.0	59.8	55.8	58	2.1	4	5.1			Good	
4	31/03/2011	27/04/2011	43.1	54.2	39.8	46	7.5	17	18.7			Good	
5	27/04/2011	02/06/2011	36.3	36.2	39.1	37	1.6	4	4.1			Good	
6	02/06/2011	29/06/2011	40.5	40.8	41.7	41	0.6	2	1.6			Good	
7	29/06/2011	03/08/2011	47.9	45.8	37.8	44	5.3	12	13.2			Good	
8	03/08/2011	31/08/2011	46.0	43.0	41.3	43	2.4	5	5.9			Good	
9	31/08/2011	29/09/2011	47.3	44.1	48.1	47	2.1	5	5.3			Good	
10	29/09/2011	02/11/2011	54.5	58.0	54.6	56	2.0	4	4.9			Good	
11	02/11/2011	29/11/2011	57.2	47.6	54.4	53	4.9	9	12.3			Good	
12	29/11/2011	04/01/2012	48.9	44.3	51.3	48	3.6	7	8.8			Good	
13													
											Overall survey -->	Good precision	#DIV/0!

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

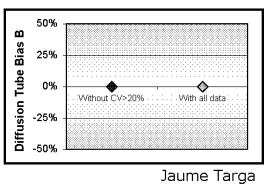
Site Name/ ID:

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

(Check average CV & DC from Accuracy calculations)

Accuracy (with 95% confidence interval) without periods with CV larger than 20%		
Bias calculated using 0 periods of data		
Bias factor A	#DIV/0!	
Bias B	#DIV/0!	
Diffusion Tubes Mean:	#DIV/0!	μgm^{-3}
Mean CV (Precision):	#DIV/0!	#DIV/0!
Automatic Mean:	#DIV/0!	μgm^{-3}
Data Capture for periods used	#DIV/0!	#DIV/0!
Adjusted Tubes Mean:	#DIV/0!	μgm^{-3}

Accuracy (with 95% confidence interval) WITH ALL DATA			
Bias calculated using 0 periods of data			
Bias factor A	#DIV/0!		
Bias B	#DIV/0!		
Diffusion Tubes Mean:	#DIV/0!	μgm^{-3}	
Mean CV (Precision):	#DIV/0!		#DIV/0!
Automatic Mean:	#DIV/0!	μgm^{-3}	
Data Capture for periods used	#####		#DIV/0!
Adjusted Tubes Mean:	#DIV/0!	μgm^{-3}	



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Appendix B – Report from the laboratory

ESG
Environmental Scientifics Group

Information Sheet – NO_2 Diffusion Tubes

50% TEA:50% Acetone (Blue Cap)

20% TEA:80% Water (Black Cap)

50% TEA: 50% Acetone – Alternate Holder

Overview;

It has been shown (*Palmes et al 1976*) that the principle of molecular diffusion can be utilised for the indicative measurement of ambient nitrogen dioxide in the atmosphere. Using this research, a cost effective passive sampler was developed for the diffusive monitoring of NO_2.

Diffusion Tube Performance:

Uncertainty:	Under European guidelines, diffusion tubes are considered an indicative method, and as such the uncertainty is defined as <20%. (In field intercomparisons Scientifics' diffusion tubes perform at <10% uncertainty.)
Analytical Repeatability:	± 2.1%
LOD:	0.03µg NO_2 on the tube. Over a 4-week exposure this would equate to 0.6µg/m^3, or 0.3ppb
Shelf-life:	Tubes should be analysed within 4 months of manufacture
Storage:	Ideally, tubes should be stored in a fridge. A cool dark location is an acceptable alternative.
Exposure:	2-6 Weeks
Diffusion Coefficient:	0.1361cm^{2}s^{-1} at STP (*Massman 1998*)
Quality Assurance:	- The manufacture and analysis of NO_2 diffusion tubes is covered by our UKAS accreditation - The method meets the requirements laid out in DEFRA's "Diffusion Tubes For Ambient NO2 Monitoring: Practical Guidance." - The laboratory has taken part in the WASP proficiency scheme since it's inception, and has the highest ranking of 'Satisfactory' as well achieving 100% on the DEFRA scoring system.

Manufacture:

Description:	Two stainless steel grids coated in the absorbent are located within a coloured polyethylene end cap. The cap is placed on a polypropylene tube and the open end sealed with a white polyethylene cap.	
Quality Control:	2% of manufactured tubes are analysed to check the tubes are free from contamination.	
Tubes:	Material:	Natural Polypropylene
	Internal Diameter:	10.8 ± 0.2 mm
	Outer Diameter:	13.8 ± 0.4 mm
	Length:	71.0 ± 1.0 mm
Stainless Steel Grids:	Type:	304
	Diameter:	12mm
	Weave:	Plain
	Mesh Number:	100
	Wire Diameter:	0.112mm
	Aperture:	0.142mm
	Open Area:	31.3%
	Weight:	0.62 kg/m^2
End Caps (Grid End):	Material:	LDPE (Low Density Polyethylene)
	Colour:	Blue or Black
	Internal Diameter:	13.70mm ± 0.25mm
	Height:	14.99mm ± 0.25mm
End Cap:	Material:	LDPE (Low Density Polyethylene)
	Colour:	White
Absorbent:	50% Triethanolamine : 50% Acetone	Dipping Method (Blue Caps)
	20% Triethanolamine : 80% Ultrapure Water	Pipette Method (Black Caps)

Dispatch:

- Each tube is labelled with a unique, sequentially numbered ID, and each batch placed in an airtight bag before being dispatched to the customer.
- An exposure sheet, pre-printed with the tube IDs and manufacturing lot number, is included with each batch of tubes.
- Each bag of tubes is marked with a use by date.
- Tubes will normally be dispatched 7-14 days prior to the changeover date.
- Upon receipt the tubes should be checked, and then left in the airtight bag prior to use.

Exposure:

- A monitoring site should be selected that best meets current guidelines.
- Clips or similar should be used to position the tubes, so that they are approximately 5cm from any flat surface, and ideally 1.5m from the ground. However, it is not uncommon practice to position the tubes higher to prevent vandalism.
- To begin exposure, remove the white end cap, and position the tube perpendicular to the ground with the open-end facing down.
- Note the time and date in the 'On Time' column of the exposure sheet.
- If required, a brief description of the tube location should be entered in the 'Site' column.
- Once the exposure is complete the process should be reversed – Remove the tube, replace the white cap, and note the date and time in the 'OFF time' column. Return the tube to the airtight bag.
- Where applicable, additional observations should be annotated on the exposure sheet e.g. spider in tube, water in tube etc;
- The tubes should then be returned to the laboratory for analysis as soon as possible.

Note 1: Insects should be removed before the white cap is replaced.

Note 2: The tubes should be put out for exposure no later than the use-by date given on the tubes.

Analysis:

Analytical Technique:	Colorimetric
Instrument:	Continuous Flow Auto-analyser
Principle:	Nitrite ions react with Sulphanilamide to form a diazonium compound. In acidic conditions, this couples with N-(1-naphthyl)-ethylenediamine dihydrochloride to form a purple azo dye. Utilising spectrophotometric analysis at 540nm, the NO_2 concentration is calculated by quantification of the colour change in comparison to that produced by known standards.
Extraction:	To ensure complete, homogeneous extraction, a vibrating tray or vortex mixer is used.
Quality Control:	A quality control sample of known concentration is run every 10 samples. The data generated is compared to acceptable limits as determined statistically using a Shewhart Chart control system. The laboratory takes part in inter-comparison schemes, to monitor data accuracy.

Reporting & Calculations:

- Data is imported directly from the analytical software, eliminating the possibility of transcription errors.
- As per current guidelines, air volumes are calculated assuming an average exposure temperature of 11°C, and a pressure of 101.3kPa.
- Final results are converted to an equivalency at 20°C, to allow direct comparison to EU guidelines.
- The report lists;
  - The amount of the Nitrite (NO_2) on the tube in µg. This is the analytically derived value.
  - The µg/m^3 of gaseous NO_2 at the sampling location. Knowing the tube dimensions and gas diffusion coefficient, the sampling rate of the tube can be calculated. In turn, knowing the sampling rate, the length of exposure and the total µg of NO_2 on the tube allows the µg/m^3 of NO_2 to be calculated.
  - Parts Per billion (ppb) NO_2. The ppb levels are calculated from the µg/m^3 value, using the known relationship that: ppb = 24.04 x Concentration (µg/m^3) / Molecular Weight. For NO_2, 1ppb = 1.91 µg/m^3, or 1 µg/m^3 = 0.52ppb (at 20°C, 101.3kPa)
- A soft copy of the report is emailed to the customer (for ease of data handling), with a hard copy being available on request.

NOTE: ***The reported values are NOT bias adjusted. The guidance is for the end user to select and use the bias factor best suited to their monitoring program.***

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