Neath Port Talbot
Castell-nedd Port Talbot
County Borough Council Cyngor Bwrdeistref Sirol
Making a difference Gwahaniaeth er gwell

Part IV Environment Act 1995

Review and Assessment of Air Quality

Updating and Screening Assessment (April 2006)

April 2006

Air Quality

UPDATING AND SCREENING ASSESSMENT (APRIL 2006)

CONTENTS

SUMMARY
This document has been produced in response to the requirements of the Welsh Assembly Government for the review and assessment of air quality. This review under part IV of the Environment Act 1995 consists of two stages. The first stage is an updating and screening assessment of all seven pollutants designated for the purposes of local air quality management. The second stage is a detailed assessment of individual pollutants if the first stage screening assessment indicates that it is needed.

The updating and screening assessments are set out on the following pages and these relate to:

- Carbon monoxide
- Benzene
- 1,3-Butadiene
- Lead
- Nitrogen dioxide
- Sulphur dioxide
- Fine particulate matter (PM_{10})

The updating and screening assessment in relation to five of the seven pollutants identified that there was no need to proceed to a detailed assessment. There were also no new or modified sources producing any significant affect to air quality in this Authorities area from outside the area.

Additional diffusion tube monitoring carried out following the previous review and assessment has shown that nitrogen dioxide concentrations at Victoria Gardens, Neath do not exceed the annual average (objective level) for this substance (40 µg/m^3), but are very close to it. Additional diffusion tubes are also to be deployed at locations on several busy roads as accurate traffic speed information is not available to enable the Design Manual for Roads and Bridges (DMRB) screening tool to be used with confidence.

The air quality management area for fine particulate matter in Taibach/Margam will remain in force until such time that the ongoing achievement of the air quality objective can be confidently predicted. Further detailed assessment using continuous monitoring data will continue.

Introduction

The air quality objective is 10 mg/m^3 expressed as a maximum daily running 8-hour mean concentration, in line with the second Air Quality Daughter Directive limit value.

Updating and screening assessment

The checklist approach suggested by Defra has been adopted and the assessment therefore consists of two main parts:

Box 1: Summary of the Updating and Screening checklist for carbon monoxide	
Reference No.	**Source, location or data that need to be assessed**
A	Monitoring data
B	Very busy roads and junctions in built-up areas

The detailed checklist is shown below:

Section A - Monitoring data

1. *Collation of monitoring data*

   Carbon monoxide is continuously measured at Groeswen Hospital, Margam. The instrument used is a model M300 manufactured by Advanced Pollution Instruments. Data for the calendar years of 2004 and 2005 are considered for the purposes of the Updating and Screening Assessment.

2. *Ratification of monitoring data*

   The analyser does not provide data to the Automatic Urban Network as the other analysers do in the monitoring station. Consequently, the data does not benefit from the quality assurance benefits that derive from membership of this network. However, the instrument is subject to regular servicing according to an annual contract with Enviro Technology Services. Calibrations are carried out at approximately fortnightly intervals using a cylinder of gas sourced from Air Liquide. Calibration responses are input to the Monnet database application, which handles acquisition and quality assurance of the collected data. Data is retrieved on an hourly basis and is subject to automatic scaling. Subsequently, data is subject to a final scaling and ratification before use in reports.

3. Identify the maximum daily running 8-hour concentrations

   The maximum daily running 8-hour concentration in 2004 was 3.3 mg/m^3 and the corresponding figure for 2005 was 3.4 mg/m^3.

   The Data capture rates for 2004 and 2005 were 99.97% and 99.93% respectively, much better than those reported in 2002 and well above the 90% minimum ideally required for demonstration of compliance with the objective. It is clear from these data that there was no breach of the air quality objective in either year.

Section B - Very busy roads or junctions in built up areas

1. *Identify "very busy" roads and junctions in areas where the background is expected to be above 1 mg/m^3.*

   The average concentration measured at the Groeswen Hospital monitoring site during 2004 and 2005 were both approximately 0.4 mg/m^3. This site, which is also close to the M4 motorway would therefore be expected to be exposed to some of the higher carbon monoxide concentrations in the County Borough.

   There are no single carriageway roads with daily average traffic flows that exceed 80,000 vehicles per day.

   There are no dual carriageway (2 or 3-lane) roads with daily average traffic flows that exceed 120,000 vehicles per day.

   There are no motorways with daily average traffic flows that exceed 140,000 vehicles per day.

   There are no criteria that indicate that the carbon monoxide objective will be exceeded at very busy roads.

Conclusion

The updating and screening checklist shows that there is no need to proceed to a detailed assessment for carbon monoxide.

Introduction

The Government and Devolved Administrations have adopted a running annual mean concentration of 16.25 μg/m^3 as the air quality objective. However, in the light of other health advice the government has resolved to reduce benzene levels in air to as low as possible and additional tighter objectives have been set. The additional objective is for an annual mean of 5 μg/m^3 to be achieved by the end of 2010 in England and Wales.

Updating and screening assessment

The checklist approach suggested by Defra has been adopted and the assessment therefore consists of six main parts:

Box 2: Summary of the Updating and Screening checklist for benzene

Reference No.	Source, location or data that need to be assessed
A	Monitoring data outside an AQMA
B	Monitoring data inside an AQMA
C	Very busy roads
D	New industrial sources
E	Industrial sources with substantially increased emissions, or new relevant exposure
F	Petrol stations

The detailed checklist is shown below:

Section A - Monitoring data outside an AQMA

1. *Collation of monitoring data*

   Benzene has been continuously measured at Baglan Primary School, Baglan. The instrument used is a Perkin Elmer Ozone Precursor Monitoring System. Benzene is one of several compounds that are first concentrated, then separated and measured using gas chromatography. Data for the calendar year 2004 and 2005 are considered for the purposes of the Updating and Screening Assessment. Monitoring was discontinued in late 2005 because the concentrations of all substances of interest had decreased to background levels following closure of nearby industrial activities. The expense of running this type of equipment could no longer be justified under those circumstances.

2. *Ratification of monitoring data*

   The analyser did not provide data to the national hydrocarbon network. Consequently, the data did not benefit from the quality assurance benefits that derive from membership of this network. However, the instrument was subject to regular servicing according to an annual contract with Perkin Elmer. Calibrations were carried out at approximately monthly intervals using a cylinder of gas sourced from the National Physical Laboratory. Calibration responses were input to the Monnet database application, which handles acquisition and quality assurance of the collected data. Data was retrieved on an hourly basis and was subject to

automatic scaling. Subsequently data is subject to a final scaling and ratification before use in reports.

3. *Calculate annual means from the data and identify highest values*

The maximum running annual mean concentration in 2004 was 0.3 µg/m^3 and the corresponding figure for 2005 was 0.2 µg/m^3. These represent concentrations at the limit of detection for the equipment.

There are no running annual means greater than 16.25 µg/m^3 and none greater than 5 µg/m^3.

Section B - Monitoring data inside an AQMA

There are no existing AQMAs declared in respect of benzene, so there is no data to consider.

Section C - Very busy roads

1. Identify "very busy" roads in areas where the 2010 background is expected to be above 2 µg/m^3.

The average concentration measured at the Baglan Primary School monitoring site during 2004, was less than 0.1 µg/m^3.

There are no single carriageway roads with daily average traffic flows that exceed 80,000 vehicles per day.

There are no dual carriageway (2 or 3-lane) roads with daily average traffic flows that exceed 120,000 vehicles per day.

There are no motorways with daily average traffic flows that exceed 140,000 vehicles per day.

Therefore there are no criteria that indicate that the benzene objective will be exceeded at very busy roads.

Section D – New Industrial Sources

There are no significant new industrial sources of benzene that have arisen since the last updating and screening assessment in 2003.

Section E – Industrial sources with substantially increased emissions, or new relevant exposure

1.Have any previously identified industrial sources increased emissions by 30% or more? Include emissions in neighbouring authorities. Has there been any new relevant exposure.

The carbonisation process at Port Talbot steelworks with Environment Agency Permit reference BL7108 was previously identified as a source of benzene.

There have been increases in benzene emissions since the last review and assessment.

2. *Obtain updated information for the total annual emission of benzene and the height of the emission.*

In 2001 the process emitted 2.087 tonnes of benzene. The process was responsible for the emission of 11.568 tonnes of benzene in 2004 and 14.890 tonnes in 2005. The emission was confirmed by the Environment Agency as being fugitive and arising at low-level. The nearest residential property remains at some 2km distance.

3. *Use the nomogram, Figure 3.3 of LAQM. TG(03) on page 3-23 to assess the ground-level concentration of benzene at the nearest property.*

It is clear from the nomogram that the concentration at ~2km distance for either 11 or 15 tonnes of benzene are not sufficient to result in an exceedence of the 1.625 µg/m^3 (or the 0.22 µg/m^3) objective, irrespective of the height of the stack in the 0 - 9m range. This result is also in agreement with the large benzene diffusion tube survey that was carried out by the Authority in 1997 as part of the First Phase Review.

There are no other Part A or B industrial processes in the area that are liable to emit significant amounts of benzene.

Section F – Petrol Stations

1. *Identify petrol stations on busy roads*

There are only two petrol stations in the County Borough on busy roads i.e. roads having more than 30,000 vehicles per day. These are a) Skewen Service Station, on A465 trunk road at Neath and b) Shell Swansea Bay Service Station, Fabian Way, Crymlyn Burrows. Both petrol stations have an annual throughput of more than 2 million litres of petrol per annum. Both petrol stations were considered in the previous updating and screening assessment and were found not to be relevant since there were no properties within 10m of the kerb.

Conclusion

The updating and screening checklist shows that there is no need to proceed to a detailed assessment for benzene.

Introduction

The Government and Devolved Administrations have adopted a running annual mean concentration of 2.25 µg/m^3 as the air quality standard for 1,3-butadiene with an objective for the standard to be achieved by the end of 2003.

Updating and screening assessment

The checklist approach suggested by Defra has been adopted and the assessment therefore consists of three main parts:

Box 3: Summary of the Updating and Screening checklist for 1,3-butadiene

Reference No.	Source, location or data that need to be assessed
A	Monitoring data
B	New industrial sources
C	Existing industrial sources with significantly increased emissions or new relevant exposure

The detailed checklist is shown below:

Section A - Monitoring data

1. *Collation of monitoring data*

   1,3-butadiene was continuously measured at Baglan Primary School, Baglan. The instrument used was a Perkin Elmer Ozone Precursor Monitoring System. 1,3-butadiene was one of several compounds that are first concentrated, then separated and measured using gas chromatography. Data for the calendar year 2004 and 2005 is considered for the purposes of the Updating and Screening Assessment. Monitoring was discontinued in late 2005 because the concentrations of all substances of interest had decreased to background levels following closure of nearby industrial activities. The expense of running this type of equipment could no longer be justified under those circumstances.

2. *Ratification of monitoring data*

   The analyser did not provide data to the national hydrocarbon network. Consequently, the data did not benefit from the quality assurance benefits that derive from membership of this network. However, the instrument was subject to regular servicing according to an annual contract with Perkin Elmer. Calibrations were carried out at approximately monthly intervals using a cylinder of gas sourced from the National Physical Laboratory. Calibration responses were input to the Monnet database application, which handled acquisition and quality assurance of the collected data. Data was retrieved on an hourly basis and is subject to automatic scaling. Subsequently data was subject to a final scaling and ratification before use in reports.

3. Calculate annual means from the data and identify highest values

The maximum running annual mean concentration was 0.05 µg/m^3 in both 2004 and 2005. This concentration is around the limit of detection of this substance for this instrument.

The results show that there are no running annual means greater than 2.25 µg/m^3.

Section B - New industrial sources

1. Identify any new industrial sources liable to emit significant quantities of 1,3-butadiene.

There have been no new industrial sources of 1,3-butadiene since the first review and assessment has been carried out.

Section C - Industrial sources with substantially increased emissions or new relevant exposure

No industrial sources of 1,3-butadiene were identified during the first review and assessment and none have changed so as to emit this substance in the interim period. In the absence of any new or existing industrial sources, there is also no new relevant exposure.

Conclusion

The updating and screening checklist shows that there is no need to proceed to a detailed assessment for 1,3-butadiene.

Introduction

The Government and Devolved Administrations have adopted a running annual mean concentration of 0.5 µg/m^3 as the air quality standard for lead with an objective for the standard to be achieved by the end of 2004. In addition, a lower air quality objective of 0.25 µg/m^3 to be achieved by the end of 2008 has also been set.

Updating and screening assessment

The checklist approach suggested by Defra has been adopted and the assessment therefore consists of three main parts:

Box 4: Summary of the Updating and Screening checklist for lead	
Reference No.	**Source, location or data that need to be assessed**
A	Monitoring data outside an AQMA
B	New industrial sources
C	Existing industrial sources with significantly increased emissions or new relevant exposure

The detailed checklist is shown below:

Section A - Monitoring data

1. *Collation of monitoring data*

   Lead is monitored at Pontardawe Leisure Centre as part of a study of 13 airborne metals that has continued since 1972. Metered air is continuously pumped through cellulose filters, which are subsequently analysed by Netcen.

2. *Ratification of monitoring data*

   The analysis of the prepared samples is effected using either inductively-coupled plasma mass spectrometry (ICP-MS) or inductively-coupled plasma atomic emission spectrometry (ICP-AES).

3. *Calculate annual means from the data and identify highest values*

   The concentration of lead found at Pondardawe during 2004 was 8.8 ng/m^3, the corresponding figure for 2005 was 6.7 ng/m^3. These concentrations represent approximately 1.8% and 1.3% respectively of the 2005 objective and 3.6% and 2.7% respectively of the 2008 objective.

Section B - New industrial sources

1. Identify any new industrial sources liable to emit significant quantities of lead.

There have been no new industrial sources of lead since the previous updating and screening and assessment was been carried out.

Section C - Industrial sources with substantially increased emissions or new relelvant exposure

Since no significant industrial sources exist, there are none with increased emissions and no relevant exposure.

Conclusion

The updating and screening checklist shows that there is no need to proceed to a detailed assessment for lead.

Introduction

The Government and Devolved Administrations have adopted two Air Quality Objectives for nitrogen dioxide. An annual mean concentration of 40 µg/m^3 and a 1-hour mean concentration of 200 µg/m^3 not to be exceeded more than 18 times per year. Both objectives are to be achieved by the end of 2005.

In addition, the first Air Quality Daughter Directive also sets limit values for nitrogen dioxide, which have been translated into UK legislation. A 1-hour limit of 200 µg/m^3 applies, not to be exceeded by more than 18 times per year. An annual mean limit value of 40 µg/m^3 also applies, both to be achieved by the 1st January 2010.

Updating and screening assessment

The checklist approach suggested by Defra has been adopted and the assessment therefore consists of twelve main parts:

Box 5: Summary of the Updating and Screening checklist for nitrogen dioxide

Reference No.	Source, location or data that need to be assessed
A	Monitoring data outside an AQMA
B	Monitoring data within an AQMA
C	Narrow congested streets with residential properties close to the kerb
D	Junctions
E	Busy streets where people may spend 1-hour or more close to the traffic
F	Roads with high flow of buses and/or HGVs
G	New roads constructed or proposed since previous review and assessment
H	Roads with significantly changed traffic flows, or new relevant exposure
I	Bus stations
J	New industrial sources
K	Industrial sources with significantly increased emissions
L	Aircraft

The detailed checklist is shown below:

Section A - Monitoring data outside an AQMA

1. *Collation of monitoring data*

   Nitrogen dioxide is continuously measured at Groeswen Hospital, Margam. The instrument used is a model M200 manufactured by Advanced Pollution Instruments. Data for the calendar years 2004 and 2005 are considered for the purposes of the Updating and Screening Assessment.

   The Authority has also been employed to operate another M200 analyser, which is located at Baglan Primary School. The data from this analyser was required in order to satisfy planning conditions in respect of a Combined Cycle Gas Turbine (CCGT) power station in Baglan. The company has allowed the Authority to utilise the data from this monitoring for the purposes of this Assessment.

The authority also operates twelve nitrogen dioxide monitoring tubes, seven of which formed part of the UK nitrogen dioxide network until its decommissioning in 2005, which was controlled by AEA Technology.

2. *Ratification of monitoring data*

The continuous nitrogen dioxide analyser at Groeswen Hospital is part of the Automatic Urban and Rural Network (AURN) and is subject to the calibration and quality assurance to the standards of that network. The data for 2004 and 2005 were downloaded from the AEA Technology website.

The continuous nitrogen dioxide analyser at Baglan Primary School is not part of a national network but is subject to similar quality assurance regime as the carbon monoxide analyser at Groeswen Hospital. The instrument is subject to regular servicing, and calibrations are carried out at approximately fortnightly intervals using a cylinder of gas sourced from Air Liquide. The calibration gas has been re-certified to ensure tracability to national standards. Calibration responses are input to the Monnet database application, which handles acquisition and quality assurance of the collected data. Data is retrieved on an hourly basis and is subject to automatic scaling. Subsequently, data is subject to a final scaling and ratification before use in reports.

The diffusion tubes are provided by Harwell Scientifics Limited. The tubes are prepared using 50% TEA in acetone and are subject to a WASP quality assurance scheme. The Review and Assessment Helpdesk quotes a bias correction of 0.89 for these tubes for 2004 and 0.93 for 2005. These factors are derived from several co-location studies where diffusion tubes are compared to results from a chemiluminescent analyser. The factors used can be found at the following location:

http://www.uwe.ac.uk/aqm/review/diffusiontube270206.xls

3. *Calculate annual means from the data and identify highest values*

The annual mean concentration of nitrogen dioxide in 2004 at the Groeswen Hospital continuous monitoring station was 21 µg/m^3. The corresponding figure for 2005 was 19 µg/m^3. There were no breaches of the 1-hour mean Air Quality Objective in either year.

The annual mean concentration of nitrogen dioxide in 2004 at the Baglan Primary School continuous monitoring station was 11 µg/m^3. The corresponding figure for 2005 was 10 µg/m^3. There were no breaches of the 1-hour mean Air Quality Objective in either year.

Additional diffusion tubes were commissioned following the 2003 assessment. These were required in order to further investigate the relatively high concentrations measured at Victoria Gardens site E2/10/9. These tubes were started at different times in 2004, which explains the reduced number of tubes used in some cases. The tubes E2/10/19 and E2/10/20 are used to estimate compliance in the vicinity of Victoria Gardens as they are located on the frontage of domestic properties.

Frontage locations provide a better assessment of pollution in terms of public exposure than those at the roadside. The annual average concentrations for the twelve diffusion tube sites are shown in the tables below:

Table 1. Bias corrected nitrogen dioxide tube data for 2004

Site Id	NO2 µg/m^3	Tube Count	Site Type	Site Address
E2/10/18	44.8	9	Roadside	Victoria Gardens, junction lamp post.
E2/10/9	44.2	12	Roadside	6 Victoria Gardens, Neath.
E2/10/20	36.9	9	House frontage	28 Eastland Road, Neath
E2/10/3	36.1	10	Roadside	Groeswen Hospital, Port Talbot.
E2/10/19	33.9	10	House frontage	8 Victoria Gardens
E2/10/7	27.5	12	Roadside	11 High Street, Pontardawe.
E2/10/22	25.7	3	House frontage	102 Commercial Road, Port Talbot
E2/10/10	23	12	Urban Background	Civic Centre, Neath.
E2/10/21	22	3	Urban Background	Groeswen Hospital No. 2, Port Talbot.
E2/10/4	19.6	12	Urban Background	21 Rice Street, Port Talbot.
E2/10/6	17.6	8	Urban Background	11 College Green, Port Talbot
E2/10/12	14.9	10	Urban Background	Cwmnedd Primary School, Glynneath.

Table 2. Bias corrected nitrogen dioxide tube data for 2005

Site Id	NO2 µg/m^3	Tube Count	Site Type	Site Address
E2/10/18	47.6	11	Roadside	Victoria Gardens, junction lamp post.
E2/10/9	40.1	11	Roadside	6 Victoria Gardens, Neath.
E2/10/19	38	11	House frontage	8 Victoria Gardens
E2/10/20	37.3	10	House frontage	28 Eastland Road, Neath
E2/10/3	33.4	11	Roadside	Groeswen Hospital, Port Talbot.
E2/10/7	28.5	11	Roadside	11 High Street, Pontardawe.
E2/10/22	24.5	9	House frontage	102 Commercial Road, Port Talbot
E2/10/10	22.1	10	Urban Background	Civic Centre, Neath.
E2/10/4	21.7	9	Urban Background	21 Rice Street, Port Talbot.
E2/10/21	21.3	10	Urban Background	Groeswen Hospital No. 2, Port Talbot.
E2/10/6	20.3	11	Urban Background	11 College Green, Port Talbot
E2/10/12	15.2	11	Urban Background	Cwmnedd Primary School, Glynneath.

The results have been sorted according to the highest nitrogen dioxide concentrations. The bias corrected values were obtained by multiplying the reported values by the bias correction factor.

4. *Estimate the annual mean concentrations in the current year.*

The Year Adjustment Calculator used to obtain the factors for estimation of the concentrations was obtained from:

http://www.airquality.co.uk/archive/laqm/tools/Year_Adjustment_Calculator2.2.a.xls

The diffusion tubes at house frontages are regarded as being roadside locations for the purposes of the factoring. The factor for 2004 for roadside sites is 0.97, so the adjusted annual mean concentrations are shown below.

Table 3. Annual mean concentrations in 2004 at roadside locations.

Site Id	NO2 µg/m^3	Tube Count	Site Type	Site Address
E2/10/18	43.5	9	Roadside	Victoria Gardens, junction lamp post.
E2/10/9	42.9	12	Roadside	6 Victoria Gardens, Neath.
E2/10/20	35.7	9	House frontage	28 Eastland Road, Neath
E2/10/3	35	10	Roadside	Groeswen Hospital, Port Talbot.
E2/10/19	32.9	10	House frontage	8 Victoria Gardens
E2/10/7	26.7	12	Roadside	11 High Street, Pontardawe.

Note: The roadside site at Commercial Road, Port Talbot has been excluded since monitoring had only recently commenced and only 3 results were obtained.

The factor for 2005 is 1.00, so the annual means remain unchanged.

Table 4. Annual mean concentrations in 2005 at roadside locations.

Site Id	NO2 µg/m^3	Tube Count	Site Type	Site Address
E2/10/18	47.6	11	Roadside	Victoria Gardens, junction lamp post.
E2/10/9	40.1	11	Roadside	6 Victoria Gardens, Neath.
E2/10/19	38	11	House frontage	8 Victoria Gardens
E2/10/20	37.3	10	House frontage	28 Eastland Road, Neath
E2/10/3	33.4	11	Roadside	Groeswen Hospital, Port Talbot.
E2/10/7	28.5	11	Roadside	11 High Street, Pontardawe.
E2/10/22	24.5	9	House frontage	102 Commercial Road, Port Talbot

5. *Calculate the number of 1-hour exceedences of 200 µg/m^3 in a full year, or the 99.8th percentile of hourly means.*

   The maximum 1-hour average during 2004 at the Groeswen Hospital site was 96 µg/m^3 and the corresponding figure for 2005 was 101 *µg/m^3*, both being well below the 200 µg/m^3 limit.

   Item 4 above shows that samples taken at lampposts at Victoria Gardens (E2/10/9 & E2/10/18) exceed the annual 40 µg/m3 limit. However these locations are not deemed to represent "relevant exposure".

   Of greater relevance are samples taken at the frontages of properties (E2/10/19 & E2/10/20) in the vicinity of Victoria Gardens. Both sites were below the 40 µg/m^3 limit in 2004 and 2005. However the higher results in 2005 mean that the margin to exceedence has narrowed. If results at 8 Victoria Gardens were to increase in 2006 by the same margin as they did during 2005 then an exceedence of the objective would occur.

Section B - Monitoring within an AQMA

There is currently no AQMA for nitrogen dioxide, and no further consideration of this section is required.

Section C - Narrow congested streets with residential properties close to the kerb

There are no additional narrow congested street locations having flows of >10,000 vehicles per day that were not fully considered in the Section A above. Identification of such sites is based in part upon local knowledge. Consequently it is considered that no further consideration is required in respect of this section.

Section D - Junctions

1. *Identify 'busy' junctions*

The following junctions have been identified as having a flow of vehicles of more than 10,000 per day.

Table 5. Junctions having vehicle flows of > 10,000 per day

Junction ID	Road	Vehicle Flow (AADT)	Easting	Northing	Properties within 10m?
1	J43 rbt	49637	273130	196838	No
2	A483 Jersey Marin erbt	34250	271800	193404	No
3	A48 Sunnycroft	35750	274150	193350	No
4	A48 Heilbronn Water St rbt	31500	276053	189877	No
7	A474 Stockham,s Corner	24000	274300	195645	Yes
8	A474 Cwrt Herbert rbt	33250	274120	197570	No
9	A48/A483 Earlswood	28050	273750	194110	No
10	A48 Briton Ferry rbt	32000	274150	193350	No
11	A474/B4434 Neath bridge	25750	274928	197942	No
12	A474 Dwr-y-felin	20000	274505	197638	No
13	A4241 Baglan energy Pk rbt	24150	274613	192163	No
14	A4241 Water street	25150	275943	189790	Yes
16	A48 Station junc	17506	276770	189640	No
17	A474/A4230 Pen-y-wern rbt	20750	275810	198750	No
18	Port Talbot Tesco rbt	20454	276700	190210	No
19	B4434/B4287 Cimla junc	16500	275630	197120	No
22	A474 Shelone Rd/Old Road	18602	274330	194870	Yes
24	B4286 Heilbronn Cwmafan	29514	276550	190320	No
25	A4241 Dalton Rd junc	17900	274791	190703	No
27	J39 rbt	13262	279136	186780	No
28	A48/A4107 Abbey Rd	17550	277246	189409	Yes
31	B4434 Victoria Gdns	13400	275500	197340	Yes
32	J40 rbt	17903	277368	189551	Yes
37	B4434 P.of Wales Dr/Gnoll	16750	275451	197841	No
38	A4241 Southdown Rd rbt	13803	274270	191460	No
39	A48 Dyffryn Rd	13300	278120	187980	No
41	A4107 Tan-y-groes rbt	11800	277517	189565	No
43	A4241 Seaway Pde rbt	13675	274399	191844	No
44	B4287 Hillside (Cimla)	16500	275630	197120	No
45	A474 Pen-y-wern/Main Rd	13400	274950	198840	No
50	J38 rbt	14612	279875	185885	No
54	A48 Cefn Gwrgan (Corus)	13206	279136	186780	No
55	A4107 Ynys-y-gwas	9800	278040	191740	No
56	J41 rbt	37315	276330	190250	No
57	A4067 Pontardawe	21325	272410	203690	No

58	A474 Pontardawe	17550	272410	203690	No
59	B4603 Pontardawe	14450	272140	203890	No
60	Pontardawe Cross	11641	272017	203931	No
61	A4067 Ynysmeudwy	12875	273073	204328	No
62	A4067 Ystalyfera	11550	275050	206370	No

2. *Determine whether there is relevant exposure within 10m of the kerb.*

   The table above shows that there are six junctions having domestic properties within 10m of the kerb. But the junction at Victoria Gardens (ID = 31) is subject to diffusion tube measurements as discussed above. This location does not therefore require further consideration.

3. *Obtain detailed information on traffic flows, speeds and the proportion of different vehicle types.*

   No accurate speed data is available in respect of the remaining five junctions, so it is proposed to measure the nitrogen dioxide concentrations for a period of 9 months. This will provide more accurate information than would be possible by using estimated data for input into the DMRB.

4. *Use the DMRB screening model to predict the annual mean concentration in 2005.*

   Monitoring is to be used as described above.

Section E - Busy Streets where people may spend 1 hour or more close to the traffic

1. *Identify 'busy' streets*

   The following roads have been identified as having a flow in excess of 10,000 vehicles per day.

   Table 6. Busy Streets having vehicle flows of > 10,000 per day

Road ID	Road	Location	Vehicle Flow (AADT)	Easting	Northing	Properties within 10m?
1	M4	J42 - 43	73160	272500	195420	No
2	M4	J43 - 44	64435	271233	197124	No
3	M4	J39 - 40	63936	278310	188120	Yes
4	M4	J41 - 42	62047	274490	192600	No
5	M4	J40 - 41	61424	276563	190377	Yes
6	M4	J38 - 39	59667	279248	186731	No
7	M4	J37 - 38	58409	280041	184228	No
8	(T)A465	N. of Llandarcy	41500	273130	196838	No
9	A483	Fabian Way	33200	270250	193000	No
10	A483	Fabian Way	29000	271800	193404	No
11	A474	Milland Link	28000	274650	197170	No

12	A474	Southern Link	28000	274240	197440	No
13	(T)A48	Baglan	27000	274150	193350	No
14	(T)A465	N.of saltings	26600	275550	198200	No
16	A4241	Water Street	25000	276053	189877	Yes
18	B4286	Heilbronn Way	24400	276550	190320	No
19	A474	Milland Link	24000	275039	197052	Yes
20	A4241	Seaway Pde	23600	274613	192163	No
21	A474	Stockham's	22500	275183	196958	No
22	A48	Heilbronn Way	21500	276330	190250	No
24	(T)A465	S. of Resolven	21000	279500	200390	No
25	M4slip	J43 W.side slips	20300	272121	196209	No
26	A474	Cadoxton Rd.	20000	274505	197638	Yes
27	(T)A48	Neath Bridge	19000	273750	194110	No
28	A4230	Neath Abbey	18500	274120	197570	Yes
29	A4067	Pontardawe BP	18500	272210	203362	Yes
30	A474		18500	275043	198162	No
31	(T)A465	N. of Resolven	17400	285168	204617	No
32	B4434	N of Riverside	17000	275080	197930	No
33	A48	Heilbronn Way	16500	276479	189940	No
34	B4434	Riverside Dr.	16500	275170	197920	No
36	A474	Cadoxton Rd.	16000	274928	197942	No
37	B4290	at J43	15973	272047	196023	No
38	(T)A465	G'neath, S.of	15700	287650	206010	No
39	A4241	Afan Way	15000	275943	189790	No
40	B4287	Cimla Rd.	15000	275840	196770	Yes
41	(T)A465	G'neath, at	15000	289910	207370	Yes
42	A474	Neath Road	15000	274333	194663	Yes
43	A4230	St.John's Terrace	15000	273180	197390	Yes
44	A48	Talbot Rd	15000	276966	189403	No
45	A48	Talbot Rd.	15000	276770	189640	No
46	A474	Neath Road	14500	274300	195645	Yes
47	A4067	A4067 to A474	14000	272410	203690	No
48	A474	Pen-y-wern Rd.	14000	274950	198840	Yes
49	A474	Herbert st B.P.	13100	272140	203890	Yes
50	A4241	Seaway Pde	13000	274399	191844	No
51	A48	Pentyla Baglan	12679	276413	190351	No
52	M4slip	J41 W.side slips	12600	275518	191112	Yes
53	B4286	Cwmafan Rd	12500	276690	190380	Yes
54	B4287	Cimla Rd.	12000	275630	197120	Yes
55	A483	Fabian Way	12000	272923	193985	No
56	A48	Margam Rd dual	12000	279136	186780	No
57	A4230	Siding Terr.	12000	272357	197388	Yes
58	B4434	Victoria Gardens	12000	275500	197340	Yes
59	A4107		12000	277517	189565	Yes
60	B4434	windsor rd	11800	275130	197380	Yes
61	U/C	Baglan Way	11700	274524	191997	No
62	A4241	Afan Way	11600	275293	190134	No
63	A4067	Godre'r graig	11500	275050	206370	No
64	A48	Talbot Rd	11500	277110	189180	Yes
65	A4230	Dynefwr Pl.	11300	271764	197316	Yes

66	A4107	Abbey Rd	11000	277368	189551	Yes
67	B4434	Eastland Rd.	11000	275440	197150	Yes
68	A48	Margam Rd	10500	278120	187980	Yes
69	B4434	Prince of Wales	10500	275451	197841	Yes
70	C Port	Ysguthan Rd	10300	275895	189892	Yes
71	A48	Margam Rd	10200	278885	187094	No
72	A4067	Pontardawe BP	10150	273073	204328	No

2. *Identify streets where members of the public may be exposed within 10m of the kerb for 1 hour or more.*

   Twenty eight locations were identified as having domestic properties within 10 metres of the kerb.

3. *Obtain detailed information about traffic flows, speeds and the proportion of different vehicle types.*

   Link 58 corresponds to Victoria Gardens, which is already subject to monitoring by diffusion tube. This location does not therefore require screening using the DMRB model.

   Link 64 is the same link that is currently monitored using diffusion tubes at Commercial Road (E2/10/22), which is compliant with the objective and therefore requires no further investigation.

   Accurate speed information is not available in respect of the links shown above. It is therefore proposed to carry out diffusion tube monitoring for a period of 9 months in respect of the following link IDs:

   3, 5, 16, 19, 26, 28, 29, 40, 41, 42, 43, 46, 48, 49, 52, 53, 54, 57, 59, 60, 65, 66, 68, 69, 70

   This approach will provide more accurate information than would be possible by using estimated data for input into the DMRB.

4. *Use the DMRB screening model to predict the annual mean in 2005.*

   Monitoring will be used instead of the DMRB to establish compliance.

Section F - Roads with high flows of buses and/or HGV's

1. *Check whether such locations were assessed during the first round of review and assessment*

   These types of location were specifically considered during the previous round. There are still no roads within the County Borough with a proportion of heavy-duty vehicles of 25%. The highest proportion continues to be about 17%, which is west of the Ynys-y-gerwn highways depot on the B4242.

There is no need to proceed further as there are no roads that exceed the criteria for having an unusually high proportion of heavy-duty vehicles.

Section G - New roads constructed or proposed since the previous round of review and assessment

There have been no new roads constructed since the previous review and assessment that have had a traffic flow of 10,000 vehicles per day. No further consideration is therefore required for this section.

Section H - Roads with significantly changed traffic flows or new exposure

The only roads having an annual mean above 36 µg/m^3 but below 40 µg/m^3 are located in the vicinity of Victoria Gardens. These have already been considered in above.

There are no roads having a traffic flow of 10,000 vehicles per day, which have experienced an increase in traffic flow of more than 25%.

Section I - Bus stations

It is considered highly unlikely that there are any bus stations in the County Borough with a flow anywhere approaching 1000 buses per day.

Section J - New industrial sources

No new industrial sources that are likely to give rise to substantial nitrogen dioxide emissions have arisen. Therefore no further consideration of this section is required.

Section K - Industrial sources with substantially increased emissions

The Combined Cycle Gas Turbine (CCGT) at Baglan has been considered in previous assessments. The Authority has carried out monitoring on behalf of the operator since March 2001. No breaches of the air quality objectives have been observed and the results for 2004/5 are discussed above.

Section L - Aircraft

There are no airports within the area bounded by the County Borough.

Conclusion

The updating and screening checklist does not show any direct indications of breaches of the air quality objectives. But it will be necessary to investigate nitrogen dioxide levels at the 21 locations identified above in order to fully investigate whether there is a risk of breaches of the annual Air Quality Objective at those sites.

The properties at Victoria Gardens and possibly Eastland Road do not yet exceed the objective but may do so in future if nitrogen dioxide levels continue to increase at the rate of previous years.

Introduction

The Government and Devolved Administrations have adopted a 15-minute mean of 266 µg/m^3 as an air quality standard for sulphur dioxide, with an objective for the standard not to be exceeded more than 35 times per year by the end of 2005. Additional objectives have also been set which are equivalent to the EU limit values specified in the First Air Quality Daughter Directive. These are for a 1-hour mean objective of 350 µg/m^3, to be exceeded no more than 24 times per year, and a 24-hour objective of 125 µg/m^3, to be exceeded no more than 3 times per year, to be achieved by the end of 2004.

Updating and screening assessment

The checklist approach suggested by Defra has been adopted and the assessment therefore consists of eight main parts:

Box 6: Summary of the Updating and Screening checklist for sulphur dioxide

Reference No.	Source, location or data that need to be assessed
A	Monitoring data outside an AQMA
B	Monitoring data within an AQMA
C	New industrial sources
D	Industrial sources with substantially increased emissions or new relevant exposure
E	Areas of domestic coal burning
F	Small boilers (>5MW$_{(thermal)}$) burning coal or oil
G	Shipping
H	Railway locomotives

The detailed checklist is shown below:

Section A - Monitoring data outside an AQMA

1. *Collation of monitoring data*

   Sulphur dioxide is continuously measured at Groeswen Hospital, Margam. The instrument used is a model M400 manufactured by Advanced Pollution Instruments. Data for the calendar years 2004 and 2005 are considered for the purposes of the Updating and Screening Assessment.

   The authority no longer operates any 8-port bubblers as the measured concentrations were consistently low. The authority does not deploy any diffusion tube samplers for sulphur dioxide.

2. *Ratification of monitoring data*

   The continuous sulphur dioxide analyser is part of the Automatic Urban and Rural Network (AURN) and is subject to the calibration and quality assurance to the standards of that network. The data for 2004 and 2005 were downloaded from the AEA Technology website.

3. *Calculate exceedences.*

   The annual mean concentration of sulphur dioxide in 2004 at the Groeswen Hospital continuous monitoring station was 6 µg/m^3, whilst the

maximum concentration expressed as a 15 minute average was 210 µg/m^3. The corresponding figures for 2005 were 8 µg/m^3 and 290 µg/m3. During 2005, there were two occasions when the 266 µg/m^3 15 minute average air quality standard was exceeded. But the objective was not exceeded as up to 35 such exceedences are permitted.

The maximum hourly averaged sulphur dioxide concentration in 2004 was 154 µg/m3, and the corresponding figure for 2005 was 223 µg/m^3. Consequently there were no breaches of the 350 µg/m^3 hourly averaged objective.

The maximum daily averaged sulphur dioxide concentration in 2004 was 32 µg/m^3, whilst the corresponding figure for 2005 was 43 µg/m^3. Both figures are well within the 125 µg/m^3 objective limit.

There were no breaches of any of the air quality standards or Objectives. But, examination of the data seems to indicate an increasing trend in sulphur dioxide concentrations.

Section B - Monitoring within an AQMA

There is currently no AQMA for sulphur dioxide, and no further consideration of this section is required.

Section C New industrial sources

There are no new significant industrial sources that utilise sulphur-bearing fuels that have arisen since the first review and assessment.

Section D - Industrial sources with substantially increased emissions

There are no industrial sources with increased sulphur dioxide emissions that amount to 30% or more.

Section E - Areas of domestic coal burning

There are no areas in the Authority having 100 or more houses in a 0.5km square that utilise coal as their main fuel for domestic heating.

Section F - Small boilers >5 $MW_{(thermal)}$

1. *Identify all boiler plant >5 $MW_{(thermal)}$ that burn coal or fuel oil.*

   The authority is not aware of any such boilers that are not part of Part A processes that have been subject to monitoring elsewhere as part of the review and assessment process.

Section G - Shipping

The Corus steelworks does have deliveries of iron ore and minerals using large ships. However, the number of shipping movements in 2005 was 109 which is substantially less than the 5000 required for a detailed assessment.

Section H - Railway locomotives

There are a number of locations in the County Borough where railway locomotives may be at a standstill for 15 minutes or more. Examples include Corus steelworks at Port Talbot, Onllwyn Washery, Cwmgwrach Railhead. However, it is not considered likely that there will be any regular exposure to members of the public within 15m of the stationary locomotives. A detailed assessment is therefore not required.

Conclusion

The updating and screening checklist shows that there is no need to proceed to a detailed assessment for sulphur dioxide.

Introduction

The Government and Devolved Administrations have adopted two Air Quality Objectives for PM_{10}. An annual mean concentration of 40 µg/m^3 and 50 µg/m^3 as a fixed 24-hour mean not to be exceeded more than 35 times per year. Both objectives are to be achieved by the end of 2004. The objectives are based upon measurement carried out using the European gravimetric transfer reference sampler method.

Updating and screening assessment

The checklist approach suggested by Defra has been adopted and the assessment therefore consists of thirteen main parts:

Box 7: Summary of the Updating and Screening checklist for PM_{10}

Reference No.	Source, location or data that need to be assessed
A	Monitoring data outside an AQMA
B	Monitoring data within an AQMA
C	Busy roads and junctions in Scotland
D	Junctions
E	Roads with high flow of buses and/or HGVs
F	New roads constructed or proposed since first round of review and assessment
G	Roads with significantly changed traffic flows or new relevant exposure
H	Roads close to the objective during the previous review and assessment
I	New industrial sources
J	Industrial sources with significantly increased emissions or new relevant exposure
K	Areas with domestic solid fuel burning
L	Quarries, landfill sites, opencast coal, handling of dusty cargoes at ports etc
M	Aircraft

The detailed checklist is shown below:

Section A - Monitoring data outside and AQMA

1. *Collation of monitoring data*

   No PM_{10} measurements were made at locations outside the AQMA during 2004 or 2005, so there is no data to ratify or consider.

Section B - Monitoring within an AQMA

1. *Collation of monitoring data*

   PM_{10} is continuously measured at Groeswen Hospital, Margam. The instrument used is Tapered Element Oscillating Microbalance (TEOM), manufactured by Rupprecht and Pattaschnick. Data for the calendar years of 2004 and 2005 are considered for the purposes of the Updating and Screening Assessment.

2. *Ratification of monitoring data*

   The continuous PM_{10} analyser is part of the Automatic Urban and Rural Network (AURN) and is subject to the calibration and quality assurance to the standards of that network. The data used for 2004 and 2005 were downloaded from the AEA Technology website.

3. *Calculate annual means and the number of 24-hour exceedences*

   The annual mean gravimetric concentration of PM_{10} in 2004 at the Groeswen Hospital continuous monitoring station was 31 µg/m^3. The corresponding figure for 2005 was 30 µg/m^3. There were 38 gravimetric exceedences of the 24-hour 50 µg/m^3 limit in 2004, but only 29 exceedences during 2005. However, it must be emphasised that 26 days of data were lost during November 2005 due to equipment failure. As a consequence, the data capture rate for PM_{10} in 2005 fell below the 90% figure considered ideal for the network.

Section C - Busy roads and junctions in Scotland

This section does not apply to Wales.

Section D - Junctions

1. *Identify 'busy' junctions*

   The method for identification of busy junctions is the same as that used for assessment of nitrogen dioxide. The same six junctions are therefore identified as having flows of >10,000 vehicles per day and residences within 10m.

   Table 7. Busy Junctions

Junction ID	Road	Vehicle Flow (AADT)	Easting	Northing	Properties within 10m?
7	A474 Stockham's Corner	24000	274300	195645	Yes
14	A4241 Water street	25150	275943	189790	Yes
22	A474 Shelone Rd/Old	18602	274330	194870	Yes
28	A48/A4107 Abbey Rd	17550	277246	189409	Yes
31	B4434 Victoria Gdns	13400	275500	197340	Yes
32	J40 rbt	17903	277368	189551	Yes

2. *Determine whether there is relevant exposure within 10m of the kerb.*

   There are residences within 10 metres of the kerb in each of the above cases.

3. *Obtain detailed information on traffic flows, speeds and the proportion of different vehicle types.*

   Information on the flows and proportions of heavy goods vehicles are shown in Table 4 above. However, information on vehicle speeds is not available and therefore an estimation of speed at junctions has been made in accordance with TG(03). This is a notoriously difficult process for

junctions where the estimated speed for all vehicles is estimated to be in the range 20-40 kph. Consequently the figure of 30 kph will be used in the DMRB calculations. Monitoring would be preferable to DMRB model calculations, but there is no spare PM_{10} monitoring capability at present to deploy.

4. *Use the DMRB screening model to predict the annual mean concentration in 2005.*

   The background concentrations of PM_{10} for 2005 were obtained from the airquality.co.uk website.

   http://www.airquality.co.uk/archive/laqm/tools/404_2004.csv

   This information is combined with proportion of flows of different vehicle types in the following table.

   Table 8. Vehicle types and flows and background PM_{10} levels for 2005

Junction ID	Road	Vehicle Flow (AADT)	%HGV	%LDV	Backgd $\mu g/m^3$
7	A474 Stockham's Corner	24000	2.1	97.9	16.5
14	A4241 Water street	25150	2.8	97.2	17.1
22	A474 Shelone Rd/Old	18602	2.2	97.8	16.8
28	A48/A4107 Abbey Rd	17550	3.6	96.4	17.4
31	B4434 Victoria Gdns	13400	3.6	96.4	17.0
32	J40 rbt	17903	4.4	95.6	17.4

   The results of the DMRB calculations are shown in the table below.

   Table 9. DMRB screening model results for 2005

Junction ID	Road	Annual Mean PM_{10}	Days > 50 $\mu g/m^3$
7	A474 Stockham's Corner	20.2	4
14	A4241 Water street	21.2	5
22	A474 Shelone Rd/Old	20.2	4
28	A48/A4107 Abbey Rd	21.2	5
31	B4434 Victoria Gdns	20.2	4
32	J40 rbt	21.6	6

   The results of the DMRB calculations do not reveal a need to proceed to a detailed assessment for PM_{10} in respect of the locations identified.

Section E - Roads with high flow of buses and/or HGV's

1. *Check whether such locations were assessed during the first round of review and assessment*

   No qualifying roads were identified during the first round.

2. *Identify all roads with an unusually high proportion of heavy-duty vehicles.*

   There are still no roads in the County Borough with a proportion of heavy-duty vehicles that is greater than 25% and consequently there is no need to proceed further.

Section F - New roads constructed or proposed since first round of review and assessment

There have been no new roads constructed since the first round of review and assessment that have had a traffic flow of 10,000 vehicles per day or have resulted in significantly increased flow on existing roads. No further consideration is therefore required for this section.

Section G - Roads close to the objective during the first round of review and assessment

There were no roads predicted to have more than 30 24-hour exceedences of 50 µg/m^3 during the first review and assessment.

Section H - Roads with significantly changed traffic flows

There are no roads having a traffic flow of 10,000 vehicles per day, which have experienced an increase in traffic flow of more than 25%.

Section I - New industrial sources

No other new industrial sources that are likely to give rise to substantial PM_{10} emissions have arisen. Therefore no further consideration of this section is required.

Section J - Industrial sources with substantially increased emissions

There are no industrial sources in the area for which emissions of PM_{10} have increased by more than 30%.

Section K - Areas of domestic solid fuel burning

1. *Identify areas where significant solid fuel burning still takes place.*

   The Authority has no firm data from Census or other sources on this issue. However, local knowledge indicates that it is now unlikely that there are any areas where the number of houses that rely primarily on coal for domestic heating exceeds 50 in a half kilometre square. Some towns which previously relied heavily upon coal, such as Glynneath, have now had access to gas for some years.

Section L - Quarries/landfill sites/opencast coal/handling of dusty cargoes at ports etc

1. *Establish if there is relevant exposure 'near' to the sources of dust emission.*
   The only site that has exposure within the 200m specified for background concentrations of less than 26 µg/m^3 is Onllwyn washery.

2. *Establish whether there are dust concerns associated with the facility.*

There are regular dust complaints about this site, but the process has been the subject of dust measurements using a TEOM as described in section A above and has been shown to be not at risk of exceeding the objectives.

Section M - Aircraft

There are no airports within the area bounded by the County Borough.

Conclusion

The results show some improvement in the PM_{10} concentrations measured at Groeswen Hospital. However, the reduction in data capture rates that arose from equipment failure in November 2005, means that more monitoring is required before consideration can be given to revocation of the Air Quality Management Area. Air quality can also vary from year to year and this is another reason why further monitoring is required.

The assessment has not revealed any other areas that require detailed assessment.