SCHEDULE 1

Regulation 6

Air quality standards

PART 1

Limit values for Group A pollutants

Benzene

	Averaging period	*Limit value*	*Attainment date*
Limit value for the protection of human health	Calendar year	5 $\mu g/m^3$	1 January 2010

Carbon monoxide

For the purposes of this table, the maximum daily 8-hour mean concentration will be selected by examining 8-hour running averages, calculated from hourly data and updated each hour. Each 8-hour average so calculated will be assigned to the day on which it ends, i.e. the first calculation period for any one day will be the period from 17:00 on the previous day to 01:00 on that day; the last calculation period for any one day will be the period from 16:00 to 24:00 on that day.

	Averaging period	*Limit value*
Limit value for the protection of human health	Maximum daily 8-hour mean	10 mg/m^3

Lead

	Averaging period	*Limit value*
Annual limit value for the protection of human health	Calendar year	0.5 $\mu g/m^3$

Nitrogen dioxide (NO2) and oxides of nitrogen (NOx)

	Averaging period	*Limit value*	*Attainment date*
Hourly limit value for the protection of human health	1 hour	200 $\mu g/m^3$ NO2, not to be exceeded more than 18 times a calendar year	1 January 2010
Annual limit value for the protection of human health	Calendar year	40 $\mu g/m^3$ NO2	1 January 2010
Annual limit value for the protection of vegetation	Calendar year	30 $\mu g/m^3$ NOx	

PM_{10}

	Averaging period	*Limit value*
24-hour limit value for the protection of human health	24 hours	50 µg/m^3 PM_{10}, not to be exceeded more than 35 times a calendar year
Annual limit value for the protection of human health	Calendar year	40 µg/m^3 PM_{10}

Sulphur dioxide

	Averaging period	*Limit value*
Hourly limit value for the protection of human health	1 hour	350 µg/m^3, not to be exceeded more than 24 times a calendar year
Daily limit value for the protection of human health	24 hours	125 µg/m^3, not to be exceeded more than 3 times a calendar year
Limit value for the protection of ecosystems	Calendar year and winter (1 October to 31 March)	20 µg/m^3

PART 2

Margins of tolerance for benzene and nitrogen dioxide

Start of period during which the margin applies	*End of period during which the margin applies*	*Benzene*	*Nitrogen dioxide (hourly limit value for the protection of human health)*	*Nitrogen dioxide (annual limit value for the protection of human health)*
Coming into force of these Regulations	31 December 2007	3 µg/m^3	30 µg/m^3	6 µg/m^3
1 January 2008	31 December 2008	2 µg/m^3	20 µg/m^3	4 µg/m^3
1 January 2009	31 December 2009	1 µg/m^3	10 µg/m^3	2 µg/m^3

PART 3

Target values for Group B pollutants

1. The target values in the table below in each case relate to the total content of the relevant pollutant in the PM_{10} fraction averaged over one calendar year.

2. The attainment date for each of these target values is 31 December 2012.

Pollutant	Target value
Arsenic	6 ng/m^3
Benzo(a)pyrene	1 ng/m^3
Cadmium	5 ng/m^3
Nickel	20 ng/m^3

PART 4

Target values and long-term objectives for ozone

3. In this Part—

(a) all values must be expressed in µg/m^3;

(b) the volume must be standardised at the following conditions of temperature and pressure: 293K and 101.3kPa;

(c) the time must be specified in Central European Time;

(d) "AOT40" (expressed in (µg/m^3) hours) means the sum of the difference between hourly concentrations greater than 80 µg/m^3 (which equals 40 parts per billion) and 80 µg/m^3 over a given period using only the 1 hour values measured between 8:00 and 20:00 Central European Time each day; and

(e) in order to be valid, the annual data on exceedances used to check compliance with the target values and long-term objectives below must meet the criteria set out in Part 2 of Schedule 12.

Target values

	Parameter	Target value for 2010(1)
Target value for the protection more of human health	Maximum daily 8-hour mean(2)	120 µg/m^3 not to be exceeded on than 25 days per calendar year averaged over three years(3)
Target value for the protection of vegetation	AOT 40, calculated from 1-hour values from May to July	18,000 µg/m^3.h averaged over five years(3)

(1) Compliance with target values will be assessed as of this value; that is, 2010 will be the first year the data for which is used in calculating compliance over three or five years, as appropriate.

(2) The maximum daily 8-hour mean concentration will be selected by examining 8-hour running averages, calculated from hourly data and updated each hour. Each 8-hour average so calculated will be assigned to the day on which it ends; that is, the first calculation period for any one day will be the period from 17:00 on the previous day to 01:00 on that day; the last calculation period for any one day will be the period from 16:00 to 24:00 on the day.

(3) If the three or five-year averages cannot be determined on the basis of a full and consecutive set of annual data, the minimum annual data required for checking compliance with the target values will be as follows: (i) for the target value for the protection of human health, valid data for one year, and (ii) for the target value for the protection of vegetation, valid data for three years.

Long-term objectives

	Parameter	*Long-term objective*
Long-term objective for the protection of human health	Maximum daily 8-hour mean within a calendar year	120 $\mu g/m^3$
Long-term objective for the protection of vegetation	AOT40, calculated from 1-hour values from May to July	6,000 $\mu g/m^3.h$

SCHEDULE 2

Regulation 8(4)

Information to be included in an Improvement Plan

1. Localisation of excess pollution—

(a) region;

(b) city (map); and

(c) measuring station (map, geographical coordinates).

2. General information—

(a) type of zone (city, industrial or rural area);

(b) estimate of the polluted area (km^2) and of the population exposed to the pollution;

(c) useful climatic data;

(d) relevant data on topography; and

(e) sufficient information on the type of targets requiring protection in the zone.

3. Responsible authorities (names and addresses of persons responsible for the development and implementation of improvement plans).

4. Nature and assessment of pollution—

(a) concentrations observed over previous years (before the implementation of the improvement measures);

(b) concentrations measured since the beginning of the project; and

(c) techniques used for the assessment.

5. Origin of pollution—

(a) list of the main emission sources responsible for pollution (map);

(b) total quantity of emissions from these sources (tonnes/year); and

(c) information on pollution imported from other regions.

6. Analysis of the situation—

(a) details of those factors responsible for the excess (transport, including cross-border transport, formation); and

(b) details of possible measures for improvement of air quality.

7. Details of those measures or projects for improvements which existed prior to 21 November 1996—

(a) local, regional, national and international measures; and

(b) observed effects of these measures.

8. Details of those measures or projects adopted with a view to reducing pollution following 21 November 1996—

(a) listing and description of all the measures set out in the project;

(b) timetable for implementation; and

(c) estimate of the improvement of air quality planned and of the expected time required to attain these objectives.

9. Details of the measures or projects planned or being researched for the long term.

10. List of the publications, documents and work used to supplement information required by this Schedule.

SCHEDULE 3

Regulation 11(6)

Alert and information thresholds

PART 1

Alert thresholds for nitrogen dioxide and sulphur dioxide

Nitrogen dioxide	400 µg/m^3 measured over three consecutive hours at locations representative of air quality over at least 100 km^2 or an entire zone or agglomeration, whichever is the smaller
Sulphur dioxide	500 µg/m^3 measured over three consecutive hours at locations representative of air quality over at least 100 km^2 or an entire zone or agglomeration, whichever is the smaller

PART 2

Alert and information thresholds for ozone

	Parameter	*Threshold*
Alert threshold	1-hour average(1)	240 µg/m^3
Information threshold	1-hour average	180 µg/m^3

(1) For the purposes of regulation 11 (action plans), exceedance of the 1-hour average in respect of the alert threshold is to be measured or predicted for three consecutive hours.

SCHEDULE 4 Regulation 13(5)

Assessment thresholds

PART 1

Assessment thresholds for Group A pollutants

Benzene

	Annual average
Upper assessment threshold	70% of limit value (3.5 μg/m^3)
Lower assessment threshold	40% of limit value (2 μg/m^3)

Carbon monoxide

	Eight-hour average
Upper assessment threshold	70% of limit value (7 mg/m^3)
Lower assessment threshold	50% of limit value (5 mg/m^3)

Lead

	Annual average
Upper assessment threshold	70% of limit value (0.35 μg/m^3)
Lower assessment threshold	50% of limit value (0.25 μg/m^3)

Nitrogen dioxide (NO2) and oxides of nitrogen (NOx)

	Hourly limit value for the protection of human health (NO2)	*Annual limit value for the protection of human health (NO2)*	*Annual limit value for the protection of vegetation (NOx)*
Upper assessment threshold	70% of limit value (140 μg/m^3), not to be exceeded more than 18 times in any calendar year	80% of limit value (32 μg/m^3)	80% of limit value (24 μg/m^3)
Lower assessment threshold	50% of limit value (100 μg/m^3), not to be exceeded more than 18 times in any calendar year	65% of limit value (26 μg/m^3)	65% of limit value (19.5 μg/m^3)

PM_{10}

	24-hour average	*Annual average*
Upper assessment threshold	60% of limit value (30 µg/m^3), not to be exceeded more than 7 times in any calendar year	70% of limit value (14 µg/m^3)
Lower assessment threshold	40% of limit value (20 µg/m^3), not to be exceeded more than 7 times in any calendar year	50% of limit value (10 µg/m^3)

Sulphur dioxide

	Health protection	*Ecosystem protection*
Upper assessment threshold	60% of 24-hour limit value (75 µg/m^3), not to be exceeded more than 3 times in any calendar year	60% of winter limit value (12 µg/m^3)
Lower assessment threshold	40% of 24-hour limit value (50 µg/m^3), not to be exceeded more than 3 times in any calendar year	40% of winter limit value (8 µg/m^3)

PART 2

Assessment thresholds for Group B pollutants

Arsenic

Upper assessment threshold	60% of target value (3.6 ng/m^3)
Lower assessment threshold	40% of target value (2.4 ng/m^3)

Benzo(a)pyrene

Upper assessment threshold	60% of target value (0.6 ng/m^3)
Lower assessment threshold	40% of target value (0.4 ng/m^3)

Cadmium

Upper assessment threshold	60% of target value (3 ng/m^3)
Lower assessment threshold	40% of target value (2 ng/m^3)

Nickel

Upper assessment threshold	70% of target value (14 ng/m3)
Lower assessment threshold	50% of target value (10 ng/m3)

PART 3

Determination of when assessment thresholds are exceeded

1. Exceedances of upper and lower assessment thresholds must be determined on the basis of concentrations during the previous five years where sufficient data are available. An assessment threshold will be deemed to have been exceeded if it has been exceeded during at least three separate years out of the previous five years.

2. Where fewer than five years' data are available, measurement campaigns of short duration during the period of the year and at locations likely to be typical of the highest concentrations may be combined with results obtained from emission inventories and modelling to determine exceedances of the upper and lower assessment thresholds.

SCHEDULE 5

Regulation 15(1)(b) Regulation 19(4)(b) Regulation 20(3)(b)

Location of sampling points

PART 1

Macroscale siting for Group A pollutants

Sampling points for the protection of human health

1. Sampling points directed at the protection of human health should be sited to provide data on—

- (a) the areas within zones where the highest concentrations occur to which the population is likely to be directly or indirectly exposed for a period which is significant in relation to the averaging period of the limit value; and
- (b) concentrations in other areas within the zones which are representative of the exposure of the general population.

2. Sampling points should in general be sited to avoid measuring very small micro-environments in their immediate vicinity. As a guideline, a sampling point should be sited to be representative of air quality in a surrounding area of no less than 200 m^2 at traffic-orientated sites and of several square kilometres at urban-background sites.

3. Sampling points should also, where possible, be representative of similar locations not in their immediate vicinity.

4. Account should be taken of the need to locate sampling points on islands, where that is necessary for the protection of human health.

Protection of ecosystems and vegetation

5. Sampling points targeted at the protection of ecosystems or vegetation should be sited more than 20 km from agglomerations or more than 5 km from other built-up areas, industrial installations or motorways. As a guideline, a sampling point should be sited to be representative of air quality in a surrounding area of at least 1000 km^2. A sampling point may be sited at a lesser distance or to be representative of air quality in a less extended area, taking account of geographical conditions.

6. Account should be taken of the need to assess air quality on islands.

PART 2

Macroscale siting for Group B pollutants

7. The sites of sampling points should be selected in such a way as to provide data on—

- (a) the areas within zones where the population is likely to be directly or indirectly exposed to the highest concentrations averaged over a calendar year;
- (b) concentrations in other areas within zones which are representative of the exposure of the general population;
- (c) deposition rates representing the indirect exposure of the population through the food chain.

8. Sampling points should in general be sited so as to avoid measuring very small micro-environments in their immediate vicinity. As a guideline, a sampling point should be representative of air quality in surrounding areas of no less than 200 m^2 at traffic-orientated sites, at least 250 m ×; 250 m at industrial sites, where feasible, and several square kilometres at urban-background sites.

9. Where the objective is to assess background levels the sampling site should not be influenced by agglomerations or industrial sites in its vicinity, i.e. sites closer than a few kilometres.

10. Where contributions from industrial sources are to be assessed, at least one sampling point must be installed downwind of the source in the nearest residential area. Where the background concentration is not known, an additional sampling point must be situated within the main wind direction. In particular, where regulation 9(1)(a) applies, the sampling points should be sited such that the application of the measures referred to at regulation 7(2)(b) can be monitored.

11. Sampling points should also, where possible, be representative of similar locations not in their immediate vicinity. Where appropriate, they should be co-located with sampling points for PM_{10}.

PART 3

Macroscale siting for ozone

12. Sampling points for ozone must be located in accordance with the considerations set out in the following table—

Type of station	*Objective of measurement*	*Representativeness*[(1)]	*Macroscale siting criteria*
Urban	*Protection of human health*: to assess the exposure of the	A few km^2	Away from the influence of local emissions such as

---

(1) Sampling points should also, where possible, be representative of similar locations not in their immediate vicinity.

Type of station	*Objective of measurement*	*Representativeness*[1]	*Macroscale siting criteria*
	urban population to ozone, i.e. where the population density and ozone concentration are relatively high and representative of the exposure of the general population		traffic, petrol stations etc.; vented locations where the urban population to well mixed levels can be measured; locations such as residential and commercial areas of cities, parks (away from the trees), big streets or squares with very little or no traffic open areas characteristic of education, sports or recreation facilities
Suburban	*Protection of human health and vegetation*: To assess the exposure of the population and vegetation located in the outskirts of the agglomeration, where the highest ozone levels, to which the population and vegetation is likely to be directly or indirectly exposed, occur	Some tens of km^2	At a certain distance from the area of maximum emissions, downwind following the main wind direction during conditions favourable to ozone formation; where population, sensitive crops or natural ecosystems located in the outer fringe of an agglomeration are exposed to high ozone levels; where appropriate, some sub urban stations also upwind of the area of maximum emissions, in order to determine the regional background levels of ozone
Rural	*Protection of human health and vegetation:* to assess the exposure of population, crops and natural ecosystems to sub-regional scale ozone concentrations	Sub-regional levels (a few km^2)	Stations can be located in small settlements and/or areas with natural ecosystems, forests or crops; representative for ozone away from the influence of immediate

---

(1) Sampling points should also, where possible, be representative of similar locations not in their immediate vicinity.

Type of station	*Objective of measurement*	*Representativeness*[(1)]	*Macroscale siting criteria*
			local emissions such as industrial installations and roads; at open area sites, but not on higher mountain-tops
Rural background	Protection of vegetation and human health: To assess the exposure of crops and natural ecosystems to regional-scale ozone concentrations as well as exposure of the populations	Regional/national / continental levels (1,000 to 10,000 km2)	Stations located in areas with lower population density, e.g. with natural ecosystems, forests, far removed from urban and industrial areas and away from local emissions; avoid locations which are subject to locally enhanced formation of near- ground inversion conditions, also summits of higher mountains; coastal sites with pronounced diurnal wind cycles of local character are not recommended

(1) Sampling points should also, where possible, be representative of similar locations not in their immediate vicinity.

13. For rural and background stations, consideration should be given, where appropriate, to co-ordination with the monitoring requirements of Commission Regulation 1091/94(**1**) concerning protection of the Community's forests against atmospheric pollution.

PART 4

Microscale siting

14. The following guidelines should be met as far as practicable—

(a) the flow around the inlet sampling probe should be unrestricted (and, for ozone sampling, free in an arc of at least 270°), without any obstructions affecting the airflow in the vicinity of the sampler (normally some metres away from buildings, balconies, trees and other obstacles by more than twice the height the obstacle protrudes above the sampler and at least 0.5 m from the nearest building in the case of sampling points representing air quality at the building line);

(b) in general, the inlet sampling point should be between 1.5 m (the breathing zone) and 4 m above the ground. Higher positions (up to 8 m) may be necessary in some circumstances and in wooded areas. Higher siting may also be appropriate if the station is representative of a large area;

(**1**) OJ No L 125, 18.05.94, p.1.

(c) the inlet probe should not be positioned in the immediate vicinity of sources in order to avoid the direct intake of emissions unmixed with ambient air;

(d) the sampler's exhaust outlet should be positioned so that recirculation of exhaust air to the sampler inlet is avoided;

(e) in relation to the location of traffic orientated samplers—

  (i) for all pollutants, such sampling points should be at least 25 m from the edge of major junctions and at least 4 m from the centre of the nearest traffic lane,

  (ii) for nitrogen dioxide and carbon monoxide, inlets should be no more than 5 m from the kerbside, and

  (iii) for PM_{10}, lead, benzene and Group B pollutants, inlets should be sited so as to be representative of air quality near to the building line;

(f) for ozone, the inlet probe should be positioned well away from such sources as furnaces and incineration flues and more than 10 m from the nearest road, with distance increasing as a function of traffic intensity;

(g) for deposition measurements in rural background areas as respects Group B pollutants and other pollutants falling within regulations 19 and 20, the European Monitoring and Evaluation of Pollutants guidelines and criteria should be applied as far as practicable.

15. The following factors may also be taken into account—

(a) interfering sources;

(b) security;

(c) access;

(d) availability of electrical power and telephone communications;

(e) visibility of the site in relation to its surroundings;

(f) safety of public and operators;

(g) the desirability of co-locating sampling points for different pollutants;

(h) planning requirements.

PART 5

Documentation and review of site selection

16. The site-selection procedures should be fully documented at the classification stage by such means as compass-point photographs of the surrounding area and a detailed map. Sites should be reviewed at regular intervals with repeated documentation to ensure that selection criteria remain valid over time.

17. For ozone, this requires screening and interpretation of the monitoring data in the context of the meteorological and photochemical processes affecting the ozone concentrations measured at the respective site.

SCHEDULE 6

Regulation 15(2)

Minimum number of sampling points

PART 1

Group A pollutants: human health-based limit values and alert thresholds

1. This Part sets out the minimum number of sampling points for fixed measurement of Group A pollutants to assess compliance with limit values for the protection of human health and alert thresholds in zones where fixed measurement is the sole source of information.

Diffuse sources

Population of zone (thousands)	*If concentrations exceed the upper assessment threshold*[1]	*If maximum concentrations are between the upper and lower assessment thresholds*	*For nitrogen dioxide and sulphur dioxide in agglomerations where maximum concentrations are below the lower assessment thresholds*
0—249	1	1	not applicable
250—499	2	1	1
500—749	2	1	1
750—999	3	1	1
1,000—1,499	4	2	1
1,500—1,999	5	2	1
2,000—2,749	6	3	2
2,750—3,749	7	3	2
3,750—4,749	8	4	2
4,750—5,999	9	4	2
6,000 or more	10	5	3

(1) For NO2 and PM_{10} to include at least one urban-background station and one traffic-orientated station; this requirement also applies to benzene and carbon monoxide provided that it does not increase the number of sampling points.

Point sources

2. For the assessment of pollution in the vicinity of point sources, the number of sampling points for fixed measurement should be calculated taking into account emission densities, the likely distribution patterns of ambient-air pollution and the potential exposure of the population.

PART 2

Group A pollutants: limit values for the protection of ecosystems or vegetation

3. The Table below sets out the minimum number of sampling points for fixed measurements to assess compliance with limit values for the protection of ecosystems or vegetation in zones other than agglomerations.

If maximum concentrations exceed the upper assessment threshold	*If maximum concentrations are between the upper and lower assessment thresholds*
1 station every 20,000 km2	1 station every 40,000 km^2

4. In island zones, the number of sampling points for fixed measurement should be calculated taking into account the likely distribution patterns of ambient-air pollution and the potential exposure of ecosystems or vegetation.

PART 3

Group B pollutants

5. This Part sets out the minimum number of sampling points for fixed measurement of Group B pollutants to assess compliance with target values for the protection of human health in zones where fixed measurement is the sole source of information.

Diffuse sources

Population of zone (thousands)	*If maximum concentrations exceed the upper assessment threshold*[(1)]		*If maximum concentrations are between the upper and lower assessment thresholds*	
	Arsenic, Cadmium, Nickel	Benzo(a) pyrene	Arsenic, Cadmium, Nickel	Benzo(a)pyrene
0—749	1	1	1	1
750—1,999	2	2	1	1
2,000—3,749	2	3	1	1
3,750—4,749	3	4	2	2
4,750—5,999	4	5	2	2
=<6,000	5	5	2	2

(1) To include at least one urban-background station and for benzo(a)pyrene also one traffic-oriented station provided this does not increase the number of sampling points.

Point sources

6. For the assessment of pollution in the vicinity of point sources, the number of sampling points for fixed measurement should be determined taking into account emission densities, the likely distribution patterns of ambient air pollution and potential exposure of the population. The sampling points should be sited such that the application of the measures referred to at regulation 7(2)(b) can be monitored.

PART 4

Ozone

7. Except insofar as otherwise provided by regulation 15(5) or (6), the minimum number of sampling points for fixed continuous measurement to assess air quality in view of compliance with the target values, long-term objectives and information and alert thresholds where continuous measurement is the sole source of information is set out in the table below.

Population of zone (thousands)	*Agglomerations (urban and suburban)*(1)	*Other zones (suburban and rural)*(1)	*Rural background*
0—249		1	1 station/50,000 km^2 as an average density over all zones in Wales(2)
250—499	1	2	1 station/50,000 km^2 as an average density over all zones in Wales(2)
500—999	2	2	1 station/50,000 km^2 as an average density over all zones in Wales(2)
1,000—1,499	3	3	1 station/50,000 km^2 as an average density over all zones in Wales(2)
1,500—1,999	3	4	1 station/50,000 km^2 as an average density over all zones in Wales(2)
2,000—2,749	4	5	1 station/50,000 km^2 as an average density over all zones in Wales(2)
2,750—3,749	5	6	1 station/50,000 km^2 as an average density over all zones in Wales(2)
3,750 or more	1 additional station per 2 million inhabitants	1 additional station per 2 million inhabitants	1 station/50,000 km^2 as an average density

(1) At least 1 station in suburban areas, where the highest exposure of the population is likely to occur. In agglomerations at least 50% of the stations should be located in suburban areas.

(2) 1 station per 25,000 km^2 for complex terrain is recommended.

Population of zone (thousands)	*Agglomerations (urban and suburban)*[(1)]	*Other zones (suburban and rural)*[(1)]	*Rural background*
			over all zones in Wales[(2)]

[(1)] At least 1 station in suburban areas, where the highest exposure of the population is likely to occur. In agglomerations at least 50% of the stations should be located in suburban areas.

[(2)] 1 station per 25,000 km^2 for complex terrain is recommended.

PART 5

Ozone: minimum number of sampling points for fixed measurements for zones attaining the long-term objectives

8. In cases where zones attain the long-term objectives, the number of sampling points for ozone must, in combination with other means of supplementary assessment such as air quality modelling and co-located nitrogen dioxide measurements, be sufficient to examine the trend of ozone pollution and check compliance with the long-term objectives.

9. The number of stations located in agglomerations and other zones may be reduced to one-third of the number specified in the Table in Part 4. Where information from fixed measurement stations is the sole source of information, at least one monitoring station should be kept. If, in zones where there is supplementary assessment, the result of this is that a zone has no remaining station, co-ordination with the number of stations in neighbouring zones must ensure adequate assessment of ozone concentrations against long-term objectives.

10. The number of rural background stations should be 1 per 100,000 km^2.

SCHEDULE 7

Regulation 15(6)(b) Regulation 16(1)

Requirements for assessment methods other than fixed measurement

PART 1

Group A pollutants

1. The following information must be compiled for zones within which sources other than fixed measurement are employed to supplement information from fixed measurement or as the sole means of air quality assessment—

(a) a description of assessment activities carried out;

(b) the specific methods used, with references to descriptions of the method;

(c) the sources of data and information;

(d) a description of results, including uncertainties and, in particular, the extent of any area or, if relevant, the length of road within the zone over which concentrations exceed the limit value or, as the case may be, the limit value plus applicable margin of tolerance and of any area within which concentrations exceed the upper assessment threshold or the lower assessment threshold;

(e) for limit values the object of which is the protection of human health, the population potentially exposed to concentrations in excess of the limit value.

2. Where possible, maps must be compiled showing concentration distributions within each zone.

PART 2

Group B pollutants

Requirements for air quality models

3. Where an air quality model is used for assessment, references to descriptions of the model and information on the uncertainty must be compiled. The uncertainty for modelling is defined as the maximum deviation of the measured and calculated concentration levels, over a full year, without taking into account the timing of the events.

Requirements for objective estimation techniques

4. Where objective estimation techniques are used, the uncertainty must not exceed 100%.

Standardisation

5. For substances to be analysed in the PM_{10} fraction, the sampling volume refers to ambient conditions.

PART 3

Ozone and ozone precursor substances

6. The following information should be compiled for zones within which sources other than measurements are employed to supplement information from measurement—

(a) a description of the assessment activities carried out;

(b) specific methods used, with references to descriptions of the method;

(c) sources of data and information;

(d) a description of results, including uncertainties and, in particular, the extent of any area within the zone over which concentrations exceed long-term objectives or target values;

(e) for long-term objectives or target values whose object is the protection of human health, the population potentially exposed to concentrations in excess of the threshold.

7. The National Assembly must ensure that maps are compiled showing concentration distributions within each zone.

SCHEDULE 8

Regulation 16(2) Regulation 17(2)(d) Regulation 19(6) Regulation 20(4)

Data quality objectives

PART 1

Group A pollutants and $PM_{2\cdot5}$

Group A pollutants (other than benzene and carbon monoxide) and $PM_{2\cdot5}$

1. Data-quality objectives are set out in the table and paragraphs below for the required accuracy of assessment methods, of minimum time coverage and of data capture of measurement are laid down to guide quality assurance programmes—

	Sulphur dioxide, nitrogen dioxide and oxides of nitrogen	*Lead, $PM_{2\cdot5}$ and PM_{10}*
Continuous measurement		
Accuracy	15%	25%
Minimum data capture	90%	90%
Indicative measurement		
Accuracy	25%	50%
Minimum data capture	90%	90%
Minimum time coverage	14% (one measurement a week at random, evenly distributed over the year, or eight weeks evenly distributed over the year)	14% (one measurement a week at random, evenly distributed over the year, or eight weeks evenly distributed over the year)
Modelling		
Accuracy		
Hourly averages	50%-60%	
Daily averages	50%	
Annual averages	30%	50%
Objective estimation		
Accuracy	75%	100%

2. The accuracy of the measurement is defined as laid down in the "Guide to the Expression of Uncertainty of Measurements" (ISO 1993)(**2**) or in ISO 5725-1 "Accuracy (trueness and precision) of measurement methods and results" (ISO 1994). The percentages in the table are given for individual measurements averaged, over the period considered, by the limit value, for a

---

(**2**) Copies of International Standards Organisation publications may be purchased from the British Standards Institution ('BSI') Sales Department either by telephone (0208 996 9001) or by post from the BSI, Standards House, 389 Chiswick High Road, London W4 4AL, http://www.bsi-global.com

95% confidence interval (bias + two times the standard deviation). The accuracy for continuous measurements should be interpreted as being applicable in the region of the appropriate limit value.

3. The accuracy for modelling and objective estimation is defined as the maximum deviation of the measured and calculated concentration levels, over the period considered by the limit value, without taking account the timing of the events

4. The requirements for minimum data capture and time coverage do not include losses of data due to the regular calibration or the normal maintenance of the instrumentation.

5. The National Assembly may allow for random measurements to be made instead of continuous measurements for lead, $PM_{2 \cdot 5}$ and PM_{10} by methods for which accuracy within the 95% confidence interval with respect to continuous monitoring has been demonstrated to be within 10%. Random sampling must be spread evenly over the year.

Benzene and carbon monoxide

6. The data quality objectives in the following table, for allowed uncertainty of assessment methods, of minimum time coverage and of data capture of measurement are provided to guide quality assurance programmes—

	Benzene	*Carbon monoxide*
Fixed measurements		
Uncertainty	25%	15%
Minimum data capture	90%	90%
Minimum time coverage	35% at urban background and traffic sites (distributed over the year to be representative of various conditions for climate and traffic); 90% at industrial sites	
Indicative measurements		
Uncertainty	30%	25%
Minimum data capture	90%	90%
Minimum time coverage	14% (one day's measurement a week at random, evenly distributed over the year, or 8 weeks evenly distributed over the year)	14% (one measurement a week at random, evenly distributed over the year, or 8 weeks evenly distributed over the year)
Modelling		
Uncertainty:		
Eight-hour averages		50%
Annual averages	50%	
Objective estimation		
Uncertainty	100%	75%

7. The uncertainty (on a 95% confidence interval) of the assessment methods must be evaluated in accordance with the "Guide to the Expression of Uncertainty of Measurements" (ISO 1993) or the methodology of ISO 5725:1994. The percentages for uncertainty in the above table are given for individual measurements averaged over the period considered by the limit value, for a 95% confidence interval. The uncertainty for the fixed measurements should be interpreted as being applicable in the region of the appropriate limit value.

8. The uncertainty for modelling and objective estimation is defined as the maximum deviation of the measured and calculated concentration levels, over the period considered by the limit value, without taking into account the timing of the events.

9. The requirements for minimum data capture and time coverage do not include losses of data due to the regular calibration or the normal maintenance of the instrumentation.

10. The National Assembly may allow for random measurements to be made instead of continuous measurements for benzene if the uncertainty, including the uncertainty due to random sampling, meets the quality objective of 25%. Random sampling must be spread evenly over the year.

PART 2

Group B pollutants, polycyclic aromatic hydrocarbons and total gaseous mercury

11. The data quality objectives set out in the table and paragraphs below are provided to guide quality assurance programmes—

	Benzo(a) pyrene	*Arsenic, cadmium and nickel*	*Polycyclic aromatic hydrocarbons and total gaseous mercury*	*Total deposition*
Uncertainty				
Fixed and indicative measurements	50%	40%	50%	70%
Modelling	60%	60%	60%	60%
Minimum data capture	90%	90%	90%	90%
Minimum time coverage				
Fixed measurements	33%	50%		
Indicative measurements[1]	14%	14%	14%	33%

---

(1) Indicative measurement being measurements which are performed at reduced regularity but fulfil the other data quality objectives.

12. The uncertainty (expressed at a 95 % confidence level) of the methods used for the assessment of ambient air concentrations must be evaluated in accordance with the CEN Guide to the Expression of Uncertainty in Measurement (ENV 13005-1999)(**3**), the methodology of ISO 5725:1994, and the guidance provided in the CEN Report, "Air quality — Approach to uncertainty estimation for ambient air reference measurement methods" (CR 14377:2002E). The percentages for uncertainty in the above table are given for individual measurements, which are averaged over typical sampling times, for a 95 % confidence interval. The uncertainty of the measurements should be interpreted as being applicable in the region of the appropriate target value. Fixed and indicative measurements must be evenly distributed over the year in order to avoid skewing of results.

13. The requirements for minimum data capture and time coverage do not include losses of data due to regular calibration or normal maintenance of the instrumentation. Twenty-four-hour sampling is required for the measurement of benzo(a)pyrene and other polycyclic aromatic hydrocarbons. With care, individual samples taken over a period of up to one month may be combined and analysed as a composite sample, provided the method ensures that the samples are stable for that period. The three congeners benzo(b)fluoranthene, benzo(j)fluoranthene, benzo(k)fluoranthene where they are difficult to resolve analytically. In such cases they can be reported as sum. Twenty-four hour sampling is also recommended as advisable for the measurement of arsenic, cadmium and nickel concentrations. Sampling must be spread evenly over the weekdays and the year. For the measurement of deposition rates monthly, or weekly, samples throughout the year are recommended.

14. The National Assembly may allow for use of wet only instead of bulk sampling if it can be demonstrated to its satisfaction that the difference between them is within 10 %. Deposition rates should generally be given as μg/m^2 per day.

15. The National Assembly may apply a minimum time coverage lower than indicated in the table, but not lower than 14 % for fixed measurements and 6 % for indicative measurements provided that it is satisfied that it can be demonstrated that the 95 % expanded uncertainty for the annual mean, calculated from the data quality objectives in the table according to ISO 11222:2002 — "Determination of the uncertainty of the time average of air quality measurements" will be met.

PART 3

Ozone and nitrogen dioxide assessed at ozone sampling points

16. The data quality objectives set out in the table and paragraphs below, for allowed uncertainty of assessment methods, and of minimum time coverage and of data capture of measurement, are provided to guide quality-assurance programmes—

	For ozone, NO and NO2 assessed at ozone sampling points
Continuous fixed measurement	
Uncertainty of individual measurements	15%
Minimum data capture	90% during summer; 75% during winter
Indicative measurement	
Uncertainty of individual measurements	30%
Minimum data capture	90%
Minimum time coverage	>10% during summer
Modelling	

(**3**) European Committee for Standardisation ("CEN") publication; the address of CEN is 36, Rue de Stassart, B-1050, Brussels, Belgium http://www.cenorm.be

	For ozone, NO and NO2 assessed at ozone sampling points
Uncertainty	
1 hour averages (daytime)	50%
8 hours daily maximum	50%
Objective estimation	
Uncertainty	75%

17. The uncertainty (on a 95% confidence interval) of the measurement methods must be evaluated in accordance with the principles laid down in the "Guide to the Expression of Uncertainty of Measurements" (ISO 1993) or the methodology in ISO 5725-1 "Accuracy (trueness and precision) of measurement methods and results" (ISO 1994) or equivalent. The percentages for uncertainty in the table are given for individual measurements, averaged over the period for calculating target values and long-term objectives, for a 95% confidence interval. The uncertainty for continuous fixed measurements should be interpreted as being applicable in the region of the concentration used for the appropriate threshold.

18. The uncertainty for modelling and objective estimation means the maximum deviation of the measured and calculated concentration levels, over the period for calculating the appropriate threshold, without taking into account the timing of events.

19. "Time coverage"("*yr amser a gwmpesir*") means the percentage of time considered for settling the threshold value during which the pollutant is measured.

20. "Data capture" ("*y data a gipir*") means the ratio of the time for which the instrument produces valid data, to the time for which the statistical parameter or aggregated value is to be calculated.

SCHEDULE 9

Regulation 16(3)(a) Regulation 19(6) Regulation 20(4)

Reference methods

PART 1

Group A pollutants

	Reference method
Sampling and analysis of benzene	A pumped sampling method on a sorbent cartridge followed by gas chromatographic determination
Analysis of carbon monoxide	A non-dispersive infra-red spectrometric (NDIR) method
Sampling of lead	The same reference method as for PM_{10}
Analysis of lead	ISO 9855: 1993 Ambient air — Determination of the particulate lead content of aerosols

	Reference method
	collected in filters. Atomic absorption spectroscopy method
Analysis of nitrogen dioxide and oxides of nitrogen	ISO 7996: 1985 Ambient air — determination of the mass concentrations of nitrogen oxides — chemiluminescence method
Sampling and measurement of PM_{10}	The reference method for the sampling and measurement of PM_{10} is that described in EN 12341 “Air Quality — Field Test Procedure to Demonstrate Reference Equivalence of Sampling Methods for the PM_{10} fraction of particulate matter” . The measurement principle is based on the collection on a filter of the PM_{10} fraction of ambient particulate matter and the gravimetric mass determination
Analysis of sulphur dioxide	ISO/FDIS 10498 (Standard in draft) Ambient air — determination of sulphur dioxide — ultraviolet fluorescence method

PART 2

Group B pollutants in ambient air

	Reference method
Sampling and analysis of Group B pollutants other than benzo(a)pyrene in ambient air	A method based on manual PM_{10} sampling equivalent to EN 12341, followed by digestion of the samples and analysis by Atomic Absorption Spectrometry or ICP Mass Spectrometry
Benzo(a)pyrene concentrations in ambient air	A method based on manual PM_{10} sampling equivalent to EN 12341

PART 3

Ozone

	Reference method
Analysis of ozone	UV photometric method (ISO FDIS 13964 or equivalent)
Calibration of ozone instruments	The Reference UV photometer method (ISO FDIS 13964, VDI 2468, B1.6 or equivalent)

PART 4

Other reference methods

	Reference method
Sampling and analysis of polycyclic aromatic hydrocarbons in ambient air	A method based on manual PM_{10} sampling equivalent to EN 12341
Sampling and analysis of mercury in ambient air	An automated method based on Atomic Absorption Spectrometry or Atomic Fluorescence Spectrometry
Sampling and analysis of the deposition of Group B pollutants, mercury, and polycyclic aromatic hydrocarbons	A method based on the exposition of cylindrical deposit gauges with standardised dimensions

SCHEDULE 10

Regulation 18

Ozone precursor substances

Objectives

1. The main objectives of measurements of ozone precursor substances are to analyse any trend in ozone precursors, to check the efficiency of emission reduction strategies, to check the consistency of emission inventories and to help attribute emission sources to pollution concentration.

2. An additional aim is to support the understanding of ozone formation and precursor dispersion processes, as well as the application of photochemical models.

Substances

3. Measurements of ozone precursor substances must include at least nitrogen oxides, and appropriate volatile organic compounds. For the purposes of this Schedule, “volatile organic compounds” means all organic compounds from anthropogenic and biogenic sources, other than methane, that are capable of producing photochemical oxidants by reaction with nitrogen oxides in the presence of sunlight.

4. A list of volatile organic compounds recommended for measurement by Directive 2002/3/EC(**4**) is given in the table below—

Ethane	1-Butene	Isoprene	Ethyl benzene
Ethylene	trans-2-Butene	n-Hexane	m+p-Xylene
Acetylene	cis-2-Butene	i-Hexane	o-Xylene
Propane	1.3-Butadiene	n-Heptane	1,2,4-Trimeth. Benzene
Propene	n-Pentane	n-Octane	1,2,3-Trimeth. Benzene

(**4**) A full reference for this Directive is given at regulation 2(2)(d).

n-Butane	i-Pentane	i-Octane	1,3,5-Trimeth. Benzene
i-Butane	1-Pentene	Benzene	Formaldehyde
	2-Pentene	Toluene	Total non-methane hydrocarbons

Reference methods

5. The reference method for the analysis of oxides of nitrogen is ISO 7996:1985, Ambient air — determination of the mass concentrations of nitrogen oxides — chemiluminescence method.

Monitoring sites

6. Measurements should be taken in particular in urban and suburban areas at any monitoring site considered appropriate with regard to the monitoring objectives in this Schedule.

SCHEDULE 11

Regulation 24(2) and (3)

Public information where alert or information thresholds are exceeded

PART 1

Alert thresholds for nitrogen dioxide and sulphur dioxide

1. In cases where the alert thresholds for nitrogen dioxide or sulphur dioxide are exceeded, the information to be made available to the public should include at least—

(a) the date, hour and place of the occurrence and the reasons for the occurrence, where known;

(b) any forecasts of—

  (i) changes in concentration (improvement, stabilisation or deterioration), together with the reasons for those changes,

  (ii) the geographical area concerned, and

  (iii) the duration of the occurrence;

(c) the type of population potentially sensitive to the occurrence; and

(d) the precautions to be taken by the sensitive population concerned.

PART 2

Alert and information thresholds for ozone

2. In cases where either the information threshold or the alert threshold for ozone—

(a) is exceeded; or

(b) is predicted to be exceeded,

the details set out in paragraphs 3 to 6 must, as a minimum, be made available to the public on a sufficiently large scale.

3. Information on any observed exceedance—

(a) the location or area of the exceedance;

(b) the type of threshold exceeded (information threshold or alert threshold);

(c) the time at which the exceedance began and its duration; and

(d) the highest 1-hour and 8-hour mean concentration.

4. Forecast for the following afternoon, day or days—

(a) the geographical area of expected exceedances of an information threshold or alert threshold; and

(b) the expected change in pollution, that is, improvement, stabilisation or deterioration.

5. Information on the type of population concerned, possible health effects and recommended conduct—

(a) information on population groups at risk;

(b) description of likely symptoms;

(c) recommended precautions to be taken by the population concerned; and

(d) where to find further information.

6. Information provided under this Schedule must also include—

(a) information on preventive action to reduce pollution or exposure to it;

(b) an indication of main source sectors; and

(c) recommendations for action to reduce emissions.

SCHEDULE 12

Regulation 29

Collation of information and criteria for aggregating data and calculating statistical parameters

PART 1

Information to be submitted to the Commission

1. The following information on ozone concentrations must be obtained and collated—

	Type of station	*Level*	*Averaging / accumulation time*	*Provisional data for each month from April to September*	*Report for each year*
Information threshold	Any	180µg/m^3	1 hour	For each day with any exceedance: date, total hours of, exceedance,	For each day with any exceedance: date, total hours of exceedance,

(1) Maximum daily 8-hour mean.

(2) In this table, "AOT40" has the same meaning as in paragraph 3(d) of Part 4 of Schedule 1.

	Type of station	*Level*	*Averaging / accumulation time*	*Provisional data for each month from April to September*	*Report for each year*
				maximum 1-hour ozone and related NO2 values when required Monthly 1-hour maximum ozone	maximum 1-hour ozone and related NO2 values, when required
Alert threshold	Any	240µg/m^3	1 hour	For each day with any exceedance: date, total hours of exceedance, maximum 1-hour ozone and related NO2 values, when required	For each day with any exceedance: date, total hours of exceedance, maximum 1-hour ozone and related NO2 values, when required
Health protection	Any	120µg/m^3	8 hours	For each day with any exceedance: date, 8 hours maximum(1)	For each day with any exceedance: date, 8 hours maximum(1)
Vegetation protection	Suburban, rural, rural background	AOT40(2) = 6,000 µg/m^3.h	1 hour, accumulated from May to June		Value
Forest protection	Suburban, rural, rural background	AOT40(2) = 20,000 µg/m^3.h	1 hour, accumulated from April to September		Value
Materials	Any	40 µg/m3	1 year		Value

(1) Maximum daily 8-hour mean.

(2) In this table, "AOT40" has the same meaning as in paragraph 3(d) of Part 4 of Schedule 1.

2. The National Assembly must also ensure that the following information is collated—

(a) for ozone, nitrogen dioxide, oxides of nitrogen and the sums of ozone and nitrogen dioxide (added as parts per billion and expressed in µg/m^3 ozone) the maximum, 99.9th, 98th and 50th percentiles and annual average and number of valid data from hourly series; and

(b) the maximum, 98th and 50th percentile and annual average from a series of daily 8-hour ozone maxima.

3. Data compiled in monthly reports will be considered provisional and must be updated where necessary in subsequent submissions.

PART 2

Criteria for aggregating data and calculating statistical parameters

4. In this Part, percentiles are to be calculated using the method specified in Council Decision 97/101/EC(**5**) establishing a reciprocal exchange of information and data from networks and individual stations measuring ambient air pollution within member States.

5. The following criteria are to be used for checking validity when aggregating data and calculating statistical parameters—

Parameter	*Required proportion of valid data*
1 hour values	75% (45 minutes)
8 hour values	75% of values (6 hours)
Maximum daily 8 hours mean from hourly running 8 hours averages	75% of the hourly running 8-hour averages (18 8 hours per day)
AOT40	90% of the 1-hour values over the time period defined for calculating the AOT40 value[(1)]
Annual mean	75% of the 1-hour values over summer (April to September) and winter (January to March, October to December) seasons separately
Number of exceedances and maximum values per month	90% of the daily maximum 8 hours mean value (27 available daily values per month) 90% of the 1-hour values between 8:00 and 20:00 Central European Time
Number of exceedances and maximum values per year	Five out of six summer months over the summer season (April to September)

(1) In cases where all possible measured data are not available, the following factor must be used to calculate AOT40 values: AOT40 (estimate) = AOT40 measured × (total possible number of hours ÷ number of measured hourly values). The reference in this formula to the total possible number of hours is to the hours within the time period of AOT40 definition (that is, 8:00 to 20:00 Central European Time from 1 May to 31 July each year, for vegetation protection and from 1 April to 30 September each year for forest protection).

(**5**) OJ L 35, 05.02.97, p.14.

SCHEDULE 13

Regulation 30

Revocations

Regulations revoked	*Reference*	*With effect from*
The Air Quality Limit Values (Wales) (Amendment) Regulations 2005	S.I. 2005/1157 (W.74)	15 March 2007
The Air Quality (Ozone) (Wales) Regulations 2003	S.I. 2003/1848 (W.198)	15 March 2007
The Air Quality Limit Values (Wales) Regulations 2002	S.I. 2002/3183 (W.299)(1)	15 March 2007
Regulation 6 of the Air Quality Standards Regulations 1989(2), insofar as it applies in relation to Wales	S.I. 1989/317(3)	1 January 2010

---

(1) as amended by S.I. 2005/1157 (W.74).

(2) Regulation 6 of S.I. 1989/317 has been revoked, insofar as it applies in relation to Wales, by regulation 13(2) of S.I. 2002/3183 (W.299) from the date specified in the third column of the above table, with the effect that the revocation will not have taken effect by the time S.I. 2002/3183 (W.299) is itself revoked.

(3) as amended by S.I. 1995/3146 in relation to regulation 6.