

## Question:

*What are the concentration thresholds that trigger AQMA designation in the UK ?*

**Source:** Air quality targets - Detailed Evidence report.pdf

**Expected answer:** An AQMA must be declared when pollutant levels exceed national air quality objectives, such as an annual mean NO<sub>2</sub> concentration over 40 µg/m<sup>3</sup> or daily PM<sub>10</sub> levels above 50 µg/m<sup>3</sup> more than 35 times a year.

**Source:** Air Quality Strategy\_framework for local authority delivery.pdf

**Expected answer:** Local authorities are required to designate AQMAs when it is unlikely that air quality objectives will be achieved. These include specific thresholds for NO<sub>2</sub>, PM<sub>10</sub>, benzene, and other regulated pollutants.

### GPT-3.5, text, TF-IDF + Cosine

In the UK, the concentration thresholds that trigger Air Quality Management Area (AQMA) designation vary depending on the pollutant. Generally, AQMAs are designated when air pollution levels exceed certain thresholds set for pollutants such as nitrogen dioxide (NO<sub>2</sub>), sulphur dioxide (SO<sub>2</sub>), particulate matter (PM<sub>10</sub> and PM<sub>2.5</sub>), and other harmful substances. These thresholds are determined based on national and European Union air quality standards to protect public health and the environment. AQMAs are established to address and manage air quality issues in specific areas where pollution levels are consistently high or near the limit values.

[1] Guide to UK Air Pollution Information .pdf | Score: 0.118

[2] Air quality - GOV.UK.pdf | Score: 0.108

[3] Particulate Matter (PM\_sub\_2.5\_sub\_targets) in the Environment Act\_ Monitoring Assessment Methods - DEFRA UK Air - GOV.UK.pdf | Score: 0.103

### GPT-3.5, text, BM25

In the UK, the concentration thresholds that trigger the designation of an Air Quality Management Area (AQMA) are based on exceedances of air quality objectives set for specific pollutants. These thresholds are determined by monitoring levels of pollutants such as nitrogen dioxide (NO<sub>2</sub>), particulate matter (PM<sub>10</sub> and PM<sub>2.5</sub>), sulfur dioxide (SO<sub>2</sub>), carbon monoxide (CO), and volatile organic compounds (VOCs). When these pollutants exceed the specified objectives, an AQMA may be designated to address and mitigate the air pollution issue in that area.

[1] 20.21.066 Draft Clean Air Strategy for NI - Public Discussion Doc Final V6.pdf | Score: 22.301

[2] clean-air-plan-for-wales-healthy-air-healthy-wales.pdf | Score: 18.844

[3] Air quality policies, proposals and concerns.pdf | Score: 17.304

### GPT-3.5, text, SBERT + FAISS

In the United Kingdom, the concentration thresholds that trigger the designation of an Air Quality Management Area (AQMA) are based on the Air Quality Standards Regulations. These regulations require reporting of ambient air quality data on an annual basis and set specific thresholds for pollutants such as nitrogen dioxide (NO<sub>2</sub>). If the concentration of NO<sub>2</sub> exceeds the specified threshold in a particular zone, it may lead to the designation of an AQMA in that area. The UK has achieved compliance with NO<sub>2</sub> concentration limits in all 43 zones in 2020, meeting the target values for ozone and other pollutants as well.

### GPT-3.5, text, No-RAG

In the UK, the concentration thresholds that trigger Air Quality Management Area (AQMA) designation are set by the government and vary depending on the specific air pollutant being monitored. Generally, AQMAs are designated when air pollutant concentrations exceed the following thresholds:

1. Nitrogen dioxide (NO<sub>2</sub>): Annual mean concentration exceeds 40 µg/m<sup>3</sup>
2. Particulate matter (PM<sub>10</sub>): Daily mean concentration exceeds 50 µg/m<sup>3</sup>

### 3. Particulate matter (PM<sub>2.5</sub>): Annual mean concentration exceeds 25 µg/m<sup>3</sup>

These thresholds are set based on the World Health Organization (WHO) guidelines and European Union air quality standards. Once an AQMA is designated, local authorities are required to develop and implement an action plan to improve air quality in the area.

[1] Revised\_National\_Air\_Pollution\_Control\_Programme\_\_NAPCP\_.pdf | Score: 0.403

[2] Particulate Matter (PM<sub>sub\_2.5\_sub\_targets</sub>) in the Environment Act\_ Monitoring Assessment Methods - DEFRA UK Air - GOV.UK.pdf | Score: 0.402

[3] Guide to UK Air Pollution Information .pdf | Score: 0.357

#### **GPT-3.5, text, Hybrid-RAG**

In the UK, the government sets concentration thresholds that trigger the designation of Air Quality Management Areas (AQMAs), which vary depending on the pollutant [1]. For instance, AQMAs are typically designated when air quality standards for pollutants like nitrogen dioxide (NO<sub>2</sub>) or particulate matter (PM<sub>10</sub>) are exceeded at monitoring sites over specific periods [1].

For NO<sub>2</sub>, an AQMA may be designated if the annual mean concentration exceeds 40 µg/m<sup>3</sup> or if the hourly mean concentration surpasses 200 µg/m<sup>3</sup> for more than 18 hours in a year [1]. Similarly, for PM<sub>10</sub>, an AQMA may be designated if the daily mean concentration exceeds 50 µg/m<sup>3</sup> on more than 35 days in a year [1]. These thresholds are crucial in safeguarding public health and the environment from the adverse effects of air pollution [1].

Additionally, the UK government is focusing on reducing exposure to air pollution, with a particular emphasis on addressing air pollutants such as NO<sub>2</sub> and PM<sub>10</sub> [2]. This aligns with the trends in air pollutants and the enforcement of air quality legislation, as highlighted in recent research briefings [3].

Overall, the UK's approach to setting AQMA thresholds and addressing air pollution reflects a commitment to protecting public health and the environment from the harmful impacts of poor air quality.

[1] 20.21.066 Draft Clean Air Strategy for NI - Public Discussion Doc Final V6.pdf | Score: 22.301

[2] clean-air-plan-for-wales-healthy-air-healthy-wales.pdf | Score: 18.844

[3] Air quality policies, proposals and concerns.pdf | Score: 17.304

[4] Revised\_National\_Air\_Pollution\_Control\_Programme\_\_NAPCP\_.pdf | Score: 0.403

[5] Particulate Matter (PM<sub>sub\_2.5\_sub\_targets</sub>) in the Environment Act\_ Monitoring Assessment Methods - DEFRA UK Air - GOV.UK.pdf | Score: 0.402

[6] Guide to UK Air Pollution Information .pdf | Score: 0.357

#### **GPT-3.5, paragraph, TF-IDF + Cosine**

In the UK, the concentration thresholds that trigger Air Quality Management Area (AQMA) designation vary depending on the pollutant. Common pollutants that lead to AQMA designation include nitrogen dioxide, particulate matter, sulfur dioxide, and smoke. Once these pollutants exceed specific concentration levels set by environmental authorities, AQMAs are declared to address and mitigate the air quality issues in the affected areas. AQMAs may involve measures such as road charging, parking restrictions, waiting and loading time regulations, and incentives to encourage the use of cleaner transportation modes like rail.

[1] Print Preventing air pollution\_ Local controls - GOV.UK.pdf | Score: 0.226

[2] air\_pollution\_uk\_2023\_issue\_1.pdf | Score: 0.191

[3] 20.21.066 Draft Clean Air Strategy for NI - Public Discussion Doc Final V6.pdf | Score: 0.170

### **GPT-3.5, paragraph, BM25**

The concentration thresholds that trigger Air Quality Management Area (AQMA) designation in the UK are based on the national air quality objectives for various pollutants. These thresholds include concentrations for pollutants such as benzene, PAHs, 1,3-butadiene, carbon monoxide, lead, ozone, particulate matter, nitrogen oxides, and sulfur dioxide, measured over specific averaging periods. Once an area exceeds these concentration thresholds, it may be declared as an AQMA until evidence shows that the national air quality objectives are consistently met and future exceedances are unlikely.

[1] chief-medical-officers-annual-report-air-pollution-dec-2022.pdf | Score: 22.036

[2] 20.21.066 Draft Clean Air Strategy for NI - Public Discussion Doc Final V6.pdf | Score: 20.729

[3] chief-medical-officers-annual-report-air-pollution-dec-2022.pdf | Score: 20.031

### **GPT-3.5, paragraph, SBERT + FAISS**

In the UK, Air Quality Management Areas (AQMAs) are designated when air pollutant concentrations exceed specified thresholds. These thresholds vary depending on the pollutant and are set by local authorities. Once these thresholds are exceeded, local authorities have a duty to review and assess air quality, and if necessary, declare AQMAs to manage and improve air quality in the affected areas.

[1] air\_pollution\_uk\_2023\_issue\_1.pdf | Score: 0.735

[2] 20.21.066 Draft Clean Air Strategy for NI - Public Discussion Doc Final V6.pdf | Score: 0.626

[3] air\_pollution\_uk\_2023\_issue\_1.pdf | Score: 0.606

### **GPT-3.5, paragraph, No-RAG**

In the UK, the concentration thresholds that trigger Air Quality Management Area (AQMA) designation are set by the government and vary depending on the pollutant in question. Generally, AQMAs are designated when air quality standards for pollutants such as nitrogen dioxide (NO<sub>2</sub>) or particulate matter (PM<sub>10</sub>) are exceeded at monitoring sites over a certain period of time. For example, for NO<sub>2</sub>, an AQMA may be designated if the annual mean concentration exceeds 40 µg/m<sup>3</sup> or if the hourly mean concentration exceeds 200 µg/m<sup>3</sup> for more than 18 hours in a year. For PM<sub>10</sub>, an AQMA may be designated if the daily mean concentration exceeds 50 µg/m<sup>3</sup> on more than 35 days in a year. These thresholds are set by the government to protect public health and the environment from the harmful effects of air pollution.

### **GPT-3.5, paragraph, Hybrid-RAG**

In the UK, the government sets concentration thresholds that trigger the designation of Air Quality Management Areas (AQMAs) based on pollutant levels [4]. For instance, an AQMA may be designated for nitrogen dioxide (NO<sub>2</sub>) if the annual mean concentration exceeds 40 µg/m<sup>3</sup> or if the hourly mean concentration surpasses 200 µg/m<sup>3</sup> for more than 18 hours in a year. Similarly, for particulate matter (PM<sub>10</sub>), an AQMA may be designated if the daily mean concentration exceeds 50 µg/m<sup>3</sup> on more than 35 days in a year [2].

Local district councils in the UK primarily identify road transport as a significant source of air pollution within their areas [2]. When national air quality objectives are not met, an area is declared as an AQMA, which can range from a few streets to a larger area. Currently, Northern Ireland has 19 AQMAs across 9 of its 11 councils [2][5].

As of August 2024, 251 Local Authorities in the UK, accounting for 69.5% of all authorities, have one or more AQMAs [4]. These AQMAs can be for multiple pollutants, and many local authorities have more than one AQMA [4].

In Northern Ireland, 17 AQMAs have been declared due to air pollutant emissions from road traffic [5]. District councils in Northern Ireland are mandated to monitor and assess air quality, declaring AQMAs where pollutant levels exceed set limits [5].

Overall, AQMAs play a crucial role in addressing air pollution issues in the UK, with a focus on key pollutants like NO<sub>2</sub> and PM<sub>10</sub>, and a particular emphasis on road transport emissions as a significant contributor to poor air quality [2][4][5].

- [1] chief-medical-officers-annual-report-air-pollution-dec-2022.pdf | Score: 22.036
- [2] 20.21.066 Draft Clean Air Strategy for NI - Public Discussion Doc Final V6.pdf | Score: 20.729
- [3] chief-medical-officers-annual-report-air-pollution-dec-2022.pdf | Score: 20.031
- [4] air\_pollution\_uk\_2023\_issue\_1.pdf | Score: 0.735
- [5] 20.21.066 Draft Clean Air Strategy for NI - Public Discussion Doc Final V6.pdf | Score: 0.626
- [6] air\_pollution\_uk\_2023\_issue\_1.pdf | Score: 0.606

### **DeepSeek, text, TF-IDF + Cosine**

In the UK, Air Quality Management Areas (AQMAs) are designated when monitoring or modeling indicates that air pollutant concentrations exceed, or are likely to exceed, national air quality objectives or EU limit values (now retained in UK law). The key thresholds triggering AQMA designation include:

1. **\*\*Annual mean concentrations\*\***:
  - Nitrogen dioxide (NO<sub>2</sub>): 40 µg/m<sup>3</sup>
  - Particulate matter (PM<sub>10</sub>): 40 µg/m<sup>3</sup> (annual mean)
  - Fine particulate matter (PM<sub>2.5</sub>): 20 µg/m<sup>3</sup> (annual mean, as per the Environmental Targets regulations in England).
2. **\*\*Short-term objectives\*\*** (based on EU Directive 2008/50/EC, retained in UK law):
  - NO<sub>2</sub>: 200 µg/m<sup>3</sup> (1-hour mean, not to be exceeded >18 times/year)
  - PM<sub>10</sub>: 50 µg/m<sup>3</sup> (24-hour mean, not to be exceeded >35 times/year)
  - PM<sub>2.5</sub>: While no short-term limit is specified for AQMA designation, the annual target is legally binding.
3. **\*\*Other pollutants\*\*** (e.g., SO<sub>2</sub>, ozone) may also trigger AQMAs if their concentrations exceed statutory thresholds, though NO<sub>2</sub> and PM are the most common drivers.

Local authorities must declare AQMAs where exceedances occur or are projected, particularly in areas with sensitive receptors (e.g., residential zones). The UK-AIR website provides real-time data and historical exceedance records to support these assessments.

**\*Note\***: Post-Brexit, the UK maintains these standards under the Environment Act 2021, with PM<sub>2.5</sub> targets now formalized in England via the 2023 regulations. Devolved administrations (Scotland, Wales, NI) align with similar thresholds but may have additional local requirements.

- [1] Guide to UK Air Pollution Information .pdf | Score: 0.118
- [2] Air quality - GOV.UK.pdf | Score: 0.108
- [3] Particulate Matter (PM\_sub\_2.5\_\_sub\_ targets) in the Environment Act\_ Monitoring Assessment Methods - DEFRA UK Air - GOV.UK.pdf | Score: 0.103

### DeepSeek, text, BM25

In the UK, the concentration thresholds that trigger Air Quality Management Area (AQMA) designation are based on the objectives set out in the UK Air Quality Strategy (2007) and its associated Technical Guidance. These thresholds align with or exceed EU air quality standards for certain pollutants. Key thresholds include:

1. **Nitrogen Dioxide (NO<sub>2</sub>)**
  - **1-hour mean**: 200 µg/m<sup>3</sup>, not to be exceeded more than 18 times per year.
  - **Annual mean**: 40 µg/m<sup>3</sup>.
2. **Particulate Matter (PM<sub>10</sub>)**
  - **24-hour mean**: 50 µg/m<sup>3</sup>, not to be exceeded more than 35 times per year.
  - **Annual mean**: 40 µg/m<sup>3</sup>.
3. **Fine Particulate Matter (PM<sub>2.5</sub>)**
  - **Annual mean**: 25 µg/m<sup>3</sup> (UK target value; no statutory exceedance threshold, but local authorities are encouraged to reduce exposure).
4. **Sulphur Dioxide (SO<sub>2</sub>)**
  - **15-minute mean**: 266 µg/m<sup>3</sup>, not to be exceeded more than 35 times per year.
  - **1-hour mean**: 350 µg/m<sup>3</sup>, not to be exceeded more than 24 times per year.
5. **Ozone (O<sub>3</sub>)**
  - **8-hour daily maximum**: 100 µg/m<sup>3</sup>, not to be exceeded more than 10 times per year.
6. **Benzene**
  - **Running annual mean**: 16.25 µg/m<sup>3</sup>.
7. **Polycyclic Aromatic Hydrocarbons (PAHs, as Benzo[a]pyrene)**
  - **Annual mean**: 0.25 ng/m<sup>3</sup>.

Local authorities must declare an AQMA if monitoring or modeling indicates these thresholds are exceeded or at risk of being exceeded. The system aims to address localized pollution hotspots, particularly from road transport, industrial emissions, and domestic solid fuel burning. Note that some objectives (e.g., PM<sub>2.5</sub>) are based on exposure reduction targets rather than strict exceedance limits.

[1] 20.21.066 Draft Clean Air Strategy for NI - Public Discussion Doc Final V6.pdf | Score: 22.301

[2] clean-air-plan-for-wales-healthy-air-healthy-wales.pdf | Score: 18.844

[3] Air quality policies, proposals and concerns.pdf | Score: 17.304

### DeepSeek, text, SBERT + FAISS

In the UK, Air Quality Management Areas (AQMAs) are designated when pollutant concentrations exceed specific thresholds, primarily based on national and EU-derived air quality objectives. The key concentration thresholds that trigger AQMA designation include:

1. **Nitrogen Dioxide (NO<sub>2</sub>)**:

- **Annual mean limit**: 40 µg/m<sup>3</sup> (EU Directive 2008/50/EC and UK Air Quality Standards Regulations).
  - **Hourly mean limit**: 200 µg/m<sup>3</sup>, not to be exceeded more than 18 times per year.
2. **Particulate Matter (PM<sub>10</sub>)**:
- **Annual mean limit**: 40 µg/m<sup>3</sup>.
  - **24-hour mean limit**: 50 µg/m<sup>3</sup>, not to be exceeded more than 35 times per year.
3. **Fine Particulate Matter (PM<sub>2.5</sub>)**:
- **Annual mean limit**: 20 µg/m<sup>3</sup> (UK target value, aligned with WHO interim guidelines).
4. **Sulfur Dioxide (SO<sub>2</sub>)**:
- **24-hour mean limit**: 125 µg/m<sup>3</sup>, not to be exceeded more than 3 times per year.
  - **1-hour mean limit**: 350 µg/m<sup>3</sup> (for acute exposure).
5. **Ozone (O<sub>3</sub>)**:
- **Maximum daily 8-hour mean**: 100 µg/m<sup>3</sup> (target value).
6. **Benzo[a]pyrene (BaP)**:
- **Annual mean limit**: 0.25 ng/m<sup>3</sup> (EU target value).

Local authorities are required to monitor these pollutants and declare AQMAs where exceedances occur, followed by action plans to reduce concentrations. The UK framework also references WHO guidelines for additional context, though legal thresholds are binding. Recent strategies, such as the Clean Air Strategy 2019, emphasize stricter alignment with WHO recommendations for PM<sub>2.5</sub> (10 µg/m<sup>3</sup> annual mean) as a long-term goal.

[1] Revised\_National\_Air\_Pollution\_Control\_Programme\_\_NAPCP\_.pdf | Score: 0.403

[2] Particulate Matter (PM\_sub\_2.5\_sub\_targets) in the Environment Act\_Monitoring Assessment Methods - DEFRA UK Air - GOV.UK.pdf | Score: 0.402

[3] Guide to UK Air Pollution Information .pdf | Score: 0.357

### DeepSeek, text, No-RAG

In the UK, **Air Quality Management Areas (AQMAs)** are designated when pollutant concentrations exceed specific thresholds set by national air quality objectives and EU-derived limits (now retained in UK law). The key concentration thresholds that trigger AQMA designation are as follows:

#### ### 1. Nitrogen Dioxide (NO<sub>2</sub>)

- **Annual Mean**: 40 µg/m<sup>3</sup> (micrograms per cubic metre)  
(Exceeding this level may require an AQMA if persistent.)
- **1-Hour Mean**: 200 µg/m<sup>3</sup> (not to be exceeded more than 18 times per year).

#### ### 2. Particulate Matter (PM<sub>10</sub>)

- **Annual Mean**: 40 µg/m<sup>3</sup>
- **24-Hour Mean**: 50 µg/m<sup>3</sup> (not to be exceeded more than 35 times per year).

#### ### 3. Particulate Matter (PM<sub>2.5</sub>)

- **Annual Mean**: 20 µg/m<sup>3</sup> (UK target, but not yet a strict AQMA trigger).

(The UK has a long-term target of **10 µg/m³** by 2040.)

#### ### **4. Sulphur Dioxide (SO<sub>2</sub>)**

- **15-Minute Mean**: **266 µg/m³** (not to be exceeded more than **35 times per year**).
- **1-Hour Mean**: **350 µg/m³** (not to be exceeded more than **24 times per year**).
- **24-Hour Mean**: **125 µg/m³** (not to be exceeded more than **3 times per year**).

#### ### **5. Ozone (O<sub>3</sub>)**

- **8-Hour Mean**: **100 µg/m³** (not to be exceeded more than **10 times per year**).
- (Based on the **WHO guideline**, though not a strict AQMA trigger.)

#### ### **6. Benzene (C<sub>6</sub>H<sub>6</sub>)**

- **Annual Mean**: **5 µg/m³** (England & Wales).
- (Scotland: **3.25 µg/m³** by 2020.)

#### ### **7. Carbon Monoxide (CO)**

- **8-Hour Mean**: **10 mg/m³** (milligrams per cubic metre).

#### ### **Key Notes**

- AQMAs are declared by **local authorities** under **Part IV of the Environment Act 1995** if air quality objectives are unlikely to be met.
- The UK follows **EU Directive 2008/50/EC** (retained post-Brexit) and **national Air Quality Strategy** targets.
- **PM<sub>2.5</sub>** is increasingly monitored, but AQMAs are more commonly triggered by **NO<sub>2</sub>** and **PM<sub>10</sub>** exceedances.

Would you like details on specific regions or mitigation measures?

### **DeepSeek, text, Hybrid-RAG**

In the UK, **Air Quality Management Areas (AQMAs)** are designated when pollutant concentrations exceed specific thresholds set by national air quality objectives or retained EU limit values (now UK law) [3][4]. The key concentration thresholds that trigger AQMA designation are:

#### ### **1. Nitrogen Dioxide (NO<sub>2</sub>)**

- **Annual Mean**: **40 µg/m³** (EU/UK limit value) [3][6].
- (Local authorities must declare an AQMA if this is exceeded.)

- **1-Hour Mean**: **200 µg/m³** (not to be exceeded more than **18 times per year**) [6].

#### ### **2. Particulate Matter (PM<sub>10</sub>)**

- **Annual Mean**: **40 µg/m³** (UK objective) [6].
- **24-Hour Mean**: **50 µg/m³** (not to be exceeded more than **35 times per year**) [3][6].

#### ### **3. Particulate Matter (PM<sub>2.5</sub>)**

- **Annual Mean**: **20 µg/m³** (UK objective, but not a strict AQMA trigger; long-term target) [3][6].
- (The **WHO guideline** is **5 µg/m³**, but the UK has not adopted this legally [3].)

#### ### **4. Sulfur Dioxide (SO<sub>2</sub>)**

- **24-Hour Mean**: **125 µg/m³** (not to be exceeded more than **3 times per year**) [6].
- **15-Minute Mean**: **266 µg/m³** (not to be exceeded more than **35 times per year**) [6].

### ### \*\*5. Ozone (O<sub>3</sub>)\*\*

- \*\*8-Hour Mean\*\*: \*\*100 µg/m<sup>3</sup>\*\* (target, but not a strict AQMA trigger) [6].

### ### \*\*6. Carbon Monoxide (CO)\*\*

- \*\*8-Hour Mean\*\*: \*\*10 mg/m<sup>3</sup>\*\* (rarely exceeded in the UK) [6].

### ### \*\*7. Benzene (C<sub>6</sub>H<sub>6</sub>)\*\*

- \*\*Annual Mean\*\*: \*\*5 µg/m<sup>3</sup>\*\* (UK objective) [6].

### ### \*\*Key Notes:\*\*

- \*\*Local authorities\*\* monitor air quality and declare AQMAs where \*\*objectives are exceeded\*\* [3][4].
- \*\*NO<sub>2</sub>\*\* (primarily from road traffic) is the \*\*most common reason\*\* for AQMA declarations [3][6].
- The UK government has faced legal challenges over persistent NO<sub>2</sub> breaches [3].
- \*\*PM<sub>2.5</sub>\*\* thresholds may become stricter in future, aligning with WHO guidelines [3].

Would you like details on specific regions with AQMAs or mitigation strategies?

Let me know if you'd like further refinements!

[1] 20.21.066 Draft Clean Air Strategy for NI - Public Discussion Doc Final V6.pdf | Score: 22.301

[2] clean-air-plan-for-wales-healthy-air-healthy-wales.pdf | Score: 18.844

[3] Air quality policies, proposals and concerns.pdf | Score: 17.304

[4] Revised\_National\_Air\_Pollution\_Control\_Programme\_\_NAPCP\_.pdf | Score: 0.403

[5] Particulate Matter (PM\_sub\_2.5\_sub\_targets) in the Environment Act\_ Monitoring Assessment Methods - DEFRA UK Air - GOV.UK.pdf | Score: 0.402

[6] Guide to UK Air Pollution Information .pdf | Score: 0.357

### **DeepSeek, paragraph, TF-IDF + Cosine**

In the UK, Air Quality Management Areas (AQMAs) are designated when pollutant concentrations exceed national air quality objectives or EU limit values (now retained in UK law post-Brexit). The specific thresholds vary by pollutant and averaging period. Key thresholds include:

- \*\*Nitrogen Dioxide (NO<sub>2</sub>)\*\*:
  - Annual mean: \*\*40 µg/m<sup>3</sup>\*\*
  - 1-hour mean (not to be exceeded more than 18 times/year): \*\*200 µg/m<sup>3</sup>\*\*
- \*\*Particulate Matter (PM<sub>10</sub>)\*\*:
  - Annual mean: \*\*40 µg/m<sup>3</sup>\*\* (until 2011; now \*\*20 µg/m<sup>3</sup>\*\* under stricter targets)
  - 24-hour mean (not to be exceeded more than 35 times/year): \*\*50 µg/m<sup>3</sup>\*\*
- \*\*Sulphur Dioxide (SO<sub>2</sub>)\*\*:
  - 24-hour mean: \*\*125 µg/m<sup>3</sup>\*\* (not to be exceeded more than 3 times/year)
  - 15-minute mean: \*\*266 µg/m<sup>3</sup>\*\* (not to be exceeded more than 35 times/year)

Local authorities monitor these pollutants and declare AQMAs where exceedances persist, often targeting transport, industrial, or domestic sources. Revocation occurs if levels fall below thresholds, as seen in some cases (e.g., PM<sub>10</sub> in Belfast). The UK aligns with WHO guidelines in principle but often adopts phased compliance timelines.

\*(Sources: UK Air Quality Strategy, Defra AQMA guidance, and retained EU Directive 2008/50/EC thresholds.)\*



- [1] Print Preventing air pollution\_ Local controls - GOV.UK.pdf | Score: 0.226  
[2] air\_pollution\_uk\_2023\_issue\_1.pdf | Score: 0.191  
[3] 20.21.066 Draft Clean Air Strategy for NI - Public Discussion Doc Final V6.pdf | Score: 0.170

### DeepSeek, paragraph, BM25

In the UK, Air Quality Management Areas (AQMA) are designated when national air quality objectives are not met. The concentration thresholds for these objectives vary by pollutant and are categorized based on their impacts—either on human health or vegetation/ecosystems. Below are the key thresholds relevant to AQMA designation:

#### ### \*\*Protection of Human Health\*\*

- **Benzene**: 3.25 µg/m<sup>3</sup> (annual mean)
- **PAHs (B[a]P)**: 0.25 ng/m<sup>3</sup> (annual mean)
- **1,3-Butadiene**: 2.25 µg/m<sup>3</sup> (annual mean)
- **Carbon Monoxide**: 10 mg/m<sup>3</sup> (running 8-hour mean)
- **Lead**: 0.25 µg/m<sup>3</sup> (annual mean)
- **Ozone**:
  - 100 µg/m<sup>3</sup> (8-hour mean)
  - 40 µg/m<sup>3</sup> (annual mean)
- **Particulate Matter (PM<sub>10</sub>)**: 40 µg/m<sup>3</sup> (annual mean)
- **PM<sub>2.5</sub>** (exposure reduction target): 25 µg/m<sup>3</sup> (annual mean)

#### ### \*\*Protection of Vegetation & Ecosystems\*\*

- **Nitrogen Oxides (NO<sub>x</sub>)**: 30 µg/m<sup>3</sup> (annual mean)
- **Sulphur Dioxide (SO<sub>2</sub>)**: 20 µg/m<sup>3</sup> (annual mean)
- **Ozone**: 18,000 µg/m<sup>3</sup> (average over 5 years)

When monitoring reveals exceedances of these thresholds, local authorities must declare an AQMA and develop an action plan to address the issue. The AQMA remains in effect until compliance is demonstrated and future exceedances are deemed unlikely.

- [1] chief-medical-officers-annual-report-air-pollution-dec-2022.pdf | Score: 22.036  
[2] 20.21.066 Draft Clean Air Strategy for NI - Public Discussion Doc Final V6.pdf | Score: 20.729  
[3] chief-medical-officers-annual-report-air-pollution-dec-2022.pdf | Score: 20.031

### DeepSeek, paragraph, SBERT + FAISS

In the UK, Air Quality Management Areas (AQMA) are designated when local air pollutant concentrations exceed national air quality objectives or EU limit values (now retained in UK law post-Brexit). The specific concentration thresholds vary by pollutant and are based on legally binding standards.

Key thresholds include:

- **Nitrogen dioxide (NO<sub>2</sub>)**:
  - Annual mean: 40 µg/m<sup>3</sup> (EU/UK limit value)
  - 1-hour mean: 200 µg/m<sup>3</sup> (not to be exceeded more than 18 times per year)
- **Particulate matter (PM<sub>10</sub>)**:
  - Annual mean: 40 µg/m<sup>3</sup> (UK objective)

- 24-hour mean: 50 µg/m<sup>3</sup> (not to be exceeded more than 35 times per year)
- **Fine particulate matter (PM<sub>2.5</sub>)**:
  - Annual mean: 20 µg/m<sup>3</sup> (UK objective, with stricter long-term targets under the Environment Act 2021)
- **Sulfur dioxide (SO<sub>2</sub>)**:
  - 1-hour mean: 350 µg/m<sup>3</sup> (not to be exceeded more than 24 times per year)
  - 24-hour mean: 125 µg/m<sup>3</sup> (not to be exceeded more than 3 times per year)

Local authorities must declare an AQMA if monitoring or modeling indicates exceedances of these thresholds, with road traffic being the most common source of NO<sub>2</sub> breaches. The exact pollutants and sources vary by region, as seen in the data on AQMA declarations.

[1] air\_pollution\_uk\_2023\_issue\_1.pdf | Score: 0.735

[2] 20.21.066 Draft Clean Air Strategy for NI - Public Discussion Doc Final V6.pdf | Score: 0.626

[3] air\_pollution\_uk\_2023\_issue\_1.pdf | Score: 0.606

### DeepSeek, paragraph, No-RAG

In the UK, **Air Quality Management Areas (AQMAs)** are designated when pollutant concentrations exceed specific **national air quality objectives** or **EU limit values** (now retained in UK law post-Brexit). The key thresholds for common pollutants are:

#### 1. Nitrogen Dioxide (NO<sub>2</sub>)

- **Annual Mean**: 40 µg/m<sup>3</sup> (EU/UK limit value)  
(If exceeded, an AQMA must be declared.)
- **1-Hour Mean**: 200 µg/m<sup>3</sup> (not to be exceeded more than 18 times per year).

#### 2. Particulate Matter (PM<sub>10</sub>)

- **Annual Mean**: 40 µg/m<sup>3</sup> (UK objective, but 20 µg/m<sup>3</sup> under EU/WHO guidelines).
- **24-Hour Mean**: 50 µg/m<sup>3</sup> (not to be exceeded more than 35 times per year).

#### 3. Particulate Matter (PM<sub>2.5</sub>)

- **Annual Mean**: 20 µg/m<sup>3</sup> (UK objective, but 5 µg/m<sup>3</sup> under WHO guidelines).
- **24-Hour Mean**: No UK legal threshold, but WHO recommends 15 µg/m<sup>3</sup> (24-hour).

#### 4. Sulfur Dioxide (SO<sub>2</sub>)

- **24-Hour Mean**: 125 µg/m<sup>3</sup> (not to be exceeded more than 3 times per year).
- **1-Hour Mean**: 350 µg/m<sup>3</sup> (not to be exceeded more than 24 times per year).

#### 5. Ozone (O<sub>3</sub>)

- **8-Hour Mean**: 100 µg/m<sup>3</sup> (not to be exceeded more than 10 times per year).

#### 6. Carbon Monoxide (CO)

- **8-Hour Mean**: 10 mg/m<sup>3</sup> (EU/UK limit).

### ### \*\*AQMA Declaration Process\*\*

- Local authorities **must** declare an AQMA if monitoring or modelling shows exceedances of these thresholds.
- They must then develop an **Air Quality Action Plan (AQAP)** to reduce pollution.

### ### \*\*Post-Brexit Changes\*\*

- The UK still follows **EU-derived limits** but may align more closely with **WHO guidelines** (stricter for PM<sub>2.5</sub> and NO<sub>2</sub>) in future updates.

Would you like details on specific regions with AQMAs?

## DeepSeek, paragraph, Hybrid-RAG

In the UK, **Air Quality Management Areas (AQMAs)** are designated when pollutant concentrations exceed specific thresholds set by national air quality objectives. The key concentration thresholds that trigger AQMA designation are based on **pollutant-specific limits** defined in the **Air Quality (England) Regulations 2000** (and similar regulations in Scotland, Wales, and Northern Ireland). Below are the main thresholds:

### ### \*\*Key Pollutant Thresholds for AQMA Designation\*\*

<b>Pollutant</b>	<b>Averaging Period</b>	<b>Objective (Threshold)</b>	<b>Legal Basis</b>
<b>Nitrogen Dioxide (NO<sub>2</sub>)</b>	1-hour mean	<b>200 µg/m<sup>3</sup></b> (not to be exceeded >18 times per year)	EU Directive 2008/50/EC (retained in UK law)
	Annual mean	<b>40 µg/m<sup>3</sup></b>	
<b>Particulate Matter (PM<sub>10</sub>)</b>	24-hour mean	<b>50 µg/m<sup>3</sup></b> (not to be exceeded >35 times per year)	
	Annual mean	<b>40 µg/m<sup>3</sup></b> (until 2004, now <b>20 µg/m<sup>3</sup></b> as a target)	
<b>Sulphur Dioxide (SO<sub>2</sub>)</b>	15-minute mean	<b>266 µg/m<sup>3</sup></b> (not to be exceeded >35 times per year)	
	1-hour mean	<b>350 µg/m<sup>3</sup></b> (not to be exceeded >24 times per year)	
<b>Ozone (O<sub>3</sub>)</b>	8-hour mean	<b>100 µg/m<sup>3</sup></b> (target, not to be exceeded >10 times per year)	
<b>Carbon Monoxide (CO)</b>	8-hour mean	<b>10 mg/m<sup>3</sup></b>	

### ### \*\*How AQMAs Are Triggered\*\*

- Local authorities **must** declare an AQMA if monitoring or modelling shows that **any of these thresholds are exceeded** (or likely to be exceeded) [4].
- The most common reason for AQMA designation is **NO<sub>2</sub> exceedances**, particularly near busy roads [5].
- PM<sub>10</sub> and PM<sub>2.5</sub> are also significant concerns, though UK targets are less strict than WHO guidelines. Some high-PM episodes are influenced by both UK and European emissions [1].

### ### \*\*Post-Declaration Actions

Once an AQMA is declared, the local authority must develop an **Air Quality Action Plan (AQAP)** to reduce pollution levels. Measures may include:

- Traffic management (e.g., low-emission zones, congestion charging) [5].
- Promotion of cleaner transport (electric vehicles, cycling).
- Industrial emission controls.

### ### \*\*Current AQMA Coverage

- As of **August 2024**, **69.5%** of UK local authorities (251 out of 361) have declared one or more AQMAs [4].

- Some AQMAs cover multiple pollutants, and many authorities have overlapping zones due to complex pollution sources (e.g., transport, domestic heating, and industry) [6].

### **Changes Post-Brexit**

The UK still largely follows EU-derived air quality standards, but future adjustments may occur under the **Environment Act 2021**, which sets new long-term targets (e.g., for PM<sub>2.5</sub>).

Would you like details on a specific pollutant or region?

Let me know if you'd like further refinements!

[1] chief-medical-officers-annual-report-air-pollution-dec-2022.pdf | Score: 22.036

[2] 20.21.066 Draft Clean Air Strategy for NI - Public Discussion Doc Final V6.pdf | Score: 20.729

[3] chief-medical-officers-annual-report-air-pollution-dec-2022.pdf | Score: 20.031

[4] air\_pollution\_uk\_2023\_issue\_1.pdf | Score: 0.735

[5] 20.21.066 Draft Clean Air Strategy for NI - Public Discussion Doc Final V6.pdf | Score: 0.626

[6] air\_pollution\_uk\_2023\_issue\_1.pdf | Score: 0.606

### **LLaMa ,text, TF-IDF + Cosine**

According to the provided information, the concentration thresholds that trigger Air Quality Management Area (AQMA) designation in the UK are not explicitly stated. However, it is mentioned that the UK has set long-term targets for fine particulate matter (PM<sub>2.5</sub>) concentrations, which are as follows:

\* The Environmental Targets (Fine Particulate Matter) (England) Regulations 2023 set a target of no more than 10 µg/m<sup>3</sup> for the annual mean PM<sub>2.5</sub> concentration.

It is also mentioned that the UK has set a limit value for PM<sub>2.5</sub> concentrations, which is 25 µg/m<sup>3</sup>, and that the measurement uncertainty for PM<sub>2.5</sub> monitoring is 25% at the limit value.

AQMA designation is typically triggered when air quality exceeds the relevant EU air quality limit values or target values, which are set for different pollutants, including PM<sub>2.5</sub>. In the UK, the Air Quality (England) Regulations 2000 set the limit values for PM<sub>2.5</sub> as 25 µg/m<sup>3</sup> for the annual mean concentration. If the measured concentrations exceed this limit value, the area may be designated as an AQMA.

[1] Guide to UK Air Pollution Information .pdf | Score: 0.118

[2] Air quality - GOV.UK.pdf | Score: 0.108

[3] Particulate Matter (PM<sub>sub</sub> 2.5<sub>sub</sub> targets) in the Environment Act\_ Monitoring Assessment Methods - DEFRA UK Air - GOV.UK.pdf | Score: 0.103

### **LLaMa, text, BM25**

The text does not explicitly mention the concentration thresholds that trigger AQMA (Air Quality Management Area) designation in the UK. However, it does mention that the EU Air Quality Directive's annual mean limit value for nitrogen dioxide is exceeded in the Greater Belfast area, which is one of the 37 UK reporting areas.

[1] 20.21.066 Draft Clean Air Strategy for NI - Public Discussion Doc Final V6.pdf | Score: 21.498

[2] clean-air-plan-for-wales-healthy-air-healthy-wales.pdf | Score: 18.067

### **LLaMa, text, SBERT + FAISS**

The concentration thresholds that trigger Air Quality Management Area (AQMA) designation in the UK are not explicitly stated in the provided excerpts. However, it is mentioned that the Environmental Targets (Fine Particulate Matter) (England) Regulations 2023 set long-term targets for fine particulate matter (PM<sub>2.5</sub>) concentrations. The regulations require that these targets be achievable and objectively measurable.

In the UK, the Air Quality (England) Regulations 2000 set the following concentration thresholds for PM<sub>10</sub> and PM<sub>2.5</sub>:

\* PM<sub>10</sub>: 18 µg/m<sup>3</sup> (annual mean)

\* PM<sub>2.5</sub>: 10 µg/m<sup>3</sup> (annual mean)

If these thresholds are exceeded, local authorities are required to declare an Air Quality Management Area (AQMA) and develop an Air Quality Action Plan to reduce pollutant concentrations.

It is worth noting that the UK has also implemented the EU's Ambient Air Quality Directive, which sets more stringent concentration thresholds for PM<sub>2.5</sub> and PM<sub>10</sub>. The directive requires that the annual mean concentration of PM<sub>2.5</sub> not exceed 25 µg/m<sup>3</sup> and the annual mean concentration of PM<sub>10</sub> not exceed 40 µg/m<sup>3</sup>.

[1] Particulate Matter (PM\_sub\_2.5\_sub\_targets) in the Environment Act\_Monitoring Assessment Methods - DEFRA UK Air - GOV.UK.pdf | Score: 0.399

[2] Revised\_National\_Air\_Pollution\_Control\_Programme\_\_NAPCP\_.pdf | Score: 0.396

[3] Guide to UK Air Pollution Information .pdf | Score: 0.366

### **LLaMa, text, No-RAG**

In the UK, the Air Quality Management Areas (AQMA) are designated by local authorities based on the concentration of certain pollutants in the air. The concentration thresholds for designating an AQMA are set out in the Environment Act 1995 and the Air Quality (England) Regulations 2000.

The main pollutants that can trigger an AQMA designation are:

1. Nitrogen Dioxide (NO<sub>2</sub>): 40 µg/m<sup>3</sup> (micrograms per cubic meter) or more over a 1-hour average, or 18 µg/m<sup>3</sup> or more over a 1-year average.
2. Particulate Matter (PM<sub>10</sub>): 50 µg/m<sup>3</sup> or more over a 24-hour average, or 18 µg/m<sup>3</sup> or more over a 1-year average.
3. Particulate Matter (PM<sub>2.5</sub>): 25 µg/m<sup>3</sup> or more over a 24-hour average, or 10 µg/m<sup>3</sup> or more over a 1-year average.
4. Ozone (O<sub>3</sub>): 120 µg/m<sup>3</sup> or more over an 8-hour average, or 100 µg/m<sup>3</sup> or more over a 1-hour average.
5. Nitrogen Dioxide (NO<sub>2</sub>) and Particulate Matter (PM<sub>10</sub>) combined: If the combined concentration of NO<sub>2</sub> and PM<sub>10</sub> exceeds 50 µg/m<sup>3</sup> over a 1-hour average.

These concentration thresholds are based on the World Health Organization's (WHO) guidelines for air quality, which are designed to protect public health.

Local authorities must designate an AQMA if they identify a site where the concentration of one or more of these

pollutants exceeds the relevant threshold. Once an AQMA is designated, the local authority must develop an action plan to reduce the pollutant concentrations and improve air quality.

### **LLaMa, text, Hybrid-RAG**

In the UK, the concentration thresholds that trigger Air Quality Management Area (AQMA) designation are set by the Environment Agency and are based on the levels of pollutants in the air. AQMAs are designated when the levels of certain pollutants exceed the relevant air quality objectives, as outlined in the World Health Organization's (WHO) air quality guidelines and the European Union's (EU) Ambient Air Quality Directive [1].

The concentration thresholds that trigger AQMA designation in the UK are as follows:

1. Particulate Matter (PM10):
  - \* Annual mean: 40 µg/m<sup>3</sup> (micrograms per cubic meter) [2]
  - \* 24-hour mean: 50 µg/m<sup>3</sup> [2]
2. Nitrogen Dioxide (NO<sub>2</sub>):
  - \* Annual mean: 40 µg/m<sup>3</sup> [3]
3. Ozone (O<sub>3</sub>):
  - \* 8-hour mean: 120 µg/m<sup>3</sup> (summer season only) [4]
4. Carbon Monoxide (CO):
  - \* 8-hour mean: 10 mg/m<sup>3</sup> (milligrams per cubic meter) [5]
5. Benzene:
  - \* Annual mean: 5 µg/m<sup>3</sup> [6]
6. 1,3-Butadiene:
  - \* Annual mean: 1.5 µg/m<sup>3</sup> [6]
7. Toluene:
  - \* Annual mean: 20 µg/m<sup>3</sup> [6]
8. Xylenes:
  - \* Annual mean: 10 µg/m<sup>3</sup> [6]

These thresholds are used by the Environment Agency to assess the air quality in different areas of the UK and to determine whether AQMAs need to be designated. The Agency also uses these thresholds to monitor and enforce air quality standards, as outlined in the Air Quality (England) Regulations 2000 [3].

It's worth noting that these thresholds are subject to change as new scientific evidence emerges and as the UK's air quality objectives are updated. For example, the UK's Air Quality Plan 2017 set out a plan to reduce nitrogen dioxide levels in the UK, which included measures to improve public transport, promote walking and cycling, and reduce emissions from vehicles [4].

[1] 20.21.066 Draft Clean Air Strategy for NI - Public Discussion Doc Final V6.pdf | Score: 21.498

[2] clean-air-plan-for-wales-healthy-air-healthy-wales.pdf | Score: 18.067

[3] Air quality policies, proposals and concerns.pdf | Score: 16.468

[4] Particulate Matter (PM\_sub\_2.5\_sub\_targets) in the Environment Act\_ Monitoring Assessment Methods - DEFRA UK Air - GOV.UK.pdf | Score: 0.399

[5] Revised\_National\_Air\_Pollution\_Control\_Programme\_\_NAPCP\_.pdf | Score: 0.396

[6] Guide to UK Air Pollution Information .pdf | Score: 0.366

### **LLaMa, paragraph, TF-IDF + Cosine**

The concentration thresholds that trigger Air Quality Management Area (AQMA) designation in the UK are not explicitly stated in the provided excerpts. However, it is generally understood that AQMA designation is triggered when the concentration of a pollutant exceeds the National Air Quality (NAQ) objectives set by the UK government.

In the UK, the NAQ objectives for nitrogen dioxide (NO<sub>2</sub>) are typically met if the annual mean concentration does not exceed 40 micrograms per cubic meter (µg/m<sup>3</sup>) and the daily mean concentration does not exceed 200 µg/m<sup>3</sup>. For particulate matter (PM<sub>10</sub>), the NAQ objectives are typically met if the annual mean concentration does not exceed 40 µg/m<sup>3</sup> and the daily mean concentration does not exceed 50 µg/m<sup>3</sup>.

AQMA designation is typically triggered when the concentration of a pollutant exceeds these NAQ objectives, and the local authority is required to develop an action plan to improve air quality and reduce pollutant concentrations to meet the NAQ objectives.

- [1] Print Preventing air pollution\_ Local controls - GOV.UK.pdf | Score: 0.226  
[2] air\_pollution\_uk\_2023\_issue\_1.pdf | Score: 0.191  
[3] 20.21.066 Draft Clean Air Strategy for NI - Public Discussion Doc Final V6.pdf | Score: 0.170

### **LLaMa, paragraph, BM25**

According to the provided excerpts, the concentration thresholds that trigger Air Quality Management Area (AQMA) designation in the UK are:

- \* Benzene: 3.25 µg/m<sup>3</sup> (annual mean)
- \* PAHs: 0.25 ng/m<sup>3</sup> (annual mean)
- \* B[a]P: 1.3-butadiene: 2.25 µg/m<sup>3</sup> (annual mean)
- \* Carbon monoxide: 10 mg/m<sup>3</sup> (running 8-hour mean)
- \* Lead: 0.25 µg/m<sup>3</sup> (annual mean)
- \* Ozone: 100 µg/m<sup>3</sup> (annual mean) or 40 µg/m<sup>3</sup> (annual mean) for protection of human health and vegetation and ecosystems, respectively
- \* Particulate matter (PM<sub>2.5</sub>): 25 µg/m<sup>3</sup> (annual mean) for exposure reduction

These thresholds are used to determine whether an area is meeting the national air quality objectives, and if not, an AQMA is declared to require local authorities to take action to reduce pollution levels.

- [1] 20.21.066 Draft Clean Air Strategy for NI - Public Discussion Doc Final V6.pdf | Score: 20.729  
[2] chief-medical-officers-annual-report-air-pollution-dec-2022.pdf | Score: 20.031  
[3] Air quality targets - Detailed Evidence report.pdf | Score: 19.431

### **LLaMa, paragraph, SBERT + FAISS**

The concentration thresholds that trigger Air Quality Management Area (AQMA) designation in the UK are not explicitly stated in the provided excerpts. AQMAs are declared by local authorities when air pollutant concentrations exceed certain levels, but the specific threshold values are not specified in these documents.

- [1] air\_pollution\_uk\_2023\_issue\_1.pdf | Score: 0.719  
[2] air\_pollution\_uk\_2023\_issue\_1.pdf | Score: 0.603  
[3] 20.21.066 Draft Clean Air Strategy for NI - Public Discussion Doc Final V6.pdf | Score: 0.596

### **LLaMa, paragraph, No-RAG**

In the UK, the concentration thresholds that trigger Air Quality Management Area (AQMA) designation are based on the levels of five key pollutants: particulate matter (PM), nitrogen dioxide (NO<sub>2</sub>), ozone (O<sub>3</sub>), nitrogen oxides (NO<sub>x</sub>), and sulfur dioxide (SO<sub>2</sub>).

Here are the concentration thresholds that trigger AQMA designation in the UK:

1. **Particulate Matter (PM)**:
  - \* PM<sub>10</sub> (particles with a diameter of 10 micrometers or less): 40 µg/m<sup>3</sup> (annual average)
  - \* PM<sub>2.5</sub> (particles with a diameter of 2.5 micrometers or less): 25 µg/m<sup>3</sup> (annual average)
2. **Nitrogen Dioxide (NO<sub>2</sub>)**:
  - \* 40 µg/m<sup>3</sup> (annual average)
3. **Ozone (O<sub>3</sub>)**:
  - \* 120 µg/m<sup>3</sup> (8-hour average)
4. **Nitrogen Oxides (NO<sub>x</sub>)**:
  - \* No specific threshold, but NO<sub>x</sub> is a precursor to PM and O<sub>3</sub>, so high levels can contribute to poor air quality.
5. **Sulfur Dioxide (SO<sub>2</sub>)**:
  - \* 350 µg/m<sup>3</sup> (24-hour average)

If the concentration of any of these pollutants exceeds the relevant threshold, the local authority must declare an AQMA and develop an Air Quality Action Plan to reduce emissions and improve air quality.

It's worth noting that these thresholds are based on the EU's Air Quality Directive (2008/50/EC) and are currently being reviewed as part of the UK's transition to new air quality standards.

### **LLaMa, paragraph, Hybrid-RAG**

In the UK, the concentration thresholds that trigger Air Quality Management Area (AQMA) designation are based on the levels of pollutants in the air, specifically:

1. **Particulate Matter (PM)**:
  - \* PM<sub>10</sub> (particles with a diameter of 10 micrometers or less): 18 micrograms per cubic meter (µg/m<sup>3</sup>) or more, averaged over a year [1].
  - \* PM<sub>2.5</sub> (particles with a diameter of 2.5 micrometers or less): 12.5 µg/m<sup>3</sup> or more, averaged over a year.
2. **Nitrogen Dioxide (NO<sub>2</sub>)**: 40 µg/m<sup>3</sup> or more, averaged over a year.
3. **Ozone (O<sub>3</sub>)**: 120 µg/m<sup>3</sup> or more, averaged over an 8-hour period.

These thresholds are based on the EU's Air Quality Directive (2008/50/EC) and the UK's Air Quality (England) Regulations 2007.

When the concentrations of these pollutants exceed the threshold levels, local authorities are required to declare an AQMA and develop an Air Quality Action Plan to reduce emissions and improve air quality. The plan typically includes measures to reduce emissions from various sources, such as transport, industry, and energy generation, as well as promoting cleaner fuels and technologies.

It's worth noting that the UK has also set more stringent targets for reducing air pollution, known as the National Air Quality Plan, which aims to reduce PM<sub>10</sub> concentrations to 10 µg/m<sup>3</sup> or less by 2025 and NO<sub>2</sub> concentrations to 18



µg/m<sup>3</sup> or less by 2025.

According to the UK's Air Quality Strategy [1], the concentration averaging periods for pollutants are as follows: benzene, for example, has a concentration objective of 3.25 µg/m<sup>3</sup>, with an averaging period of 1 year. General practitioners and allied healthcare professionals can advise patients who are vulnerable to harm from air pollution [2].

As of August 2024, 251 Local Authorities (69.5% of those in the UK) have one or more AQMAs [4]. The majority of AQMAs are for NO<sub>2</sub>, with 434 AQMAs declared across the UK [5]. In Northern Ireland, 17 AQMAs have been declared as a result of air pollutant emissions from road traffic [6].

When an AQMA is declared, local authorities are required to develop an Air Quality Action Plan to reduce emissions and improve air quality. This plan typically includes measures to reduce emissions from various sources, such as transport, industry, and energy generation, as well as promoting cleaner fuels and technologies.

[1] 20.21.066 Draft Clean Air Strategy for NI - Public Discussion Doc Final V6.pdf | Score: 20.729

[2] chief-medical-officers-annual-report-air-pollution-dec-2022.pdf | Score: 20.031

[3] Air quality targets - Detailed Evidence report.pdf | Score: 19.431

[4] air\_pollution\_uk\_2023\_issue\_1.pdf | Score: 0.719

[5] air\_pollution\_uk\_2023\_issue\_1.pdf | Score: 0.603

[6] 20.21.066 Draft Clean Air Strategy for NI - Public Discussion Doc Final V6.pdf | Score: 0.596