*Draft Regulations laid before Parliament under sections 4(8) and 143(5)(b) of the Environment Act 2021, for approval by resolution of each House of Parliament.*

DRAFT STATUTORY INSTRUMENTS

# 2022 No.

# ENVIRONMENTAL PROTECTION, ENGLAND

# The Environmental Targets (Fine Particulate Matter) (England) Regulations 2022

*Made - - - -* ***

*Coming into force in accordance with regulation 1*

The Secretary of State makes these Regulations in exercise of the powers conferred by sections 1, 2, 6(1) and 143(1) of the Environment Act 2021(**a**) ("the 2021 Act").

In accordance with section 4(1) and (2) of the 2021 Act, the Secretary of State has sought advice from persons the Secretary of State considers to be independent and to have relevant expertise, and is satisfied that the targets in these Regulations can be met.

In accordance with sections 4(8) and 143(5)(b) of the 2021 Act, a draft of these Regulations has been laid before, and approved by resolution of, each House of Parliament.

## PART 1

## Introduction

### Citation, commencement, extent and application

**1.**—(1) These Regulations may be cited as the Environmental Targets (Fine Particulate Matter) (England) Regulations 2022.

(2) Subject to paragraph (3), these Regulations come into force on the day after the day on which they are made.

(3) Paragraph 3(1)(b) of Schedule 2 comes into force on 1st January 2024.

(4) These Regulations extend to England and Wales but apply in relation to England only.

### Interpretation

**2.**—(1) In these Regulations—

"the 2021 Act" means the Environment Act 2021;

(**a**) 2021 c. 30.

"the 2010 Regulations" means the Air Quality Standards Regulations 2010(**a**);

"ambient air" means outdoor air, excluding the air in workplaces where members of the public do not have regular access;

"AQSR monitoring station" means a monitoring station which is used to measure $PM_{2.5}$ levels for the purposes of the 2010 Regulations;

"fixed measurement" means a measurement taken at a fixed location, either continuously or by sampling at regular intervals, to determine levels of $PM_{2.5}$;

"minimum annual data capture requirement" has the meaning given in regulation 14(4);

"monitoring station" is to be interpreted in accordance with regulation 12(4);

"ratified" has the meaning given in regulation 14(5);

"year" means a calendar year;

"zone" means one of the zones or agglomerations into which England is divided for air quality monitoring purposes, as determined under regulation 4 of the 2010 Regulations.

(2) For the purposes of these Regulations—

(a) particulate matter is to be treated as meeting the definition of $PM_{2.5}$(**b**) if it passes through a size-selective inlet with a 50% efficiency cut-off at 2.5 micrometres aerodynamic diameter;

(b) a reference to the "level" of $PM_{2.5}$ means the mass concentration of $PM_{2.5}$ measured in micrograms per cubic metre ("µg/m³").

**Air quality targets**

**3.**—(1) Regulation 4 specifies a target ("the annual mean concentration target") for the purposes of the Secretary of State's duty in section 2 of the 2021 Act to set a target in respect of the annual mean level of $PM_{2.5}$ in ambient air.

(2) Regulation 7 specifies a target ("the population exposure reduction target") for the purposes of the Secretary of State's duty in section 1 of the 2021 Act to set a long-term target in respect of air quality.

# PART 2

## Annual Mean Concentration Target for $PM_{2.5}$

**Target**

**4.** The annual mean concentration target is that by the end of 31st December 2040 the annual mean level of $PM_{2.5}$ in ambient air must be equal to or less than 10 µg/m³ ("the target level").

**Measurement**

**5.**—(1) The annual mean concentration target is met by 31st December 2040 if, at every relevant monitoring station, the annual mean level of $PM_{2.5}$ in ambient air, calculated in accordance with regulation 15 and rounded to the nearest whole number of µg/m³, is equal to or less than the target level in the year 2040.

(2) In paragraph (1), "relevant monitoring station" means a monitoring station from which fixed measurements of $PM_{2.5}$ are taken—

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(**a**) S.I. 2010/1001, amended by S.I. 2016/1184, 2018/110, 2019/74 and 2020/1313.
(**b**) See section 2(3) of the 2021 Act.

(a) throughout the whole of the year 2040, disregarding any periods during that year in which the monitoring station is temporarily out of operation, for example for repair or maintenance; and

(b) which meet the minimum annual data capture requirement in that year.

**Reporting date**

**6.** For the purposes of section 6(1) of the 2021 Act the reporting date for the annual mean concentration target is 15th July 2041.

# PART 3

## Population exposure reduction target for $PM_{2.5}$

**Target**

**7.** The population exposure reduction target is that there is at least a 35% reduction in population exposure by the end of 31st December 2040 ("the target date"), as compared with the average population exposure in the three-year period from 1st January 2016 to 31st December 2018 ("the baseline period"), determined in accordance with regulation 8.

**Measurement**

**8.**—(1) The percentage change in population exposure between the baseline period and the target date is to be measured by—

(a) determining, for each year from 2019 to 2040, the amount (in $\mu g/m^3$) by which the Population Exposure Indicator for that year is greater or less than the Reference Indicator for that year;

(b) determining the sum of annual changes in population exposure between the baseline period and the target date, by adding together the amounts determined under sub-paragraph (a) for all years from 2019 to 2040; and

(c) expressing the sum of annual changes in population exposure, as represented by the amount determined under sub-paragraph (b), as a percentage of the Population Exposure Indicator for the baseline period, rounded to the nearest whole number.

(2) Schedule 1 specifies calculations which the Secretary of State is to carry out, for the purposes of enabling the determinations in paragraph (1) to be made and progress towards meeting the population exposure reduction target to be measured.

**Reporting date**

**9.** For the purposes of section 6(1) of the 2021 Act, the reporting date for the population exposure reduction target is 15th July 2041.

**Interpretation of this Part**

**10.** In this Part and in Schedule 1—

"the baseline period" has the meaning given in regulation 7;

"population exposure" means population exposure to $PM_{2.5}$;

"the Population Exposure Indicator"—

(a) for the baseline period is a measure of average population exposure in that period;

(b) for a year from 2019 onwards is a measure of average population exposure in the three-year period ending on 31st December in that year,

calculated in accordance with Schedule 1;

"the Reference Indicator" for a year is a measure of average population exposure in the three-year period ending on 31st December in the preceding year, calculated in accordance with Schedule 1 and to be used only for the purposes of making the determination required by regulation 8(1)(a) and the calculations required by paragraphs 1(d) and 2(c) of Schedule 1.

# PART 4

## Monitoring and assessment

### Scope of this Part

**11.** This Part applies in relation to monitoring and assessment of $PM_{2.5}$ levels carried out for the purposes of the annual mean concentration target and the population exposure reduction target.

### Monitoring stations

**12.**—(1) The Secretary of State must ensure that the requirements in Schedule 2 (relating to the location and number of monitoring stations and position of monitoring equipment) are met.

(2) Subject to any determination under paragraph (3)(b), every AQSR monitoring station which was in operation immediately before the coming into force of this regulation is a monitoring station for the purposes of these Regulations.

(3) The Secretary of State may from time to time—

(a) establish new monitoring stations to measure $PM_{2.5}$ levels for the purposes of these Regulations; or

(b) determine that a monitoring station is to cease to be used for the purposes of these Regulations, provided that the requirements in paragraph 3 of Schedule 2 (minimum number of monitoring stations) continue to be met.

(4) References to monitoring stations in these Regulations are to monitoring stations for the measurement of $PM_{2.5}$ levels to which paragraph (2) applies or which are established by the Secretary of State under paragraph (3)(a) except—

(a) in the expression "AQSR monitoring station" and its definition (see regulation 2(1)); and

(b) where specific provision is made in relation to the meaning of "monitoring station" in relation to a time before these Regulations come into force (see regulation 14(5) and the definition of "background monitoring station" in paragraph 5 of Schedule 1).

### Assessment

**13.**—(1) The Secretary of State must ensure that $PM_{2.5}$ levels at each monitoring station are assessed as follows.

(2) Fixed measurements of $PM_{2.5}$ must be taken either continuously or at hourly or other regular intervals which are not less frequent than once per day—

(a) in accordance with the method described in BS EN 12341:2014 ("the reference method"); or

(b) by another method which is equivalent to the reference method ("an equivalent method").

(3) For the purposes of paragraph (2)(b), a method of assessing $PM_{2.5}$ levels is an equivalent method if it gives results which—

(a) are equivalent to the results which would be given by the reference method; or

(b) otherwise bear a consistent relationship with the results which would be given by the reference method, disregarding any change to that relationship as a result of changes in the composition of $PM_{2.5}$ in ambient air over time.

(4) If $PM_{2.5}$ levels are assessed by a method to which paragraph (3)(b) applies, the results must be adjusted to produce results equivalent to the results which would be given by the reference method.

(5) If $PM_{2.5}$ levels are assessed otherwise than in accordance with paragraph (2)(a), the Secretary of State must keep under review whether that method satisfies the requirements in paragraph (3).

(6) In this regulation "BS EN 12341:2014" means the British Standard so numbered and titled 'Ambient Air – standard gravimetric measurement method for the determination of the $PM_{10}$ or $PM_{2.5}$ mass concentration of suspended particulate matter'(**a**).

**Measurement, data ratification and minimum annual data capture requirement**

**14.**—(1) For the purposes of these Regulations, $PM_{2.5}$ levels are to be measured in $\mu g/m^3$ to at least one decimal place.

(2) The data obtained from fixed measurements of $PM_{2.5}$ must be independently checked, and not used for the purposes of any calculations if it is determined that they are likely to be incorrect.

(3) The data obtained from fixed measurements of $PM_{2.5}$ at a monitoring station in a year are not to be used for the purposes of any calculations unless the minimum annual data capture requirement is met by the monitoring station in that year.

(4) The minimum annual data capture requirement for a monitoring station is that fixed measurements of $PM_{2.5}$ levels are taken, and the data from such measurements are ratified, for at least 85% of the hours in a year, or if measurements are taken at periodic intervals less frequent than hourly, for at least 85% of those periods in a year.

(5) In this regulation—

"monitoring station" in relation to any time before these Regulations came into force includes any AQSR monitoring station which was in operation at that time;

"ratified" means that data have been checked in accordance with paragraph (2) and not excluded from being used in calculations.

**Calculation of annual mean $PM_{2.5}$ level at monitoring stations**

**15.**—(1) The Secretary of State must ensure that, as soon as reasonably practicable after the end of each year, the annual mean $PM_{2.5}$ level is calculated for each monitoring station.

(2) If $PM_{2.5}$ levels are measured at periodic intervals, the annual mean $PM_{2.5}$ level at a monitoring station is to be calculated as the mean of all the ratified periodic measurements taken in a year.

# PART 5

## Supplementary

**Information**

**16.**—(1) The Secretary of State must publish on a website the information specified in Schedule 3.

(2) The information must be published within a reasonable time after—

(a) the information is available to the Secretary of State; and

(**a**) Published by the British Standards Institution. Digital and hard copies can be purchased online from the BSI Group at http://www.bsigroup.com. Hard copies can also be purchased by post from the BSI Group Customer Services Department at 389 Chiswick High Road, London W4 4AL. A copy is available for inspection free of charge at the offices of the Department for Environment, Food and Rural Affairs, 2 Marsham Street, London SW1P 4DF.

(b) in the case of the data specified in paragraphs 8 to 11 of Schedule 3, the Secretary of State is satisfied that the data are correct.

*Name*
Parliamentary Under Secretary of State
Date Department for Environment, Food and Rural Affairs

# SCHEDULE 1

Regulation 8(2)

## Population exposure reduction target: calculations

### Initial calculations

**1.** The following are to be calculated by 15th July 2023—

(a) the Population Exposure Indicator for the baseline period ("PEIbase");

(b) the Population Exposure Indicator for each of the years 2019, 2020, 2021 and 2022;

(c) the Reference Indicator for each of the years 2019, 2020, 2021 and 2022;

(d) Δ for each of the years 2019, 2020, 2021 and 2022, where "Δ", for a year, means the amount by which the Population Exposure Indicator for that year is greater or less than the Reference Indicator for that year.

### Annual calculations

**2.** The following are to be calculated for each year from 2023 onwards ("year n"), by 15th July in the following year—

(a) the Population Exposure Indicator for year n;

(b) the Reference Indicator for year n;

(c) Δ for year n;

(d) the sum of Δ for each of the years beginning with 2019 up to and including year n ("Δsum");

(e) the cumulative total of the annual changes to the Population Exposure Indicator from the baseline period up to and including year n, expressed as a percentage of PEIbase, as determined by the calculation—

$$\frac{\Delta sum}{PEIbase} \times 100$$

### Calculation of PEIbase, Population Exposure Indicator and Reference Indicator

**3.**—(1) PEIbase is to be calculated by carrying out the following steps—

— step 1: the mean is calculated of the annual mean $PM_{2.5}$ level in 2016 for each baseline monitoring station which was in operation throughout that year and met the minimum annual data capture requirement in that year;

— step 2: step 1 is repeated for 2017 and 2018;

— step 3: the mean of the values calculated under steps 1 and 2 for the years 2016, 2017 and 2018 is calculated to obtain PEIbase.

(2) The Population Exposure Indicator for a year ("PEIyear") is to be calculated by carrying out the following steps—

— step 1: the mean is calculated of the annual mean $PM_{2.5}$ levels in that year for each PEI monitoring station, excluding any PEI monitoring station which did not meet the minimum annual data capture requirement in that year;

— step 2: step 1 is repeated for each of the two preceding years;

— step 3: the mean of the values calculated under steps 1 and 2 for those three years is calculated to obtain PEIyear.

(3) The Reference Indicator for a year ("RIyear") is to be calculated by carrying out the following steps—

— step 1: the mean is calculated of the annual mean $PM_{2.5}$ levels in the preceding year for each PEI monitoring station, excluding any PEI monitoring station which did not meet the minimum annual data capture requirement in that year;

— step 2: step 1 is repeated for each of the two previous years;

— step 3: the mean of the values calculated under steps 1 and 2 for those three years is calculated to obtain RIyear.

**Calculation and rounding**

**4.**—(1) The calculations in this Schedule are to be made using $PM_{2.5}$ levels in µg/m³ measured to one decimal place.

(2) Any amount or value to be calculated under this Schedule is to be calculated to at least two decimal places, and if it is used for any subsequent calculation under this Schedule the unrounded amount or value is to be used.

(3) For the purpose of publication under paragraphs 9 to 11 of Schedule 3 (information required to be published)—

(a) PEIbase and PEIyear are to be expressed to two decimal places;

(b) the percentage calculated under paragraph 2(e) is to be rounded to the nearest whole number.

**Interpretation of Schedule 1**

**5.**—(1) In this Schedule—

"background monitoring station" means a monitoring station which is at an urban background site or a suburban background site, within the meanings given in paragraph 1 of Schedule 2, and for this purpose "monitoring station" in relation to any time before these Regulations came into force includes any AQSR monitoring station which was in operation at that time;

"baseline monitoring station" means a background monitoring station which in one or more of the years 2016, 2017 and 2018—

(a) was in operation throughout that year; and

(b) met the minimum annual data capture requirement in that year;

"Δ" has the meaning given in paragraph 1(d);

"PEIbase" has the meaning given in paragraph 1(a);

"PEI monitoring station", in relation to the measurement of the Population Exposure Indicator or the Reference Indicator for a year, means a background monitoring station which—

(a) is or was in operation throughout that year and the three preceding years; and

(b) met the minimum annual data capture requirement in at least three of those four years.

(2) In determining whether a background monitoring station was in operation throughout a year any periods in which the station was temporarily out of operation, for example for maintenance or repair, are to be disregarded.

# SCHEDULE 2

Regulation 12

## Monitoring stations

**Site descriptions: interpretation**

**1.** In this Schedule, the following descriptions of sites of monitoring stations have the following meanings—

"near-source" means a site in a location where the $PM_{2.5}$ level is likely to be elevated above the background level due to the influence of one or more sources of pollution in close proximity to the site, such as emissions from traffic from a major road or from nearby industrial sources;

"suburban background" means a site—

(a) in a partially built-up area which is mixed with non-urbanised areas; and

(b) where the $PM_{2.5}$ level is not significantly influenced by a source or sources of pollution in close proximity to the site, and is therefore representative of the background level of $PM_{2.5}$ to which the population is likely to be exposed across a wider area than the immediate vicinity of the site;

"urban background" means a site—

(a) in a continuously or predominantly built-up area which is not mixed with any non-urbanised areas except for urban parks; and

(b) where the $PM_{2.5}$ level is not significantly influenced by a source or sources of pollution in close proximity to the site, and is therefore representative of the background level of $PM_{2.5}$ to which the population is likely to be exposed across a wider area than the immediate vicinity of the site.

**Location of monitoring stations**

**2.**—(1) All monitoring stations must be located at a site which—

(a) is in, or representative of, an area to which members of the public or a section of the public have access and are likely to frequent;

(b) is not within the boundary of a factory or other industrial premises;

(c) is not on the carriageway of a road, or on a central reservation of a road to which there is not normally pedestrian access.

(2) Subject to complying with sub-paragraph (1), and to the requirements in paragraphs 4 and 5, a monitoring station may be located at a site of any description (and not only at a site of a description in paragraph 1).

**Minimum numbers of monitoring stations**

**3.**—(1) Until 31st December 2027—

(a) the total number of monitoring stations in each zone must be not less than the number of AQSR monitoring stations in that zone immediately before the coming into force of these Regulations;

(b) at least one monitoring station in each zone must be at an urban background or suburban background site.

(2) From 1st January 2028—

(a) the total number of monitoring stations in each zone, and

(b) the number of those monitoring stations which are—

(i) at urban background or suburban background sites;

(ii) at near-source sites,

must be not less than the minimum numbers specified in the following table.

| *Population of zone (thousands)* | *Minimum total number of monitoring stations* | *Minimum number of monitoring stations at urban background or suburban background sites* | *Minimum number of monitoring stations at near-source sites* |
|---|---|---|---|
| ≥ 6,000 | 15 | 10 | 5 |
| 4,750 – 5,999 | 11 | 7 | 4 |
| 3,750 – 4,749 | 10 | 6 | 4 |
| 2,750 – 3,749 | 9 | 6 | 3 |
| 1,000 – 2,749 | 6 | 4 | 2 |
| 250 – 999 | 3 | 2 | 1 |
| <250 | 2 | 1 | 1 |

**Siting criteria**

**4.**—(1) Monitoring stations must be sited in accordance with the criteria in sub-paragraphs (2) to (4).

(2) Monitoring stations must be sited to avoid measuring $PM_{2.5}$ levels within very small micro-environments in their immediate vicinity.

(3) Monitoring stations at near-source sites, as a group, must include stations which are sited to provide data that are representative of locations where the highest $PM_{2.5}$ concentrations are likely to occur to which the population is exposed for significant periods.

(4) Monitoring stations at near-source sites where the main nearby source of pollution is traffic emissions from a road must be—

(a) not more than 10 metres from the kerbside of the road;

(b) not less than 25 metres from the edge of any junction which interrupts the traffic flow and causes different levels of vehicular $PM_{2.5}$ emissions from the rest of the road; and

(c) representative of $PM_{2.5}$ levels in a length of the road of not less than 100 metres.

**Position of monitoring equipment**

**5.** Equipment for measuring $PM_{2.5}$ levels at monitoring stations must be positioned in accordance with the following criteria—

(a) the flow of air around the sampling inlet must be unrestricted (free in an arc of at least 180° if the equipment is affixed or adjacent to a building or 270° otherwise);

(b) the sampling inlet must—

(i) be not less than 0.5 metres from the nearest building, tree or other obstacle; and

(ii) not be positioned in the immediate vicinity of a source of $PM_{2.5}$ emissions;

(c) the height of the inlet sampling probe must be not less than 1.5 metres and not more than 8 metres above the ground;

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

# SCHEDULE 3

Regulation 16

## Information required to be published

*Monitoring stations: general information*

**1.** In relation to each monitoring station—

(a) its zone and location;

(b) the date on which it first entered into operation for the monitoring of $PM_{2.5}$ levels;

(c) the description of site (as listed in paragraph 1 of Schedule 2), if any, at which it is located;

(d) whether $PM_{2.5}$ levels measured at the monitoring station are used for the purposes of—

(i) the annual mean concentration target and the population exposure reduction target; or

(ii) the annual mean concentration target only.

*Monitoring stations: location details*

**2.** In relation to each monitoring station—

(a) a map of its location and photographs of the surrounding area;

(b) the precise location of the sampling inlet including its height above the ground.

**3.** In relation to each monitoring station at a near-source site—

(a) a description of the predominant nearby source of $PM_{2.5}$ emissions;

(b) the distance of the monitoring station from that source.

*Monitoring stations: temporary or permanent impacts*

**4.** In relation to each monitoring station, a description of any local influences (such as construction or roadworks) which have led to a temporary or permanent change in the extent to which $PM_{2.5}$ levels measured at the site are representative of $PM_{2.5}$ levels in the surrounding area.

*Assessment methods and quality control*

**5.** In relation to each monitoring station, a narrative description of the method used to take fixed measurements of $PM_{2.5}$ levels.

**6.** An explanation of how any equivalent methods used are equivalent to the reference method.

**7.** A description of any quality assurance and quality control systems used to ensure the continued accuracy of measuring devices and the data obtained from them.

*Data*

**8.** In relation to each monitoring station—

(a) for each period in which a fixed measurement of $PM_{2.5}$ was taken and ratified, the measured value, or the mean of the measured values if more than one measurement was taken and ratified;

(b) the annual data capture rate;

(c) the annual mean $PM_{2.5}$ level in each year.

**9.** PEIbase (that is, the Population Exposure Indicator, as defined in regulation 10, for the baseline period as defined in regulation 7).

**10.** The Population Exposure Indicator for the most recent year for which it has been calculated.

**11.** The result of the calculation in paragraph 2(e) of Schedule 1 (that is, the percentage of PEIbase which represents the cumulative sum of annual changes to the Population Exposure Indicator since the baseline period), for the most recent year for which it has been calculated.

## EXPLANATORY NOTE

*(This note is not part of the Regulations)*

These Regulations, which apply to England, set—

— a target in respect of the annual mean concentration of $PM_{2.5}$ (fine particulate matter) in ambient air under section 2 of the Environment Act 2021 (c.30) ("the annual mean concentration target"), and

— a long-term target to reduce population exposure to $PM_{2.5}$ (fine particulate matter), within the priority area of air quality under section 1 of that Act ("the population exposure reduction target").

The Regulations specify, in respect of both targets, the target to be achieved and the date by which it is to be achieved.

Part 2 makes provision in relation to the annual mean concentration target. Regulation 4 sets the target to ensure that the annual mean concentration of $PM_{2.5}$ in ambient air is equal to or less than 10 micrograms per cubic metre by 31st December 2040. Regulation 5 makes provision about how this is to be measured.

Part 3 makes provision in relation to the population exposure reduction target. Regulation 7 sets the target to ensure that there is at least a 35% reduction in population exposure to $PM_{2.5}$ by 31st December 2040, as compared with a baseline period of 1st January 2016 to 31st December 2018. Regulation 8 makes provision about how this is to be measured, taking into account any changes over time to the network of monitoring stations used to measure $PM_{2.5}$ levels. Schedule 1 specifies calculations to be made for the purposes of enabling it to be determined whether the target is met and enabling progress towards meeting the target to be measured.

Regulations 6 and 9 set the reporting date for each target for the purposes of section 6(1) of the Environment Act 2021.

Part 4 and Schedule 2 contain provisions about monitoring and assessment which apply in relation to both targets.

Part 5 and Schedule 3 contain provisions about information to be published.

A full impact assessment of the effect that this instrument will have on the costs of business, the voluntary sector and the public sector is available from the Department for Environment, Food and Rural Affairs, 2 Marsham Street, London SW1P 4DF, and is published with an Explanatory Memorandum alongside these Regulations on www.legislation.gov.uk.

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£6.90

http://www.legislation.gov.uk/id/ukdsi/2022/9780348242959

ISBN 978-0-34-824295-9

