



Comhairle Cathrach
& Contae **Luimnigh**

Limerick City
& County Council

Air Quality Report for Limerick

November 2025

Introduction

Limerick City and County Council currently has air quality monitors operating at three locations in the metropolitan area of Limerick to provide live indicative air quality data to the public. These monitors are located in Mungret, Castletroy and Lock Quay.

The monitors measure particulate matter and gases, including nitrogen dioxide (NO₂), sulphur dioxide (SO₂), carbon monoxide (CO) and ozone (O₃). Real time data from these monitors can be accessed at www.airqweb.com.

The following report is a presentation of the results of that monitoring.

Particulate matter

Particulate matter (PM) which is commonly used as an indicator of dust particles in air, including total suspended particulates, PM₁₀, PM_{2.5} and PM₁.

PM₁₀ is particulate matter 10 microns or less in diameter, PM_{2.5} is particulate matter 2.5 microns or less in diameter and PM₁ is particulate matter 1 micron or less. PM_{2.5} is generally described as fine particulates. As a comparison, the width of a human hair is around 100 microns so approximately 40 PM_{2.5} will fit along its width.

The particulate matter indices that are of primary concern for human health are PM₁₀, PM_{2.5} and PM₁. These are the sub-fraction of particles, which can penetrate into the alveoli (air sacs) in the lungs. Chronic exposure to particles contributes to the risk of developing cardiovascular and respiratory diseases, as well as of lung cancer.

Nitrogen dioxide

Nitrogen dioxide (NO₂) is produced during combustion at high temperatures with the main sources in Ireland being vehicles and power stations. Short-term exposure to NO₂ is linked to adverse respiratory effects including airway inflammation in healthy people and increased respiratory symptoms in asthmatics. Long-term exposure is associated with increased risk of respiratory infections in children.

Sulphur dioxide

Sulphur dioxide (SO₂) is a gas, which is formed when sulphur-containing fuels (e.g. coal and oil) are burned in power stations, domestically and elsewhere. Impacts of high concentrations of SO₂ include temporary breathing difficulties for those that suffer from respiratory conditions such as asthma. Long-term exposure to SO₂ can aggravate existing cardiovascular disease and respiratory illness.

Carbon monoxide

Carbon monoxide (CO) is a colourless gas, formed from incomplete oxidation during combustion of fuel. Outdoor sources of CO are mainly from vehicles with concentrations generally highest in areas of traffic congestion. CO enters the bloodstream through the lungs and impairs the delivery of oxygen to the body's organs and tissues. The health impact of CO concentrations in ambient air is most serious for those suffering cardiovascular disease such as angina.

Ozone

Ozone (O₃) is formed as a secondary pollutant in the troposphere from the chemical reaction of NO_x (the two pollutants nitric oxide, NO, and nitrogen dioxide, NO₂), CO and volatile organic compounds (VOCs) in the presence of sunlight. Ozone can also be present in the troposphere due to downward flux from the ozone-rich stratosphere, where it occurs naturally and has a role in absorbing harmful UV radiation. Ground-level ozone is depleted through reactions with traffic-emitted pollutants and so levels of ozone are higher in rural areas than in urban areas.

Ozone irritates the eyes, nose, throat and lungs. It can destroy throat and lung tissue leading to a decrease in lung function and respiratory symptoms such as coughing, shortness of breath, aggravated asthma and other lung diseases.

Air Quality Standards

The CAFE (Clean Air for Europe) Directive sets air quality standards for member states in Europe and has been transposed into Irish legislation by the **Air Quality Standards Regulations**. The limit values for particulates are given below.

| Pollutant | Objective | Averaging Period | Limit Value | Basis of Application of the Limit Value | Limit Value Attainment Date |
|-------------------|----------------------------|------------------|-----------------------|--|-----------------------------|
| PM ₁₀ | Protection of human health | 24-hours | 50 µg/m ³ | Not to be exceeded more than 35 times in a calendar year | 1 Jan 2005 |
| | Protection of human health | Calendar year | 40 µg/m ³ | Annual mean | 1 Jan 2005 |
| PM _{2.5} | Protection of human health | Calendar year | 25 µg/m ³ | Annual mean | 1 Jan 2005 |
| | Protection of human health | Calendar year | 20 µg/m ³ | Annual mean | 1 Jan 2020 |
| NO ₂ | Protection of human health | 1-hour | 200 µg/m ³ | Not to be exceeded more than 18 times in a calendar year | 1 Jan 2010 |
| | Protection of human health | Calendar year | 40 µg/m ³ | Not to be exceeded more than 18 times in a calendar year | 1 Jan 2010 |

| | | | | | |
|-----------------|----------------------------|----------------------|-----------------------|--|------------|
| SO ₂ | Protection of human health | 1-hour | 150 µg/m ³ | Not to be exceeded more than 24 times in a calendar year | 1 Jan 2005 |
| | Protection of human health | 24-hours | 125 µg/m ³ | Not to be exceeded more than 3 times in a calendar year | 1 Jan 2005 |
| CO | Protection of human health | Maximum 8-hour mean* | 10mg/m ³ | 60% of the hourly running 8-hour averages | 1 Jan 2005 |

*The maximum daily 8-hour mean concentration is selected by examining eight-hour running averages, calculated from hourly data.

The World Health Organisation (WHO) provides air quality guidelines as follows:

| Pollutant | Averaging period | 2005 AQGs | 2021 AQGs |
|-------------------|--------------------------|-----------------------|-----------------------|
| PM ₁₀ | Calendar year | 20 µg/m ³ | 15 µg/m ³ |
| | 24-hours ^a | 50 µg/m ³ | 45 µg/m ³ |
| PM _{2.5} | Calendar year | 10 µg/m ³ | 5 µg/m ³ |
| | 24-hours ^a | 25 µg/m ³ | 15 µg/m ³ |
| NO ₂ | Calendar year | 40 µg/m ³ | 10 µg/m ³ |
| | 24-hour ^a | - | 25 µg/m ³ |
| SO ₂ | 24-hour ^a | 20 µg/m ³ | 40 µg/m ³ |
| O ₃ | Peak season ^b | - | 60 µg/m ³ |
| | 8-hour ^a | 100 µg/m ³ | 100 µg/m ³ |
| CO | 24-hour ^a | - | 4 µg/m ³ |

^a 99th percentile (i.e. 3–4 exceedance days per year).

^b Average of daily maximum 8-hour mean O₃ concentration in the six consecutive months with the highest six-month running-average O₃ concentration.

Note: Annual and peak season is long-term exposure, while 24 hour and 8 hour is short-term exposure.

Air Quality in November

The graphs on the following pages show the 24-hourly mean values of Total Particulates, PM₁₀, PM_{2.5}, PM₁, NO₂, SO₂, CO and ozone for the month of November at the three monitoring sites.

The monitoring results for particulate matter have been filtered out where the humidity at the station has been measured as greater than 85 %, as per a recommendation by the EPA¹. The relevant air quality standards or WHO guideline values for PM₁₀, PM_{2.5}, NO₂, SO₂ and CO also indicated. There are no standards currently set for Total Particulates, PM₁ and ozone.

Further information on air quality and health can be found at <http://www.epa.ie/air/quality/index/#d.en.51478>.

The long-term mean values for particulate matter and gases (NO₂, SO₂, CO and ozone) since the monitors were installed are shown in the table below and compared with the annual mean limits and guidelines.

¹ Limerick City and County Council included humidity and temperature sensors to the monitoring suite on 24th January 2018.

| Parameter | Location | Measured long term mean ($\mu\text{g}/\text{m}^3$) | WHO annual mean guidelines ($\mu\text{g}/\text{m}^3$) | EU CAFÉ Directive annual mean limit ($\mu\text{g}/\text{m}^3$) |
|--|------------|--|---|--|
| Total Particulates Nov 2024 – Nov 2025 Lock Quay Castletroy Mungret | Lock Quay | 15 $\mu\text{g}/\text{m}^3$ | None specified | None specified |
| | Castletroy | 15 $\mu\text{g}/\text{m}^3$ | | |
| | Mungret | 17 $\mu\text{g}/\text{m}^3$ | | |
| PM₁₀ Nov 2024 – Nov 2025 Lock Quay Castletroy Mungret | Lock Quay | 11 $\mu\text{g}/\text{m}^3$ | 20 $\mu\text{g}/\text{m}^3$ | 40 $\mu\text{g}/\text{m}^3$ |
| | Castletroy | 9 $\mu\text{g}/\text{m}^3$ | | |
| | Mungret | 11 $\mu\text{g}/\text{m}^3$ | | |
| PM_{2.5} Nov 2024 – Nov 2025 Lock Quay Castletroy Mungret | Lock Quay | 8 $\mu\text{g}/\text{m}^3$ | 5 $\mu\text{g}/\text{m}^3$ | 20 $\mu\text{g}/\text{m}^3$ |
| | Castletroy | 6 $\mu\text{g}/\text{m}^3$ | | |
| | Mungret | 6 $\mu\text{g}/\text{m}^3$ | | |
| PM₁ Nov 2024 – Nov 2025 Lock Quay Castletroy Mungret | Lock Quay | 4 $\mu\text{g}/\text{m}^3$ | None specified | None specified |
| | Castletroy | 4 $\mu\text{g}/\text{m}^3$ | | |
| | Mungret | 4 $\mu\text{g}/\text{m}^3$ | | |
| NO₂ Nov 2024 – Nov 2025 Lock Quay Castletroy Mungret | Lock Quay | 13 $\mu\text{g}/\text{m}^3$ | 10 $\mu\text{g}/\text{m}^3$ | 40 $\mu\text{g}/\text{m}^3$ |
| | Castletroy | 16 $\mu\text{g}/\text{m}^3$ | | |
| | Mungret | 11 $\mu\text{g}/\text{m}^3$ | | |
| SO₂ Nov 2024 – Nov 2025 Lock Quay Castletroy Mungret | Lock Quay | 10 $\mu\text{g}/\text{m}^3$ | None specified | None specified |
| | Castletroy | 8 $\mu\text{g}/\text{m}^3$ | | |
| | Mungret | 9 $\mu\text{g}/\text{m}^3$ | | |
| CO Nov 2024 – Nov 2025 Lock Quay Castletroy Mungret | Lock Quay | 0.13 $\mu\text{g}/\text{m}^3$ | None specified | None specified |
| | Castletroy | 0.09 $\mu\text{g}/\text{m}^3$ | | |
| | Mungret | 0.26 $\mu\text{g}/\text{m}^3$ | | |
| Ozone Nov 2024 – Nov 2025 Lock Quay Castletroy Mungret | Lock Quay | 50 $\mu\text{g}/\text{m}^3$ | None specified | None specified |
| | Castletroy | 54 $\mu\text{g}/\text{m}^3$ | | |
| | Mungret | 62 $\mu\text{g}/\text{m}^3$ | | |

The maximum daily mean values for particulate matter, for November, are shown in the table below and compared with the WHO air quality guidelines where they exist.

| Pollutant | Total Particulates | PM₁₀ | PM_{2.5} | PM₁ |
|-------------------------------|----------------------------------|----------------------------------|----------------------------------|---------------------------------|
| Averaging period | - | 24-hours | 24-hours | - |
| Guideline | None | 45 µg/m³ | 15 µg/m³ | None |
| Maximum Nov '25 Lock Quay | 22 µg/m ³ 08/11/25 | 17 µg/m ³ 08/11/25 | 14 µg/m ³ 27/11/25 | 8 µg/m ³ 27/11/25 |
| Maximum Nov '25 Castletroy | 22 µg/m ³ 13/11/25 | 13 µg/m ³ 27/11/25 | 11 µg/m ³ 27/11/25 | 7 µg/m ³ 27/11/25 |
| Maximum Nov '25 Mungret | 22 µg/m ³ 27/11/25 | 18 µg/m ³ 27/11/25 | 12 µg/m ³ 27/11/25 | 7 µg/m ³ 27/11/25 |

There were no exceedances of the WHO guideline values for particulates in November.

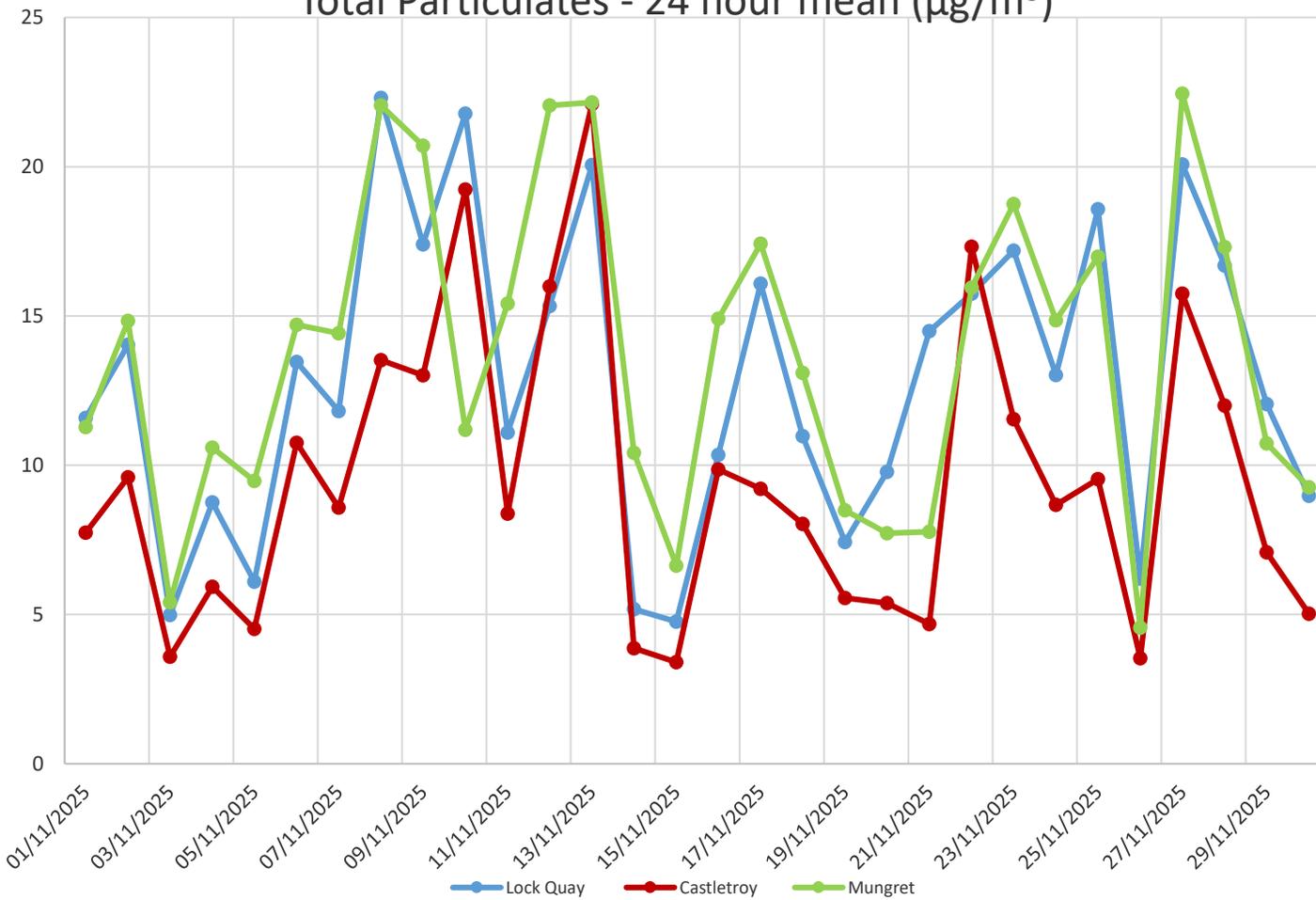
The maximum recorded short-term mean values for gases (NO₂, SO₂ and ozone), for November, are shown in the table below and compared with the WHO air quality guidelines.

| Pollutant | NO₂ | SO₂ | Ozone |
|---------------------------------|---|--|--|
| Averaging period | 1-hour | 10-minutes² | 8-hours |
| Guideline | 200 µg/m³ | 500 µg/m³ | 100 µg/m³ |
| Maximum Nov'25 - Lock Quay | 74 µg/m ³ 20/11/25 20:15 – 21:15 | 254 µg/m ³ 25/11/25 08:30 – 08:45 | 90 µg/m ³ 02+03/11/25 23:00 – 07:00 |
| Maximum Nov '25 – Castletroy | 77 µg/m ³ 17/11/25 18:15 – 19:15 | 140 µg/m ³ 04/11/25 16:45 – 17:00 | 106 µg/m ³ 11/11/25 05:15 – 13:15 |
| Maximum Nov '25 - Mungret | 40 µg/m ³ 04/11/25 08:30 – 09:30 | 65 µg/m ³ 17/11/25 09:00 – 09:15 | 119 µg/m ³ 02/11/25 23:30 – 07:30 |

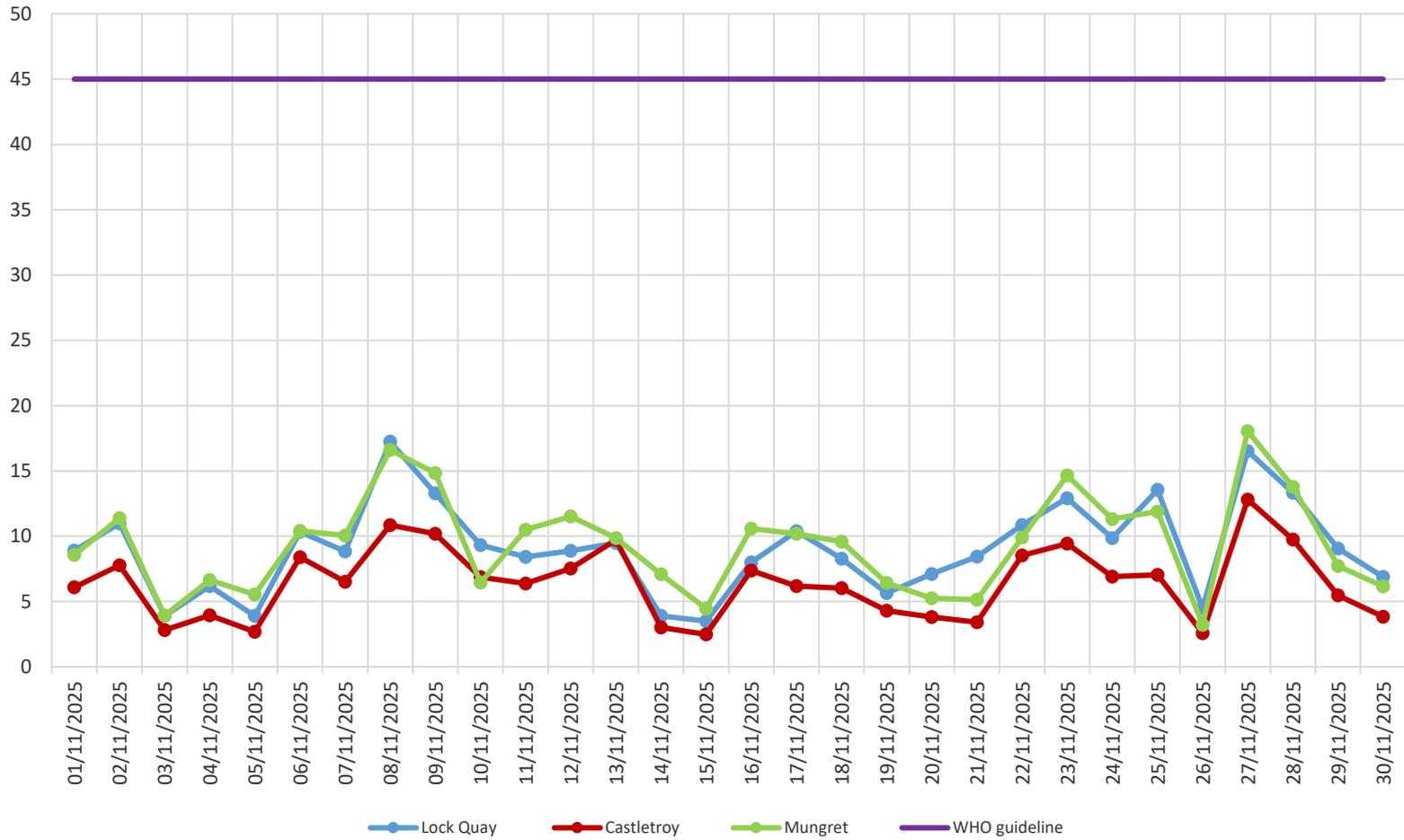
There were exceedances of the WHO guideline values for gases in November at the Castletroy monitor on the 11/11/25 and the Mungret monitor on the 02/11/25

² Measurements of SO₂ are averaged over 15-minute periods by the gas monitors. An exceedance is inferred where the measured 15-minutes average value from the gas monitors is greater than the 10-minutes WHO guideline value for SO₂.

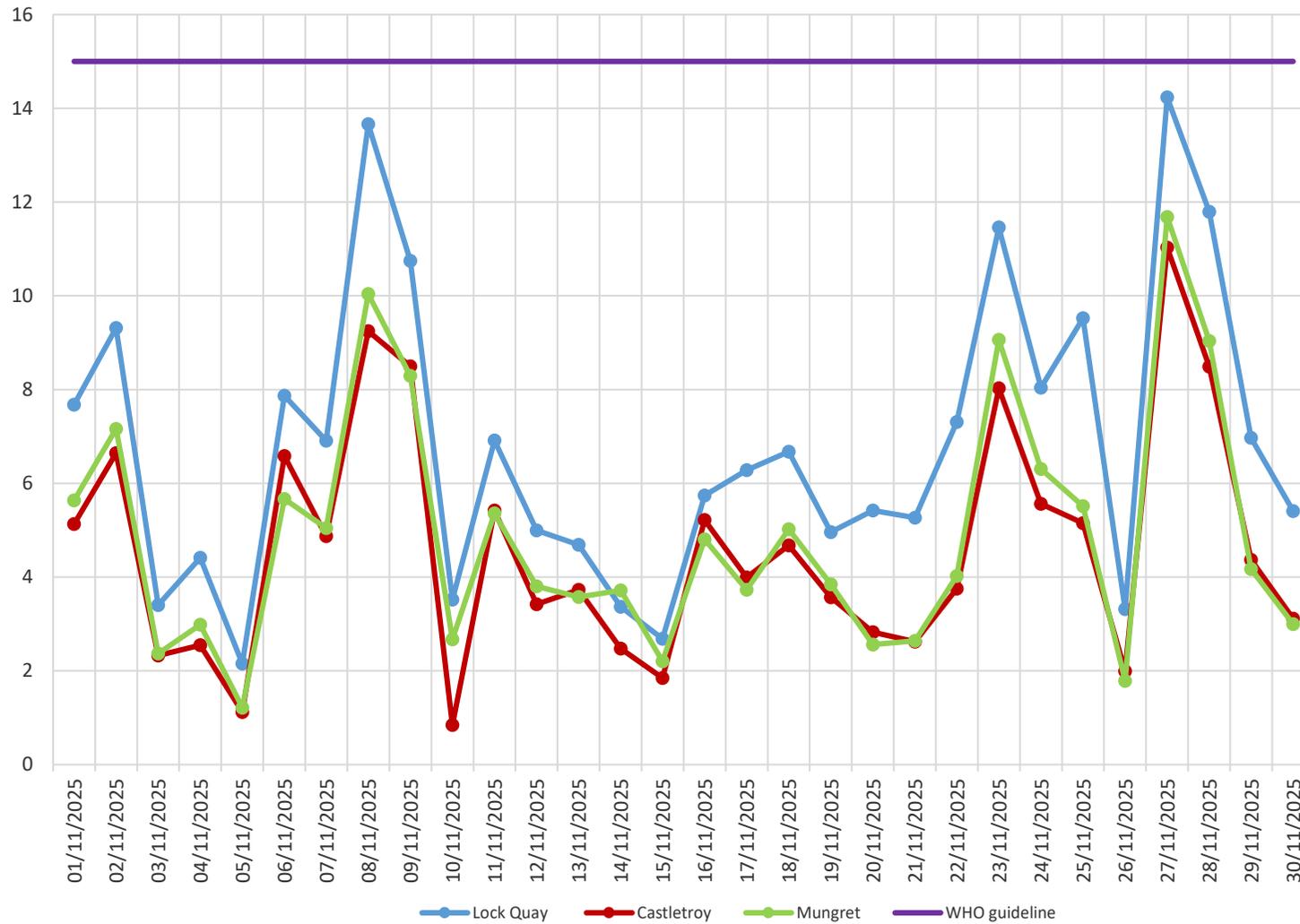
Total Particulates - 24 hour mean ($\mu\text{g}/\text{m}^3$)



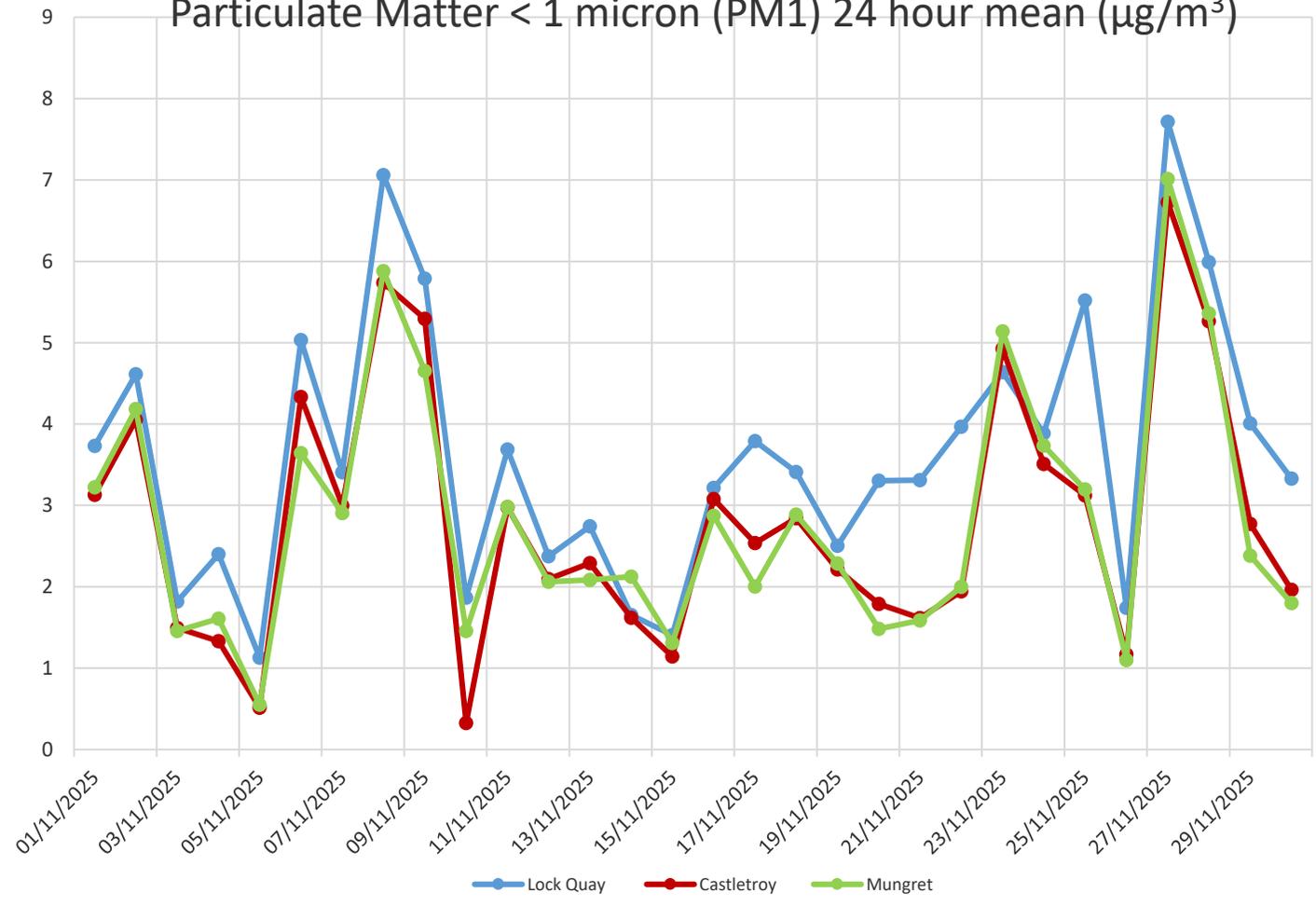
Particulate Matter < 10 microns (PM10) 24 hour mean ($\mu\text{g}/\text{m}^3$)



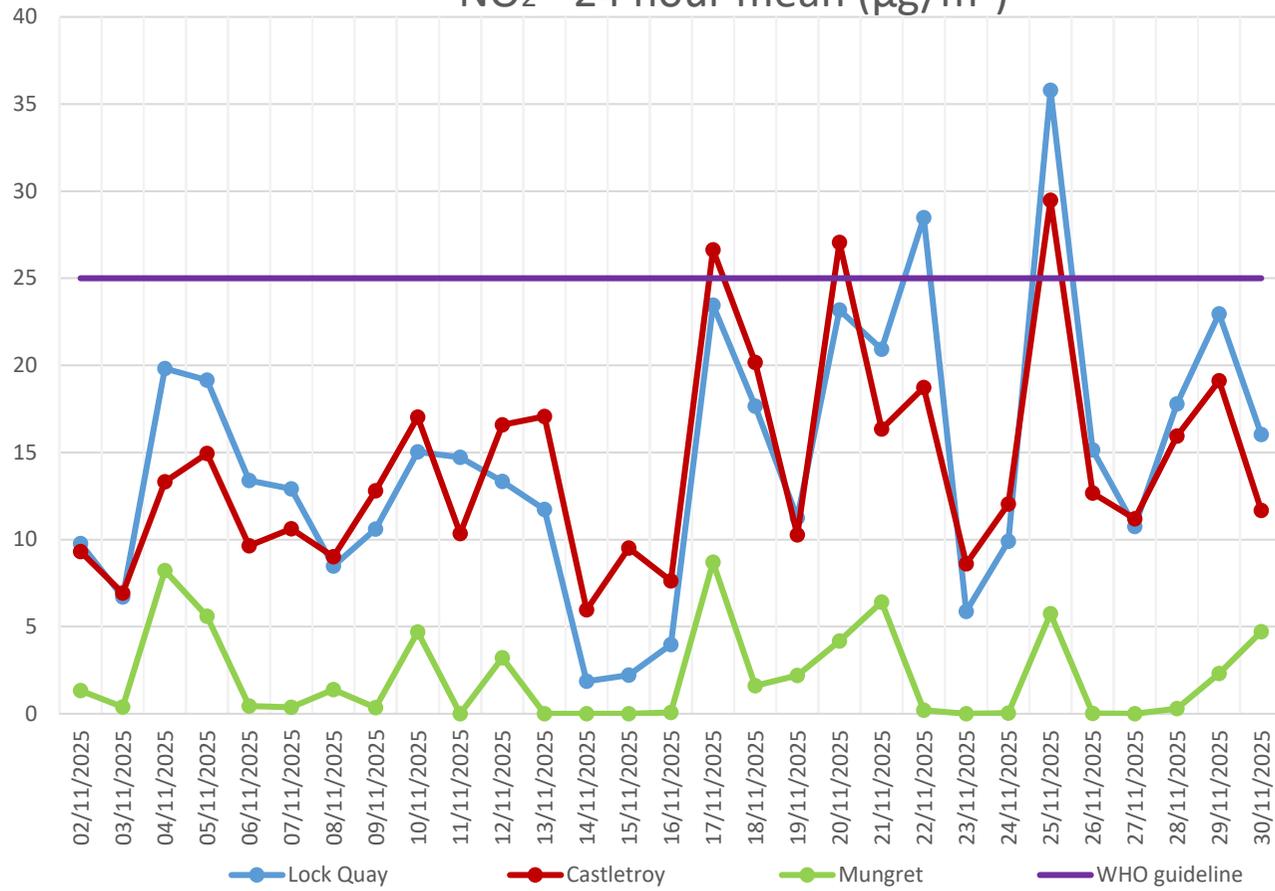
Particulate Matter < 2.5 micron (PM2.5) 24 hour mean ($\mu\text{g}/\text{m}^3$)



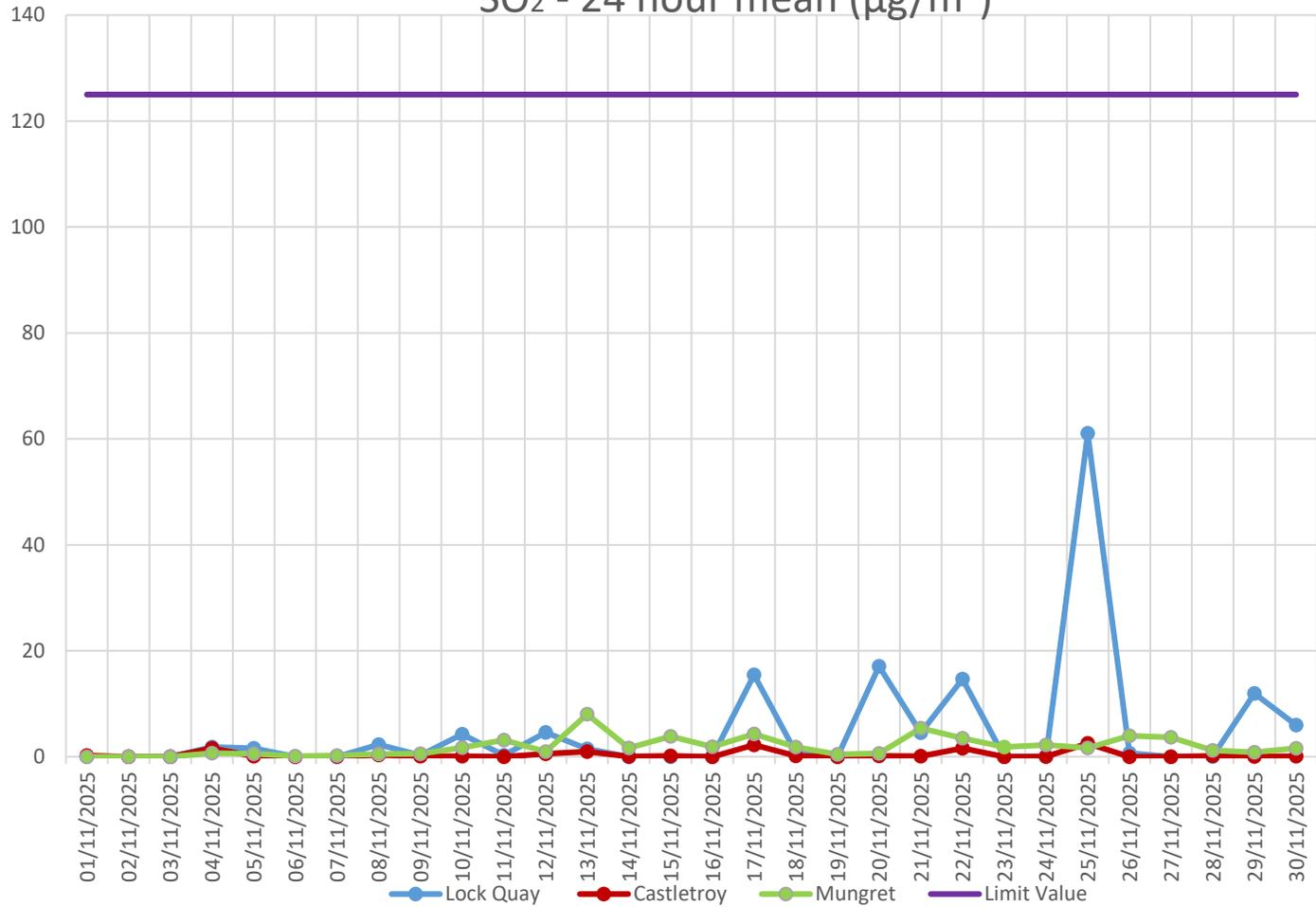
Particulate Matter < 1 micron (PM1) 24 hour mean ($\mu\text{g}/\text{m}^3$)



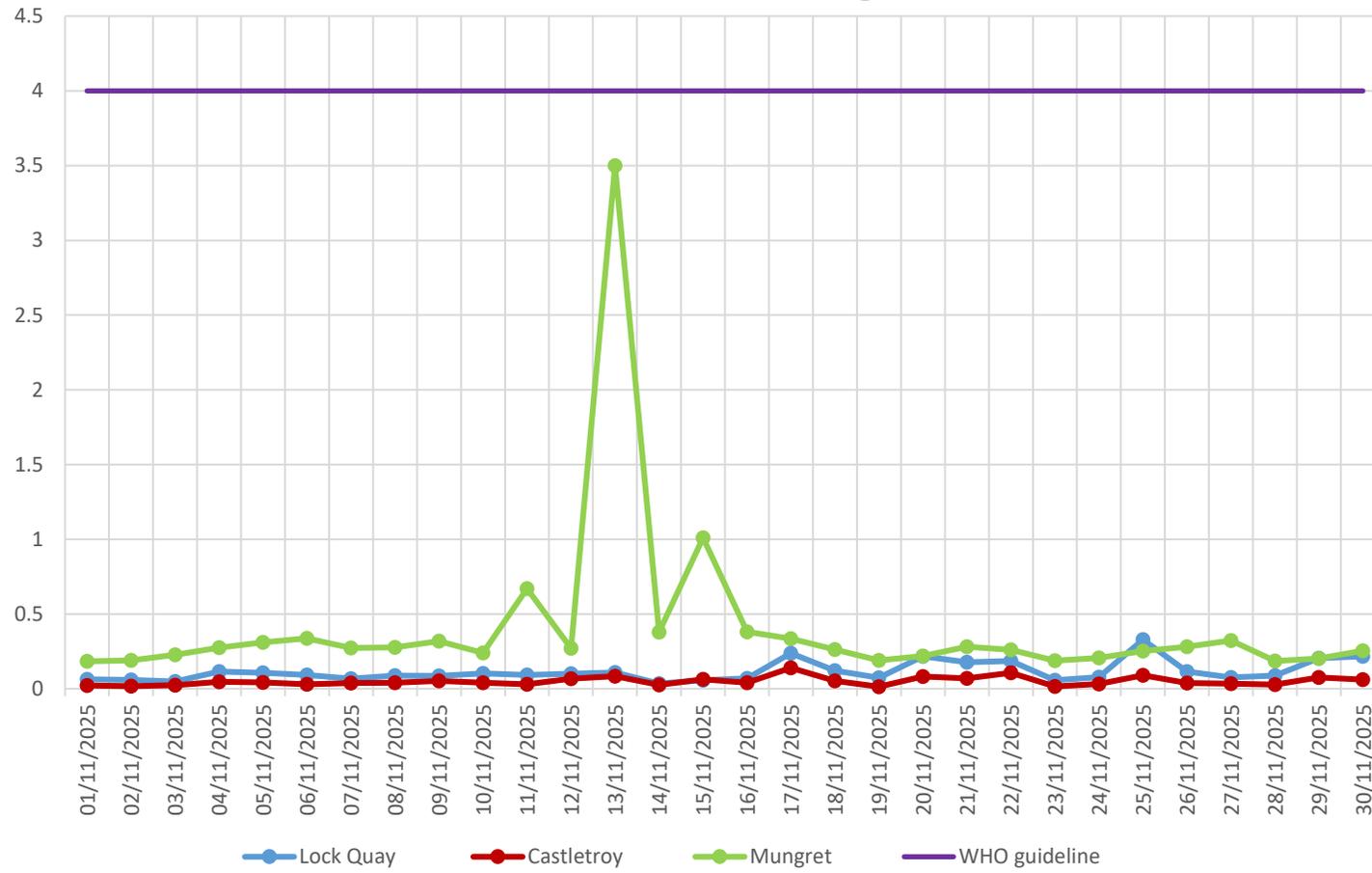
NO₂ - 24 hour mean (µg/m³)



SO₂ - 24 hour mean (µg/m³)



CO - 24 hour mean (mg/m³)



Ozone - 24 hour mean (ug/m³)

