

Air Quality in Exeter: Non-Technical Summary 2023

Air quality in Exeter mainly meets government objectives, with concentrations showing long-term downward trends and just a single hot spot where concentrations of nitrogen dioxide (NO₂) are above the objectives. This document aims to summarise the monitoring undertaken by Exeter City Council and the City's latest air pollution levels.

The Air Quality Management Area and the Air Quality Action Plan

An Air Quality Management Area (AQMA) is declared when there is an exceedance of an air quality objective. It is an area where the Council will bring forward and facilitate actions to improve air quality. Exeter's AQMA currently has two parts, targeting NO₂ 1-hour average and annual average.

When an AQMA is declared, the authority must produce an Air Quality Action Plan (AQAP), which must work towards achieving the objective level within the AQMA. The current AQAP was published in 2018 and runs until 2024. The AQAP contains 17 measures with the aim of reducing concentrations of air pollutants and exposure to air pollution; thereby positively impacting on the health and quality of life of residents and visitors to the city.

Further details of the Council's Air Quality Action Plan can be found on the [exeter.gov.uk webpage on the Air Quality Action Plan](https://www.exeter.gov.uk/webpage-on-the-Air-Quality-Action-Plan).

Monitoring

Automatic monitoring

Exeter City Council currently has two automatic (continuous) monitoring sites. One is located at the Royal Albert Memorial Museum (RAMM) in Queen Street and the other is located on Alphington Street.

In 2022 the RAMM site monitored NO₂, ozone (O₃) and particulate matter (PM₁₀ and PM_{2.5}), and the Alphington Street site monitored PM₁₀ and PM_{2.5}. The NO₂ monitor at Exeter Roadside is part of the UK's Automatic Urban and Rural Network (AURN) and the NO₂ data is collected and ratified by the AURN. The PM data is collected, validated and ratified by Exeter City Council.

Non-automatic monitoring

In 2022 Exeter City Council undertook non-automatic (passive) monitoring of NO₂ at 85 sites across the city. This is carried out through the use of diffusion tubes.

Diffusion tubes are small clear plastic tubes with a grey coloured cap at one end. Under the grey cap is a steel mesh disc which is coated with a chemical that absorbs NO₂. When gases pass over this mesh the chemical changes. This chemical change tells us how much NO₂ was in the air during the monitoring period.

These tubes are dotted throughout the city, attached to objects such as lampposts and drainpipes. The locations are carefully considered in order to assess NO₂ levels where there are relevant receptors, as well as being located to avoid any other pollution sources which could influence the result. The tubes are collected and replaced once a month by Exeter City Council and sent to a laboratory for analysis.

A map of the monitoring locations and the AQMA can be found on page 4 of this document. An online map can be found at the [exeter.gov.uk webpage on air quality monitoring](https://www.exeter.gov.uk/webpage-on-air-quality-monitoring).

Air Quality in 2022

The monitoring data collected is ratified and adjusted to be compared to England's statutory air quality objectives, which can be found in table 1.

Table 1. Air quality objectives in England

Pollutant	Concentration	Measured as
PM ₁₀	50 µg/m ³ , not to be exceeded more than 35 times a year	24-hour average
PM ₁₀	40 µg/m ³	Annual average
NO ₂	200 µg/m ³ not to be exceeded more than 18 times a year	1-hour average
NO ₂	40 µg/m ³	Annual average

PM₁₀

There were no measured exceedances of the PM₁₀ air quality objectives in Exeter in 2022. Levels were higher in 2022 than in the previous four years, but there is a longer term trend of falling levels since 2005 or 2006.

Table 2. PM₁₀ annual average concentrations since 2015

Site Name	2018 PM ₁₀ Annual Average Concentration (µg/m ³)	2019 PM ₁₀ Annual Average Concentration (µg/m ³)	2020 PM ₁₀ Annual Average Concentration (µg/m ³)	2021 PM ₁₀ Annual Average Concentration (µg/m ³)	2022 PM ₁₀ Annual Average Concentration (µg/m ³)
Exeter Roadside (RAMM)	17.7	15.8	14.1	13.9	19.2
Alphington Street	16.7	15.1	11.5	12.0	14.7

PM_{2.5}

In 2022 annual PM_{2.5} concentrations for the Exeter RAMM site were 12.7 µg/m³ and for the Alphington Street site annual PM_{2.5} concentrations were 9.0 µg/m³. The annual average EU limit value for PM_{2.5} is 25 µg/m³ so there is no suggestion that this level has been exceeded in Exeter in 2022.

NO₂

The monitoring data gathered from diffusion tubes shows that just one location measured an exceedance of the annual average NO₂ objective in 2022, at East Wonford Hill, as shown in table 3 below. This monitoring point is located on the front of a house so is representative of the concentrations at the receptor. (It does not need adjusting for the distance away from the kerb). The objective is 40 µg/m³ so the level measured in 2022 is only just above this.

Table 3. Monitoring locations which measured an exceedance of the annual average NO₂ objective in 2019

Site Name	Distance to relevant receptor (m)	Distance to kerb of nearest road (m)	NO ₂ Annual Average Concentration (µg/m ³)	NO ₂ Annual Average Concentration corrected for distance to the nearest receptor (µg/m ³)
East Wonford Hill	0	2	40.4	n/a

The concentrations measured from diffusion tubes in 2022 decreased at the majority of the sites when compared to 2021 concentrations. This could be part of the normal inter-annual variation and trends will continue to be monitored.

As you move away from busy roads, levels fall below 25 µg/m³. In 2022, levels in these areas were typically between 10 and 15 µg/m³ for purely suburban streets and between 15 and 20 µg/m³ for local through routes. The majority of the population of Exeter therefore live in locations with concentrations of nitrogen dioxide well below the objective, but a very small number are still exposed at home to levels above the objective. No schools in Exeter experience levels above the objective.

The annual average NO₂ monitoring data gathered from all the diffusion tubes and the continuous monitor at RAMM since 2018 can be found on pages 5 to 7 of this document.

Long-Term Trends in Air Quality

Figures 1 and 2 below show that a downward trend for annual average concentrations of NO₂ and PM₁₀ seems to have existed since around 2009. For NO₂ this is evident at urban background sites as well as roadside ones. This is a welcome trend, especially in the context of significant local housing and commercial development. However it has not been possible to link this trend directly to any specific national or local intervention and some element of inter-annual variability caused by weather conditions will be included.

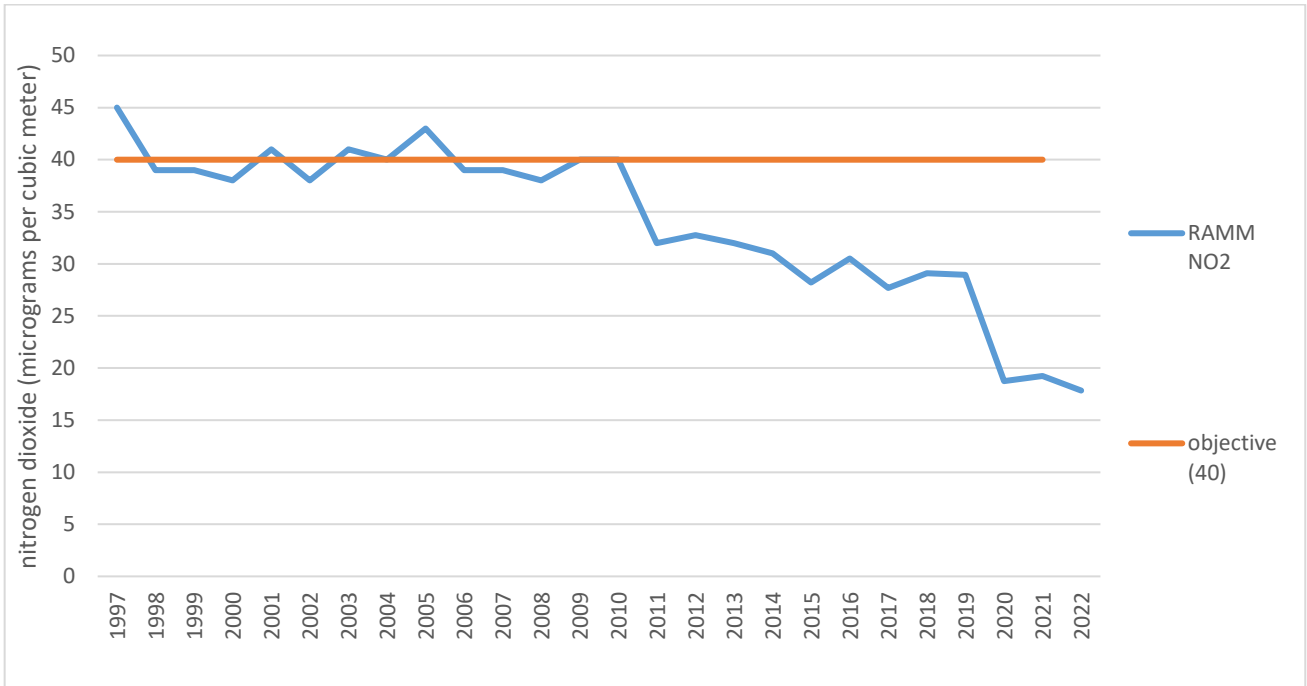


Figure 1. Trends in annual average NO₂ concentrations at the continuous monitoring site

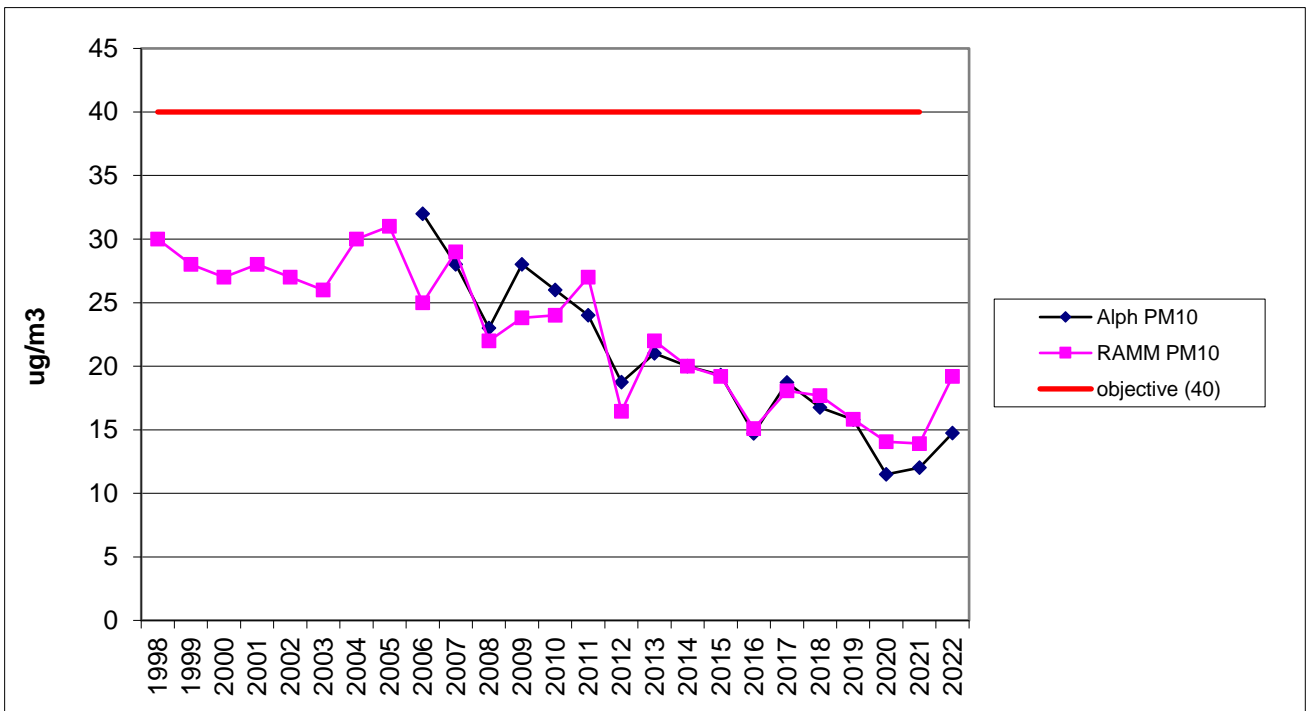


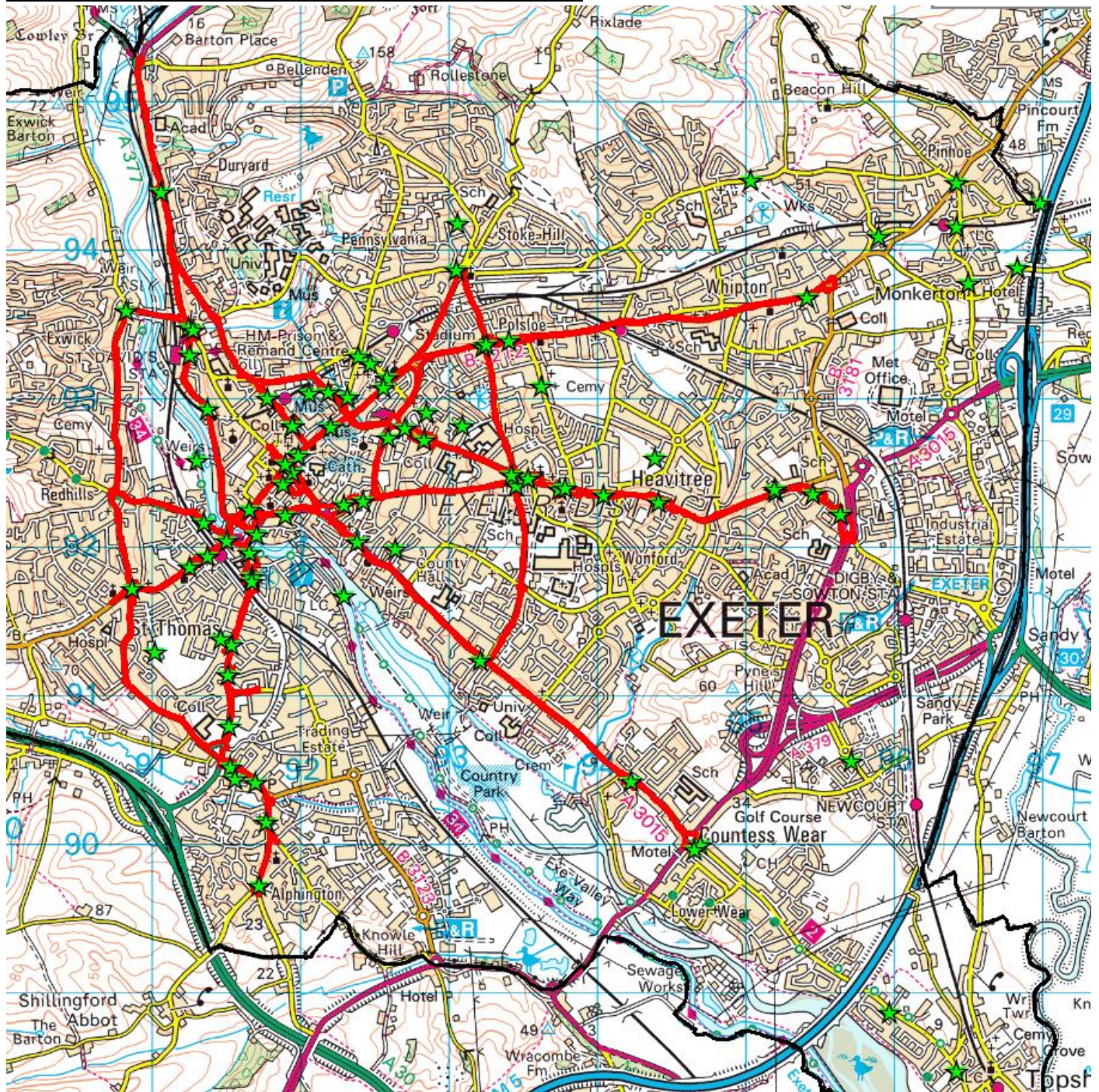
Figure 2. Trends in annual average PM₁₀ concentrations

Further Information

Every year Exeter City Council produces an Annual Status Report which has a more detailed summary of Exeter’s latest air pollution levels and actions that are being taken in the city to reduce pollution.

The report on work during 2022 is available to download at the [exeter.gov.uk webpage on air quality monitoring](https://www.exeter.gov.uk/webpage-on-air-quality-monitoring).

Exeter's air quality monitoring locations and AQMA



★ represents an air quality monitoring location | ■ represents the Air Quality Management Area boundary

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An online map of the monitoring locations and AQMA can be found at the [exeter.gov.uk webpage on air quality monitoring](https://www.exeter.gov.uk/webpage-on-air-quality-monitoring).

Annual average NO₂ monitoring results since 2018

- Exceedances of the NO₂ annual average objective of 40µg/m³ are shown in **bold**.
- NO₂ annual averages exceeding 60µg/m³, indicating a potential exceedance of the NO₂ 1-hour average objective are shown in **bold and underlined**.
- An asterisk (*) after the site name means the data is not representative of exposure. Data would be corrected for distance to the nearest receptor before comparing to objective levels.

Site Name	2018 NO ₂ Annual Average Concentration (µg/m ³)	2019 NO ₂ Annual Average Concentration (µg/m ³)	2020 NO ₂ Annual Average Concentration (µg/m ³)	2021 NO ₂ Annual Average Concentration (µg/m ³)	2022 NO ₂ Annual Average Concentration (µg/m ³)
RAMM continuous analyser	29.1	29	18.8	19.2	17.9
High Street /Castle Street*	29.2	26.5	17.0	20.9	15.7
Longbrook Street	25.2	26.4	17.5	21.4	19.0
New North Road	25.9	27.8	18.8	22.6	20.1
Queen Street	23.1	23.8	16.2	19.0	16.6
RAMM 1 & 2	29.3	27.5	18.5	21.3	17.8
High Street Guildhall	26.0	22.6	15.7	20.4	18.1
North Street	33.9	35.7	22.6	27.9	24.0
South Street*	29.1	28.5	18.7	24.2	20.6
Market Street	30.8	29.5	18.6	23.4	20.7
Magdalen Street*	29.4	28.9	19.5	24.7	22.5
Magdalen Street façade	31.1	29.3	20.0	23.8	22.9
Archibald Road	21.6	19.6	13.2	16.8	15.2
Heavitree Road inbound	20.3	19.0	13.2	16.5	14.6
Heavitree Road outbound	34.5	31.4	22.3	28.0	24.0
Holloway Street	34.2	29.3	21.3	26.6	21.9
Carder's Court, Shilhay	22.4	21.4	15.5	18.3	15.7
Rear of Gervase Avenue*	22.3	22.7	15.8	19.2	17.5
Alphington Street	47.0	42.0	28.5	35.7	33.1
Alphington Road inbound	33.6	31.3	22.4	27.4	24.3
Queen's Road	15.3	12.7	9.1	11.7	10.1
Alphington Road outbound	29.0	26.2	17.7	21.2	20.6
Alphington Road outer*	27.3	23.4	15.3	20.6	18.7
Church Road Alphington	28.0	23.4	18.3	24.3	18.5
Church Road II	26.1	23.5	16.2	19.8	20.9
Alphington Cross	31.3	30.2	20.4	25.6	22.5

Site Name	2018 NO ₂ Annual Average Concentration (µg/m ³)	2019 NO ₂ Annual Average Concentration (µg/m ³)	2020 NO ₂ Annual Average Concentration (µg/m ³)	2021 NO ₂ Annual Average Concentration (µg/m ³)	2022 NO ₂ Annual Average Concentration (µg/m ³)
Cowick Street (Cowick Lane)	39.9	38.7	26.8	31.6	30.1
Cowick Street (inbound)	23.9	21.1	15.6	19.9	17.5
Cowick Street (outbound)	43.4	34.4	24.3	29.8	28.7
Cowick Street (Exe Bridges)	33.2	30.1	22.1	28.2	26.7
Okehampton Street	25.2	24.3	17.3	20.6	18.7
Station Road	25.4	25.4	17.7	21.2	20.3
Bonhay Road (St Clements Lane)	30.9	26.8	19.2	24.7	21.8
Red Cow Village	38.3	36.0	26.5	32.1	29.7
Red Cow II	31.4	31.1	21.5	26.0	23.1
Cowley Bridge Road	33.8	32.5	22.9	27.5	26.5
Pennsylvania Road	28.6	28.4	18.3	23.2	21.6
York Road School*	29.7	27.7	18.1	23.0	20.7
York Road*	38.9	36.2	23.3	31.2	27.8
Union Road	28.0	26.4	16.7	21.0	19.3
Pinhoe Road inbound	31.2	29.8	20.9	24.0	22.3
Pinhoe Road (Polsloe Road)	37.2	35.9	25.6	30.6	28.0
Blackboy Road (Polsloe Road)	28.2	25.7	19.2	23.5	20.6
Beacon Heath*	20.3	17.8	13.6	15.1	13.6
Venny Bridge*	19.1	18.0	14.2	16.6	15.3
Pinhoe*	24.8	23.1	18.4	21.8	18.6
Langaton Lane*	18.7	17.9	13.3	15.1	12.7
Pinn Lane*	19.3	17.6	12.8	15.5	14.3
Pinhoe Road (Fairfield Avenue)	19.7	17.9	12.6	15.8	15.9
East John Walk	14.5	14.0	9.7	11.6	10.4
Magdalen Road (Barrack Road)	39.7	35.5	24.3	29.4	27.6
Livery Dole	48.7	42.6	31.1	34.9	32.3
Rowancroft	46.4	38.5	27.4	32.1	27.2
Salutory Mount*	53.6	43.4	32.7	37.3	33.5
Fore Street Heavitree outbound*	31.2	26.7	19.8	23.4	20.7
Fore Street Heavitree inbound	43.4	40.3	29.0	32.2	30.5
East Wonford Hill	61.9	53.5	38.2	42.2	40.4
Honiton Road*	50.6	47.3	33.2	35.4	31.7

Site Name	2018 NO ₂ Annual Average Concentration (µg/m ³)	2019 NO ₂ Annual Average Concentration (µg/m ³)	2020 NO ₂ Annual Average Concentration (µg/m ³)	2021 NO ₂ Annual Average Concentration (µg/m ³)	2022 NO ₂ Annual Average Concentration (µg/m ³)
Honiton Road façade	24.5	20.4	14.8	16.0	14.9
Sidmouth Road lamp post*	37.0	30.7	23.5	26.8	25.0
Sidmouth Road Middlemoor	24.2	21.8	15.5	19.2	17.5
Newcourt Way*	19.2	16.3	11.5	14.7	13.6
Topsham Road (Countess Wear)	27.0	25.4	18.1	20.7	17.4
Bridge Road (Countess Wear)	22.6	20.6	17.8	16.9	15.6
High Street Topsham	27.9	24.4	17.2	22.1	18.7
Topsham Road (Tollards Road)	39.7	36.4	25.0	30.0	27.9
Topsham Road (Barrack Road)	25.6	21.5	15.9	19.1	19.2
Riverside Valley Park	13.7	13.8	9.4	11.7	9.9
Cowick Barton Playing Fields	11.5	11.2	7.6	9.3	8.9
Exwick Playing Fields	17.5	16.1	12.3	15.9	13.9
Heavitree Pleasure Grounds	11.2	10.5	7.6	9.1	8.7
Ladysmith School/Pretoria Road		14.2	10.6	12.2	10.5
Pennsylvania		10.2	7.5	8.3	7.8
Northernhay Gardens		11.4	8.3	10.7	8.4
Chudleigh Road		15.8	11.1	13.7	12.6
Mill Lane		14.7	9.6	12.3	11.3
Sidwell Street		31.1	18.6	23.8	20.5
Station Road Pinhoe		15.1	10.6	13.4	12.5
Tithebarn Link Road		19.5	14.5	17.3	15.4
Exeter Road		19.8	14.3	16.4	16.6
St. Leonards Road		15.6	11.2	13.9	12.2
Newtown			10.8	12.6	12.0
New Bridge Street			19.5	24.0	22.5
Lower Coombe Street			15.5	18.6	15.4
Bonhay Road bridge					26.9