Dust and Air Quality Innovation and Expertise

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Quarterly non-technical summary: Mountsorrel Quarry particulate matter, dust and weather monitoring

Date range: **Quarter 2 2025 (27 March – 25 June 2025)**

Date Report Issued: **16 October 2025**

Introduction

Every month, the results of dust and particulate matter monitoring at Mountsorrel Quarry are compiled and summarised in compliance reports, which are then shared with Charnwood Borough Council (CBC), Leicestershire County Council (LCC) and the Environment Agency. The monitoring results are discussed in more detail during Technical Liaison meetings held with CBC and LCC on a quarterly basis.

Once the quarterly liaison meetings are held, we prepare a cover letter to provide a non-technical overview of the most recent three months of finalised reports. This letter covers the period from 27 March – 25 June 2025.

An explanation of how and why dust and air quality are measured at Mountsorrel Quarry is available here.

The format and focus of the compliance reports have been agreed with CBC and LCC. In addition to presenting PM_{10} and $PM_{2.5}$ data from both on-site monitors, emphasis is being placed on the frequency of short-term PM_{10} alerts sent to quarry management, the investigations triggered by the alerts and the changes to on-site processes to minimise dust.

The general air quality of the surrounding area is assessed by comparing the particulate matter concentrations recorded by CBC at the southern end of Hawcliffe Road against the relevant Air Quality Objectives (AQOs). Data from a Defra Automatic Urban and Rural Network (AURN) monitoring station at Leicester University are also presented for reference.

Weather summary

April was generally mild and dry, with very little precipitation. Temperatures increased towards the end of April. Temperatures began to drop again during early May before picking up again during the middle of the month. There was little to no rainfall during early and mid-May, with an increase in precipitations towards the end of May. June was generally mixed with temperatures gradually rising throughout the month and slightly more precipitation recorded than the previous months.

During April and May, winds were predominantly blowing from the northeast and south-southwest, meaning that there may have been the potential for dust to propagate in a south-westerly and north-northeasterly direction. However, during June winds were predominantly coming from the southeast, meaning that dust may have mainly blown to the northwest during this period, although there will have been periods when other winds were dominant.

Deposited dust

During this period, deposited dust levels were below the site-specific threshold level at all locations.

The frequency of threshold level exceedances over the previous quarter is shown for each monitoring location in Figure 1 using pie charts.

Figure 1: Frequency of high dust levels, Quarter 2 2025

Particulate Matter

On-site $PM_{2.5}$

$PM_{2.5}$ concentrations at Quorn house had a period average of 5.6 µg/m^3, with the $PM_{2.5}$ concentrations at Hawcliffe Road being slightly higher with a period average of 6.7 µg/m^3 (Figure 2).

Figure 2: $PM_{2.5}$ monitoring summary, Quarter 2 2025

Off-site $PM_{2.5}$

As shown in Figure 3, the period average $PM_{2.5}$ concentrations recorded at the CBC monitoring station at the southern end of Hawcliffe Road was 8.5 µg/m^3 or 71% of the interim target value for $PM_{2.5}$ (12 µg/m^3 as an annual average). The period average concentration at the Leicester University AURN monitoring station was similar, at 7.2 µg/m^3 or 60% of the interim target value.

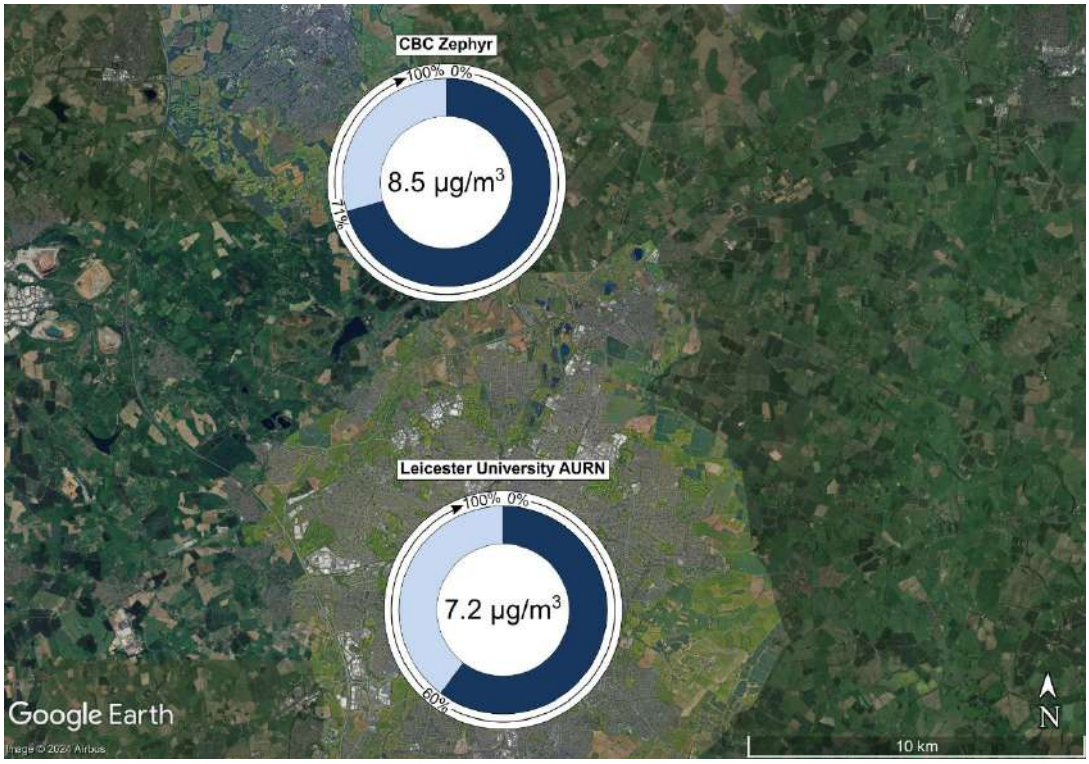

Figure 3: $PM_{2.5}$ monitoring summary, CBC and AURN monitoring stations, Quarter 2 2025

On-site PM_{10}

PM_{10} concentrations recorded at Quorn House had a period average of 8.8 µg/m^3 for this period, with the period average being 11.9 µg/m^3 at Hawcliffe Road.

The short-term PM_{10} trigger level (125 µg/m^3 over a 15-minute period) was exceeded on seven occasions during this quarter; details of the resulting investigations can be found in the attached reports.

Figure 4: PM_{10} monitoring summary, Quarter 2 2025

Off-site PM_{10}

As shown in Figure 5, PM_{10} concentrations recorded at the CBC monitoring station at the southern end of Hawcliffe Road was 11.2 µg/m^3 or 28% of the AQO (40 µg/m^3). Concentrations at the Leicester University AURN monitoring station was similar, at 12.3 µg/m^3 or 31% of the AQO.

No days with an average PM_{10} concentration above 50 µg/m^3 were recorded during this quarter.

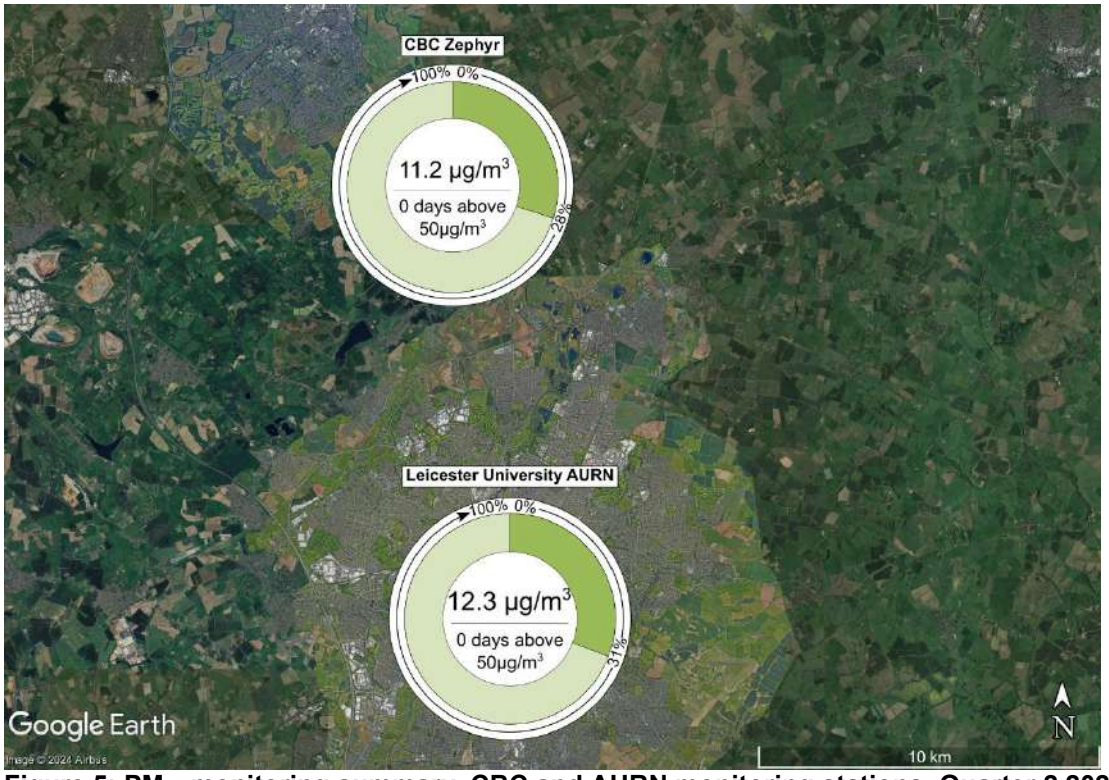

Figure 5: PM_{10} monitoring summary, CBC and AURN monitoring stations, Quarter 2 2025

Complaints

Between 27 March – 25 June 2025, a total of eighteen dust complaints were received by the quarry.

DustScanAQ
October 2025

Dust, Particulate Matter and Weather Monitoring Report: April 2025

Mountsorrel Quarry

June, 2025

Tarmac

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Document Control Sheet

Project Information

Title	Dust, particulate matter and weather monitoring report: April 2025
Project Ref	ZLFMS
Report Ref	ZLFMS_April_2025_A_Final
Report Type	Monthly Compliance Report
Client	Tarmac
Client Contact	Sarah Boustead
Revision	A
Status	Final
Date of Issue	25/06/2025

Revision History

Revision	Date	Author	Reviewer	Approver	Status
A	25/06/2025	Holly Hope	Hugh Datson	Hugh Datson	Draft
A	25/06/2025	Holly Hope	Hugh Datson	Hugh Datson	Final

Distribution

Organisation	Contact	Date of Issue	Copies
Tarmac	Sarah Boustead	25/06/2025	1

Disclaimer

This report takes into account the particular instructions and requirements of our client. It is not intended for and should not be relied upon by any third party and no responsibility is undertaken to any third party.

This report may include data obtained from trusted third-party consultants/laboratories that have been supplied to us in good faith. Whilst we do everything we can to ensure the quality of all the data we use, we cannot be held responsible for the accuracy or integrity of third-party data.

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1 Introduction

Mountsorrel Quarry has a comprehensive Dust Management and Monitoring Plan (DMMP). The DMMP was developed in 2011 and is subject to regular review and revision, in consultation between Tarmac and the local regulators (Leicestershire County Council (LCC) and Charnwood Borough Council (CBC)).

The DMMP is enacted through the quarry Site Improvement Plan (SIP). The SIP sets out a programme of actions to reduce the environmental impact of specific areas of the site operation, and is updated regularly by quarry management, with support from DustScanAQ through regular site visits and quarterly reviews with LCC and CBC.

Section 7.5 of the DMMP requires that a monthly summary and review of dust and particulate matter monitoring is prepared and circulated with LCC, CBC and the Environment Agency.

This report details the results of dust, particulate matter and weather monitoring around Mountsorrel Quarry during the period 27 March – 30 April 2025.

1.1 Report scope

The intention of this report is to summarise dust and particulate matter monitoring results for the given period and compare them against site-specific alert limits and thresholds. This report also details the results of any investigation carried out into elevated dust or particulate matter levels, as prompted by an exceedance of alert limits or thresholds.

1.2 Dust definitions

'Dust' is generally regarded as particulate matter up to 75 µm (micron) diameter and can be considered in two categories. Fine dust, essentially particles up to 10 µm, is commonly referred to as PM_{10} and is measured to agreed standards and forms part of the national Air Quality Objectives (AQO). The AQO for PM_{10} is currently 50 µg/m^3 for the 24-hour mean, not to be exceeded 35 times per year and 40 µg/m^3 for the annual mean. Particles up to 2.5 µm in diameter are referred to as $PM_{2.5}$. The interim AQO for $PM_{2.5}$ is 12 µg/m^3 for the annual mean (to be achieved by 2028), whilst the legal AQO for $PM_{2.5}$ is 10 µg/m^3 for the annual mean (to be achieved by 2040) as per The Environmental Targets (Fine Particulate Matter) (England) Regulations 2023[1].

It may be noted that the above Regulations relate to average particle concentrations in Local Authority districts thus do not apply to any specific industrial or other operation, such as Mountsorrel Quarry, and are included for reference.

[1] Statutory Instrument. (2023), 'The Environmental Targets (Fine Particulate Matter) (England) Regulations', No. 96. King's Printer of Acts of Parliament

Coarser dust (essentially particles greater than 10 µm) is generally regarded as ‘nuisance dust’ and can be associated with annoyance, although there are no official standards (such as AQO) for dust annoyance.

2 Sampler locations

As shown in Figure 2.1 and Table 2.1, dust, particulate matter and weather conditions are measured at a number of locations around site and the surrounding area:

- Directional and depositional dust: currently monitored at 13 locations;
- Particulate matter: currently monitored at two locations;
- Weather conditions: currently monitored at one location.

The majority of the dust samplers around Mountsorrel Quarry comprise the 'Frisbee-type' deposition gauge combined with an adhesive 'sticky pad' directional gauge. These samplers are used to monitor 'nuisance' dust and samples from these instruments are collected on a monthly basis.

For particulate matter, Turnkey Osiris samplers are located at Stn 9 (Hawcliffe Road) and at Stn 13 (Quorn House). These recognised and certificated 'indicative' real-time devices are connected to their own wind vane and anemometer and provide near-instantaneous directional PM_{10}, $PM_{2.5}$ and PM_1 data directly to the quarry management team.

A weather station is located at the site offices off Wood Lane and collects a range of weather parameters over fifteen-minute intervals. Data from the weather station are available to the quarry management by means of a dedicated modem connection to the internet.

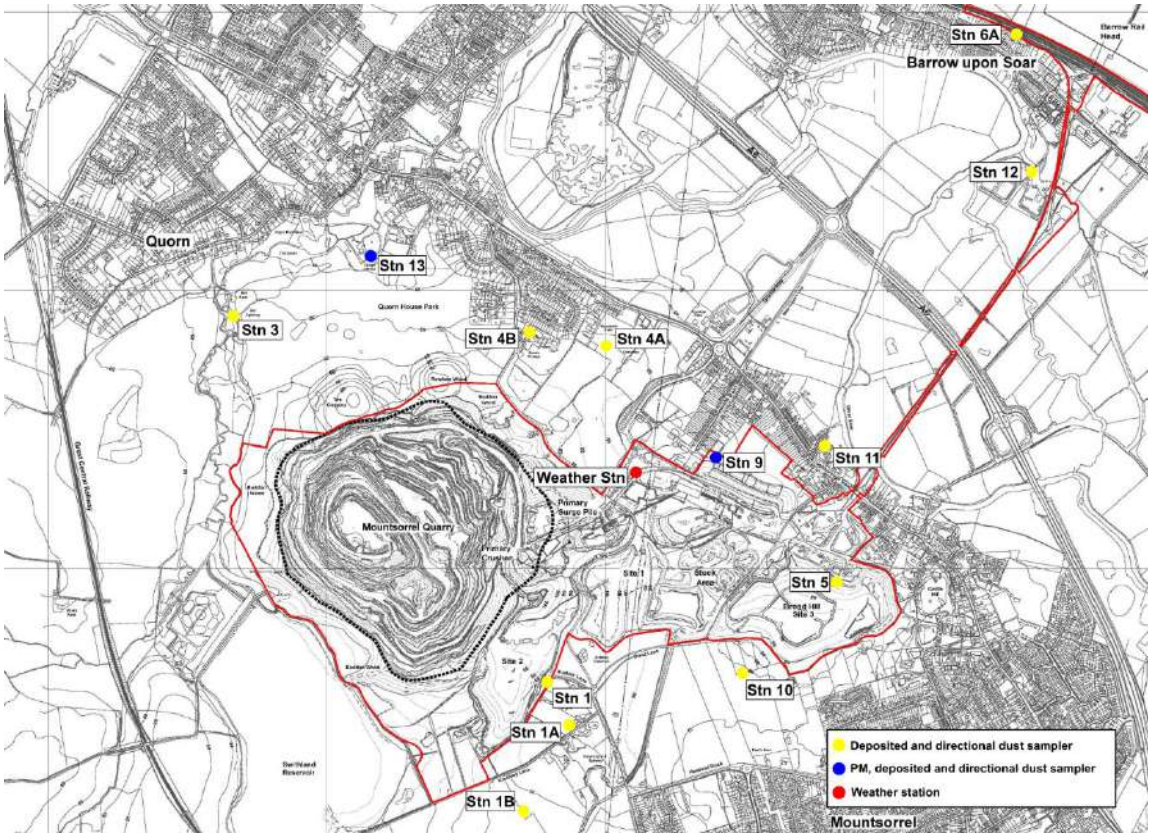

Figure 2.1: Particulate matter, dust and weather monitoring locations, Mountsorrel Quarry

Table 2.1: Weather, particulate matter and dust monitoring locations, Mountsorrel Quarry

Sampler reference	Easting	Northing	Locality monitored
Stn 1	456781	314577	Swithland Lane; Rushey Lane; Kinchley Lane
Stn 1A	456891	314436	Swithland Lane; Rushey Lane; Kinchley Lane
Stn 1B	456715	314109	Swithland Lane; Rushey Lane; Kinchley Lane
Stn 3	455681	315847	Mill Farm; Quorn House
Stn 4A	457000	315805	Woodside Farm; Leicester Road
Stn 4B	456733	315778	Quorn Grange, Unitt Road, Northage Close, Quorn Park
Stn 5	457789	314941	Bond Lane; Crown Lane
Stn 6A	458660	316786	Sileby Road; Huston Close; Sileby Road (commercial)
Stn 9 (inc. PM)	457374	315398	Hawcliffe Road
Stn 10	457487	314626	Glebe Close; Halstead Road (south); Halstead Road (north)
Stn 11	457791	315458	Loughborough Road; River Soar (marina / caravan park)
Stn 12	458575	315459	Meadow Farm Marina and Caravan Park
Stn 13 (incl. PM)	456158	316090	Northage Close, Meeting Street
Weather Station	457126	315376	Wood Lane Site Offices

Charnwood Borough Council (CBC) is responsible for the monitoring of air quality within the borough and prepares Air Quality Annual Status Reports (ASRs) for submission to Defra. It operates a Zephyr air quality monitor which is located within the Leicestershire County Council (LCC) depot at the southern end of Hawcliffe Road, in close proximity to the Osiris device at Stn 9. This device measures a number of pollutants including PM_{10} and $PM_{2.5}$, allowing CBC to compare concentrations against the relevant AQOs for these pollutants.

For additional context, the latest PM_{10} and $PM_{2.5}$ monitoring data from CBC are summarised in Appendix A and Appendix B.

2.1 Alert thresholds and response procedures

To help the site reduce its impact on the surrounding area, a number of alert thresholds have been calculated, as outlined in Table 2.2.

Table 2.2: Alert thresholds

Pollutant	Threshold	Averaging period	Applies to
PM_{10}	125 µg/m^3	15 minutes	Stn 9 (Hawcliffe Road), Stn 13 (Quorn House)
Deposited dust	125 mg/m^2/day	1 month	All deposited dust monitoring locations

For particulate matter (PM_{10}) an alert threshold of 125 µg/m^3 for the 15-minute average has been in use for several years.

Many years of monitoring and research have shown that the quarry is not a significant source of fine particulate matter ($PM_{2.5}$) hence no alert threshold for this size fraction is required.

PM_{10} and $PM_{2.5}$ concentrations recorded by CBC at the southern end of Hawcliffe Road and by Defra through the Automatic Urban and Rural Network (AURN) at Leicester University are presented in Appendix A and Appendix B respectively. Data from both locations have been compared against relevant Air Quality Objectives (AQOs) for PM_{10} and $PM_{2.5}$.

For deposited dust, the DMMP sets out a site-wide deposited dust threshold of 125 mg/m^2/day 'undissolved solids' as a trigger limit for investigation to identify the potential dust source/s, taking account of the directional data.

3 Results

3.1 Weather monitoring

Weather conditions can have a significant effect on the potential for dust propagation from a mineral site. Of particular importance are wind speeds, wind direction, and precipitation. Dust can be carried from a source towards receptors (such as nearby homes and other businesses) according to the strength and direction of wind. Precipitation is recognised to suppress dust and 0.2 mm antecedent rainfall is considered sufficient to suppress windblown dust for a number of hours.

The key weather data which might affect dust propagation (wind speed, wind direction, total daily precipitation and average daily temperature) for this reporting period are summarised in Figure 3.1 and Figure 3.2.

Due to a technical issue with a technical issue with the on-site weather station, weather data were not available between 18 – 30 April. Temperature and precipitation data from a nearby station in Mountsorrel (approx. 1.9 km southeast) was used to supplement the missing data. Due to wind data having a more local impact, wind data from the quarry has been presented for 27 March – 17 April only for this monitoring period.

This monitoring period was characterised by generally mild temperatures throughout April, with an increase in temperatures in late April. The maximum daily temperature was 17 °C, recorded on the 30 April 2025 and the minimum daily average temperature was 6.9 °C, recorded on the 9 April 2025. Due to precipitation only recorded on three days and warmer temperatures, there may have been an increased potential for dust generation and propagation during this reporting period.

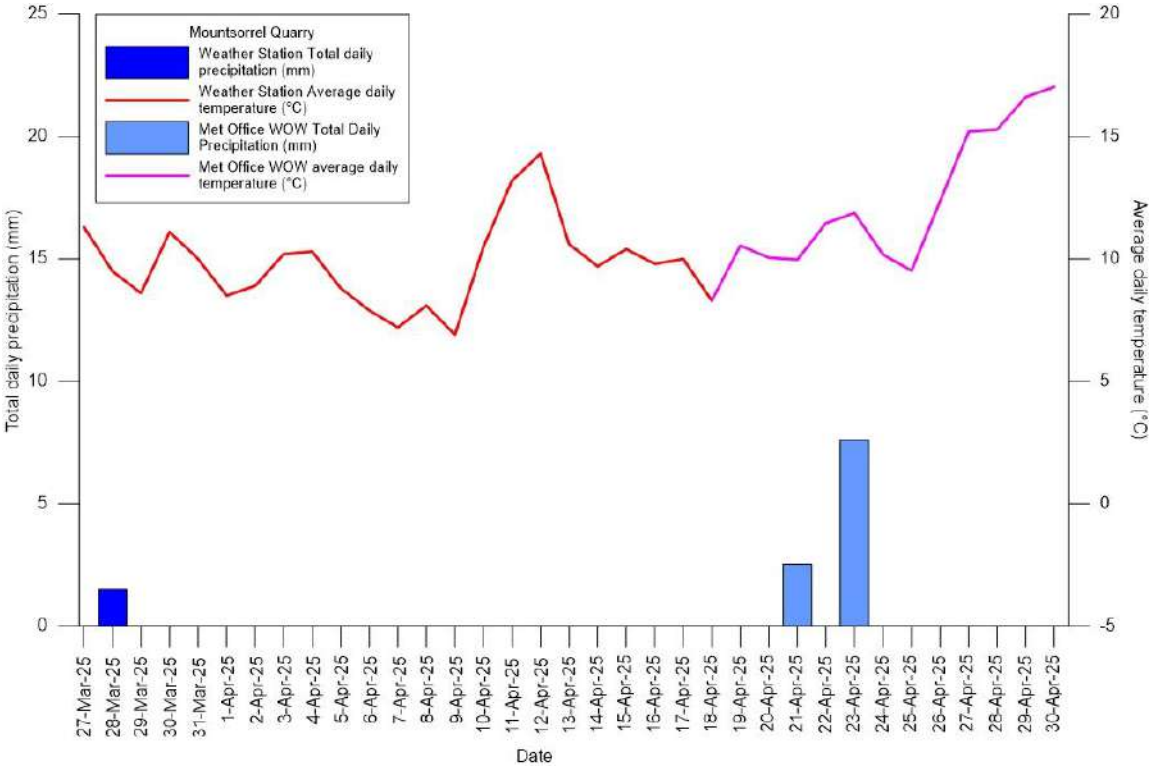

Figure 3.1: Total daily precipitation and average daily temperature, Mountsorrel Quarry, 27 March – 30 April 2025

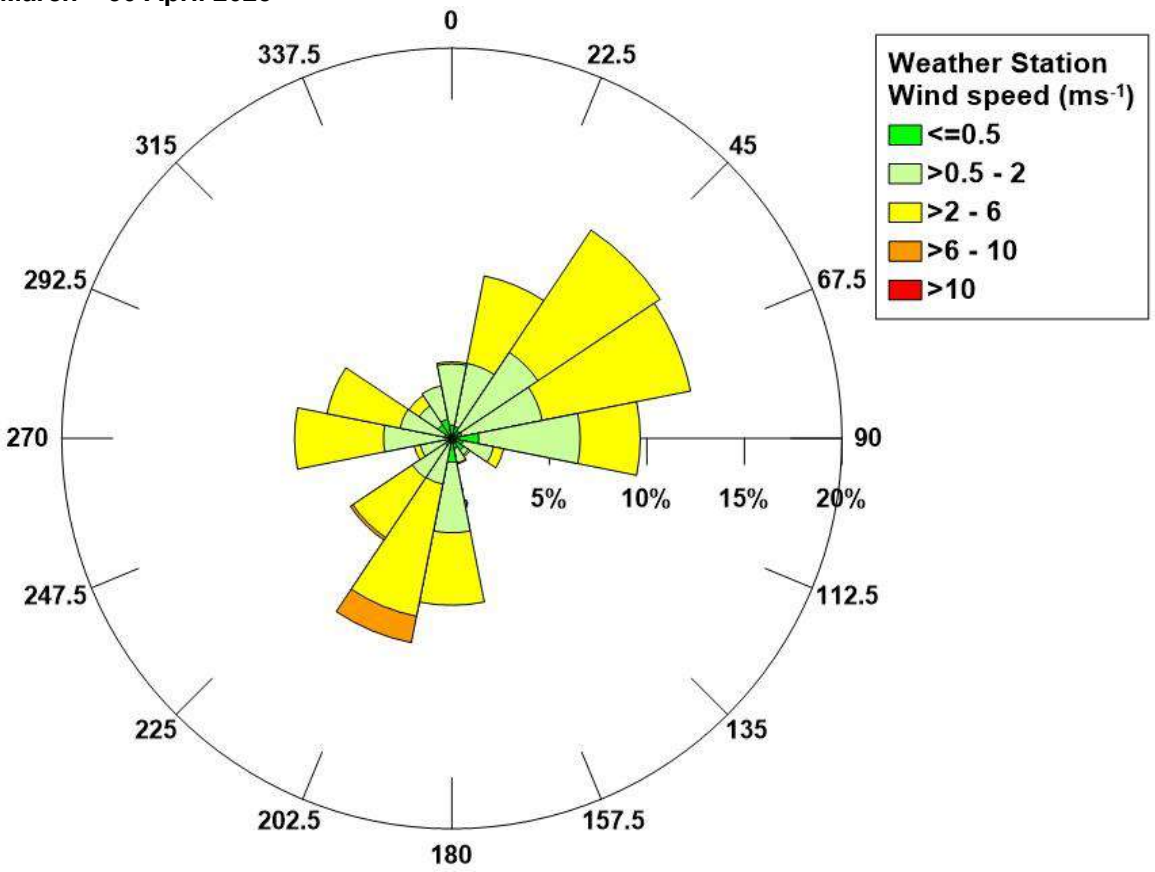

Figure 3.2: Wind rose, Mountsorrel Quarry, Mountsorrel, 27 March – 17 April 2025

As seen in Figure 3.2, winds were predominantly calm to moderate in speed (>0.5 – 6 m/s) for most of the monitoring period from the northeast with less frequent southernly and westerly winds. However, there were some occasional high wind speeds (6 – 10 m/s) recorded from the south-southwest during this period. Consequently, combined with the dry weather conditions there will have been an increased potential for dust propagation generally towards southwest, north-northeast and west throughout the monitoring period.

3.2 Particulate matter

3.2.1 PM_{10}

The available 15-minute data from the period of review are presented for both monitoring locations in Figure 3.4 and Figure 3.4. The red line denotes the site trigger level (125 µg/m^3 over the 15-minute average), whilst the dashed black line denotes the average concentration recorded over this period.

Additional PM_{10} monitoring data (collected by CBC and the Defra AURN monitoring network) are provided in Appendix A.

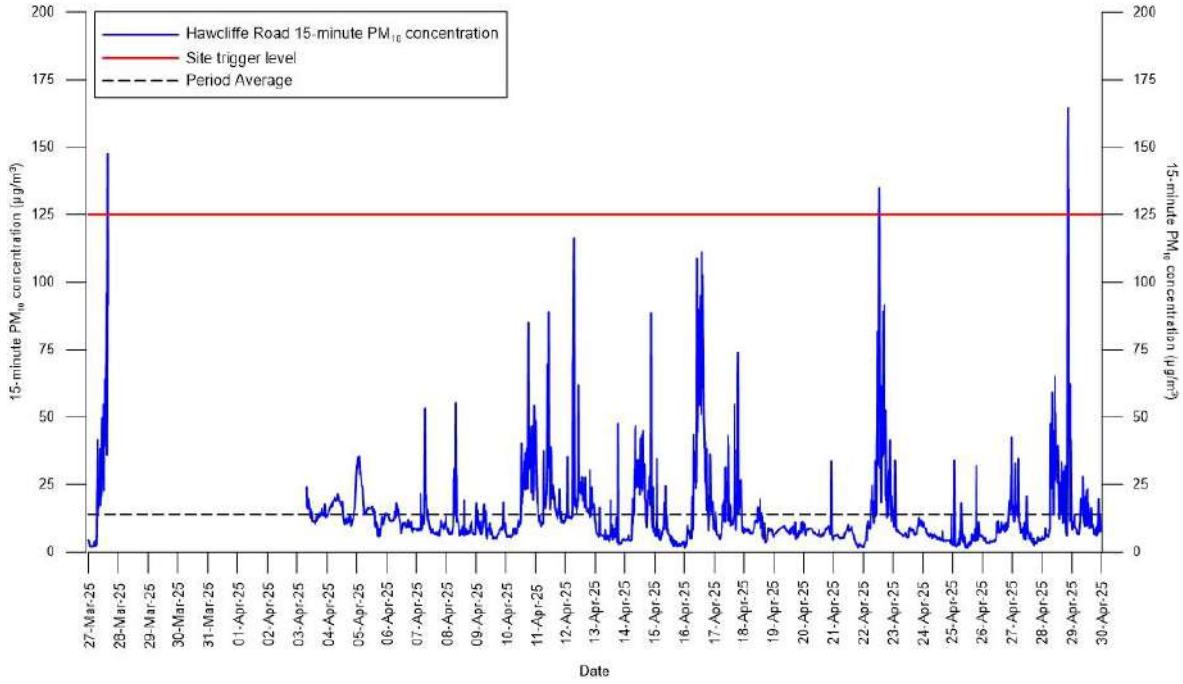

Figure 3.3: 15-minute mean PM_{10} concentration, Hawcliffe Road, 27 March – 30 April 2025

Figure 3.3 indicates that the overall average concentration at the Hawcliffe Road sampler for this period was 14.07 µg/m^3, with the alert threshold being exceeded on three days; details of these exceedances are provided in Table 3.1. No PM_{10} data were available for the period 28th March to 3rd April.

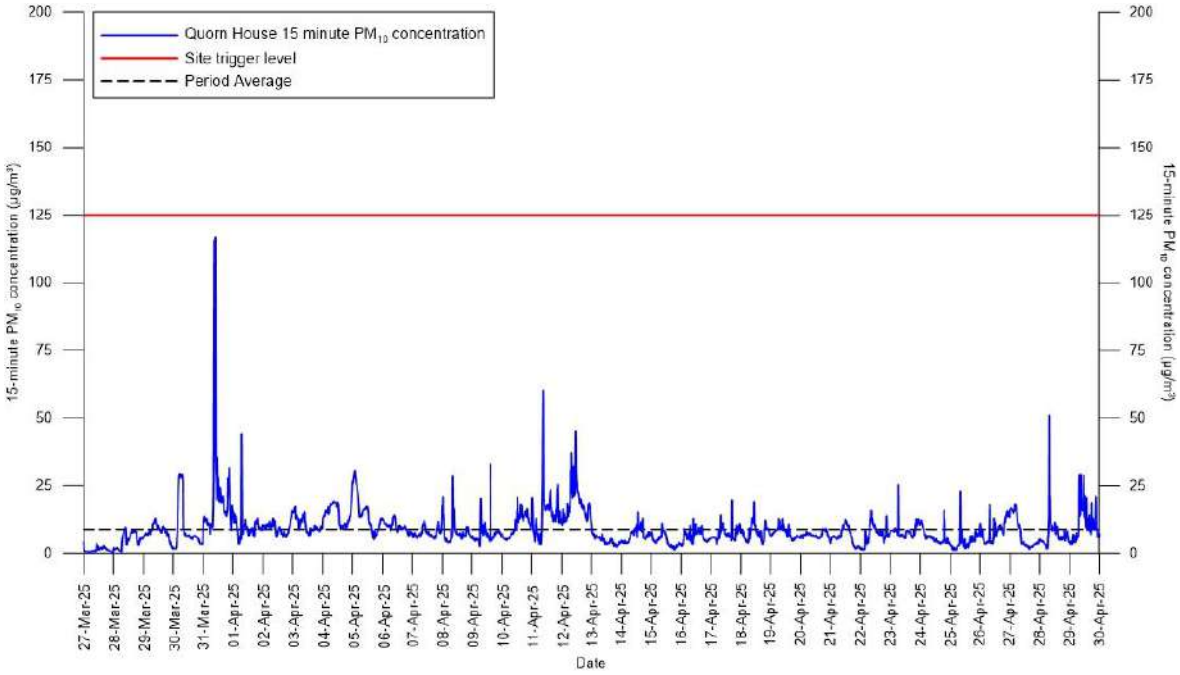

Figure 3.4: 15-minute mean PM_{10} concentration, Quorn House, 27 March – 30 April 2025

At Quorn house there were no exceedances of the PM_{10} site trigger, and the overall average for this period was 8.91 µg/m^3.

During this review period, trigger emails alerting staff to high PM_{10} levels from the direction of site operations were sent out on three occasions from the Hawcliffe Road Osiris. Details of the corresponding causes and investigations are provided in Table 3.1.

Table 3.1: Email alert responses, between 27 March – 30 April 2025 (using the trigger threshold, 125 µg/m^3 for the 15-minute average)

Date of alert	Monitor	Details	Possible cause and investigation
27/03/2025	Hawcliffe Road	Exceedance recorded from the southwest in the evening.	Site investigation at the time of the alert but no known issues identified and all dust suppression working.
22/04/2025	Hawcliffe Road	Exceedance recorded from the east-southeast at midday.	Bestchem system in processing failed at 12:30. The plant was switched off until this was resolved.
28/04/2025	Hawcliffe Road	Exceedance recorded from the west in the evening.	Alert coming from offsite direction, an investigation was carried out at the time of the alert, but no known issues identified. Processing, Rail and KVM were all off and just the Standard Havens was running. Initially there was x1 dumper stocking 20 mm out of E/F Bay with dust suppression working ok and x1 dumper was doing washed ballast. Latterly both dumpers were moving MOT from CV24 to the stock yard.

3.2.2 $PM_{2.5}$

The results of $PM_{2.5}$ monitoring at Hawcliffe Road and Quorn House are presented in Figure 3.5 and Figure 3.6. The dashed black line denotes the average concentration recorded over this period. No $PM_{2.5}$ data were available from the Hawcliffe Road sampler for the period 28th March to 3rd April.

Additional $PM_{2.5}$ monitoring data (collected by CBC and the Defra AURN monitoring network) are provided in Appendix B.

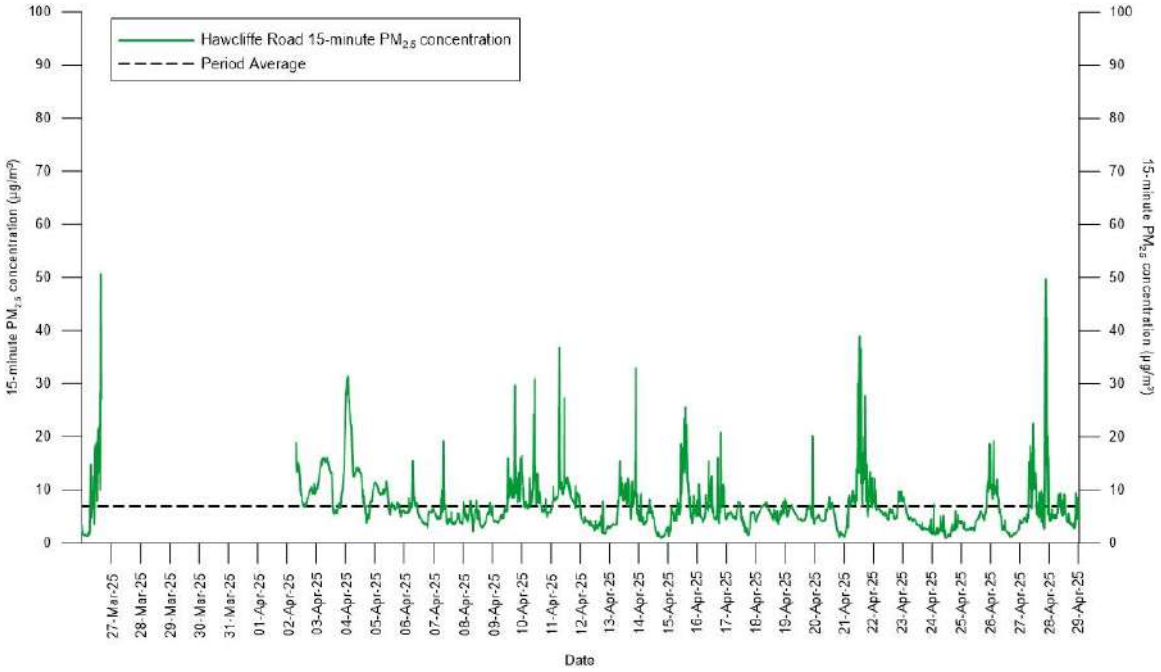

Figure 3.5: 15-minute mean $PM_{2.5}$ concentration, Hawcliffe Road, 27 March – 30 April 2025

At Hawcliffe Road, the overall average concentration for this period was 7.01 µg/m^3, whilst at Quorn House, the overall average was 6.02 µg/m^3. It would appear that $PM_{2.5}$ concentrations recorded at both locations were broadly similar for most of this period, with the exception of some spikes at Hawcliffe Road in early, mid- and late March that were not recorded at Quorn House. These spikes coincide with high PM_{10} alerts at Hawcliffe Road.

For this period, 50% of PM_{10} recorded at Hawcliffe Road comprised $PM_{2.5}$, whilst it made up 68% at Quorn House.

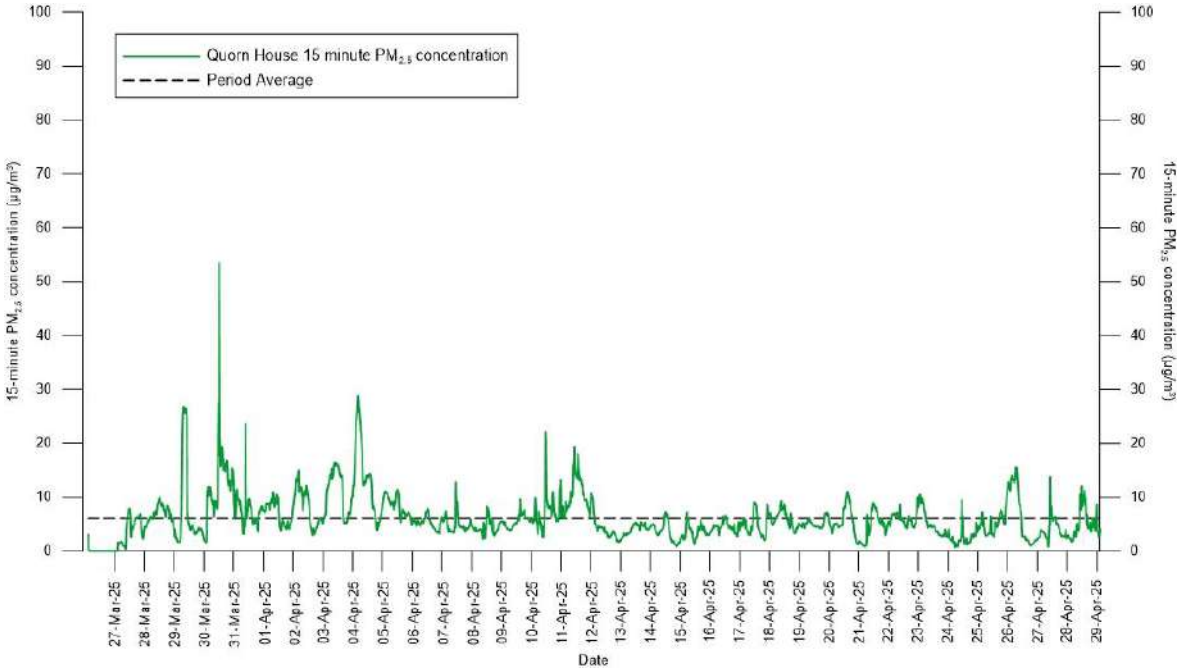

Figure 3.6: 15-minute mean $PM_{2.5}$ concentration, Quorn House, 27 March – 30 April 2025

3.3 Visible dust

3.3.1 Deposited dust monitoring summary

The deposited dust data for 27 March – 30 April 2025 are summarised in Table 3.2. As outlined above, there is a site-wide threshold for investigation to identify the potential dust source/s, taking account of the directional data. Table 3.2 shows that, for the available data, deposited dust levels during 27 March – 30 April 2025 were all within the site-specific threshold for all stations, with Stn 1 experiencing slightly elevated levels during this period. Additionally, there were no data available for Stn 4B during this monitoring period due to the Frisbee bottle being displaced.

Table 3.2: Summary of deposited dust (undissolved solids), 27/03/25 – 30/04/25

Undissolved solids (mg/m^2/day)				
This month report start date:		27-Mar-25		
This month report end date:		30-Apr-25		
Receptor location	**Nearest / appropriate dust monitoring point**	**Reported value**	**Trigger: ≥ 125[a]**	**Magnitude[b]**
Swithland Lane; Rushey Lane; Kinchley Lane	Stn 1	98	No	**Slightly Elevated**
Swithland Lane; Rushey Lane; Kinchley Lane	Stn 1A	41	No	**Very Low**
Swithland Lane; Rushey Lane; Kinchley Lane	Stn 1B	23	No	**Very Low**
Mill Farm; Quorn House	Stn 3	22	No	**Very Low**
Woodside Farm, Leicester Road	Stn 4A	50	No	**Very Low**
Quorn Grange, Unitt Road, Northage Close, Quorn Park	Stn 4B	No data	No data	**N/A**
Bond Lane; Crown Lane	Stn 5	25	No	**Very Low**
Sileby Road; Huston Close; Sileby Road (commercial)	Stn 6A	77	No	**Low**
Hawcliffe Road	Stn 9	63	No	**Low**
Glebe Close; Halstead Road (south); Halstead Road (north)	Stn 10	29	No	**Very Low**
Loughborough Road; River Soar (marina / caravan park)	Stn 11	28	No	**Very Low**
Meadow Farm Marina and Caravan Park	Stn 12	53	No	**Low**
Quorn House Park	Stn 13	33	No	**Very Low**

[a] Trigger mass deposition and Effective Area Coverage rates as in Section 7.3, ZLFMS-AG008 Dust Management and Monitoring Plan (Updated), 2015

[b] Magnitude of mass deposition rate assessed against typical rate for semi-rural areas (30 - 80 mg/m^2/day)

Regarding dust deposition over time, the rates across the sampling area have varied considerably. Trends in dust deposition rates (as undissolved solids) for the previous 12 months, together with the site-wide dust threshold are illustrated in Figure 3.7.

In general, as would be expected, dust deposition rates are typically lower in winter months than in summer months. This trend is clearly seen for most monitoring points in Figure 3.7, with some exceptions. Dust deposition rates have been consistently below the 'trigger limit' at all sampling locations except at Stn 9, where it has exceeded twice in the last 12 months.

In general, as shown in Figure 3.7, higher rates of dust deposition have been recorded near industrial settings (*i.e.* Stn 9) than in more residential areas (*e.g.* Stn 1, Kinchley Lane).

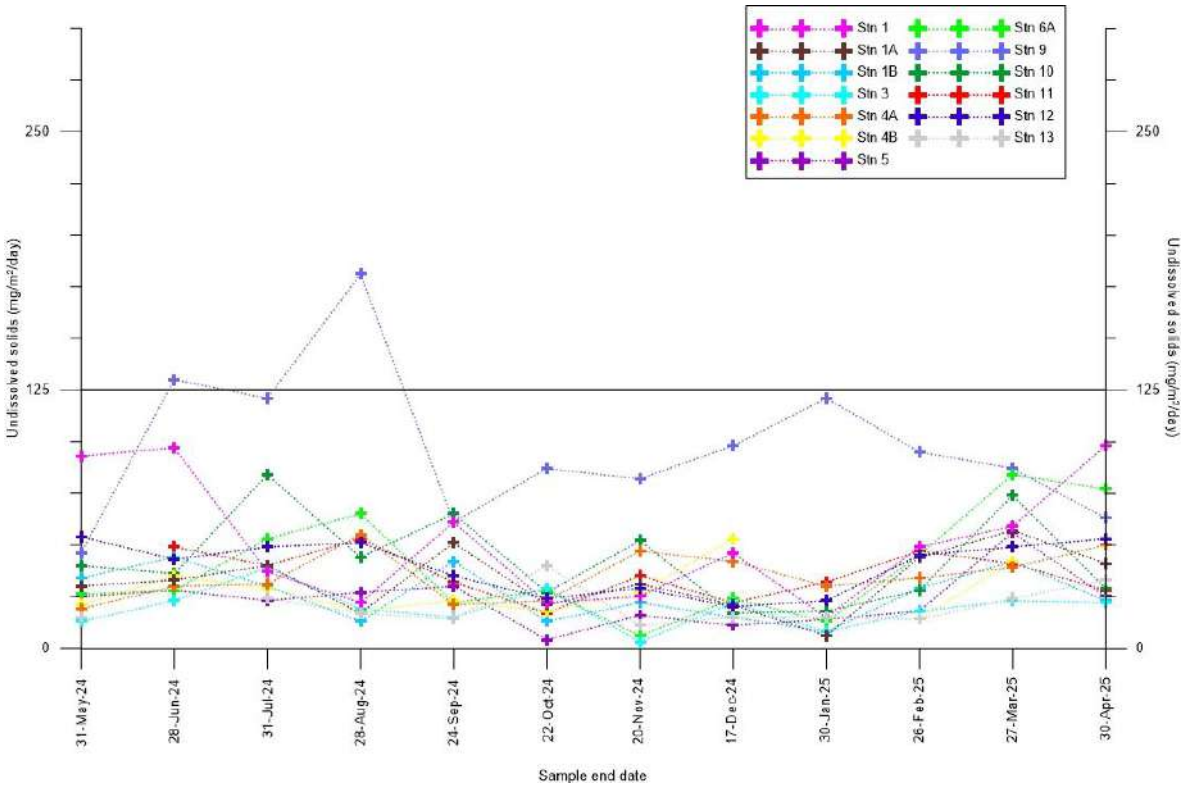

Figure 3.7: Dust deposition rates per sampling location over time (past 12 months)

3.3.2 Directional dust monitoring summary

The directional dust data for 27 March – 30 April 2025 are summarised in Table 3.3, and are presented graphically in Figure 3.8. As with deposited dust, the DMMP sets out a site-wide directional dust threshold. For directional dust soiling, 0.5 % Effective Area Coverage (EAC) per day is a trigger limit for investigation to identify the likely dust source/s, again taking account of the direction.

Table 3.3 and Figure 3.8 show that during 27 March – 30 April 2025, all stations recorded Very Low to Low dust levels from all directions.

Table 3.3: Summary of directional dust soiling, 27 March – 30 April 2025

Directional dust soiling (%EAC/day) by direction (°)									
This month report start date:		27-Mar-25							
This month report end date:		30-Apr-25							
Receptor location	Nearest / appropriate dust monitoring point		Direction (°)							
			0	45	90	135	180	225	270	315
Swithland Lane; Rushey Lane; Kinchley Lane	Stn 1	Reported value	0	0	0	0	0	0.1	0.1	0.1
		Trigger: ≥ 0.5[a]	No	No	No	No	No	No	No	No
		Magnitude[b]	Very Low	Very Low	Very Low	Very Low	Very Low	Very Low	Very Low	Very Low
Swithland Lane; Rushey Lane; Kinchley Lane	Stn 1A	Reported value	0	0.1	0.1	0	0	0.1	0.1	0.1
		Trigger: ≥ 0.5[a]	No	No	No	No	No	No	No	No
		Magnitude[b]	Very Low	Very Low	Very Low	Very Low	Very Low	Very Low	Very Low	Very Low
Swithland Lane; Rushey Lane; Kinchley Lane	Stn 1B	Reported value	0	0	0	0	0	0	0.1	0.1
		Trigger: ≥ 0.5[a]	No	No	No	No	No	No	No	No
		Magnitude[b]	Very Low	Very Low	Very Low	Very Low	Very Low	Very Low	Very Low	Very Low
Mill Farm; Quorn House	Stn 3	Reported value	0	0.1	0.1	0	0.1	0	0	0
		Trigger: ≥ 0.5[a]	No	No	No	No	No	No	No	No
		Magnitude[b]	Very Low	Very Low	Very Low	Very Low	Very Low	Very Low	Very Low	Very Low
Woodside Farm, Leicester Road	Stn 4A	Reported value	0	0.1	0.1	0.1	0	0.2	0.1	0.1
		Trigger: ≥ 0.5[a]	No	No	No	No	No	No	No	No
		Magnitude[b]	Very Low	Very Low	Very Low	Very Low	Very Low	Low	Very Low	Very Low
Quorn Grange, Unitt Road, Northage Close, Quorn Park	Stn 4B	Reported value	0	0.1	0.1	0.1	0.1	0.1	0.1	0.1
		Trigger: ≥ 0.5[a]	No	No	No	No	No	No	No	No
		Magnitude[b]	Very Low	Very Low	Very Low	Very Low	Very Low	Very Low	Very Low	Very Low
Bond Lane; Crown Lane	Stn 5	Reported value	0.1	0.1	0	0.1	0.1	0.1	0.1	0.1
		Trigger: ≥ 0.5[a]	No	No	No	No	No	No	No	No
		Magnitude[b]	Very Low	Very Low	Very Low	Very Low	Very Low	Very Low	Very Low	Very Low
Sileby Road; Huston Close; Sileby Road (commercial)	Stn 6A	Reported value	0.1	0.1	0.3	0.1	0.1	0.2	0.1	0.1
		Trigger: ≥ 0.5[a]	No	No	No	No	No	No	No	No
		Magnitude[b]	Very Low	Very Low	Low	Very Low	Very Low	Low	Very Low	Very Low
Hawcliffe Road	Stn 9	Reported value	0	0.1	0.1	0.1	0	0.2	0.2	0.1
		Trigger: ≥ 0.5[a]	No	No	No	No	No	No	No	No
		Magnitude[b]	Very Low	Very Low	Very Low	Very Low	Very Low	Low	Low	Very Low
Glebe Close; Halstead Road (south); Halstead Road (north)	Stn 10	Reported value	0	0	0	0.1	0.1	0.1	0.1	0.1
		Trigger: ≥ 0.5[a]	No	No	No	No	No	No	No	No
		Magnitude[b]	Very Low	Very Low	Very Low	Very Low	Very Low	Very Low	Very Low	Very Low
Loughborough Road; River Soar (marina / caravan park)	Stn 11	Reported value	0.1	0	0	0.1	0.1	0.1	0.1	0.1
		Trigger: ≥ 0.5[a]	No	No	No	No	No	No	No	No
		Magnitude[b]	Very Low	Very Low	Very Low	Very Low	Very Low	Very Low	Very Low	Very Low
Meadow Farm Marina and Caravan Park	Stn 12	Reported value	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
		Trigger: ≥ 0.5[a]	No	No	No	No	No	No	No	No
		Magnitude[b]	Very Low	Very Low	Very Low	Very Low	Very Low	Very Low	Very Low	Very Low
Quorn House Park	Stn 13	Reported value	0	0	0.1	0	0	0.1	0	0.1
		Trigger: ≥ 0.5[a]	No	No	No	No	No	No	No	No
		Magnitude[b]	Very Low	Very Low	Very Low	Very Low	Very Low	Very Low	Very Low	Very Low

[a] Trigger mass deposition and Effective Area Coverage rates as in Section 7.3, ZLFMS-AG008 Dust Management and Monitoring Plan (Updated), 2015

[b] Magnitude of directional dust soiling derived from Beaman and Kingsbury, 1981

[c] Direction/s not determined for daily EAC below 0.1%/day (very low soiling)

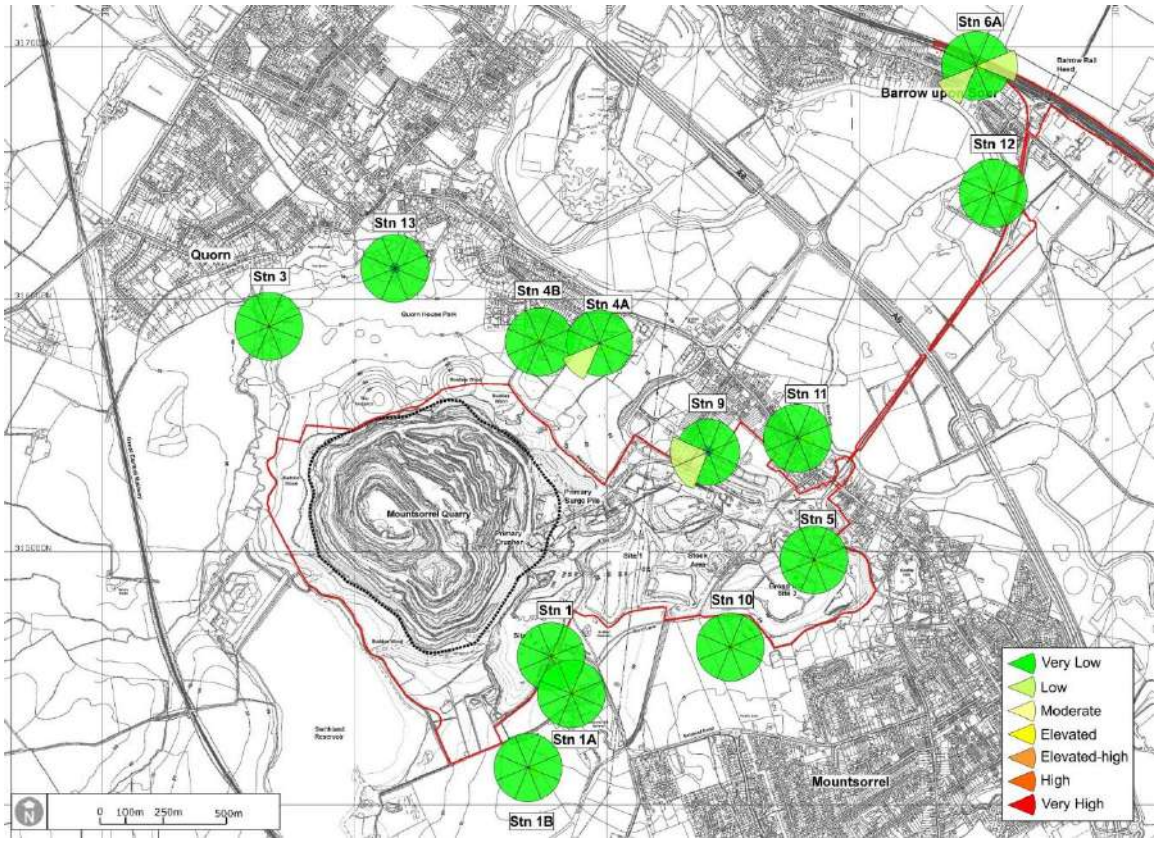

Figure 3.8: Directional dust soiling rose diagrams, 27 March – 30 April 2025

Table 3.4 shows that the average directional soiling rates have been at Very Low levels at most monitoring locations, for most directions, over the past year. At Stn 9, the annual average soiling rate to date was 0.2 % EAC/day from the southwest and west and Stn 6a from the East, resulting in 'Low' magnitudes being recorded. The cause or causes of these consistently, but marginally elevated dust soiling rates at this monitoring point are under review, as they may be related to site activities such as operations at the PSV yard, Granite Way and/or the toast rack.

Table 3.4: Running average directional dust soiling (past 12 months)

Receptor location	Nearest / appropriate dust monitoring point		Direction (°)							
			0	45	90	135	180	225	270	315
Swithland Lane; Rushey Lane; Kinchley Lane	Stn 1	Average value	0.1	0	0	0	0	0.1	0.1	0.1
		Magnitude[b]	Very Low	Very Low	Very Low	Very Low	Very Low	Very Low	Very Low	Very Low
Swithland Lane; Rushey Lane; Kinchley Lane	Stn 1A	Average value	0	0.1	0.1	0	0	0.1	0.1	0.1
		Magnitude[b]	Very Low	Very Low	Very Low	Very Low	Very Low	Very Low	Very Low	Very Low
Swithland Lane; Rushey Lane; Kinchley Lane	Stn 1B	Average value	0.1	0	0	0	0.1	0.1	0.1	0.1
		Magnitude[b]	Very Low	Very Low	Very Low	Very Low	Very Low	Very Low	Very Low	Very Low
Mill Farm; Quorn House	Stn 3	Average value	0	0.1	0.1	0	0.1	0	0	0
		Magnitude[b]	Very Low	Very Low	Very Low	Very Low	Very Low	Very Low	Very Low	Very Low
Woodside Farm, Leicester Road	Stn 4A	Average value	0	0.1	0.1	0	0	0.1	0.1	0
		Magnitude[b]	Very Low	Very Low	Very Low	Very Low	Very Low	Very Low	Very Low	Very Low
Quorn Grange, Unitt Road, Northage Close, Quorn Park	Stn 4B	Average value	0	0	0.1	0.1	0.1	0	0	0
		Magnitude[b]	Very Low	Very Low	Very Low	Very Low	Very Low	Very Low	Very Low	Very Low
Bond Lane; Crown Lane	Stn 5	Average value	0.1	0.1	0	0.1	0.1	0.1	0.1	0.1
		Magnitude[b]	Very Low	Very Low	Very Low	Very Low	Very Low	Very Low	Very Low	Very Low
Sileby Road; Huston Close; Sileby Road (commercial)	Stn 6A	Average value	0	0.1	0.2	0.1	0	0.1	0.1	0.1
		Magnitude[b]	Very Low	Very Low	Low	Very Low	Very Low	Very Low	Very Low	Very Low
Hawcliffe Road	Stn 9	Average value	0.1	0.1	0.1	0.1	0	0.2	0.2	0.1
		Magnitude[b]	Very Low	Very Low	Very Low	Very Low	Very Low	Low	Low	Very Low
Glebe Close; Halstead Road (south); Halstead Road (north)	Stn 10	Average value	0.1	0	0	0	0.1	0.1	0	0.1
		Magnitude[b]	Very Low	Very Low	Very Low	Very Low	Very Low	Very Low	Very Low	Very Low
Loughborough Road; River Soar (marina / caravan park)	Stn 11	Average value	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
		Magnitude[b]	Very Low	Very Low	Very Low	Very Low	Very Low	Very Low	Very Low	Very Low
Meadow Farm Marina and Caravan Park	Stn 12	Average value	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
		Magnitude[b]	Very Low	Very Low	Very Low	Very Low	Very Low	Very Low	Very Low	Very Low
Quorn House Park	Stn 13	Average value	0	0	0	0	0	0	0	0.1
		Magnitude[b]	Very Low	Very Low	Very Low	Very Low	Very Low	Very Low	Very Low	Very Low

[a] Trigger mass deposition and Effective Area Coverage rates as in Section 7.3, ZLFMS-AG008 Dust Management and Monitoring Plan (Updated), 2015

[b] Magnitude of directional dust soiling derived from Beaman and Kingsbury, 1981

[c] Direction/s not determined for daily EAC below 0.1%/day (very low soiling)

4 Complaints

During 27 March – 30 April 2025, it is understood that one complaint was received by the quarry. This was investigated in accordance with the procedure outlined in the DMMP.

Appendix A: Off-site PM_{10} monitoring (CBC and AURN)

The daily average PM_{10} concentrations recorded by the CBC Zephyr are presented below in Figure A.1, alongside similar data from the Defra Automatic Urban and Rural Network (AURN) station in Leicester University[2].

For the 12 months leading up to 30 April 2025, there were 365 daily PM_{10} readings taken by the CBC Zephyr, and the Leicester AURN, representing a 100 % data collection rate at each respective location.

From the available data the annual average daily PM_{10} concentration for the 12 months to date at CBC Zephyr was 14.39 µg/m^3, which is approximately 36 % of the annual average PM_{10} concentration objective (40 µg/m^3). At the Leicester AURN the annual average daily PM_{10} concentration for the 12 months to date was 13.1 µg/m^3 which is approximately 32.8 % of the annual average PM_{10} concentration objective.

For the 12 months up to 30 April 2025 there were three recorded instance where the daily average PM_{10} concentrations exceeded 50 µg/m^3 at the CBC Zephyr. In summary, for the 12 months up to 30 April 2025 neither the annual nor daily AQO have been exceeded.

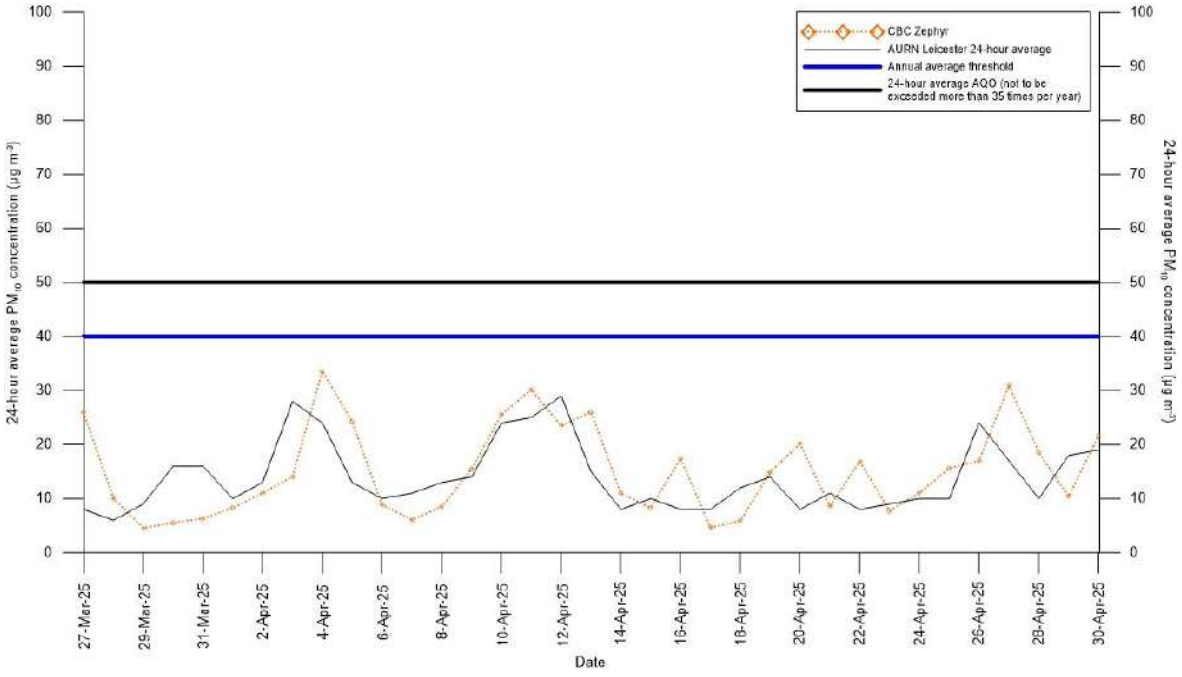

Figure A.1: Daily average PM_{10} concentration, CBC Zephyr and Leicester AURN, 27 March – 30 April 2025

[2] http://uk-air.defra.gov.uk/networks/network-info?view=aurn

Appendix B: Off-site $PM_{2.5}$ monitoring (CBC and AURN)

The daily average $PM_{2.5}$ concentrations recorded by the CBC Zephyr are presented below in Figure B.1, alongside similar data from the Defra Automatic Urban and Rural Network (AURN) station in Leicester University.

For the 12 months leading up to 30 April 2025, there were 365 daily $PM_{2.5}$ readings taken by the CBC Zephyr the Leicester AURN, representing a 100 % data collection rate respectively. From the available data the annual average daily $PM_{2.5}$ concentration for the 12 months at the CBC Zephyr was 9.28 µg/m^3, which is approximately 77 % of the interim annual average $PM_{2.5}$ concentration objective (12 µg/m^3) applicable from 31 January 2023. At the Leicester AURN the annual average daily concentration was 8.7 µg/m^3, which is approximately 73 % of the interim annual average $PM_{2.5}$ concentration objective.

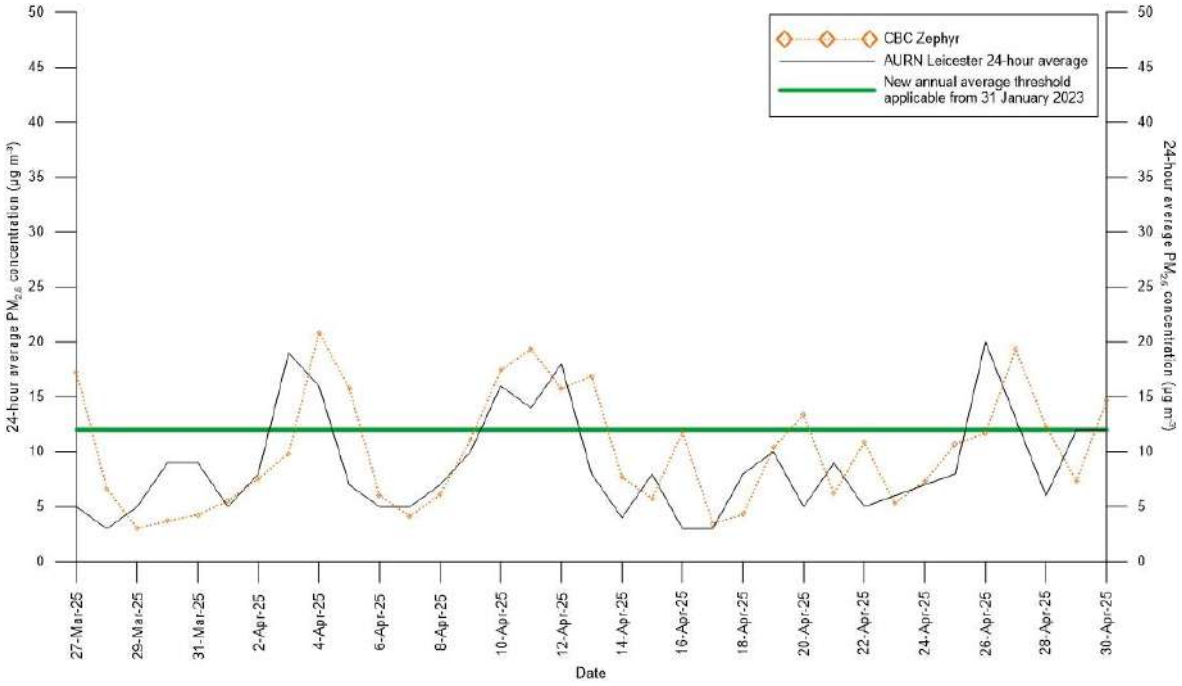

Figure B.1: Daily average $PM_{2.5}$ concentrations, CBC Zephyr and Leicester AURN, 27 March – 30 April 2025

Dust, Particulate Matter and Weather Monitoring Report: May 2025

Mountsorrel Quarry

July, 2025

Tarmac

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Document Control Sheet

Project Information

Title	Dust, particulate matter and weather monitoring report: May 2025
Project Ref	ZLFMS
Report Ref	ZLFMS_May_2025_A_Final
Report Type	Monthly Compliance Report
Client	Tarmac
Client Contact	Sarah Boustead
Revision	A
Status	Final
Date of Issue	11/07/2025

Revision History

Revision	Date	Author	Reviewer	Approver	Status
A	11/07/2025	Holly Hope	Hugh Datson	Hugh Datson	Draft
A	11/07/2025	Holly Hope	Paul Eaton	Paul Eaton	Final

Distribution

Organisation	Contact	Date of Issue	Copies
Tarmac	Sarah Boustead	11/07/2025	1

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This report may include data obtained from trusted third-party consultants/laboratories that have been supplied to us in good faith. Whilst we do everything we can to ensure the quality of all the data we use, we cannot be held responsible for the accuracy or integrity of third-party data.

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1 Introduction

Mountsorrel Quarry has a comprehensive Dust Management and Monitoring Plan (DMMP). The DMMP was developed in 2011 and is subject to regular review and revision, in consultation between Tarmac and the local regulators (Leicestershire County Council (LCC) and Charnwood Borough Council (CBC)).

The DMMP is enacted through the quarry Site Improvement Plan (SIP). The SIP sets out a programme of actions to reduce the environmental impact of specific areas of the site operation, and is updated regularly by quarry management, with support from DustScanAQ through regular site visits and quarterly reviews with LCC and CBC.

Section 7.5 of the DMMP requires that a monthly summary and review of dust and particulate matter monitoring is prepared and circulated with LCC, CBC and the Environment Agency.

This report details the results of dust, particulate matter and weather monitoring around Mountsorrel Quarry during the period 30 April – 29 May 2025.

1.1 Report scope

The intention of this report is to summarise dust and particulate matter monitoring results for the given period and compare them against site-specific alert limits and thresholds. This report also details the results of any investigation carried out into elevated dust or particulate matter levels, as prompted by an exceedance of alert limits or thresholds.

1.2 Dust definitions

'Dust' is generally regarded as particulate matter up to 75 µm (micron) diameter and can be considered in two categories. Fine dust, essentially particles up to 10 µm, is commonly referred to as PM_{10} and is measured to agreed standards and forms part of the national Air Quality Objectives (AQO). The AQO for PM_{10} is currently 50 µg/m^3 for the 24-hour mean, not to be exceeded 35 times per year and 40 µg/m^3 for the annual mean. Particles up to 2.5 µm in diameter are referred to as $PM_{2.5}$. The interim AQO for $PM_{2.5}$ is 12 µg/m^3 for the annual mean (to be achieved by 2028), whilst the legal AQO for $PM_{2.5}$ is 10 µg/m^3 for the annual mean (to be achieved by 2040) as per The Environmental Targets (Fine Particulate Matter) (England) Regulations 2023[1].

It may be noted that the above Regulations relate to average particle concentrations in Local Authority districts thus do not apply to any specific industrial or other operation, such as Mountsorrel Quarry, and are included for reference.

[1] Statutory Instrument. (2023), 'The Environmental Targets (Fine Particulate Matter) (England) Regulations', No. 96. King's Printer of Acts of Parliament

Coarser dust (essentially particles greater than 10 µm) is generally regarded as ‘nuisance dust’ and can be associated with annoyance, although there are no official standards (such as AQO) for dust annoyance.

2 Sampler locations

As shown in Figure 2.1 and Table 2.1, dust, particulate matter and weather conditions are measured at a number of locations around site and the surrounding area:

- Directional and depositional dust: currently monitored at 13 locations;
- Particulate matter: currently monitored at two locations;
- Weather conditions: currently monitored at one location.

The majority of the dust samplers around Mountsorrel Quarry comprise the 'Frisbee-type' deposition gauge combined with an adhesive 'sticky pad' directional gauge. These samplers are used to monitor 'nuisance' dust and samples from these instruments are collected on a monthly basis.

For particulate matter, Turnkey Osiris samplers are located at Stn 9 (Hawcliffe Road) and at Stn 13 (Quorn House). These recognised and certificated 'indicative' real-time devices are connected to their own wind vane and anemometer and provide near-instantaneous directional PM_{10}, $PM_{2.5}$ and PM_1 data directly to the quarry management team.

A weather station is located at the site offices off Wood Lane and collects a range of weather parameters over fifteen-minute intervals. Data from the weather station are available to the quarry management by means of a dedicated modem connection to the internet.

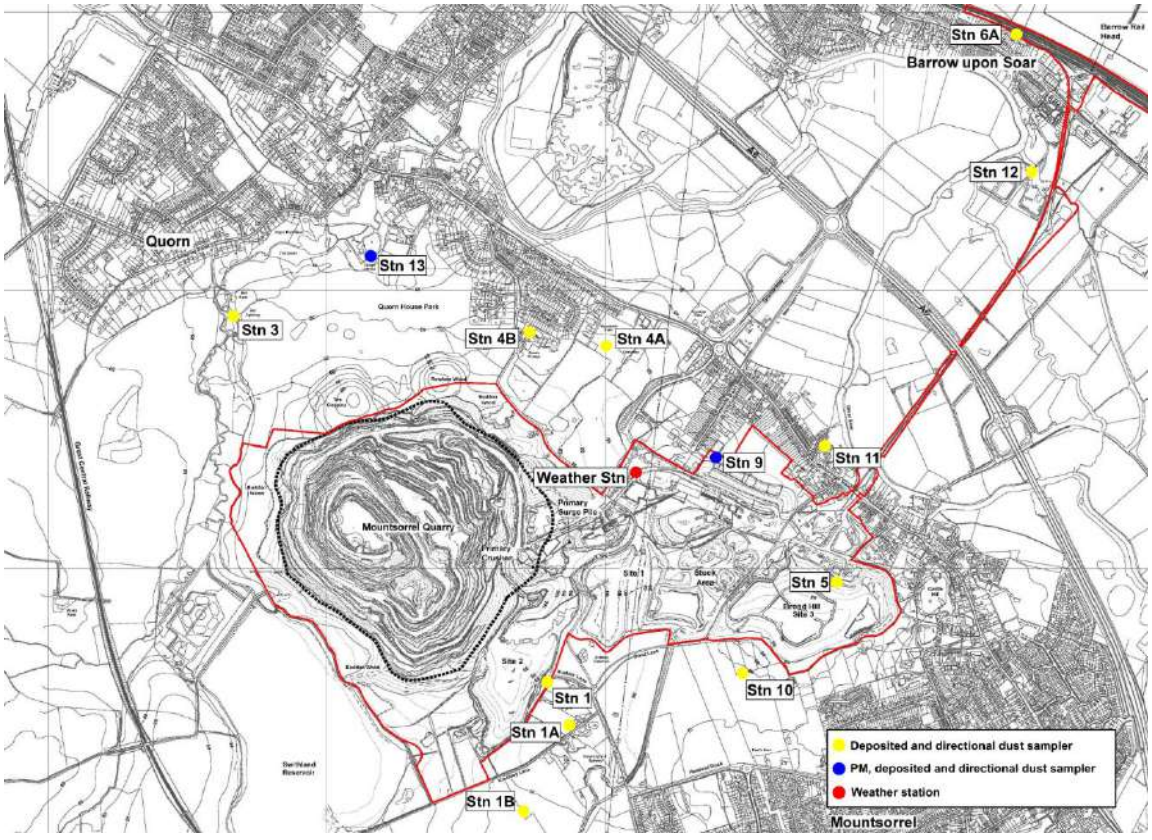

Figure 2.1: Particulate matter, dust and weather monitoring locations, Mountsorrel Quarry

Table 2.1: Weather, particulate matter and dust monitoring locations, Mountsorrel Quarry

Sampler reference	Easting	Northing	Locality monitored
Stn 1	456781	314577	Swithland Lane; Rushey Lane; Kinchley Lane
Stn 1A	456891	314436	Swithland Lane; Rushey Lane; Kinchley Lane
Stn 1B	456715	314109	Swithland Lane; Rushey Lane; Kinchley Lane
Stn 3	455681	315847	Mill Farm; Quorn House
Stn 4A	457000	315805	Woodside Farm; Leicester Road
Stn 4B	456733	315778	Quorn Grange, Unitt Road, Northage Close, Quorn Park
Stn 5	457789	314941	Bond Lane; Crown Lane
Stn 6A	458660	316786	Sileby Road; Huston Close; Sileby Road (commercial)
Stn 9 (inc. PM)	457374	315398	Hawcliffe Road
Stn 10	457487	314626	Glebe Close; Halstead Road (south); Halstead Road (north)
Stn 11	457791	315458	Loughborough Road; River Soar (marina / caravan park)
Stn 12	458575	315459	Meadow Farm Marina and Caravan Park
Stn 13 (incl. PM)	456158	316090	Northage Close, Meeting Street
Weather Station	457126	315376	Wood Lane Site Offices

Charnwood Borough Council (CBC) is responsible for the monitoring of air quality within the borough and prepares Air Quality Annual Status Reports (ASRs) for submission to Defra. It operates a Zephyr air quality monitor which is located within the Leicestershire County Council (LCC) depot at the southern end of Hawcliffe Road, in close proximity to the Osiris device at Stn 9. This device measures a number of pollutants including PM_{10} and $PM_{2.5}$, allowing CBC to compare concentrations against the relevant AQOs for these pollutants.

For additional context, the latest PM_{10} and $PM_{2.5}$ monitoring data from CBC are summarised in Appendix A and Appendix B.

2.1 Alert thresholds and response procedures

To help the site reduce its impact on the surrounding area, a number of alert thresholds have been calculated, as outlined in Table 2.2.

Table 2.2: Alert thresholds

Pollutant	Threshold	Averaging period	Applies to
PM_{10}	125 µg/m^3	15 minutes	Stn 9 (Hawcliffe Road), Stn 13 (Quorn House)
Deposited dust	125 mg/m^2/day	1 month	All deposited dust monitoring locations

For particulate matter (PM_{10}) an alert threshold of 125 µg/m^3 for the 15-minute average has been in use for several years.

Many years of monitoring and research have shown that the quarry is not a significant source of fine particulate matter ($PM_{2.5}$) hence no alert threshold for this size fraction is required.

PM_{10} and $PM_{2.5}$ concentrations recorded by CBC at the southern end of Hawcliffe Road and by Defra through the Automatic Urban and Rural Network (AURN) at Leicester University are presented in Appendix A and Appendix B respectively. Data from both locations have been compared against relevant Air Quality Objectives (AQOs) for PM_{10} and $PM_{2.5}$.

For deposited dust, the DMMP sets out a site-wide deposited dust threshold of 125 mg/m^2/day 'undissolved solids' as a trigger limit for investigation to identify the potential dust source/s, taking account of the directional data.

3 Results

3.1 Weather monitoring

Weather conditions can have a significant effect on the potential for dust propagation from a mineral site. Of particular importance are wind speeds, wind direction, and precipitation. Dust can be carried from a source towards receptors (such as nearby homes and other businesses) according to the strength and direction of wind. Precipitation is recognised to suppress dust and 0.2 mm antecedent rainfall is considered sufficient to suppress windblown dust for a number of hours.

The key weather data which might affect dust propagation (wind speed, wind direction, total daily precipitation and average daily temperature) for this reporting period are summarised in Figure 3.1.

Due to a technical issue with the on-site weather station, weather data were not available for this monitoring period. Temperature and precipitation data from a nearby Met Office WOW station in Mountsorrel (approx. 1.9 km southeast) was used to supplement the missing data. Wind data was also sourced from the same Met Office WOW station to ensure consistency across all weather data for this monitoring period.

This monitoring period was characterised by generally mild to warm temperatures throughout May. The maximum daily temperature was 18.9 °C, recorded on the 12 May 2025 and the minimum daily average temperature was 9.0 °C, recorded on the 04 May 2025. Due to precipitation only recorded on five days and warmer temperatures, there may have been an increased potential for dust generation and propagation during this reporting period.

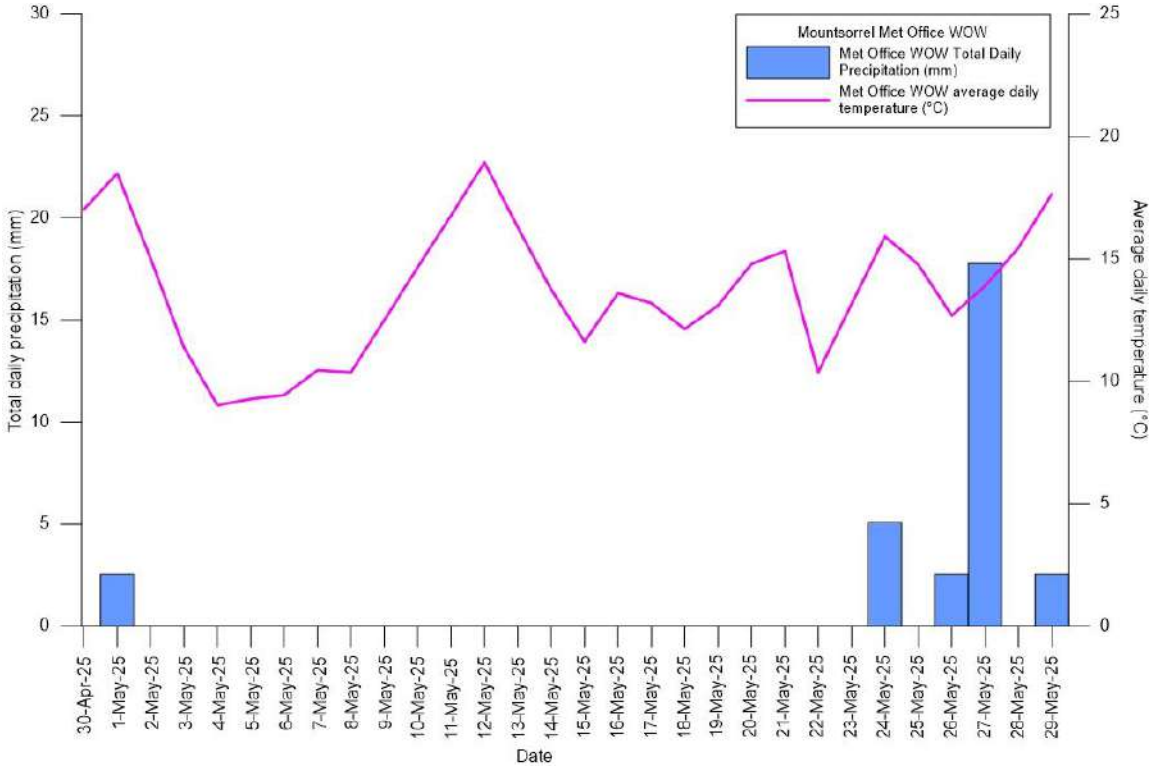

Figure 3.1: Total daily precipitation and average daily temperature, Mountsorrel Met Office WOW, 30 April – 29 May 2025

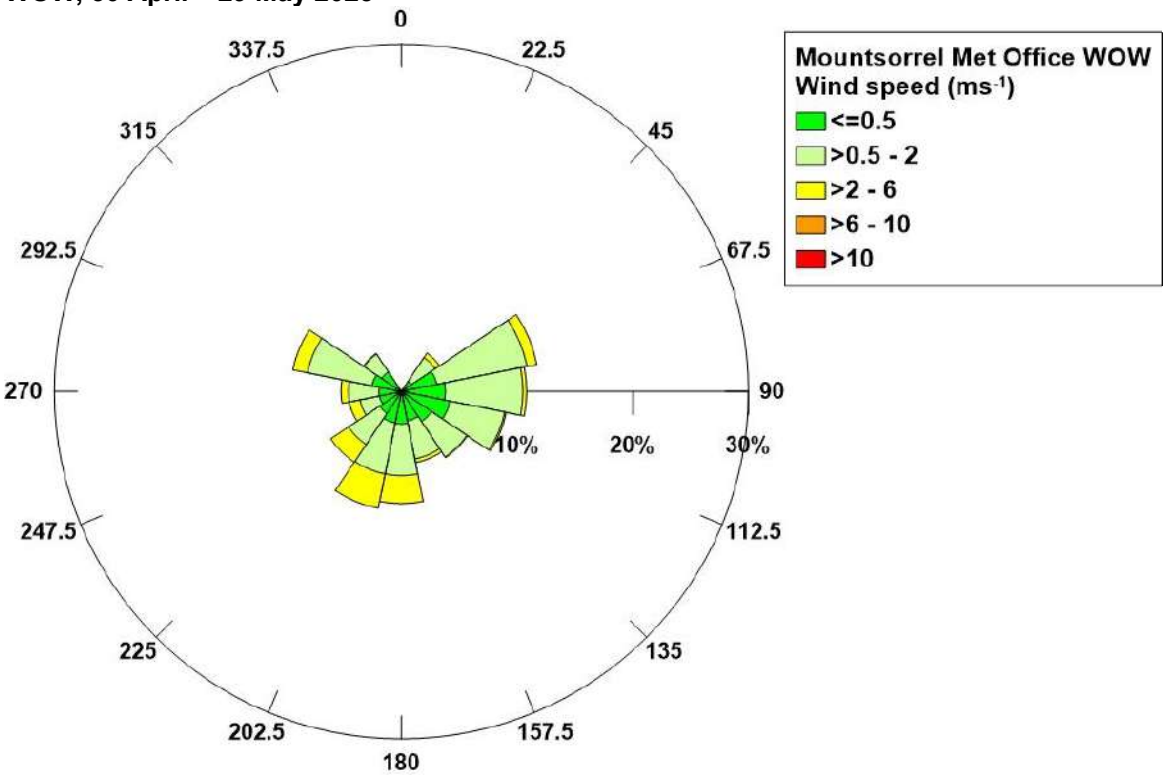

Figure 3.2: Wind rose, Mountsorrel Met Office WOW, 30 April – 29 May 2025

As seen in Figure 3.2, winds were calm to moderate in speed (>0.5 – 6 m/s) for all of the monitoring period from the south-southeast and north-east during this monitoring period, with less frequent north-westerly winds.

3.2 Particulate matter

3.2.1 PM_{10}

The available 15-minute data from the period of review are presented for both monitoring locations in Figure 3.4 and Figure 3.4. The red line denotes the site trigger level (125 µg/m^3 over the 15-minute average), whilst the dashed black line denotes the average concentration recorded over this period.

Additional PM_{10} monitoring data (collected by CBC and the Defra AURN monitoring network) are provided in Appendix A.

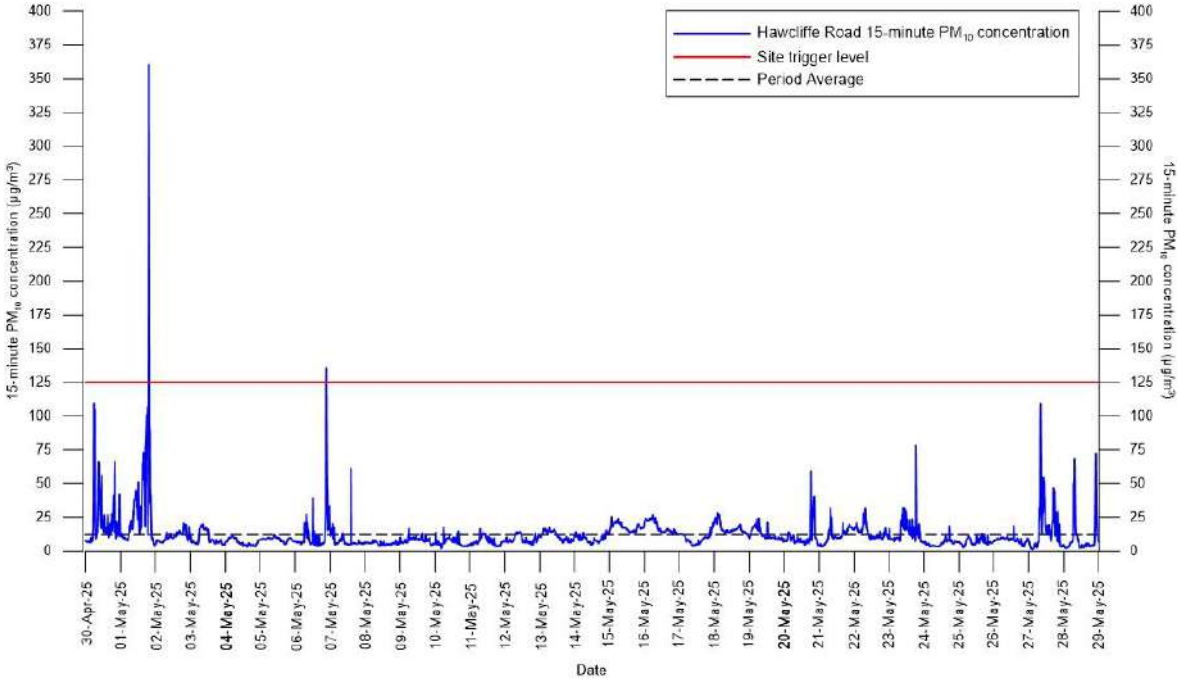

Figure 3.3: 15-minute mean PM_{10} concentration, Hawcliffe Road, 30 April – 29 May 2025

Figure 3.3 indicates that the overall average concentration at the Hawcliffe Road sampler for this period was 12.17 µg/m^3, with the alert threshold being exceeded on two occasions, with one coming from an off-site direction ; details of the onsite exceedance are provided in Table 3.1.

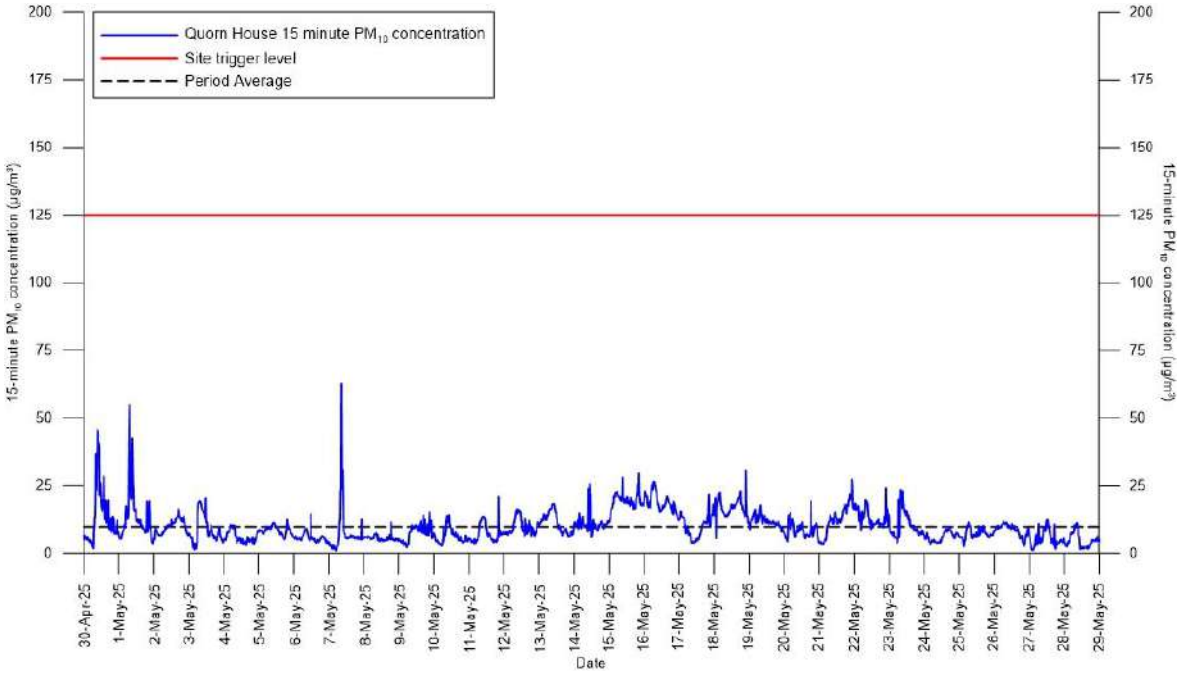

Figure 3.4: 15-minute mean PM_{10} concentration, Quorn House, 30 April – 29 May 2025

At Quorn house there were no exceedances of the PM_{10} site trigger, and the overall average for this period was 9.80 µg/m^3. There was a peak in PM10 concentrations at Quorn House on the 7th May, similar to the spike seen at Hawcliffe Road. This peak at both locations were coming from offsite directions, suggesting a more regional source.

During this review period, trigger emails alerting staff to high PM_{10} levels from the direction of site operations were sent out on one occasion from the Hawcliffe Road Osiris. Details of the corresponding causes and investigations are provided in Table 3.1.

Table 3.1: Email alert responses, between 30 April – 29 May 2025 (using the trigger threshold, 125 µg/m^3 for the 15-minute average)

Date of alert	Monitor	Details	Possible cause and investigation
01/05/2025	Hawcliffe Road	Exceedance recorded from the south south-east in the evening.	Site carried out a full investigation for the alerts. All dust suppression working and no issues identified.

3.2.2 $PM_{2.5}$

The results of $PM_{2.5}$ monitoring at Hawcliffe Road and Quorn House are presented in Figure 3.5 and Figure 3.6. The dashed black line denotes the average concentration recorded over this period. No $PM_{2.5}$ data were available from the Hawcliffe Road sampler for the period 28th March to 3rd April.

Additional $PM_{2.5}$ monitoring data (collected by CBC and the Defra AURN monitoring network) are provided in Appendix B.

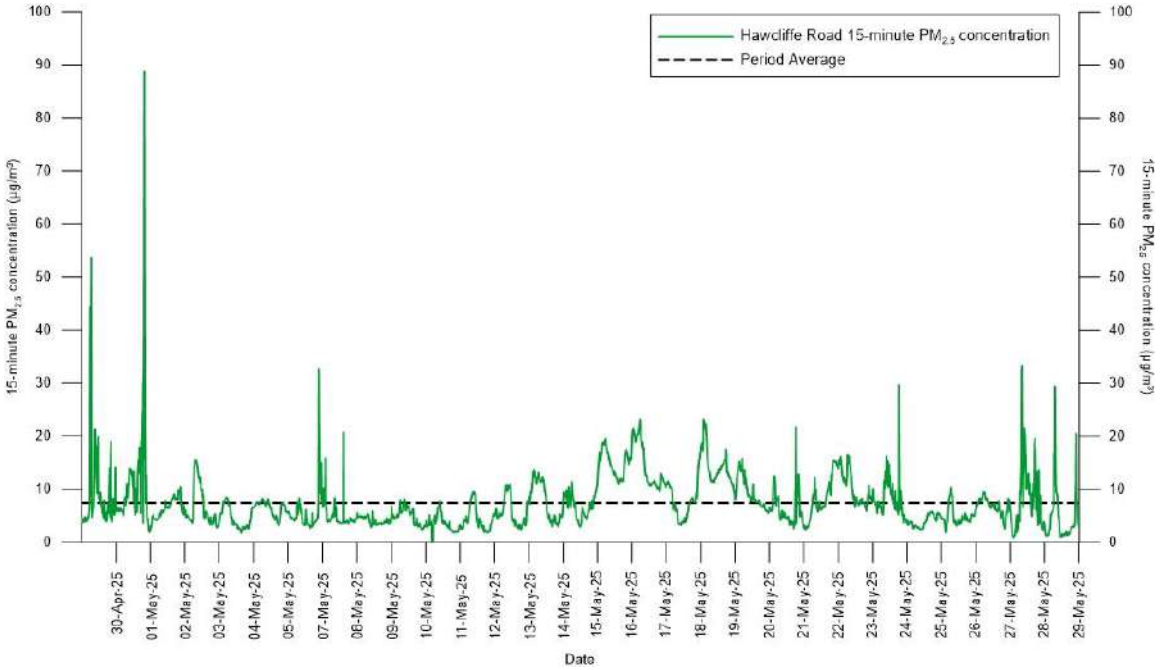

Figure 3.5: 15-minute mean $PM_{2.5}$ concentration, Hawcliffe Road, 30 April – 29 May April 2025

At Hawcliffe Road, the overall average concentration for this period was 7.41 µg/m^3, whilst at Quorn House, the overall average was 6.17 µg/m^3. It would appear that $PM_{2.5}$ concentrations recorded at both locations were broadly similar for most of this period, with the exception of some spikes at Hawcliffe Road in early May that were not recorded at Quorn House. These spikes generally coincide with PM_{10} concentrations at Hawcliffe Road.

For this period, 61% of PM_{10} recorded at Hawcliffe Road comprised $PM_{2.5}$, whilst it made up 63% at Quorn House.

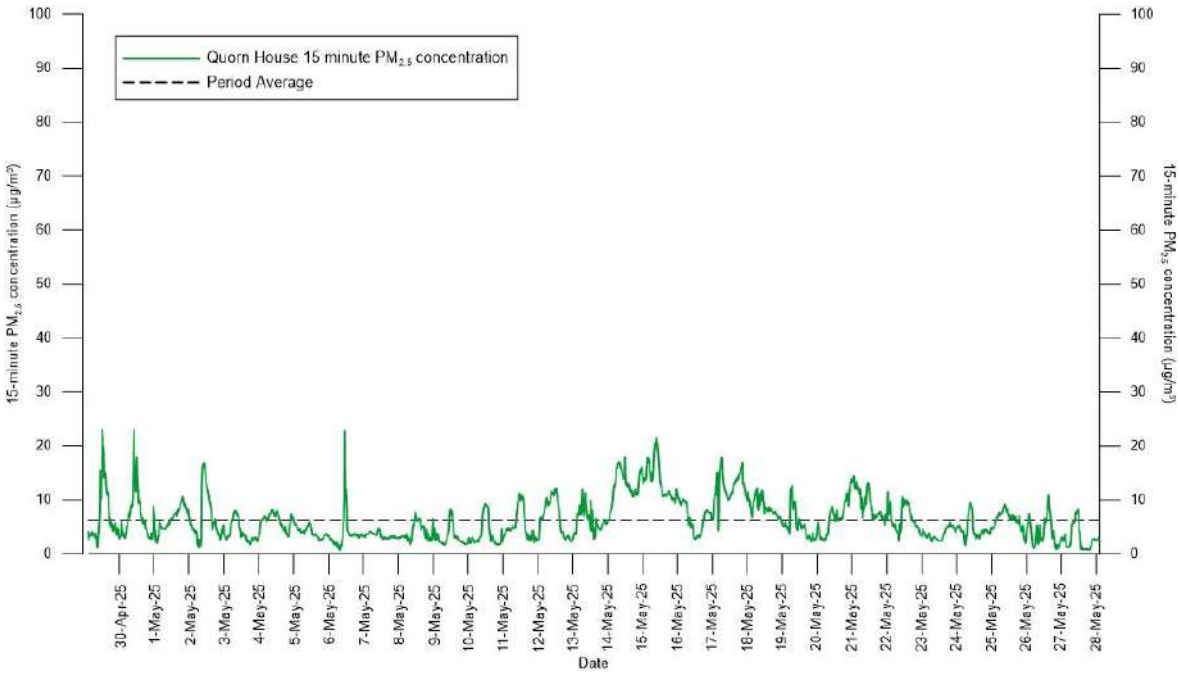

Figure 3.6: 15-minute mean $PM_{2.5}$ concentration, Quorn House, 30 April – 29 May 2025

3.3 Visible dust

3.3.1 Deposited dust monitoring summary

The deposited dust data for 30 April – 29 May 2025 are summarised in Table 3.2. As outlined above, there is a site-wide threshold for investigation to identify the potential dust source/s, taking account of the directional data. Table 3.2 shows that, for the available data, deposited dust levels during 30 April – 29 May 2025 were all within the site-specific threshold for all stations, with Stn 6 experiencing elevated levels during this period and Stn 4a experiencing slightly elevated levels.

Table 3.2: Summary of deposited dust (undissolved solids), 30/04/25 – 29/05/25

Undissolved solids (mg/m^2/day)				
This month report start date:		**30-Apr-25**		
This month report end date:		**29-May-25**		
Receptor location	**Nearest / appropriate dust monitoring point**	**Reported value**	**Trigger: ≥ 125[a]**	**Magnitude[b]**
Swithland Lane; Rushey Lane; Kinchley Lane	Stn 1	62	No	**Low**
Swithland Lane; Rushey Lane; Kinchley Lane	Stn 1A	44	No	**Very Low**
Swithland Lane; Rushey Lane; Kinchley Lane	Stn 1B	58	No	**Low**
Mill Farm; Quorn House	Stn 3	16	No	**Very Low**
Woodside Farm, Leicester Road	Stn 4A	90	No	**Slightly Elevated**
Quorn Grange, Unitt Road, Northage Close, Quorn Park	Stn 4B	69	No	**Low**
Bond Lane; Crown Lane	Stn 5	24	No	**Very Low**
Sileby Road; Huston Close; Sileby Road (commercial)	Stn 6A	121	No	**Elevated**
Hawcliffe Road	Stn 9	53	No	**Low**
Glebe Close; Halstead Road (south); Halstead Road (north)	Stn 10	70	No	**Low**
Loughborough Road; River Soar (marina / caravan park)	Stn 11	32	No	**Very Low**
Meadow Farm Marina and Caravan Park	Stn 12	42	No	**Very Low**
Quorn House Park	Stn 13	44	No	**Very Low**

[a] Trigger mass deposition and Effective Area Coverage rates as in Section 7.3, ZLFMS-AG008 Dust Management and Monitoring Plan (Updated), 2015

[b] Magnitude of mass deposition rate assessed against typical rate for semi-rural areas (30 - 80 mg/m^2/day)

Regarding dust deposition over time, the rates across the sampling area have varied considerably. Trends in dust deposition rates (as undissolved solids) for the previous 12 months, together with the site-wide dust threshold are illustrated in Figure 3.7.

In general, as would be expected, dust deposition rates are typically lower in winter months than in summer months. This trend is clearly seen for most monitoring points in Figure 3.7, with some exceptions. Dust deposition rates have been consistently below the 'trigger limit' at all sampling locations except at Stn 9, where it has exceeded twice in the last 12 months.

In general, as shown in Figure 3.7, higher rates of dust deposition have been recorded near industrial settings (*i.e.* Stn 9) than in more residential areas (*e.g.* Stn 1, Kinchley Lane).

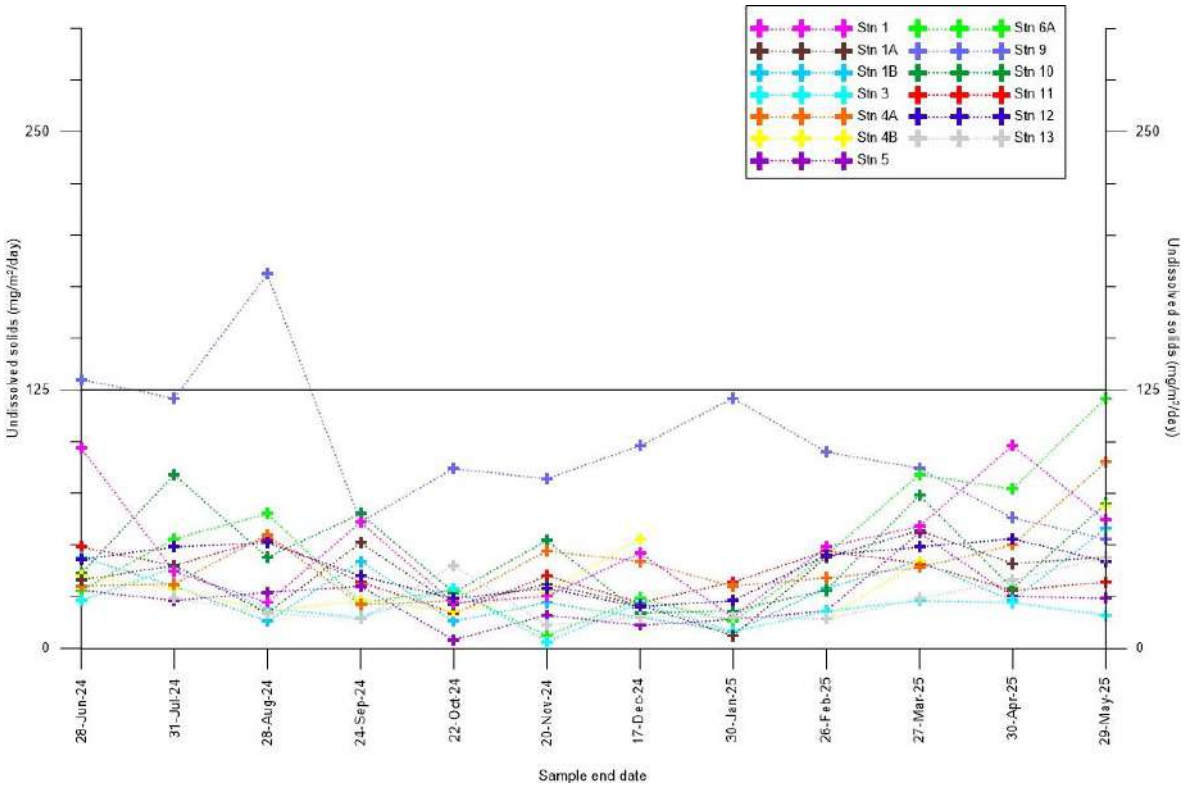

Figure 3.7: Dust deposition rates per sampling location over time (past 12 months)

3.3.2 Directional dust monitoring summary

The directional dust data for 30 April – 29 May 2025 are summarised in Table 3.3, and are presented graphically in Figure 3.8. As with deposited dust, the DMMP sets out a site-wide directional dust threshold. For directional dust soiling, 0.5 % Effective Area Coverage (EAC) per day is a trigger limit for investigation to identify the likely dust source/s, again taking account of the direction.

Table 3.3 and Figure 3.8 show that during 30 April – 29 May 2025, all stations recorded Very Low to Low dust levels from all directions.

Table 3.3: Summary of directional dust soiling, 30 April – 29 May 2025

Directional dust soiling (%EAC/day) by direction (°)									
This month report start date:		30-Apr-25							
This month report end date:		29-May-25							
Receptor location	Nearest / appropriate dust monitoring point		Direction (°)							
			0	45	90	135	180	225	270	315
Swithland Lane; Rushey Lane; Kinchley Lane	Stn 1	Reported value	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
		Trigger: ≥ 0.5[a]	No	No	No	No	No	No	No	No
		Magnitude[b]	Very Low	Very Low	Very Low	Very Low	Very Low	Very Low	Very Low	Very Low
Swithland Lane; Rushey Lane; Kinchley Lane	Stn 1A	Reported value	0.1	0.2	0.1	0.1	0	0.1	0.1	0.1
		Trigger: ≥ 0.5[a]	No	No	No	No	No	No	No	No
		Magnitude[b]	Very Low	Low	Very Low	Very Low	Very Low	Very Low	Very Low	Very Low
Swithland Lane; Rushey Lane; Kinchley Lane	Stn 1B	Reported value	0.1	0.1	0.1	0	0.1	0.1	0.1	0.1
		Trigger: ≥ 0.5[a]	No	No	No	No	No	No	No	No
		Magnitude[b]	Very Low	Very Low	Very Low	Very Low	Very Low	Very Low	Very Low	Very Low
Mill Farm; Quorn House	Stn 3	Reported value	0.1	0.2	0.1	0.1	0.1	0	0.1	0.1
		Trigger: ≥ 0.5[a]	No	No	No	No	No	No	No	No
		Magnitude[b]	Very Low	Low	Very Low	Very Low	Very Low	Very Low	Very Low	Very Low
Woodside Farm, Leicester Road	Stn 4A	Reported value	0	0.1	0	0.1	0	0.1	0.1	0.1
		Trigger: ≥ 0.5[a]	No	No	No	No	No	No	No	No
		Magnitude[b]	Very Low	Very Low	Very Low	Very Low	Very Low	Very Low	Very Low	Very Low
Quorn Grange, Unitt Road, Northage Close, Quorn Park	Stn 4B	Reported value	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
		Trigger: ≥ 0.5[a]	No	No	No	No	No	No	No	No
		Magnitude[b]	Very Low	Very Low	Very Low	Very Low	Very Low	Very Low	Very Low	Very Low
Bond Lane; Crown Lane	Stn 5	Reported value	0.1	0.1	0.2	0.1	0.1	0.1	0.2	0.1
		Trigger: ≥ 0.5[a]	No	No	No	No	No	No	No	No
		Magnitude[b]	Very Low	Very Low	Low	Very Low	Very Low	Very Low	Low	Very Low
Sileby Road; Huston Close; Sileby Road (commercial)	Stn 6A	Reported value	0.1	0.1	0.3	0.1	0.1	0.2	0.2	0.1
		Trigger: ≥ 0.5[a]	No	No	No	No	No	No	No	No
		Magnitude[b]	Very Low	Very Low	Low	Very Low	Very Low	Low	Low	Very Low
Hawcliffe Road	Stn 9	Reported value	0.1	0.1	0.1	0.1	0	0.2	0.2	0.1
		Trigger: ≥ 0.5[a]	No	No	No	No	No	No	No	No
		Magnitude[b]	Very Low	Very Low	Very Low	Very Low	Very Low	Low	Low	Very Low
Glebe Close; Halstead Road (south); Halstead Road (north)	Stn 10	Reported value	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.1
		Trigger: ≥ 0.5[a]	No	No	No	No	No	No	No	No
		Magnitude[b]	Very Low	Very Low	Very Low	Very Low	Very Low	Very Low	Low	Very Low
Loughborough Road; River Soar (marina / caravan park)	Stn 11	Reported value	0.1	0.2	0.1	0.1	0.1	0.1	0.1	0.1
		Trigger: ≥ 0.5[a]	No	No	No	No	No	No	No	No
		Magnitude[b]	Very Low	Low	Very Low	Very Low	Very Low	Very Low	Very Low	Very Low
Meadow Farm Marina and Caravan Park	Stn 12	Reported value	0.2	0.2	0.2	0.1	0.1	0.1	0.2	0.2
		Trigger: ≥ 0.5[a]	No	No	No	No	No	No	No	No
		Magnitude[b]	Low	Low	Low	Very Low	Very Low	Very Low	Low	Low
Quorn House Park	Stn 13	Reported value	0.1	0.1	0.1	0.1	0	0.1	0.1	0.1
		Trigger: ≥ 0.5[a]	No	No	No	No	No	No	No	No
		Magnitude[b]	Very Low	Very Low	Very Low	Very Low	Very Low	Very Low	Very Low	Very Low

[a] Trigger mass deposition and Effective Area Coverage rates as in Section 7.3, ZLFMS-AG008 Dust Management and Monitoring Plan (Updated), 2015

[b] Magnitude of directional dust soiling derived from Beaman and Kingsbury, 1981

[c] Direction/s not determined for daily EAC below 0.1%/day (very low soiling)

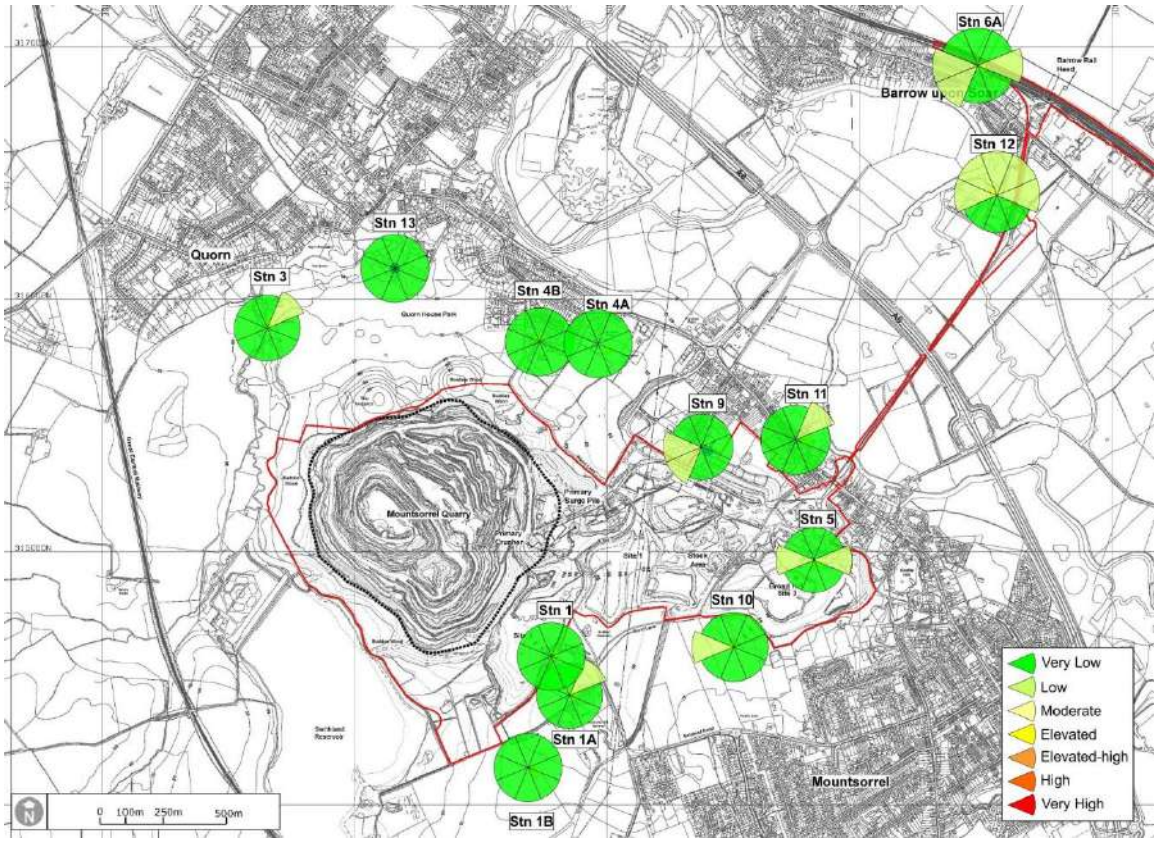

Figure 3.8: Directional dust soiling rose diagrams, 30 April – 29 May 2025

Table 3.4 shows that the average directional soiling rates have been at Very Low levels at most monitoring locations, for most directions, over the past year. At Stn 9, the annual average soiling rate to date was 0.2 % EAC/day from the southwest and west and Stn 6a from the East, resulting in 'Low' magnitudes being recorded. The cause or causes of these consistently, but marginally elevated dust soiling rates at this monitoring point are under review, as they may be related to site activities such as operations at the PSV yard, Granite Way and/or the toast rack.

Additionally, Figure 3.8 shows that during this monitoring period, several other locations have shown similar levels to Stn 9, but from off-site directions. Stations with dust levels coming from off-site directions include Stn 11, Stn 10, Stn 3, Stn 1A and Stn 5. This suggests other sources of dust may be present in the locality.

Table 3.4: Running average directional dust soiling (past 12 months)

Receptor location	Nearest / appropriate dust monitoring point		Direction (°)							
			0	45	90	135	180	225	270	315
Swithland Lane; Rushey Lane; Kinchley Lane	Stn 1	Average value	0.1	0	0	0	0	0.1	0.1	0.1
		Magnitude[b]	Very Low	Very Low	Very Low	Very Low	Very Low	Very Low	Very Low	Very Low
Swithland Lane; Rushey Lane; Kinchley Lane	Stn 1A	Average value	0.1	0.1	0.1	0	0	0.1	0.1	0.1
		Magnitude[b]	Very Low	Very Low	Very Low	Very Low	Very Low	Very Low	Very Low	Very Low
Swithland Lane; Rushey Lane; Kinchley Lane	Stn 1B	Average value	0.1	0	0	0	0.1	0.1	0.1	0.1
		Magnitude[b]	Very Low	Very Low	Very Low	Very Low	Very Low	Very Low	Very Low	Very Low
Mill Farm; Quorn House	Stn 3	Average value	0	0.1	0.1	0.1	0.1	0	0	0
		Magnitude[b]	Very Low	Very Low	Very Low	Very Low	Very Low	Very Low	Very Low	Very Low
Woodside Farm, Leicester Road	Stn 4A	Average value	0	0.1	0.1	0	0	0.1	0.1	0
		Magnitude[b]	Very Low	Very Low	Very Low	Very Low	Very Low	Very Low	Very Low	Very Low
Quorn Grange, Unitt Road, Northage Close, Quorn Park	Stn 4B	Average value	0	0.1	0.1	0.1	0.1	0	0	0
		Magnitude[b]	Very Low	Very Low	Very Low	Very Low	Very Low	Very Low	Very Low	Very Low
Bond Lane; Crown Lane	Stn 5	Average value	0.1	0.1	0	0.1	0.1	0.1	0.1	0.1
		Magnitude[b]	Very Low	Very Low	Very Low	Very Low	Very Low	Very Low	Very Low	Very Low
Sileby Road; Huston Close; Sileby Road (commercial)	Stn 6A	Average value	0	0.1	0.2	0.1	0.1	0.1	0.1	0.1
		Magnitude[b]	Very Low	Very Low	Low	Very Low	Very Low	Very Low	Very Low	Very Low
Hawcliffe Road	Stn 9	Average value	0.1	0.1	0.1	0.1	0	0.2	0.2	0.1
		Magnitude[b]	Very Low	Very Low	Very Low	Very Low	Very Low	Low	Low	Very Low
Glebe Close; Halstead Road (south); Halstead Road (north)	Stn 10	Average value	0.1	0	0	0.1	0.1	0.1	0.1	0.1
		Magnitude[b]	Very Low	Very Low	Very Low	Very Low	Very Low	Very Low	Very Low	Very Low
Loughborough Road; River Soar (marina / caravan park)	Stn 11	Average value	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
		Magnitude[b]	Very Low	Very Low	Very Low	Very Low	Very Low	Very Low	Very Low	Very Low
Meadow Farm Marina and Caravan Park	Stn 12	Average value	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
		Magnitude[b]	Very Low	Very Low	Very Low	Very Low	Very Low	Very Low	Very Low	Very Low
Quorn House Park	Stn 13	Average value	0	0	0	0	0	0	0	0.1
		Magnitude[b]	Very Low	Very Low	Very Low	Very Low	Very Low	Very Low	Very Low	Very Low

[a] Trigger mass deposition and Effective Area Coverage rates as in Section 7.3, ZLFMS-AG008 Dust Management and Monitoring Plan (Updated), 2015

[b] Magnitude of directional dust soiling derived from Beaman and Kingsbury, 1981

[c] Direction/s not determined for daily EAC below 0.1%/day (very low soiling)

4 Complaints

No Dust complaints were received during this monitoring period.

Appendix A: Off-site PM_{10} monitoring (CBC and AURN)

The daily average PM_{10} concentrations recorded by the CBC Zephyr are presented below in Figure A.1, alongside similar data from the Defra Automatic Urban and Rural Network (AURN) station in Leicester University[2].

For the 12 months leading up to 29 May 2025, there were 365 daily PM_{10} readings taken by the CBC Zephyr, and the Leicester AURN, representing a 100 % data collection rate at each respective location.

From the available data the annual average daily PM_{10} concentration for the 12 months to date at CBC Zephyr was 13.92 µg/m^3, which is approximately 34.8 % of the annual average PM_{10} concentration objective (40 µg/m^3). At the Leicester AURN the annual average daily PM_{10} concentration for the 12 months to date was 13 µg/m^3 which is approximately 32.5 % of the annual average PM_{10} concentration objective.

For the 12 months up to 29 May 2025 there were three recorded instance where the daily average PM_{10} concentrations exceeded 50 µg/m^3 at the CBC Zephyr. In summary, for the 12 months up to 30 April 2025 neither the annual nor daily AQO have been exceeded.

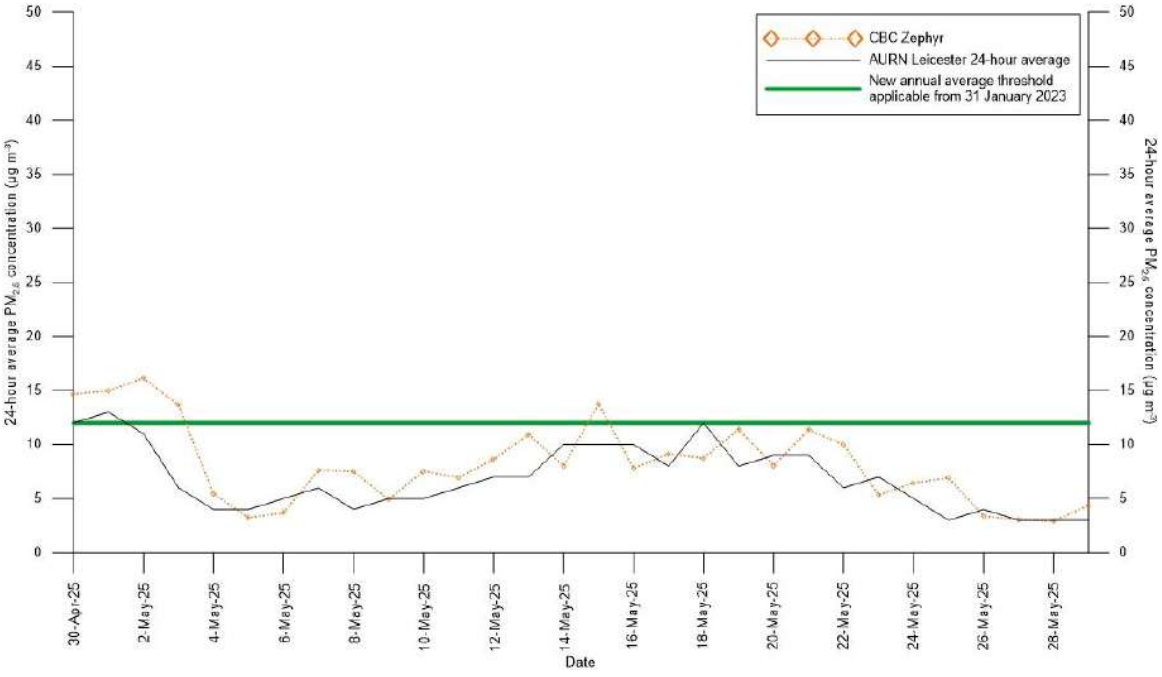

Figure A.1: Daily average PM_{10} concentration, CBC Zephyr and Leicester AURN, 30 April – 29 May 2025

[2] http://uk-air.defra.gov.uk/networks/network-info?view=aurn

Appendix B: Off-site $PM_{2.5}$ monitoring (CBC and AURN)

The daily average $PM_{2.5}$ concentrations recorded by the CBC Zephyr are presented below in Figure B.1, alongside similar data from the Defra Automatic Urban and Rural Network (AURN) station in Leicester University.

For the 12 months leading up to 29 May 2025, there were 365 daily $PM_{2.5}$ readings taken by the CBC Zephyr the Leicester AURN, representing a 100 % data collection rate respectively. From the available data the annual average daily $PM_{2.5}$ concentration for the 12 months at the CBC Zephyr was 9.16 µg/m^3, which is approximately 76 % of the interim annual average $PM_{2.5}$ concentration objective (12 µg/m^3) applicable from 31 January 2023. At the Leicester AURN the annual average daily concentration was 8.53 µg/m^3, which is approximately 71 % of the interim annual average $PM_{2.5}$ concentration objective.

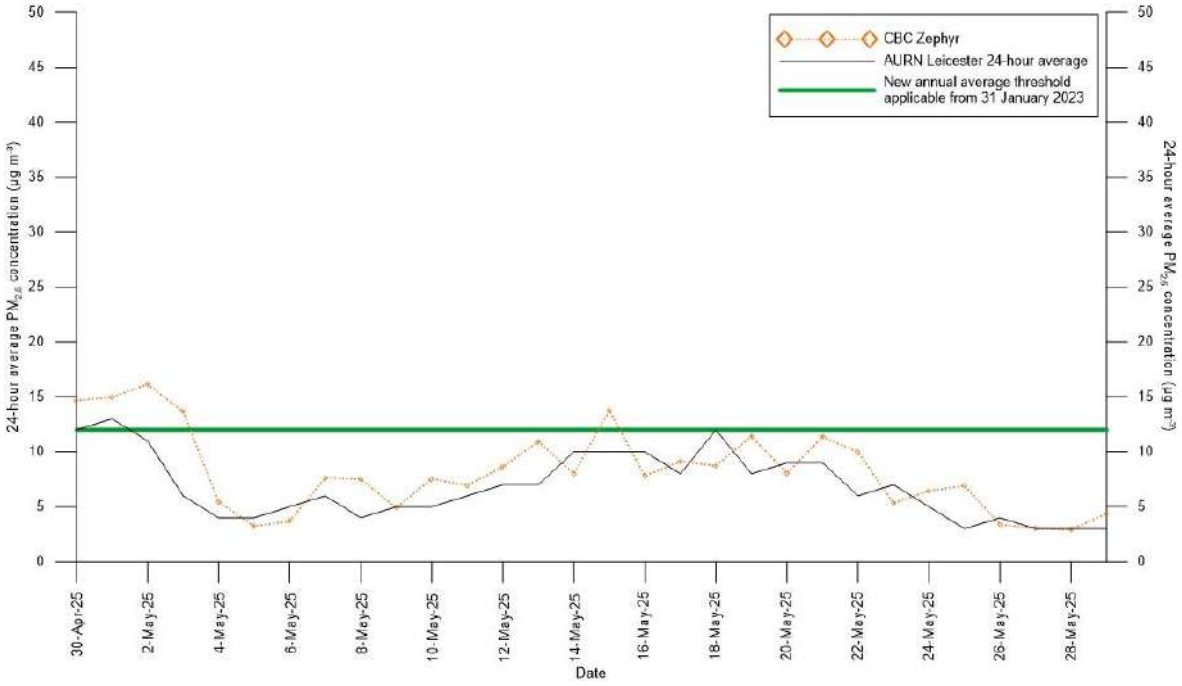

Figure B.1: Daily average $PM_{2.5}$ concentrations, CBC Zephyr and Leicester AURN, 30 April – 29 May 2025

Dust, Particulate Matter and Weather Monitoring Report: June 2025

Mountsorrel Quarry

October, 2025

Tarmac

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Document Control Sheet

Project Information

Title	Dust, particulate matter and weather monitoring report: June 2025
Project Ref	ZLFMS
Report Ref	ZLFMS_June_2025_A_Final
Report Type	Monthly Compliance Report
Client	Tarmac
Client Contact	Sarah Boustead
Revision	A
Status	Final
Date of Issue	24/09/2025

Revision History

Revision	Date	Author	Reviewer	Approver	Status
A	16/09/2025	Holly Hope	Daniel Quinn	Paul Eaton	Draft
A	24/09/2025	Holly Hope	Daniel Quinn	Paul Eaton	Final

Distribution

Organisation	Contact	Date of Issue	Copies
Tarmac	Sarah Boustead	24/09/2025	1

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1 Introduction

Mountsorrel Quarry has a comprehensive Dust Management and Monitoring Plan (DMMP). The DMMP was developed in 2011 and is subject to regular review and revision, in consultation between Tarmac and the local regulators (Leicestershire County Council (LCC) and Charnwood Borough Council (CBC)).

The DMMP is enacted through the quarry Site Improvement Plan (SIP). The SIP sets out a programme of actions to reduce the environmental impact of specific areas of the site operation, and is updated regularly by quarry management, with support from DustScanAQ through regular site visits and quarterly reviews with LCC and CBC.

Section 7.5 of the DMMP requires that a monthly summary and review of dust and particulate matter monitoring is prepared and circulated with LCC, CBC and the Environment Agency.

This report details the results of dust, particulate matter and weather monitoring around Mountsorrel Quarry during the period 29 May – 25 June 2025.

1.1 Report scope

The intention of this report is to summarise dust and particulate matter monitoring results for the given period and compare them against site-specific alert limits and thresholds. This report also details the results of any investigation carried out into elevated dust or particulate matter levels, as prompted by an exceedance of alert limits or thresholds.

1.2 Dust definitions

'Dust' is generally regarded as particulate matter up to 75 µm (micron) diameter and can be considered in two categories. Fine dust, essentially particles up to 10 µm, is commonly referred to as PM_{10} and is measured to agreed standards and forms part of the national Air Quality Objectives (AQO). The AQO for PM_{10} is currently 50 µg/m^3 for the 24-hour mean, not to be exceeded 35 times per year and 40 µg/m^3 for the annual mean. Particles up to 2.5 µm in diameter are referred to as $PM_{2.5}$. The interim target for $PM_{2.5}$ is 12 µg/m^3 for the annual mean (to be achieved by 2028), whilst the legal AQO for $PM_{2.5}$ is 10 µg/m^3 for the annual mean (to be achieved by 2040) as per The Environmental Targets (Fine Particulate Matter) (England) Regulations 2023[1].

It may be noted that the above Regulations relate to average particle concentrations in Local Authority districts thus do not apply to any specific industrial or other operation, such as Mountsorrel Quarry, and are included for reference.

[1] Statutory Instrument. (2023), 'The Environmental Targets (Fine Particulate Matter) (England) Regulations', No. 96. King's Printer of Acts of Parliament

Coarser dust (essentially particles greater than 10 µm) is generally regarded as 'nuisance dust' and can be associated with annoyance, although there are no official standards (such as AQO) for dust annoyance.

2 Sampler locations

As shown in Figure 2.1 and Table 2.1, dust, particulate matter and weather conditions are measured at a number of locations around site and the surrounding area:

- Directional and depositional dust: currently monitored at 13 locations;
- Particulate matter: currently monitored at two locations;
- Weather conditions: currently monitored at one location.

The majority of the dust samplers around Mountsorrel Quarry comprise the 'Frisbee-type' deposition gauge combined with an adhesive 'sticky pad' directional gauge. These samplers are used to monitor 'nuisance' dust and samples from these instruments are collected on a monthly basis.

For particulate matter, Turnkey Osiris samplers are located at Stn 9 (Hawcliffe Road) and at Stn 13 (Quorn House). These recognised and certificated 'indicative' real-time devices are connected to their own wind vane and anemometer and provide near-instantaneous directional PM_{10}, $PM_{2.5}$ and PM_1 data directly to the quarry management team.

A weather station is located at the site offices off Wood Lane and collects a range of weather parameters over fifteen-minute intervals. Data from the weather station are available to the quarry management by means of a dedicated modem connection to the internet, however as of April 17th there has been a technical issue with this connection. Several alternative options have been investigated.

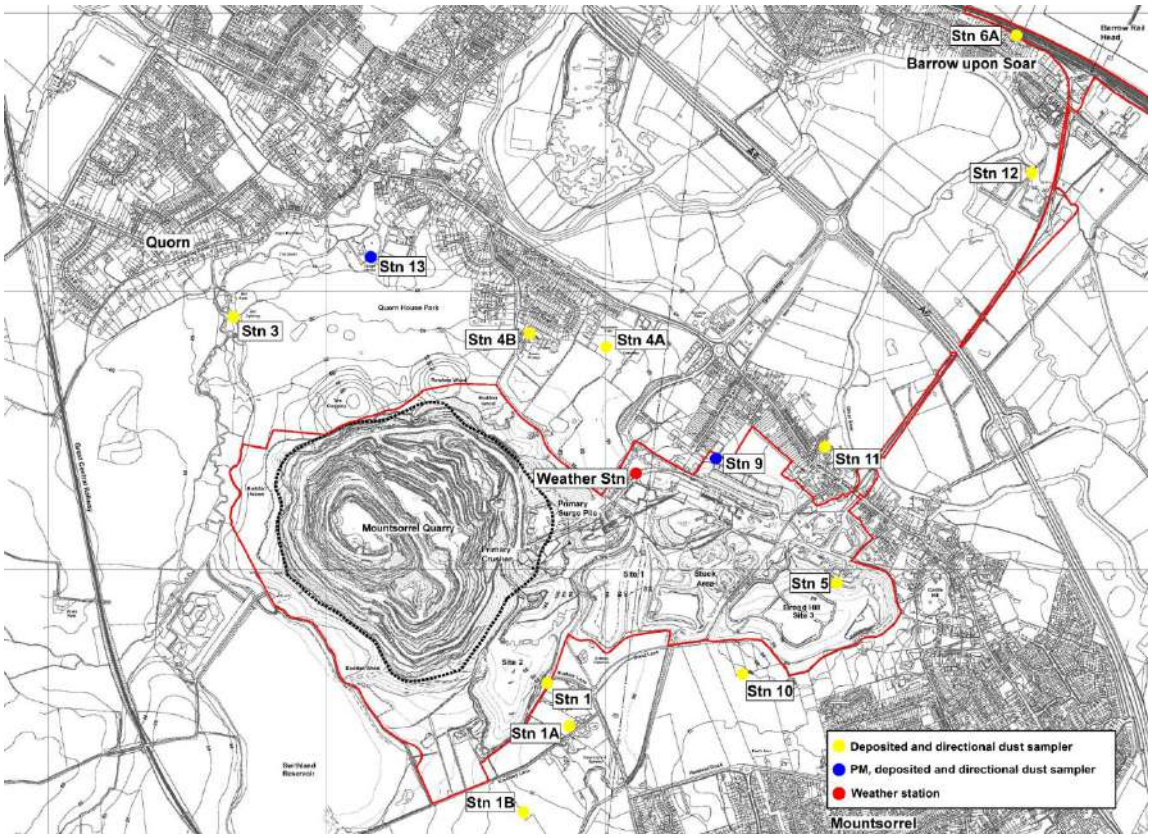

Figure 2.1: Particulate matter, dust and weather monitoring locations, Mountsorrel Quarry

Table 2.1: Weather, particulate matter and dust monitoring locations, Mountsorrel Quarry

Sampler reference	Easting	Northing	Locality monitored
Stn 1	456787	314586	Swithland Lane; Rushey Lane; Kinchley Lane
Stn 1A	456882	314449	Swithland Lane; Rushey Lane; Kinchley Lane
Stn 1B	456745	314112	Swithland Lane; Rushey Lane; Kinchley Lane
Stn 3	455685	315844	Mill Farm; Quorn House
Stn 4A	456966	315787	Woodside Farm; Leicester Road
Stn 4B	456732	315767	Quorn Grange, Unitt Road, Northage Close, Quorn Park
Stn 5	457872	314875	Bond Lane; Crown Lane
Stn 6A	458655	316785	Sileby Road; Huston Close; Sileby Road (commercial)
Stn 9 (inc. PM)	457374	315398	Hawcliffe Road
Stn 10	457509	314627	Glebe Close; Halstead Road (south); Halstead Road (north)
Stn 11	457835	315504	Loughborough Road; River Soar (marina / caravan park)
Stn 12	458551	316457	Meadow Farm Marina and Caravan Park

Stn 13 (incl. PM)	456154	316087	Northage Close, Meeting Street
Weather Station	457126	315376	Wood Lane Site Offices

Charnwood Borough Council (CBC) is responsible for the monitoring of air quality within the borough and prepares Air Quality Annual Status Reports (ASRs) for submission to Defra. It operates a Zephyr air quality monitor which is located within the Leicestershire County Council (LCC) depot at the southern end of Hawcliffe Road, in close proximity to the Osiris device at Stn 9. This device measures a number of pollutants including PM_{10} and $PM_{2.5}$, allowing CBC to compare concentrations against the relevant AQOs for these pollutants.

For additional context, the latest PM_{10} and $PM_{2.5}$ monitoring data from CBC are summarised in Appendix A and Appendix B.

2.1 Alert thresholds and response procedures

To help the site reduce its impact on the surrounding area, a number of alert thresholds have been calculated, as outlined in Table 2.2.

Table 2.2: Alert thresholds

Pollutant	Threshold	Averaging period	Applies to
PM_{10}	125 µg/m^3	15 minutes	Stn 9 (Hawcliffe Road), Stn 13 (Quorn House)
Deposited dust	125 mg/m^2/day	1 month	All deposited dust monitoring locations

For particulate matter (PM_{10}) an alert threshold of 125 µg/m^3 for the 15-minute average has been in use for several years as a trigger limit for investigation to identify potential on-site issues.

Many years of monitoring and research[2] have shown that the quarry is not a significant source of fine particulate matter ($PM_{2.5}$) hence no alert threshold for this size fraction is required.

PM_{10} and $PM_{2.5}$ concentrations recorded by CBC at the southern end of Hawcliffe Road and by Defra through the Automatic Urban and Rural Network (AURN) at Leicester University are presented in Appendix A and Appendix B respectively. Data from both locations have been compared against relevant Air Quality Objectives (AQOs) for PM_{10} and $PM_{2.5}$.

For deposited dust, the DMMP sets out a site-wide deposited dust threshold of 125 mg/m^2/day 'undissolved solids' as a trigger limit for investigation to identify the potential dust source/s, taking account of the directional data.

[2] https://iaqm.co.uk/text/guidance/mineralsguidance_2016.pdf

3 Results

3.1 Weather monitoring

Weather conditions can have a significant effect on the potential for dust propagation from a mineral site. Of particular importance are wind speeds, wind direction, and precipitation. Dust can be carried from a source towards receptors (such as nearby homes and other businesses) according to the strength and direction of wind. Precipitation is recognised to suppress dust and 0.2 mm antecedent rainfall is considered sufficient to suppress windblown dust for a number of hours.

The key weather data which might affect dust propagation (wind speed, wind direction, total daily precipitation and average daily temperature) for this reporting period are summarised in Figure 3.1 and Figure 3.2.

As mentioned earlier, due to a technical issue with the on-site weather station, site-specific weather data were not available for this monitoring period. Temperature and precipitation data from a nearby Met Office WOW station in West Leicester[3] (approx. 10 km south) was used to supplement the missing data. Wind data was also sourced from the same Met Office WOW station to ensure consistency across all weather data for this monitoring period.

This monitoring period was characterised by generally mild to warm temperatures. The maximum daily average temperature was 24.4 °C, recorded on 21 June 2025 and the minimum daily average temperature was 12.2 °C, recorded on 07 June 2025. Precipitation was only recorded on 30% of days; due to this and warmer temperatures, there may have been an increased potential for dust generation and propagation during this reporting period.

[3] https://wow.metoffice.gov.uk/observations/details/202509117fuioecxbae9bk1rxusa41wapr

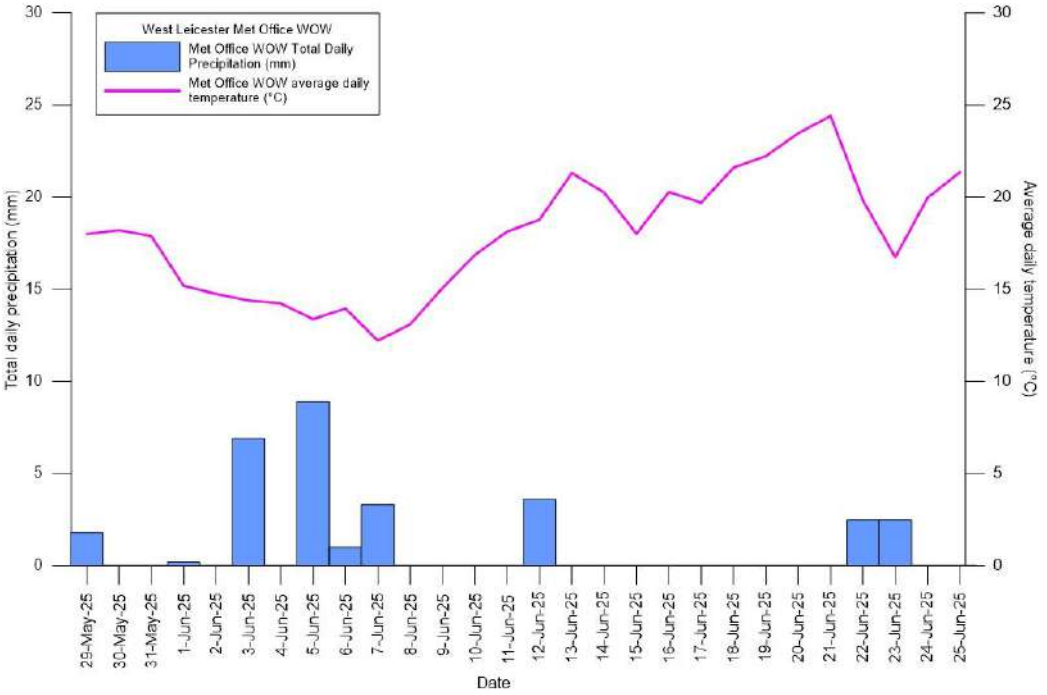

Figure 3.1: Total daily precipitation and average daily temperature, West Leicester Met Office WOW, 29 May – 25 June 2025

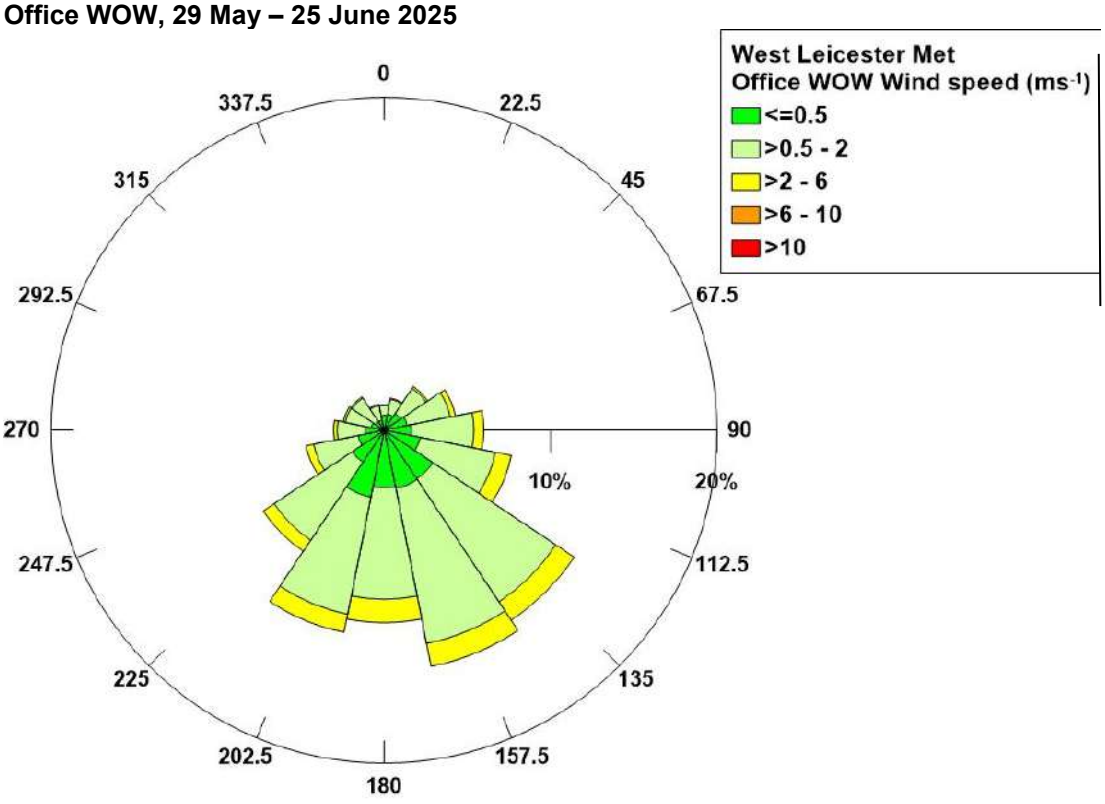

Figure 3.2: Wind rose, West Leicester Met Office WOW, 29 May – 25 June 2025

As seen in Figure 3.2, winds were calm to moderate in speed (>0.5 – 6 m/s) during this monitoring period, and were predominantly recorded from the southeast, south and southwest. This may have resulted in an increased potential for dust propagation to the northwest, north and northeast during this period.

3.2 Particulate matter

3.2.1 PM_{10}

The available 15-minute data from the period of review are presented for both monitoring locations in Figure 3.4 and Figure 3.4. The red line denotes the site trigger level (125 µg/m^3 over the 15-minute average), whilst the dashed black line denotes the average concentration recorded over this period.

Additional PM_{10} monitoring data (collected by CBC and the Defra AURN monitoring network) are provided in Appendix A.

Due to a technical issue with the equipment, no data were collected between 17 June and the morning of 24 June 2025.

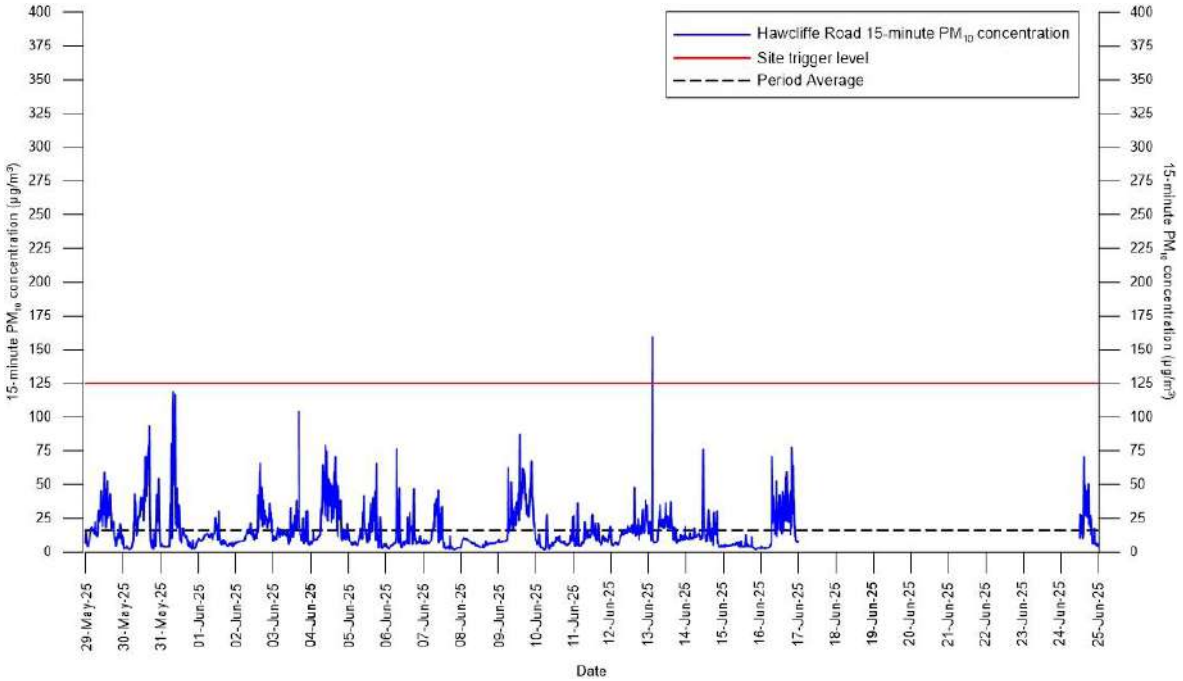

Figure 3.3: 15-minute mean PM_{10} concentration, Hawcliffe Road, 29 May – 25 June 2025

Figure 3.3 indicates that the overall average concentration at the Hawcliffe Road sampler for this period was 16.04 µg/m^3, with the alert threshold being exceeded on one occasion, with it coming from an off-site direction.

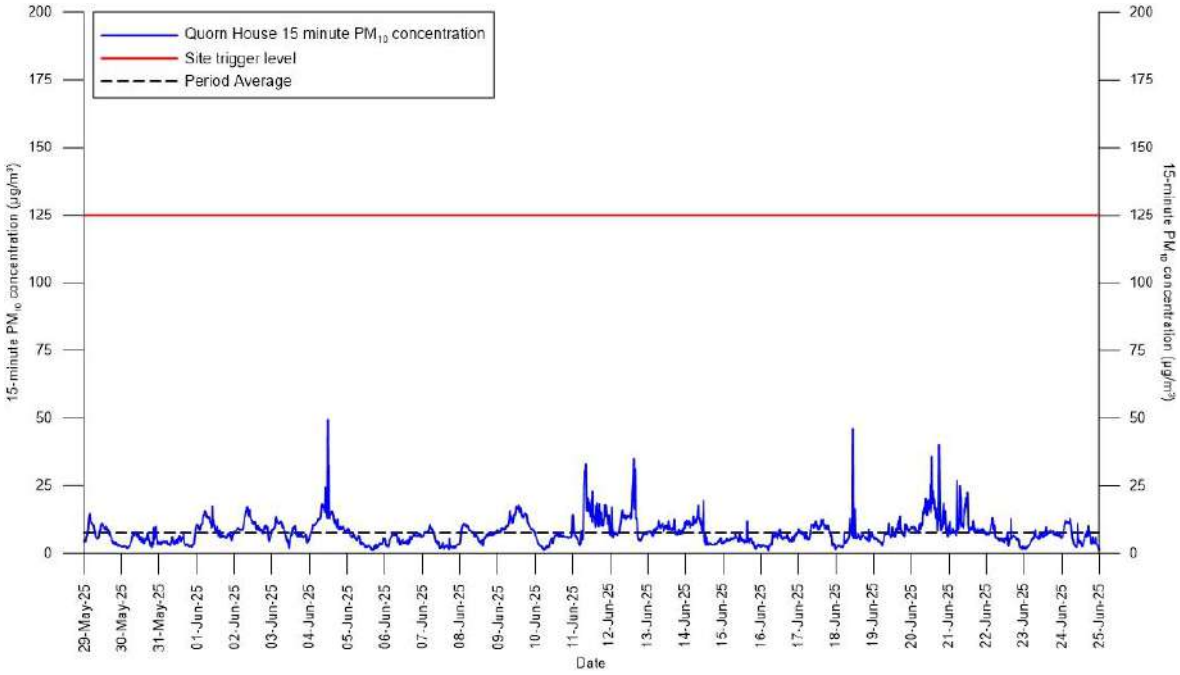

Figure 3.4: 15-minute mean PM_{10} concentration, Quorn House, 29 May – 25 June 2025

At Quorn house there were no exceedances of the PM_{10} site trigger, and the overall average for this period was 7.59 µg/m^3.

During this review period, trigger emails alerting staff to high PM_{10} levels from the direction of site operations were sent out on one occasion from the Hawcliffe Road Osiris. Details of the corresponding causes and investigations are provided in Table 3.1.

Table 3.1: Email alert responses, between 29 May – 25 June 2025 (using the trigger threshold, 125 µg/m^3 for the 15-minute average)

Date of alert	Monitor	Details	Possible cause and investigation
13/06/2025	Hawcliffe Road	Exceedance recorded from the northwest in the early morning.	Alert from offsite direction. No maintenance activities or works being carried out at this time – no site issues.

3.2.2 $PM_{2.5}$

The results of $PM_{2.5}$ monitoring at Hawcliffe Road and Quorn House are presented in Figure 3.5 and Figure 3.6. The dashed black line denotes the average concentration recorded over this period.

Additional $PM_{2.5}$ monitoring data (collected by CBC and the Defra AURN monitoring network) are provided in Appendix B.

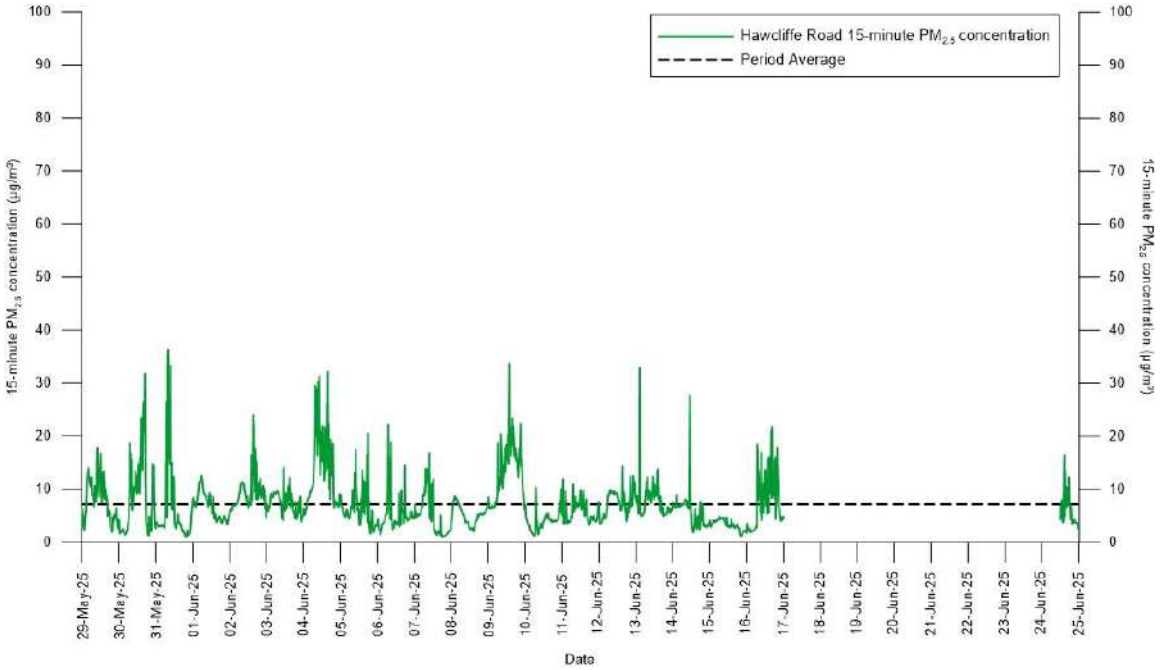

Figure 3.5: 15-minute mean $PM_{2.5}$ concentration, Hawcliffe Road, 29 May – 25 June 2025

At Hawcliffe Road, the overall average concentration for this period was 7.2 µg/m^3, whilst at Quorn House, the overall average was 4.34 µg/m^3

For this monitoring period, 45% of PM_{10} recorded at Hawcliffe Road comprised $PM_{2.5}$, whilst it made up 57% at Quorn House.

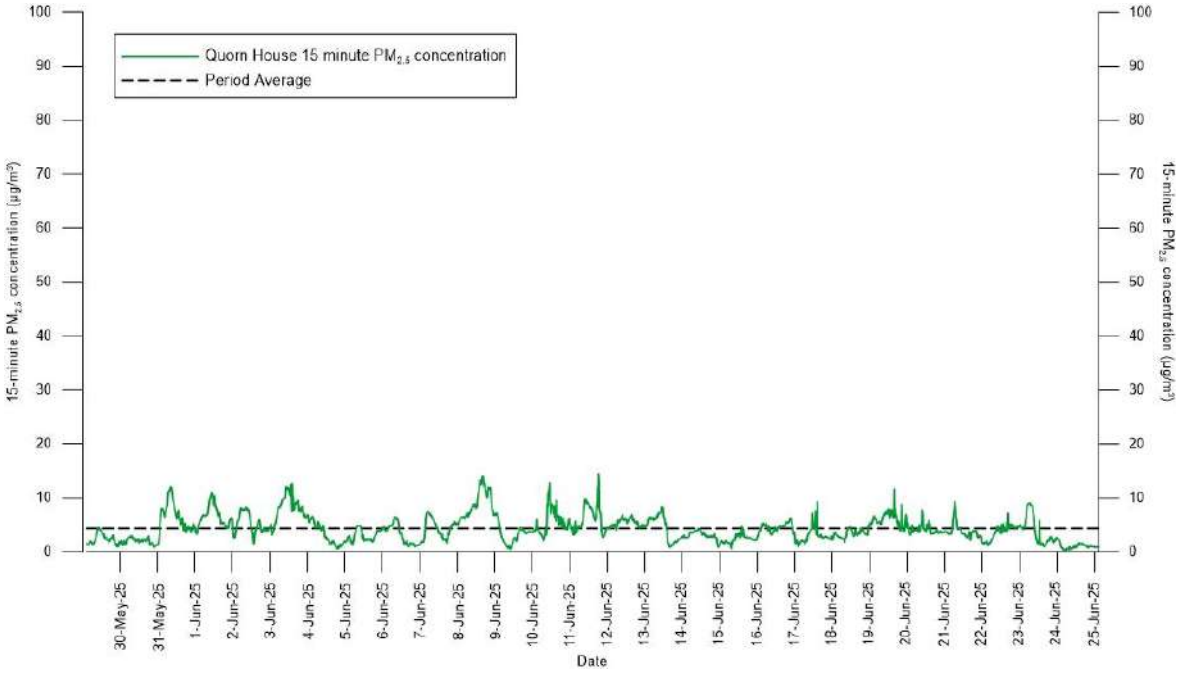

Figure 3.6**: 15-minute mean $PM_{2.5}$ concentration, Quorn House, 29 May – 25 June 2025**

3.3 Visible dust

3.3.1 Deposited dust monitoring summary

The deposited dust data for 29 May – 25 June 2025 are summarised in Table 3.2. As outlined above, there is a site-wide threshold for investigation to identify the potential dust source/s, taking account of the directional data. Table 3.2 shows that, for the available data, deposited dust levels during 29 May – 25 June 2025 were all within the site-specific threshold for all stations, with Stn 4a and Stn 6 experiencing slightly elevated levels during this period. Data was not available during this period for Stn 1A and Stn 9 due to contamination.

Table 3.2: Summary of deposited dust (undissolved solids), 29/05/25 – 25/06/25

Undissolved solids (mg/m^2/day)				
This month report start date:		**29-May-25**		
This month report end date:		**25-Jun-25**		
Receptor location	**Nearest / appropriate dust monitoring point**	**Reported value**	**Trigger: ≥ 125[a]**	**Magnitude[b]**
Swithland Lane; Rushey Lane; Kinchley Lane	Stn 1	48	No	**Very Low**
Swithland Lane; Rushey Lane; Kinchley Lane	Stn 1A	No data	No data	**N/A**
Swithland Lane; Rushey Lane; Kinchley Lane	Stn 1B	27	No	**Very Low**
Mill Farm; Quorn House	Stn 3	32	No	**Very Low**
Woodside Farm, Leicester Road	Stn 4A	88	No	**Slightly Elevated**
Quorn Grange, Unitt Road, Northage Close, Quorn Park	Stn 4B	73	No	**Low**
Bond Lane; Crown Lane	Stn 5	34	No	**Very Low**
Sileby Road; Huston Close; Sileby Road (commercial)	Stn 6A	82	No	**Slightly Elevated**
Hawcliffe Road	Stn 9	No data	No data	**N/A**
Glebe Close; Halstead Road (south); Halstead Road (north)	Stn 10	45	No	**Very Low**
Loughborough Road; River Soar (marina / caravan park)	Stn 11	51	No	**Low**
Meadow Farm Marina and Caravan Park	Stn 12	51	No	**Low**
Quorn House Park	Stn 13	23	No	**Very Low**

[a] Trigger mass deposition and Effective Area Coverage rates as in Section 7.3, ZLFMS-AG008 Dust Management and Monitoring Plan (Updated), 2015

[b] Magnitude of mass deposition rate assessed against typical rate for semi-rural areas (30 - 80 mg/m^2/day)

Regarding dust deposition over time, the rates across the sampling area have varied considerably. Trends in dust deposition rates (as undissolved solids) for the previous 12 months, together with the site-wide dust threshold are illustrated in Figure 3.7.

In general, as would be expected, dust deposition rates are typically lower in winter months than in summer months. This trend is clearly seen for most monitoring points in Figure 3.7, with some exceptions. Dust deposition rates have been consistently below the 'trigger limit' at all sampling locations except at Stn 9, where it has exceeded just twice in the last 12 months.

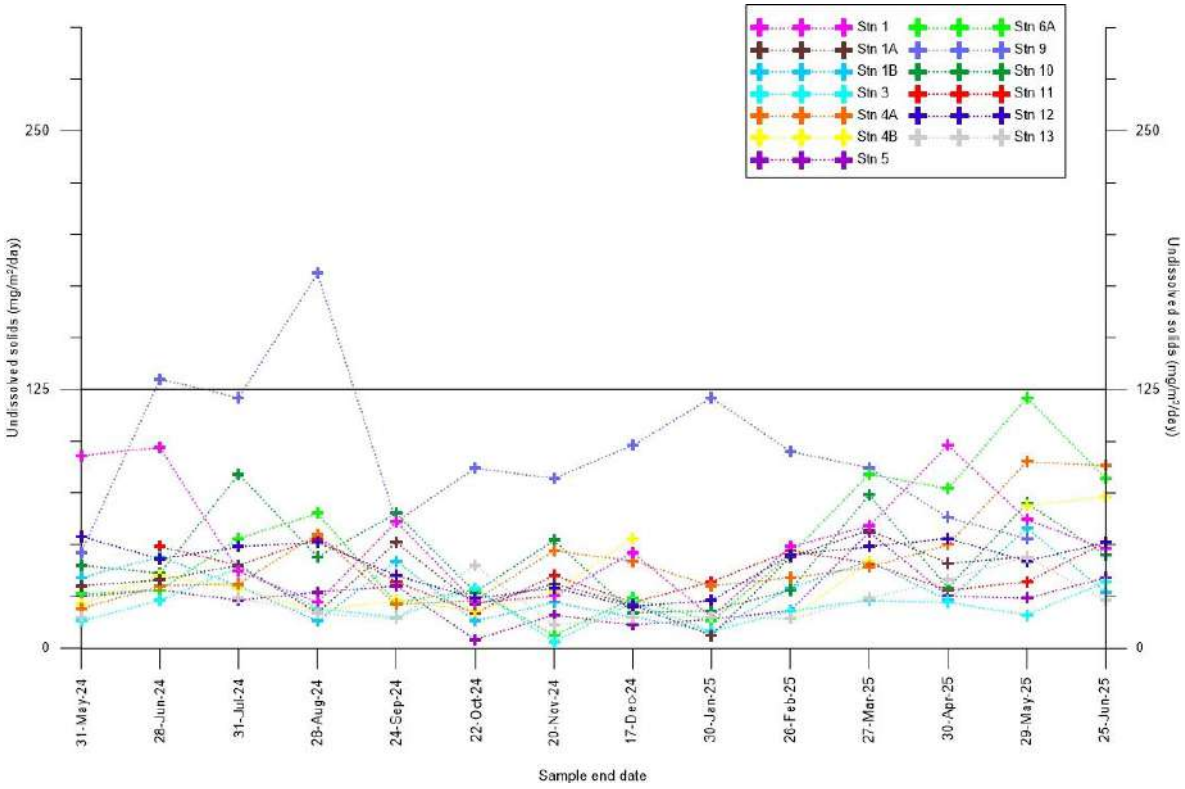

Figure 3.7: Dust deposition rates per sampling location over time (past 12 months)

3.3.2 Directional dust monitoring summary

The directional dust data for 29 May – 25 June 2025 are summarised in Table 3.3 and are presented graphically in Figure 3.8. As with deposited dust, the DMMP sets out a site-wide directional dust threshold. For directional dust soiling, 0.5 % Effective Area Coverage (EAC) per day is a trigger limit for investigation to identify the likely dust source/s, again taking account of the direction.

Table 3.3 and Figure 3.8 show that during 29 May – 25 June 2025, all stations recorded Very Low to Low dust levels from all directions, except for Stn 6A which recorded up to Moderate levels and Stn 9 which recorded levels in excess of the trigger limit from the southwest and west (0.5 % EAC and 0.6 % EAC respectively). This pattern of directional dust would suggest the impact of both on-site (e.g. the PSV yard) and off-site (e.g. industrial activities along Granite Way) dust sources impacting this location.

Table 3.3: Summary of directional dust soiling, 29 May – 25 June 2025

Directional dust soiling (%EAC/day) by direction (°)										
This month report start date:		**29-May-25**								
This month report end date:		**25-Jun-25**								
Receptor location	**Nearest / appropriate dust monitoring point**		**Direction (°)**							
			0	**45**	**90**	**135**	**180**	**225**	**270**	**315**
Swithland Lane; Rushey Lane; Kinchley Lane	Stn 1	Reported value	0.1	0.1	0.1	0.1	0.1	0.2	0.1	0.1
		Trigger: ≥ 0.5[a]	No	No	No	No	No	No	No	No
		Magnitude[b]	Very Low	Very Low	Very Low	Very Low	Very Low	Low	Very Low	Very Low
Swithland Lane; Rushey Lane; Kinchley Lane	Stn 1A	Reported value	0	0.1	0.1	0.1	0.1	0.1	0.1	0.1
		Trigger: ≥ 0.5[a]	No	No	No	No	No	No	No	No
		Magnitude[b]	Very Low	Very Low	Very Low	Very Low	Very Low	Very Low	Very Low	Very Low
Swithland Lane; Rushey Lane; Kinchley Lane	Stn 1B	Reported value	0.1	0	0.1	0.1	0.1	0.1	0.1	0.1
		Trigger: ≥ 0.5[a]	No	No	No	No	No	No	No	No
		Magnitude[b]	Very Low	Very Low	Very Low	Very Low	Very Low	Very Low	Very Low	Very Low
Mill Farm; Quorn House	Stn 3	Reported value	0.1	0.1	0.1	0.1	0	0.1	0.1	0
		Trigger: ≥ 0.5[a]	No	No	No	No	No	No	No	No
		Magnitude[b]	Very Low	Very Low	Very Low	Very Low	Very Low	Very Low	Very Low	Very Low
Woodside Farm, Leicester Road	Stn 4A	Reported value	0	0	0	0.1	0	0.1	0.1	0.1
		Trigger: ≥ 0.5[a]	No	No	No	No	No	No	No	No
		Magnitude[b]	Very Low	Very Low	Very Low	Very Low	Very Low	Very Low	Very Low	Very Low
Quorn Grange, Unitt Road, Northage Close, Quorn Park	Stn 4B	Reported value	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
		Trigger: ≥ 0.5[a]	No	No	No	No	No	No	No	No
		Magnitude[b]	Very Low	Very Low	Very Low	Very Low	Very Low	Very Low	Very Low	Very Low
Bond Lane; Crown Lane	Stn 5	Reported value	0.1	0	0.1	0.1	0	0.1	0.1	0.1
		Trigger: ≥ 0.5[a]	No	No	No	No	No	No	No	No
		Magnitude[b]	Very Low	Very Low	Very Low	Very Low	Very Low	Very Low	Very Low	Very Low
Sileby Road; Huston Close; Sileby Road (commercial)	Stn 6A	Reported value	0.1	0.1	0.1	0.1	0.1	0.4	0.2	0.1
		Trigger: ≥ 0.5[a]	No	No	No	No	No	No	No	No
		Magnitude[b]	Very Low	Very Low	Very Low	Very Low	Very Low	Moderate	Low	Very Low
Hawcliffe Road	Stn 9	Reported value	0.1	0.1	0.1	0.1	0.1	0.5	0.6	0.2
		Trigger: ≥ 0.5[a]	No	No	No	No	No	**Yes**	**Yes**	No
		Magnitude[b]	Very Low	Very Low	Very Low	Very Low	Very Low	Moderate	Elevated	Low
Glebe Close; Halstead Road (south); Halstead Road (north)	Stn 10	Reported value	0.1	0.1	0.1	0.1	0.1	0.2	0.1	0.1
		Trigger: ≥ 0.5[a]	No	No	No	No	No	No	No	No
		Magnitude[b]	Very Low	Very Low	Very Low	Very Low	Very Low	Low	Very Low	Very Low
Loughborough Road; River Soar (marina / caravan park)	Stn 11	Reported value	0.1	0.1	0.1	0.1	0.1	0.3	0.2	0.1
		Trigger: ≥ 0.5[a]	No	No	No	No	No	No	No	No
		Magnitude[b]	Very Low	Very Low	Very Low	Very Low	Very Low	Low	Low	Very Low
Meadow Farm Marina and Caravan Park	Stn 12	Reported value	0.2	0.1	0.1	0.1	0.1	0.1	0.3	0.2
		Trigger: ≥ 0.5[a]	No	No	No	No	No	No	No	No
		Magnitude[b]	Low	Very Low	Very Low	Very Low	Very Low	Very Low	Low	Low
Quorn House Park	Stn 13	Reported value	0.1	0	0.1	0.1	0	0.1	0.1	0.1
		Trigger: ≥ 0.5[a]	No	No	No	No	No	No	No	No
		Magnitude[b]	Very Low	Very Low	Very Low	Very Low	Very Low	Very Low	Very Low	Very Low

[a] Trigger mass deposition and Effective Area Coverage rates as in Section 7.3, ZLFMS-AG008 Dust Management and Monitoring Plan (Updated), 2015

[b] Magnitude of directional dust soiling derived from Beaman and Kingsbury, 1981

[c] Direction/s not determined for daily EAC below 0.1%/day (very low soiling)

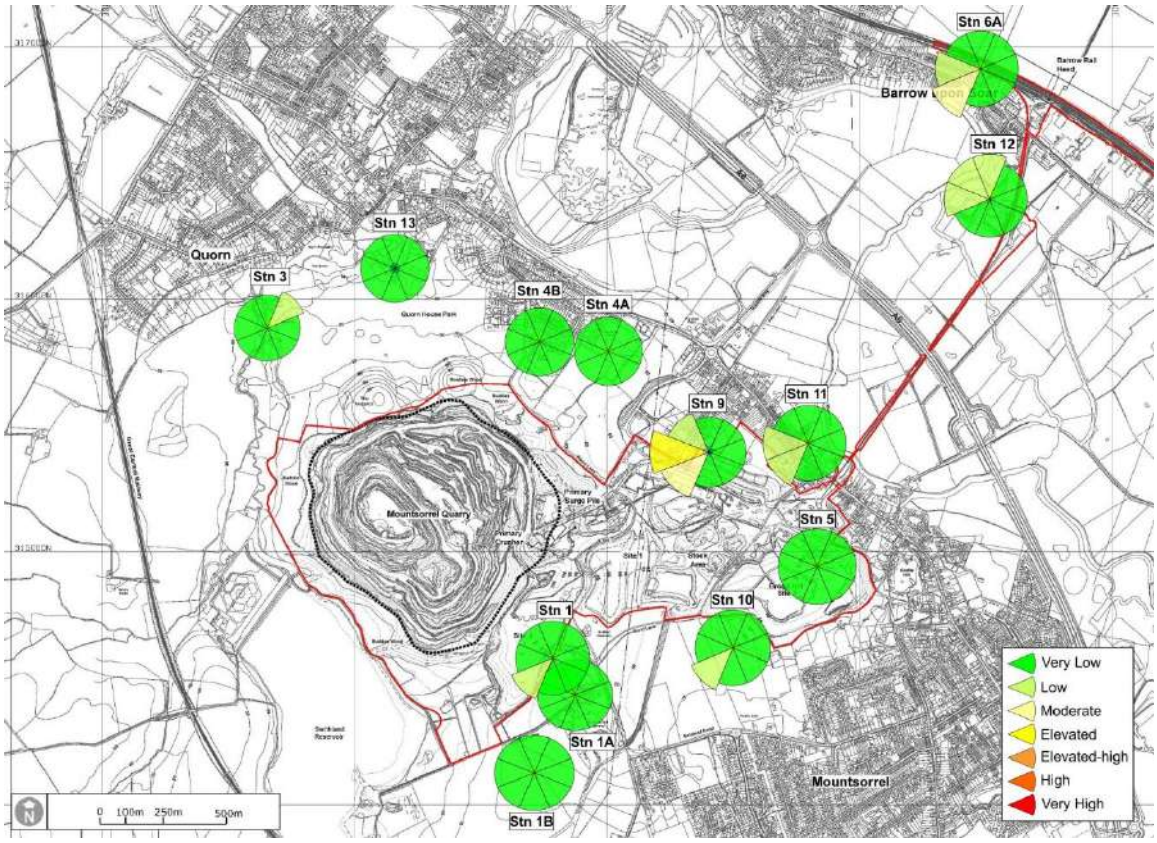

Figure 3.8: Directional dust soiling rose diagrams, 29 May – 25 June 2025

Figure 3.8 shows that during this monitoring period, several locations recorded low directional dust levels from off-site locations. Stations with dust levels coming from off-site directions include Stn 1, Stn 3, Stn 10and Stn 12. This suggests other sources of dust may be present in the locality.

Table 3.4 shows that the average directional soiling rates have been at Very Low levels at most monitoring locations, for most directions, over the past year. Low average directional dust flux levels were recorded from the southwest and west at Stn 9, and from the east at Stn 6A.

The cause or causes of these consistently but marginally elevated dust soiling rates at this monitoring point are under review, as they may be related to site activities such as operations at the PSV yard and/or the toast rack at Stn 9, and operations at Railhead at Stn 6A.

Table 3.4: Running average directional dust soiling (past 12 months)

Receptor location	Nearest / appropriate dust monitoring point		Direction (°)							
			0	45	90	135	180	225	270	315
Swithland Lane; Rushey Lane; Kinchley Lane	Stn 1	Average value	0.1	0	0.1	0	0	0.1	0.1	0.1
		Magnitude[b]	Very Low	Very Low	Very Low	Very Low	Very Low	Very Low	Very Low	Very Low
Swithland Lane; Rushey Lane; Kinchley Lane	Stn 1A	Average value	0	0.1	0.1	0	0	0.1	0.1	0.1
		Magnitude[b]	Very Low	Very Low	Very Low	Very Low	Very Low	Very Low	Very Low	Very Low
Swithland Lane; Rushey Lane; Kinchley Lane	Stn 1B	Average value	0.1	0	0	0	0.1	0.1	0.1	0.1
		Magnitude[b]	Very Low	Very Low	Very Low	Very Low	Very Low	Very Low	Very Low	Very Low
Mill Farm; Quorn House	Stn 3	Average value	0	0.1	0.1	0.1	0.1	0.1	0	0
		Magnitude[b]	Very Low	Very Low	Very Low	Very Low	Very Low	Very Low	Very Low	Very Low
Woodside Farm, Leicester Road	Stn 4A	Average value	0	0.1	0.1	0	0	0.1	0.1	0.1
		Magnitude[b]	Very Low	Very Low	Very Low	Very Low	Very Low	Very Low	Very Low	Very Low
Quorn Grange, Unitt Road, Northage Close, Quorn Park	Stn 4B	Average value	0	0.1	0.1	0.1	0.1	0.1	0	0.1
		Magnitude[b]	Very Low	Very Low	Very Low	Very Low	Very Low	Very Low	Very Low	Very Low
Bond Lane; Crown Lane	Stn 5	Average value	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
		Magnitude[b]	Very Low	Very Low	Very Low	Very Low	Very Low	Very Low	Very Low	Very Low
Sileby Road; Huston Close; Sileby Road (commercial)	Stn 6A	Average value	0.1	0.1	0.2	0.1	0.1	0.2	0.1	0.1
		Magnitude[b]	Very Low	Very Low	Low	Very Low	Very Low	Low	Very Low	Very Low
Hawcliffe Road	Stn 9	Average value	0.1	0.1	0.1	0.1	0	0.2	0.2	0.1
		Magnitude[b]	Very Low	Very Low	Very Low	Very Low	Very Low	Low	Low	Very Low
Glebe Close; Halstead Road (south); Halstead Road (north)	Stn 10	Average value	0.1	0.1	0	0.1	0.1	0.1	0.1	0.1
		Magnitude[b]	Very Low	Very Low	Very Low	Very Low	Very Low	Very Low	Very Low	Very Low
Loughborough Road; River Soar (marina / caravan park)	Stn 11	Average value	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
		Magnitude[b]	Very Low	Very Low	Very Low	Very Low	Very Low	Very Low	Very Low	Very Low
Meadow Farm Marina and Caravan Park	Stn 12	Average value	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
		Magnitude[b]	Very Low	Very Low	Very Low	Very Low	Very Low	Very Low	Very Low	Very Low
Quorn House Park	Stn 13	Average value	0	0	0.1	0	0	0.1	0	0.1
		Magnitude[b]	Very Low	Very Low	Very Low	Very Low	Very Low	Very Low	Very Low	Very Low

[a] Trigger mass deposition and Effective Area Coverage rates as in Section 7.3, ZLFMS-AG008 Dust Management and Monitoring Plan (Updated), 2015

[b] Magnitude of directional dust soiling derived from Beaman and Kingsbury, 1981

[c] Direction/s not determined for daily EAC below 0.1%/day (very low soiling)

4 Complaints

During June 2025, it is understood that seventeen complaints were received by the quarry. These were investigated in accordance with the procedure outlined in the DMMP.

Appendix A: Off-site PM_{10} monitoring (CBC and AURN)

The daily average PM_{10} concentrations recorded by the CBC Zephyr are presented below in Figure A.1, alongside similar data from the Defra Automatic Urban and Rural Network (AURN) station in Leicester University[4].

For the 12 months leading up to 25 June 2025, there were 361 daily PM_{10} readings taken by the CBC Zephyr, and 365 daily readings taken by the Leicester AURN, representing a >99 % data collection rate at each respective location.

From the available data the annual average daily PM_{10} concentration for the 12 months to date at CBC Zephyr was 13.97 µg/m^3, which is approximately 35 % of the annual average PM_{10} concentration objective (40 µg/m^3). At the Leicester AURN the annual average daily PM_{10} concentration for the 12 months to date was 13.1 µg/m^3 which is approximately 33 % of the annual average PM_{10} concentration objective.

For the 12 months up to 25 June 2025 there were three recorded instances where the daily average PM_{10} concentrations exceeded 50 µg/m^3 at the CBC Zephyr. In summary, for the 12 months up to 30 April 2025 neither the annual nor daily AQO have been exceeded.

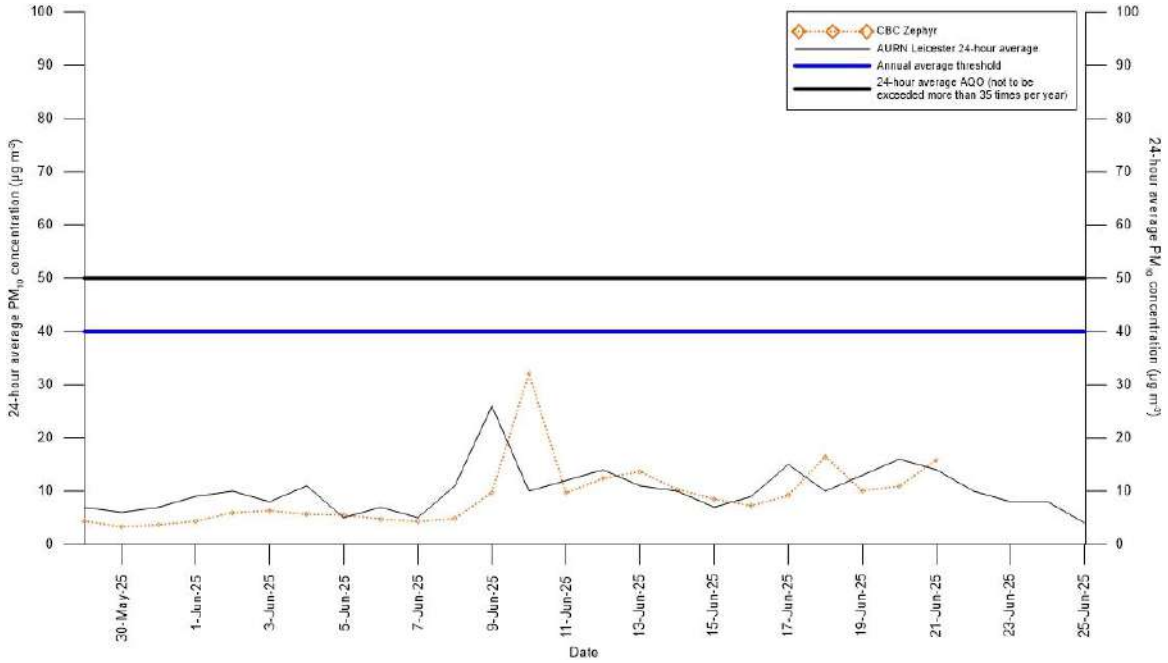

Figure A.1: Daily average PM_{10} concentration, CBC Zephyr and Leicester AURN, 29 May – 25 June 2025

[4] http://uk-air.defra.gov.uk/networks/network-info?view=aurn

Appendix B: Off-site $PM_{2.5}$ monitoring (CBC and AURN)

The daily average $PM_{2.5}$ concentrations recorded by the CBC Zephyr are presented below in Figure B.1, alongside similar data from the Defra Automatic Urban and Rural Network (AURN) station in Leicester University.

For the 12 months leading up to 25 June 2025, there were 361 daily $PM_{2.5}$ readings taken by the CBC Zephyr and 365 from the Leicester AURN, representing a >99 % data collection rate respectively. From the available data the annual average daily $PM_{2.5}$ concentration for the 12 months at the CBC Zephyr was 9.17 µg/m^3, which is approximately 76 % of the interim annual average $PM_{2.5}$ concentration objective (12 µg/m^3) applicable from 31 January 2023. At the Leicester AURN the annual average daily concentration was 8.58 µg/m^3, which is approximately 72 % of the interim target $PM_{2.5}$ concentration objective.

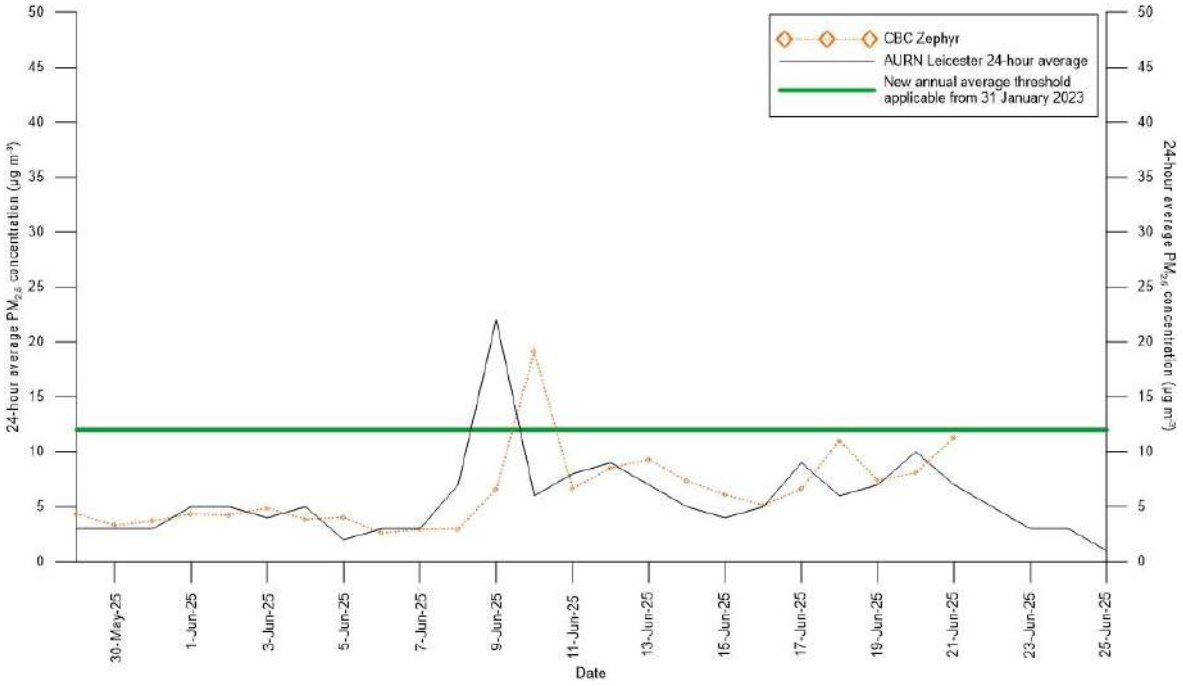

Figure B.1: Daily average $PM_{2.5}$ concentrations, CBC Zephyr and Leicester AURN, 29 May – 25 June 2025