



Dust Management and Monitoring Plan (v.6.2)

Mountsorrel Quarry, Quorn, Leicestershire

September, 2022

Tarmac Trading Ltd.



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1 Introduction

Tarmac Trading Ltd (Tarmac) operates Mountsorrel Quarry, a large granite quarry with associated processes, situated to the north of Leicester and near the communities of Quorn, Mountsorrel and Barrow upon Soar.

The quarry is consented for the extraction, processing and distribution of granite and associated quarry products until 31 December 2040. Quarry production is typically at a rate of approximately 4.5 million tonnes (Mt) per year.

The quarry produces crushed granite for use as railway ballast, road construction and other construction uses. Ready-mixed concrete and coated roadstone are also produced at the site, which also includes a secondary aggregates (aggregates recycling) facility.

A Dust Management and Monitoring Plan (DMMP) for the entire operation at Mountsorrel Quarry was prepared by Alex Grant AirQ in 2011¹, following a Review of Minerals Planning Permissions (ROMPP) application for the continuation of operations.

The 2011 DMMP was based in turn on the conclusions and recommendations provided in the air quality assessment (AQA) for Mountsorrel Quarry, which was prepared in 2009 as part of the Environmental Statement (ES) for the ROMPP application². The requirement for regular reviews was included in the DMMP. As part of the ongoing review process, the 2011 DMMP has been updated as necessary by DustScan Ltd, most recently in July 2020³, with further updates as necessary since.

An application to extend mineral operations at Mountsorrel Quarry was submitted in 2014 (2014/0067/02 (2014/CM/0011/LCC)) and consent was granted in October 2015. Condition No. 35 for the development stated, *inter alia*, that a revised DMMP for the extended quarry would be prepared.

The ES for the extension set out the development proposals in detail, and included a Dust and Air Quality Assessment (DAQA)⁴ that evaluated potential impacts to air associated with the quarry (including the extension) in relation to Air Quality Objectives (AQO) for nitrogen dioxide (NO₂) and fine particulate matter (PM₁₀), and dust annoyance.

As set out in the 2014 DAQA, it was determined that the extension, including the aggregates recycling operation would not cause a breach of the AQO for NO₂, and that PM₁₀ levels would continue to fall as a consequence of relocating and enclosing the primary crusher, and relocating and covering the primary surgepile.

'Nuisance' dust impacts would be unlikely to arise from the extension of the quarry, or relocation of the primary crusher or surgepile, but might arise due to landform modifications to the south and south-east. Consequently, supplementary dust monitoring is undertaken in the vicinity of the landform modifications.

¹ Alex Grant AirQ, Reference AG008-R01g

² Smith Grant LLP, Reference R1284-R01-v2

³ DustScanAQ, Dust Management and Monitoring Plan v.6.1

⁴ DustScan Ltd, Dust and Air Quality Assessment (2014)

The 2014 DAQA identified that there would be no change to the basic processes undertaken at Mountsorrel Quarry as a consequence of the consent, in that granite will continue to be quarried, processed and exported, and the site restored. Consequently, because the basic principles of the 2011 DMMP remained appropriate for the scale and nature of operations at Mountsorrel Quarry, an updated version of the 2011 DMMP was produced that took potential dust emissions the extended quarry operation into account (the Dust Management and Monitoring Plan (2015), abbreviated to DMMP (2015)⁵).

Previously, however and solely for land-use planning purposes the aggregates recycling area was considered as distinct from the rest of the quarry operation. From a dust management perspective this was unnecessary because the aggregates recycling facility is situated entirely within the main quarry operational area. Consequently, the 2015 DMMP was revised in 2017 to rectify that anomaly and logically incorporate the aggregates recycling area into the site, referred to as the Dust Management and Monitoring Plan (2017), abbreviated to DMMP (2017).

Subsequently, the 2017 DMMP was revised to also incorporate additional information with respect to the ballast rinsing plant at conveyor 41/42 transfer point near Barrow upon Soar Railhead. That version was referred to as the Dust Management and Monitoring Plan (2017 v.3), abbreviated to DMMP (2017 v.3).

A revision undertaken in 2018 addressed revisions to PM₁₀ monitoring put in place since 2017 and for simplicity was known as the Dust Management and Monitoring Plan (v.4), abbreviated to DMMP (v.4). An additional version (v.5) was also produced in 2019.

The previous version (v.6) was produced in April 2020 (with minor updates in July 2020, v6.1) to coincide with the release of updated monitoring and management plans for blasting and noise at the same time.

This version (v6.2) has been produced in June 2022 to address the development of a development of a recovery stockpile and scalping screen and revisions to the layout and position of the primary crusher.

⁵ DustScan Ltd, Dust Management and Monitoring Plan (2015)

2 Site operations and site setting

The quarrying and associated processes at Mountsorrel Quarry are summarised below.

2.1 Site operations

The mineral operations at Mountsorrel Quarry can be summarised in terms of four principal areas:

- Quarry (formerly Phase 1): located on land to the west of Wood Lane, this comprises the quarry void, primary crusher and primary surge pile, although as set out in the 2014 DAQA the primary crusher and primary surge pile are to be relocated at a lower level within the quarry void;
- Processing (formerly Phase 2): located between the quarry and Wood Lane, this comprises secondary, tertiary and quaternary crushing and screening;
- Asphalt and Loadout (formerly Phase 3): located to east of the Wood Lane, this comprises the aggregate stock area, covered storage (the 'toast rack'), a concrete batching plant, roadstone coating plants, secondary aggregates facility and HGV distribution; and
- Railhead: located in Barrow upon Soar, this is supplied by a conveyor system from Asphalt and Loadout, largely for rail distribution but with additional HGV distribution.

The consented quarry operation, also showing the approximate extent of the aggregates recycling facility (and the dust monitoring locations) is shown at Drawing No. 1.

2.2 Site setting

Quarry and Processing remain in an essentially rural setting and largely bounded by the remnants of Buddon Wood, whilst Asphalt and Loadout is located in a more developed setting, beyond the south-western extent of Hawcliffe Road and at the northern end of Mountsorrel.

The aggregates stocking ground, which essentially encloses the aggregates recycling facility is roughly 500 m north-west of the main residential area of Mountsorrel and 300 m south-west of Loughborough Road. The roadstone coating plants and concrete batching plant are about 140 m south-west of Loughborough Road.

The railhead is near to residential properties off Sileby Road, at the eastern end of Barrow-upon-Soar. The conveyor from Asphalt and Loadout to the railhead crosses the valley of the River Soar, and runs immediately to the east of the Meadow Farm Marina and Caravan Park. A ballast rinsing plant was installed at the conveyor 41/42 transfer point in order to improve the quality of the final product at railhead.

Other activities in the vicinity of Mountsorrel Quarry include a Leicestershire County Council (LCC) highways depot at the southern end of Hawcliffe Road, and a waste transfer station, a skip hire operation and a transport depot, a recycling depot and a mini-mix concrete plant

also immediately to the north of Asphalt and Loadout, off Granite Way. Continuing investigations into dust levels at and around Mountsorrel Quarry have identified these operations as also being sources of dust in the locality.

There is a pre-cast concrete business, with several batching plants and extensive outside stocking areas, on the south-east boundary of the railhead, with a plasterboard factory beyond. The A6 dual carriageway runs to the northeast of Quorn and Mountsorrel.

Land in the vicinity of the quarry has been subject to a number of residential planning applications, so as previously, the DMMP will continue to be revised as appropriate to consider new housing and other developments in the locality that might be affected by mineral operations at Mountsorrel Quarry.

3 Site management

The Quarry Manager⁶ will exercise, either personally or by delegation to suitably trained and responsible staff, day-to-day control of the site. They will be responsible for the satisfactory working of the whole site and for ensuring full compliance with the DMMP.

Staff at all levels will receive the necessary training and instruction in their duties relating to all operations and the potential sources of dust emissions. Particular emphasis will be given to plant and equipment malfunctions and abnormal conditions.

The Quarry Manager will ensure that customers and suppliers are aware of the need to comply with the provisions of this plan so far as they are relevant to their activities on site. Specifically, an information sheet summarising the requirements in respect of road transport will be handed to drivers employed by external hauliers. The drivers will be asked to sign for the sheet, acknowledging that they have read and understood the requirements.

Any member of staff who fails to comply with the provisions of the dust management and monitoring plan will be re-trained as necessary and may also be subject to disciplinary action. External hauliers failing to observe the requirements in respect of vehicle operations will be asked to leave the site.

⁶ The Quarry Manager is responsible for the overall management of Mountsorrel Quarry.

4 Potential for emissions

Dust is defined by the British Standards Institution as particles below 75 µm in diameter which settle out under their own weight but which remain suspended for some time⁷. Large particles tend to be deposited close to the source and smaller particles have the potential to travel greater distances.

Fine dust, essentially particles up to 10 µm, is commonly referred to as PM₁₀. PM₁₀ is measured to agreed standards and, through the National Air Quality Strategy (NAQS) objectives to be achieved for a range of pollutants, forms part of the Air Quality Objectives (AQO). The AQOs for PM₁₀ are 50 µg/m³ averaged over 24 hours, not to be exceeded more than 35 times per year and 40 µg/m³ as an annual mean.

The DMMP will be revised as necessary in accordance with changes to the NAQS, such as in relation to objectives for PM_{2.5}.

Coarser dust is generally regarded as 'nuisance dust' and can be associated with annoyance, although there are no official standards (such as AQO) for dust annoyance⁸. Coarse dust particles larger than 30 µm are generally accepted to make up the greatest proportion of dust emitted from mineral workings, and to be largely deposited within 100 m of the dust source(s)⁹. Adverse impacts due to nuisance dust are considered most likely to be experienced within this distance.

The principal potential sources of dust emissions at Mountsorrel Quarry were identified in the DAQA as:

- Soil stripping, storage and reinstatement;
- Overburden removal, placement and storage;
- Drilling and blasting;
- Mineral extraction, including loading and tipping;
- Mobile plant and site haulage;
- Mineral processing (crushing and screening, including recycled aggregate);
- Materials handling (including conveyors and ancillary processes) aggregates stocking and road transport, and
- Wind-whip from bare ground and exposed surfaces (including stockpiles).

As set out below, dust control at Mountsorrel Quarry is evaluated continuously through a programme of dust monitoring and managed proactively by means of an Site Improvement Plan (SIP). The SIP is an online resource for the quarry management team and is routinely reviewed as part of operational management at the site.

⁷ BS 6069 Part 2 British Standards Institution, 1994

⁸ Note that the expression 'nuisance dust' refers here to 'generally visible particulate matter' rather than specifically and in a legal sense to statutory nuisance, as defined in Section 79 of the Environmental Protection Act 1990.

⁹ Arup Environmental (1995) *The Environmental Effects from Surface Mineral Workings*

The results of the dust monitoring programme, and revisions to the SIP are regularly reviewed in consultation with LCC and Charnwood Borough Council (CBC), and where appropriate with the Environment Agency (EA).

4.1 Emissions in relation to the Air Quality Objectives (AQOs)

CBC declared an Air Quality Management Area (AQMA) in 2011 due to a predicted exceedance, relative to national background levels, of the 24-hour mean AQO for PM₁₀ in the vicinity of Mountsorrel Quarry and the other commercial and industrial activities off Granite Way.

A Partisol 2025 gravimetric sequential PM₁₀ sampler was installed by CBC at a 'worst case' location within the LCC depot at the southern end of Hawcliffe Road and a similar device was installed by the site operator nearby. Results from the CBC device are published routinely on the CBC website¹⁰ and until late 2017 data from both machines were reviewed as part of the actions associated with the DMMP.

PM₁₀ levels at both sampling locations have generally declined since 2011. The 2019 Air Quality Annual Status Report (ASR) CBC stated that recent monitoring data indicated that closer working with the quarry management team and the implementation of the DMMP have brought about a significant reduction ($\approx 25\%$) in the average PM₁₀ concentration at the sampling site (which is considered to be a worse case position) when compared to results prior to the declaration of the AQMA¹¹.

Since then, CBC have acknowledged that results from improved dust management at Mountsorrel Quarry show a positive influence in local PM₁₀ levels, showing that levels are in compliance with the air quality objectives.

To improve site dust management, a Turnkey Instruments Osiris real-time sampler was installed adjacent to the Partisol 2025 instruments. Following a calibration exercise, the Partisol operated by Tarmac was decommissioned and the Osiris used as the primary means of PM₁₀ monitoring for site operations.

A further Osiris device has been installed at Quorn Park House; data from this instrument shall be reviewed in relation to those from the sampler at the southern end of Hawcliffe Road to enable a greater understanding of PM₁₀ concentrations in the area.

PM₁₀ monitoring is discussed further at Section 7.5 below.

4.2 Fugitive and wind-blown 'nuisance' dust emissions

The 2014 DAQA found that at worst, there was up to a 'Medium-Low' risk of dust annoyance at a number of off-site receptors in the vicinity of Mountsorrel Quarry and the consented extension area. The assessed dust annoyance risk levels associated with the different aspects of the operation were set out at Table 12 of the DAQA (reproduced at Table 1).

¹⁰ https://www.charnwood.gov.uk/pages/mountsorrel_quarry

¹¹ Charnwood Borough Council 2019 Air Quality Annual Status Report (ASR)

Table 1: Summary of dust impact assessment, consented extension to Mountsorrel Quarry

| Location | Sensitivity ¹ | Working Area | Fugitive dust | Wind blown dust |
|---|--------------------------|--|---------------|-----------------|
| Mill Farm | Medium | Existing quarry | Near zero | Near zero |
| | | New primary crusher and covered surge pile | Near zero | Near zero |
| Quorn House | Medium | Extension (upper levels) and existing quarry | Near zero | Near zero |
| | | Haul route, new primary crusher and covered surge pile | Near zero | Near zero |
| Quorn Park ³ | Medium | Extension (upper levels) and existing quarry | Near zero | Near zero |
| | | Haul route, new primary crusher and covered surge pile | Near zero | Near zero |
| Northage Close | Medium | Extension (upper levels) and existing quarry | Near zero | Near zero |
| | | Haul route, new primary crusher and covered surge pile | Near zero | Near zero |
| Quorn Grange | Medium | Extension (upper levels) and existing quarry | Near zero | Near zero |
| | | Haul route, new primary crusher and covered surge pile | Near zero | Near zero |
| | | Stage 1: lowering northern mound | Near zero | Near zero |
| Unitt Road; Woodside Farm | Medium | Extension (upper levels) and existing quarry | Near zero | Near zero |
| | | Haul route, new primary crusher and covered surge pile | Near zero | Near zero |
| | | Stage 1: lowering northern mound | Near zero | Near zero |
| Hawcliffe Road | Medium | Stage 1: lowering northern mound | Near zero | Near zero |
| | | Extension (upper levels) and existing quarry | Near zero | Near zero |
| | | Phase 3 operations | Medium - low | Medium - low |
| Loughborough Road | Medium | Phase 3 operations | Low | Low |
| Bond Lane; Crown Lane | Medium | Phase 3 operations | Low | Low |
| Glebe Close | Medium | Stage 1 and Stage 2: modifying Site 1 and Site 2 landforms | Near zero | Near zero |
| Halstead Road (south) | Medium | Stage 1 and Stage 2: modifying Site 1 and Site 2 landforms | Near zero | Near zero |
| Halstead Road (north) ³ | Medium | Stage 1 and Stage 2: modifying Site 1 and Site 2 landforms | Near zero | Near zero |
| Swithland Lane | Medium | Stage 1: modifying Site 4 landform | Near zero | Near zero |
| Rushey Lane; Kinchley Lane | Medium | Stage 1 and Stage 2: modifying Site 1, Site 2 and Site 4 landforms | Medium - low | Low |
| Sileby Road, Huston Close; Sileby Road (commercial) | Medium | Railhead | Medium - low | Medium - low |
| River Soar (marina / caravan park) | Low | Conveyor | Medium - low | Medium - low |

Notes:

¹ Assessment of sensitivity to dust based on Table 7, NPPF (2012)

² Assessment of screening is made from the level of vegetative (or other) screening between the potential source/s

³ Planning applications for residential development currently in progress

From this, the DAQA also set out (at Section 6.4.1) areas where amendments to the DMMP for Mountsorrel Quarry were required, relating to:

- Overburden removal, particularly on the northern site boundary where close to receptors;
- Overburden placement at Site 2 (extension) and Site 4;
- Extraction within the upper levels in the extension on the northern site boundary;
- Introduction of the new crusher and surge pile (both enclosed);
- Site haulage - mineral below quarry rim but more exposed into the overburden placement areas, and
- Minor construction works for the lorry park.

Potential dust emissions from such activities and processes taking place at specific areas of Mountsorrel Quarry shall be controlled by the same management processes that are already applied to the existing quarry operations.

As set out in Section 7 of this DMMP, directional and deposited dust is monitored on a long-term basis at 9 locations at and around Mountsorrel Quarry. The monitoring locations have been selected with monitoring dust emissions from both the general operation of the quarry and the extension area in mind. As noted below a further monitoring location has been selected to obtain baseline monitoring data for the proposed northern extension.

For the duration of landform works in Stage 1 of the consented quarry extension programme, the existing dust monitoring stations are supplemented by two temporary monitoring stations located to the north and south of Kinchley Lane.

A further station has been installed on land within the marina at Barrow-upon-Soar, to monitor potential dust emissions arising from the ballast rinsing plant. In addition, an additional station has been sited within the grounds of Quorn Park House, to further increase the monitoring coverage.

As set out below, results from the dust monitoring stations are used to evaluate the efficacy of dust control measures as part of the ongoing quarry operation, with resultant revisions to the DMMP as appropriate.

In addition, short-term dust monitoring equipment has been deployed elsewhere in the site and such equipment may also be used at times as necessary.

Where material changes could lead to changes in dust emissions, the sampling programme will be reviewed as appropriate. Any changes in the dust monitoring programme shall be agreed with CBC before implementation.

4.3 Weather

Weather conditions (especially wind and precipitation) can significantly affect dust propagation at a minerals site. Consequently, a trigger system has been adopted to identify those weather conditions when there is an increased or high risk of wind-blown dust.

The trigger levels are detailed in Table 2.

Table 2: Wind speeds and associated dust ‘risk’ levels

| Wind speed | | Precipitation | | |
|------------|---|---------------|---------|------------|
| m/s | Beaufort Scale | Dry | Showers | Heavy Rain |
| > 6 | 4+ Dust and loose paper raised. Small branches begin to move. | Red | Amber | Green |
| 2 – 6 | 2 – 3 Wind felt on exposed skin. Leaves rustle. Wind vanes begin to move. | Amber | Green | Green |
| < 2 | 0 – 1 Smoke drift indicates wind direction. Leaves and win vanes are stationary. | Green | Green | Green |

5 Means of prevention

Standard good practice on dust control is set out in various publications, including PGN 3/08(12) which sets out at Section 5 a summary of best available techniques for dust control at minerals sites. In accordance with good practice guidance, potentially unacceptable dust emissions from minerals sites can be addressed through a dust management plan¹².

5.1 General requirements

Quarrying and associated operations at Mountsorrel Quarry are currently governed by a planning permission, reference 2014/0067/02. The processes which are carried on at Mountsorrel are regulated under two Pollution Control and Prevention (PPC) permits issued by CBC:

- Permit No 21A, in respect of the quarry processes, roadstone coating plants and recycling operation; and
- Permit No 014, in respect of the concrete batching process.

These permits include conditions based on the adoption of best available techniques (BAT) as detailed in the relevant process guidance notes^{13,14,15,16}.

Tarmac has implemented accredited Environmental Management Systems (EMS) across all of their UK sites. The control of dust and air quality impacts forms an integral part of the EMS. This accords with the Process Guidance Notes (PGN) which set out the desirability of a structured approach to environmental management.

This DMMP is based on the current and likely future planning conditions, PPC permits, the Tarmac EMS and appropriate best practice for the minerals industry in general. Many of the provisions in this plan are carried out by Tarmac as a matter of course.

From above, the 2019 Air Quality Annual Status Report undertaken by CBC noted that there had been a significant reduction ($\approx 25\%$) in PM_{10} levels at and around Mountsorrel Quarry since the declaration of the Mountsorrel Air Quality Management Area. A range of dust monitoring and management measures were implemented as part of the 2011 DMMP, which are recognised to have helped reduce dust emissions from Mountsorrel Quarry. These have been largely retained (or modified as required according to new information).

A schedule of actions was appended to the 2011 DMMP. These essentially comprised 'Routine' actions (whereby specific activities were to take place regularly at Mountsorrel Quarry), and 'Process-specific' actions, whereby specific actions were to take place as part of certain processes or within certain facilities within the quarry.

The dust management and monitoring actions scheduled in the 2011 DMMP have been implemented, thus the Routine and Process-specific dust management and monitoring

¹² AEA Technology, 2010: *Good practice guide: control and measurement of nuisance dust and PM_{10} from the extractive industries*

¹³ Process Guidance Note 3/1 (12) *Statutory guidance for blending, packing, loading, unloading and use of cement*

¹⁴ Process Guidance Note 3/8 (12) *Statutory guidance for quarry processes*

¹⁵ Process Guidance Note 3/15 (12) *Statutory guidance for roadstone coating*

¹⁶ Process Guidance Note 3/16 (12), *Statutory guidance for mobile crushing and screening*

actions for Mountsorrel Quarry have been updated from the 2011 DMMP and are reproduced at Table 3 (Routine actions) and Table 4 (Process-specific actions).

5.2 Site Improvement Plan (SIP)

The DMMP is proactively managed at Mountsorrel Quarry through the Site Improvement Plan (SIP). The SIP sets out a schedule of actions for specific areas of the site where dust control measures are to be implemented.

From Table 3, the SIP is reviewed monthly basis with actions identified, prioritised, implemented and reviewed accordingly. As an online resource the SIP is a 'living' document (*i.e.* it is subject to continual change).

5.3 Weather conditions

As an over-riding requirement, during dry windy weather, *i.e.* 'red' conditions as defined in Table 2, if any operations are identified as causing or likely to cause visible emissions across the site boundaries, or if abnormal emissions are observed within the site, the Quarry Manager will immediately modify, reduce or suspend those operations until either effective remedial actions can be taken or the weather conditions giving rise to the emissions have moderated.



Figure 1: Automatic weather station, Mountsorrel Quarry

As shown in Figure 1, a Davis Instruments Vantage Pro 2 automatic weather station is installed at the new Granite Way offices. The weather station records a wide range of meteorological data: wind speed (m/s), wind direction ($^{\circ}$), temperature ($^{\circ}$ C) and daily precipitation (mm). Real-time weather data are accessible remotely by all relevant

personnel via a GSM connection and hosted website¹⁷, and are used in monthly dust reports which are reported to CBC, LCC and the EA.

The weather data are used in reviewing the dust data and site observations, as part of the SIP.

Wind data are valuable in establishing the potential for dust propagation towards off-site receptors, and temperature and precipitation data can be used in considering the level of dust 'risk', in that there is a lower risk of dust in cool, wet conditions than hot, dry conditions.

5.4 PM₁₀ predictions

As part of ongoing improvements to dust and particulate matter management, the quarry now make use of a PM₁₀ predictor tool developed for the operation by DustScanAQ. This tool is based on historic site-specific meteorological and PM₁₀ data which enables site staff to minimise unacceptable emissions occurring.

The predictor utilises open-access 5-day meteorological forecast data with a 3-hour resolution from a reputable source. A summary of these data is presented alongside the PM₁₀ predictions for each 3-hour period of the following day.

PM₁₀ predictions are sent out each day at a time agreed with quarry management to ensure that they can prepare for the following day. The predictor output (Figure 2) is designed to be quickly and easily understood by quarry or site managers who have to control dust and PM₁₀ concentrations in the context of numerous operational considerations around different on-site processes. The prediction is in the form of a simple 'traffic light' colour system which allows rapid and efficient interpretation of dust/air quality risks.

To ensure that the predictor continues to be a useful management tool, the model's performance is continually assessed against site-specific monitored data on a regular basis and its efficacy is regularly reviewed in consultation with the site management team. These regular reviews enable performance monitoring and the opportunity to detect any new patterns that develop with continued operation of the predictor.

¹⁷ <https://www.weatherlink.com/embeddablePage/show/725ad4f5ba9d4dcc8e715edbc63728bc/summary>

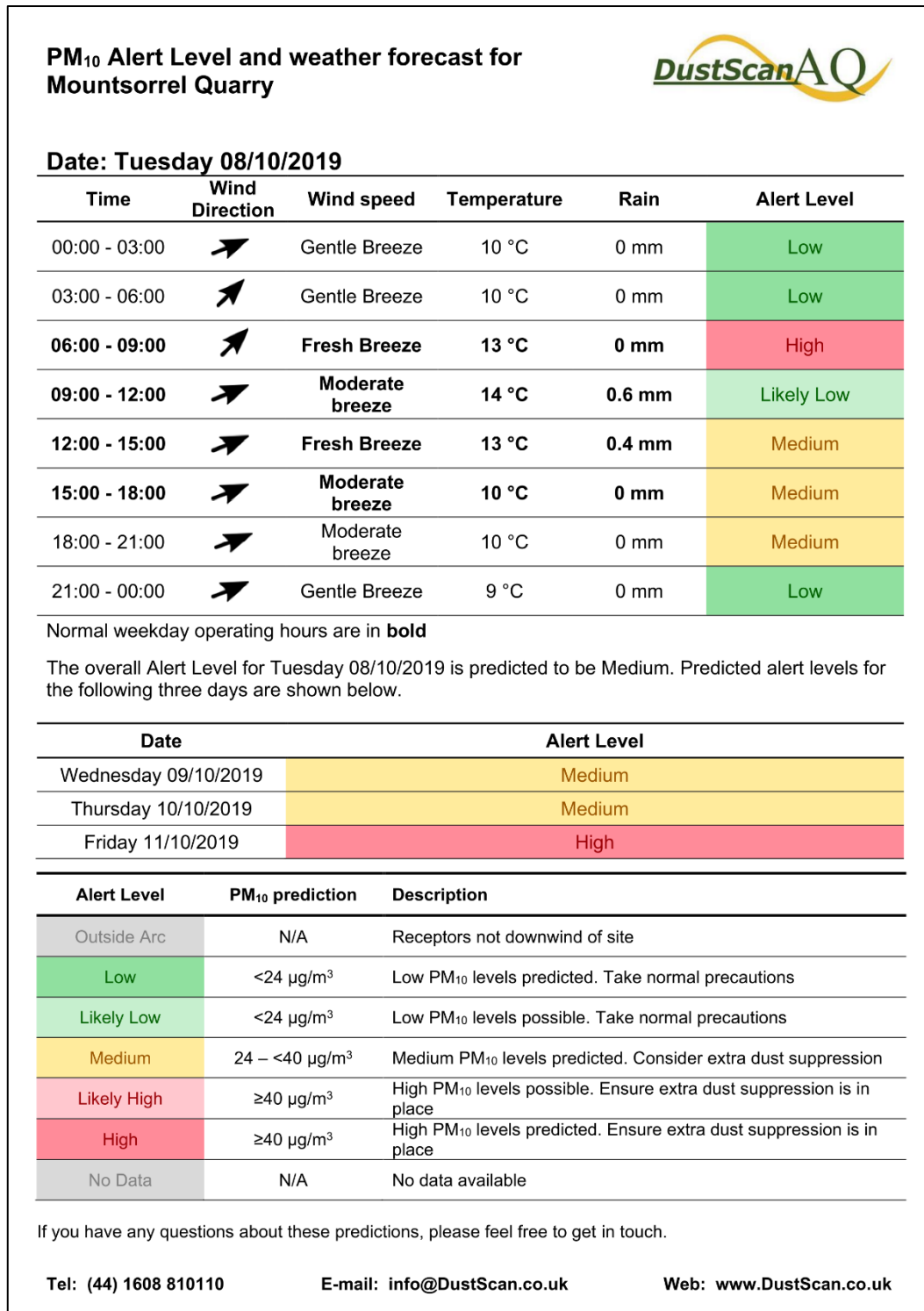


Figure 2: Example predictor output

5.5 Dust sources

From the DAQA, a range of activities at Mountsorrel Quarry has been identified with the potential to generate dust. These are considered below. Any additional potential dust sources identified as part of the proposed northern extension will be addressed accordingly.

5.5.1 Soil stripping, storage and reinstatement

Soils handling is generally a short-lived seasonal activity and there is considerable flexibility as to its timing. Some dust, however, might be raised due to the requirement to handle soils in a dry friable condition.

From the 2014 DAQA, soils are removed by hydraulic excavator and transported using articulated dump trucks. There are ground clearance operations (including removal of trees and scrub) associated with the consented quarry extension, especially during the latter stages of Stage 1, when the Northern Mound is lowered.

From the 2009 AQA, the surface soils around the Mountsorrel Quarry are generally water retentive. Consequently, soil stripping, storage and restoration operations are considered unlikely to give rise to significant airborne dust emissions

As a general provision, soils handling operations shall be suspended, or moved to another part of the site, should visible dust be carried towards any sensitive boundary. Soil storage mounds, except those of marl overburden which is cohesive and is allowed to seed naturally and replaced soils will be sealed and seeded as soon as is practicable.

5.5.2 Overburden removal, placement and storage

As noted in the 2014 DAQA, there is generally a moderate to high potential for dust to arise during overburden handling, placement and storage, although overburden can usually be worked at higher moisture contents than soils thus reducing the risk of unacceptable dust emissions. The overburden at Mountsorrel Quarry is a cohesive marl-type material from which high levels of dust emission are therefore considered unlikely.

Operations for the consented quarry extension involve both the relocation of existing overburden storage and the removal of overburden from areas to be quarried. From the 2014 DAQA, part of the Northern Mound will be lowered towards the end of Stage 1 to facilitate relocation of the primary crusher and new conveyor to Processing; also, part of the Southern Mound (Site 2) will be removed to enable the south-eastwards extension of the quarry workings. Overburden will also be removed from the area currently occupied by the primary crusher.

Overburden will be used to re-profile and extend the stock area screen mound (Site 1) to the south, to extend the Southern Mound (Site 2) to the south and for the landform south of Kinchley Lane (Site 4). As the quarry develops (Stages 2-4) overburden from the rim of the quarry would be placed in the void.

Overburden is removed by hydraulic excavator and transported by articulated dump truck.

As with soils, overburden handling, placement and storage operations are considered unlikely to give rise to significant airborne dust emissions although there would be an increased risk of dust emissions during operations to modify the landforms to the south and west (Site 2 and Site 4). Consequently, temporary dust monitoring stations were located between the Southern Mound and nearby residential receptors on Kinchley Lane, Halstead Road and in Rothley Plain.

5.5.3 Drilling and blasting

Drill rigs will continue to be equipped with cyclones and filtration systems to treat the exhaust air. Blasting operations will be designed to avoid excessive breakage and fly rock and thus reduce dust emissions.

As such, drilling and blasting within the quarry void is unlikely to result in significant dust emissions beyond the quarry. At upper benches, however, there is a much greater risk of unacceptable dust emissions from blasting in particular; as set out below the Quarry Manager is required to take the necessary actions to reduce or suspend any operation or process causing visible dust emissions across the site boundary towards a sensitive receptor until the emissions can be controlled.

Additional dust control measures (such as the use of a fog-cannon) should be considered to reduce potential dust emission when blasting at the upper benches of the quarry as part of the quarry extension.

It might be necessary to restrict blasting operations on the upper benches in dry, windy conditions when there is an elevated risk of dust propagation over the site boundary towards sensitive receptors.

The Quarry Manager shall determine whether blasting shall be restricted according to operational and environmental conditions pertaining at the time. As a guide, blasting at upper levels may be restricted in 'Red' conditions as shown in Table 2.

5.5.4 Mineral extraction, including loading and tipping

As set out in the 2014 DAQA there is a relatively low risk of dust emissions from mineral extraction although there is a possibility of wind-blow from freshly exposed rock faces and during handling.

Blasted rock is loaded by face shovel into rigid dump trucks which transport the rock to the primary crusher. Loading of the blasted rock can result in localised dust emissions but these are retained within the quarry void. Consequently, as with blasting, there would be an increased risk of dust emissions over the site boundary when quarrying at the upper benches.

It might be necessary to restrict mineral handling on the upper benches in dry, windy conditions when there is an elevated risk of dust propagation over the site boundary towards sensitive receptors.

The Quarry Manager shall determine whether mineral handling shall be restricted according to operational and environmental conditions pertaining at the time. As a guide, mineral handling at upper levels may be restricted in 'Red' conditions as shown in Table 2.

As a general provision, drop heights will be controlled during all loading and tipping operations, particularly of soils near sensitive boundaries and of processed aggregates at the 'toast rack', aggregates stocking ground and concrete batching plant, to minimise the entrainment of dust into the atmosphere.

5.5.5 Mobile plant and site haulage

All site traffic will keep to designated haul routes to reduce the creation and subsequent entrainment of fine material into the atmosphere.

Standard good practices for site haulage include:

- avoiding abrupt changes in horizontal and vertical alignment;
- regular clearing, grading and maintenance of haul routes;
- setting an appropriate site speed limit;
- fitting heavy plant with upswept exhausts and radiator fan shields;
- evenly loading vehicles to avoid spillages; and
- regular application of water, whether by bowser or by fixed sprays, in dry conditions.

Haul routes across the surface of the site will be located where possible in positions which are remote from any sensitive boundaries. Temporary haul routes, such as those used for the creation of overburden mounds in Site 2 and Site 4 shall also be constructed to a high standard and shall be maintained as appropriate to maintain a smooth running surface. As with other unpaved haul routes these shall be kept damp in dry, windy conditions using a trailed or self-propelled water bowser.

All internal paved surfaces will be sprayed and swept as necessary. The fixed water spray system shall be extended where possible and the routes and schedules for road sweeping will be reviewed and re-defined as necessary.

Should mobile plant be required to travel on or cross the public highway (such as for overburden transport to Site 4 *via* a temporary crossing over Kinchley Lane) a mobile road sweeper shall be made available as required to prevent unacceptable levels of track-out accumulating on the road surface.

As a minimum requirement, the public highway shall be cleaned at least daily where mobile plant regularly travels on the public highway.

5.5.6 Mineral processing (crushing and screening, including recycled aggregates)

All crushing and screening operations, except for temporary installations and those involving recycled materials will take place within fully clad structures. Processing recycled aggregate, which essentially comprises Recycled Asphalt Planings (RAP) do not generally give rise to significant levels of dust and as indicated in Drawing No. 1, the aggregate recycling operation takes place well within the main quarry boundary and well away from sensitive receptors.

Fixed cladding is inspected, cleaned and repaired as a matter of routine. As a general measure any loose deposits will be removed, and any gaps or other damage will be repaired promptly. Rubber sealing strips to the conveyor entries and exits to each process building will be inspected and maintained as necessary.

The primary crusher is to be located within an enclosed structure within the quarry void; it is anticipated that the construction of a building large enough for tipping to take place within

the structure will significantly reduce the potential for dust emissions to occur during tipping. An atomised water misting system will be installed within the new primary crusher building to ensure that dust emissions from this stage of the operation are minimised.

Crushed rock from the primary crusher will be fed directly to a new stone scalplings screen, which will replace the larger consented screen house. A smaller proportion of the crushed rock would be used to feed a covered recovery stockpile.

The recovery stockpile would be located within the area currently occupied by the open surge pile. The stockpile and the elevated section of its feed conveyor would be fully covered with a steel frame metal clad structure.

Until the new primary crusher and covered surgepile are constructed, the existing facilities will be used, thus the existing control measures shall be maintained. The water sprays (with polymer sealant admix as appropriate) shall be used at all times and subject to operational constraints, the primary crush surge pile shall be kept as high as possible to minimise the drop height from the discharge of the conveyor.

The dust suppression sprays within the mineral processing buildings will be used at all times that processing is taking place. The dust extraction system in the secondary crusher house will also be used at all times. Vacuum dust extraction equipment has been fitted in the Processing crusher building and process dust control measures are under continual review. The mineral process buildings and control measures in place are summarised in Table 6.

As a general measure the throughput of the crushing and screening plant (including mobile plant) will be kept within the capacity of the plant to minimise spillages.

Also, as a general rule any spillages of loose fine material within the processing buildings will be vacuum cleaned or damped down before sweeping.

5.5.7 Materials handling (including conveyors), aggregates stocking and road transport

There is an ongoing programme of repair and renewal for conveyor roofing sheets and weather boards across the site. There is a programme of continuous cleaning for the conveyor system as a whole with emergency cleaning on demand if necessary.

All external conveyors will be inspected weekly. Records of the findings, and of any actions taken, will be kept in the site logbook.

Any damaged or missing covers and weather boards to conveyors, particularly between Asphalt and Loadout and the railhead, will be replaced promptly.

From detailed inspections of the plant site it has been recognised that not all external conveyors at Mountsorrel Quarry should be fitted with roof sheets and/or wind boards. This is due to a variety of reasons including the damp and cohesive nature of some of the transported material, the need for continuous visual inspection of the transported material, the deep v-shaped profile of the conveyor run, or the sheltered location within the site at which it the conveyor is located.

Where appropriate, however roofing and wind boards (on at least one side) should be installed on external conveyors.

Shrouding will be fitted to any transfer points and conveyor discharges where visible dust emissions occur. As a general provision, other potential impacts will be mitigated by:

- installation on an even alignment with no abrupt changes in grade;
- return belt cleaners, with arisings collected into a bin or cleaned up;
- maintenance of the structures and rollers to minimise spillages;
- shrouding of feed hoppers, transfer points and discharges;
- fixed sprays where required;
- clearance of any spillages to minimise accumulations of loose dry material around the structures; and
- minimisation of drop heights at feed hoppers and discharges.

Enclosure of the primary surgepile within a clad structure can be anticipated to significantly reduce dust emissions. Mineral will be transported from the primary surgepile to the secondary processing plant by means of a covered conveyor.

There is a programme of continuous improvement and water sprays have been fitted at a number of conveyor discharge points within Processing and Asphalt and Loadout.

As a general rule the surfaces of stockpiles will be managed to maintain a smooth profile and to minimise the spreading of loose materials throughout the stocking ground. The surfaces of stockpiles in the open will be sprayed as necessary using a water bowser.

Specific care will be exercised when handling aggregates within Asphalt and Loadout. Because the high PSV stone should not be wetted, additional water sprays have been installed around the traffic areas within Asphalt and Loadout. The stockpiles of high PSV stone will be kept below the tops of the bay walls.

Any spillages or accumulations of loose material in this part of the site will be cleared promptly.

The adequacy of water supplies to all sections of the quarry operation is regularly reviewed and improved when deemed appropriate. As a rule, a water bowser is used when fixed water supplies cannot be installed (e.g. in the quarry void) and manual controls for sprinklers are replaced with automatic controls when possible. Polymer sealant is used during loading operations at the Barrow-upon-Soar railhead.

Given that ballast rinsing and cleaning is an inherently wet process, it is unlikely to result in anything other than negligible dust generation. Any screening associated with this process shall take place in an enclosed screen house. A thickener shall be used to separate the fines from the water, which can then be recovered and recirculated. The fines shall be collected in settling ponds and removed from site routinely via HGV. Whilst the settled fines can be expected to be cohesive care shall be taken to minimise dust emissions during their removal and, if necessary additional control measures (such as avoiding carrying out the operation in dry, windy conditions or wetting down with a water bowser) shall be employed.

All HGVs carrying aggregates or other potentially dusty material into or out of the site shall be securely sheeted. This is monitored using CCTV at the site exit, with disciplinary action taken against any haulier breaking this rule.

All departing transport will pass through the wheel-wash and will then be inspected for cleanliness by driver. If necessary, the vehicle will be driven through the wheel-wash again and further inspected by the driver before proceeding towards the site entrance.

A road sweeper will be deployed at least twice weekly to clean the access road, the site entrance on Wood Lane, Granite Way and Loughborough Road, including Waterside Drive. Further deployments will be made promptly in the event of spillages or deposits occurring in these areas or elsewhere on the public highway. The routes and schedules for road sweeping will be reviewed and re-defined as necessary.

5.5.8 Construction

For short-duration construction programmes (beyond those identified in the 2014 DAQA) the potential for dust emissions to occur should be assessed as appropriate. As a rule, for the type of construction works envisaged at Mountsorrel Quarry dust impacts are unlikely but can be controlled by best practice, for example by ensuring that:

- Loose, dry and dusty materials such as cement powder and dry sand are stored and handled appropriately;
- Drop heights are kept to a minimum;
- Construction and demolition wastes are cleared promptly by appropriate means;
- Spillages are promptly cleared away to reduce the risk of track-out onto the public highway;
- Vehicle speeds are kept to a minimum on unpaved surfaces;
- A water bowser is available to damp down exposed surfaces, and
- A powered road sweeper is available to clear any track-out onto the public highway.

The control measures identified above are routinely in use at Mountsorrel Quarry and their implementation should be extended to the construction sites for as long as is appropriate.

5.5.9 Wind-whip from bare ground and exposed areas (including stockpiles)

The effects of wind blow across stripped surfaces, unpaved vehicle circulation areas, stockpiles, settling lagoons and ponds and other areas of bare ground will be minimised by ensuring that loose materials are removed or treated as necessary.

As noted in the 2014 DAQA, enclosure of the primary surge pile, and its relocation with the primary crusher below the rim of the quarry, is anticipated to significantly reduce the potential for dust emissions from this aspect of the operation.

Prior to establishment of the new covered surge pile, additional control measures, such as adjusting the height of the surge pile (to minimise rock fall distance and wind-whip) and the provision of additional, temporary screening (to reduce wind speeds across exposed areas) might be required towards the end of Stage 1, when the northern mound has been lowered but before the new primary crusher is operational.

Furthermore, as also noted in the DAQA, following soil and overburden removal there will be a low to moderate risk of wind-blow from bare ground during the eastwards extension of the quarry. The risks of wind-blow from bare ground will be greatest when quarrying takes place at the upper benches of the extension area, specifically to the north and east after relocation of the primary crusher, and to the east, following removal of the existing primary crusher.

During dry conditions, unpaved circulation areas and the surfaces of stockpiles in the open will be watered using fixed sprays or a water bowser. Water will also be applied as necessary with a water bowser to stabilise other loose bare surfaces such as near the quarry rim when quarry operations take place at upper benches of the extension area.

As a general provision, although receptors are generally already screened from the effects of dust from the site, the opportunity for further planting will be kept under regular review.

5.5.10 Roadstone coating

The roadstone coating process will continue to be carried out in accordance with the requirements of the PPC permit, which is based on the guidance in PGN 3/15 (12). The measures detailed in the preceding sections will be applied as appropriate to the process.

All alarms, pressure relief valves and filters will be checked in accordance with the maintenance schedule, to ensure that they are operational, before any filler or other fine powders are discharged from the road tanker into a silo.

The tanker driver will attend the discharge controls throughout and will immediately suspend the discharge operation should any alarm be activated or if a visible emission occurs. The Quarry Manager will be informed promptly, and no further discharge will take place until the cause of the event has been identified and remedied.

5.5.11 Concrete batching

The concrete batching operations will continue to be carried out in accordance with the requirements of the PPC permit, which is based on the guidance in PGN 3/1 (12). The measures detailed in the preceding sections will be applied as appropriate to the process. Because of the proximity of the process to sensitive receptors off Loughborough Road, specific measures will be taken to ensure that adverse impacts due to dust are not caused.

The greatest risk to local residents from dust associated with concrete batching is associated with accidental release of dry powders. This can usually be managed by best practice, as set out in PGN 3/1 (12).

Specifically, however, all alarms, pressure relief valves and filters will be checked in accordance with the maintenance schedule, to ensure that they are operational, before any cement and other cementitious materials are discharged from the road tanker into a silo.

The tanker driver will attend the discharge controls throughout and will immediately suspend the discharge operation should any alarm be activated or if a visible emission occurs. The Quarry Manager will be informed promptly, and no further discharge will take place until the cause of the event has been identified and remedied.

The fixed water spray system has been extended to increase dust control in the vicinity of the concrete batching plant.

5.5.12 Other matters

General matters and the management of the site can affect the likelihood of significant dust emissions. These include:

- the use of clean water for dust suppression to avoid re-circulating fine material;
- high standards of house-keeping to minimise track-out and wind-blown dust; and
- effective staff training in respect of the causes and prevention of dust.

The water supply to the dust suppression installations will be protected against frost to ensure its availability at all times.

The operation and settings of the fixed water sprays, which are operated by timers with a manual override, will be reviewed as necessary to ensure optimum performance in all weather conditions.

6 Maintenance

Effective control of airborne dust emissions requires the maintenance and proper operation of all plant and equipment, including fixed and mobile dust extraction and suppression equipment.

A programme of planned maintenance will be carried out on all plant and equipment in accordance with the manufacturers' recommendations to ensure that it operates at optimum efficiency. Stocks of essential spares and consumable items will be held at the site or kept readily available for use at short notice.

Any malfunction or breakdown leading to abnormal emissions will be dealt with promptly and operations will be modified or suspended until normal working can be restored. All such malfunctions and the actions taken will be recorded in the site logbook.

7 Emissions monitoring

Dust emissions at Mountsorrel Quarry will be monitored routinely by means of visual means, and 'passive' (unpowered) and 'active' (powered) equipment.

7.1 Visual observations

Activities with the potential to cause dust emissions, as detailed in Section 5, will be monitored at the start-up of operations and again in the early afternoon. This will include a visual assessment of any potential impacts at downwind receptors.

The trigger levels in Table 2 will be interpreted as follows:

- Red: All exposed areas of loose bare ground and stockpiles will be inspected and treated as necessary in accordance with Section 5.5.9;
- Amber: Loose bare ground and stockpiles within 100 m of the site boundary will be inspected and treated as necessary in accordance with Section 5.5.9, and
- Green: Wind-blown dust not normally likely to occur.

All observations and findings, including wind and other weather conditions, will be recorded in the site logbook. Should visible dust be generated, the Quarry Manager will act promptly to identify the source(s) of the dust and take the necessary corrective action.

Each event, its cause and the action taken will be recorded in the site logbook. If necessary to avoid nuisance, the Quarry Manager will instruct the reduction or suspension of any operation or process causing visible dust emissions across the site boundary towards a sensitive receptor until the emissions can be controlled.

Site personnel will be instructed to inform the Quarry Manager whenever visible dust emissions are observed, or appear likely to occur, as a result of any operation or process.

7.2 Stack emissions

The monitoring of particulate matter emissions from the roadstone coating plant stacks and the filtration equipment at the secondary crusher house and concrete batching plant will continue to be carried out and reported in accordance with the PPC permits for the processes as noted above.

7.3 Long-term 'nuisance' dust (dust deposition and soiling) monitoring

Deposited dust is monitored at 9 long-term locations at and around Mountsorrel Quarry using 'Frisbee-type' dust deposition samplers. Each sampler is fitted with an adhesive 'sticky pad' directional dust sampler around the collection bottle. The samples are collected on a monthly basis and analysed at a UKAS-accredited laboratory. A typical installation is shown at Figure 3.



Figure 3: Long-term combined 'Frisbee-type' deposited dust gauge with adhesive directional dust sampler at Railhead (Stn 6A)

The analyses are reported in terms of deposition rates for undissolved and dissolved solids ($\text{mg}/\text{m}^2/\text{day}$), pH and daily percentage effective area coverage (%EAC) in each of the eight principal directions. The reporting of effective area coverage, essentially a measure of soiling, permits an assessment to be made of the main direction(s) from which the collected dust arises.

The long-term deposited and directional dust monitoring locations are set out in Table 5 and shown in Drawing No. 1. The locations have been selected to ensure that dust emissions potentially associated with quarry operations, including aggregates recycling are monitored over the longer term.

Recent guidance for the minerals industry recommends the application of site-specific dust thresholds¹⁸. Consequently, the deposited and directional dust data obtained at Mountsorrel Quarry will be interpreted in relation to current best practice guidance, the methods used and the sampling location/s.

Until site-specific thresholds are developed for Mountsorrel Quarry, a dust deposition rate of 125 mg/m²/day and a directional soiling rate of 0.5% effective area coverage per day will be applied as a 'trigger' for investigation to identify the likely dust source/s, taking account of the directional data and the sampling location. A record will be kept of the findings and of any actions which are subsequently taken.

The suitability of the dust monitoring regime will be reviewed over time. Any potential revision to the dust sampling locations methods or trigger levels will be discussed with CBC and LCC before implementation.

7.4 Supplementary 'nuisance' dust (dust deposition and soiling) monitoring

Two supplementary dust monitoring stations, comprising similar equipment to that used for long-term monitoring, are temporarily located to the south and south-east of the quarry site to monitor dust arising from landform construction works (the Southern Mound) during Stage 1 of the consented quarry extension programme.

The supplementary dust gauge locations are also shown in Drawing No. 1 and the sampler at the eastern end of Kinchley Lane is shown in Figure 4.

An additional dust monitoring station is temporarily located to the west of the ballast rinsing plant in order to monitor dust arising from the initial site development and standard site operation including the loading and removal of settled fines by HGV.

A further dust monitoring station shall be temporarily located within the grounds of Quorn Park House, initially to measure baseline conditions as part of the assessment for the proposed northern extension.

As a general rule, as required, supplementary dust monitors shall be located at strategic positions between short-term site operations and off-site receptors, according to the site conditions and the activities undertaken at the time.

¹⁸ AEA Technology, 2010: *Good practice guide: control and measurement of nuisance dust and PM₁₀ from the extractive industries*



Figure 4: Supplementary dust monitor towards the eastern end of Kinchley Lane (Stn 1A)

7.5 PM₁₀ monitoring

As noted above CBC monitor PM₁₀ concentrations at the southern end of Hawcliffe Road utilising a Partisol 2025 sequential air sampler. The sampler is recognised as appropriate for the detailed assessment of PM₁₀ under the LAQM regime.

Until late 2017 PM₁₀ was monitored by Tarmac at Stn 9, close to the CBC monitoring station using a similar sampler. The sampling head of the Partisol sampler is non-directional and, as noted by CBC, by comparison with the DEFRA Automatic Urban and Rural Network (AURN) data from other locations it was demonstrated that a significant number of occurrences of elevated PM₁₀ concentrations at Stn 9 were likely to have been 'transboundary', and not associated with quarry operations at Mountsorrel Quarry.

Consequently, a Turnkey Instruments Osiris real-time sampler was installed adjacent to the Partisol 2025 samplers and, after a period of calibration in late 2017 the Partisol operated by Tarmac was decommissioned.

A further Osiris device has been installed within the grounds of Quorn Park House.

Although not a filter reference device, the Osiris sampler is certificated by MCERTS¹⁹ for PM₁₀ in the range 0 – 100 µg/m³. The Osiris samplers were installed by the manufacturer

¹⁹ Sira Certification Service, MCERTS Performance Standards for Indicative Ambient Particulate Monitors, Version 2, dated July 2012

and will be maintained in accordance with the manufacturer's specifications, by means of a service contract. The Osiris sampler has the considerable advantage over the Partisol samplers in that an integral anemometer and wind gauge has been fitted to enable directional reporting, and data are reported in real-time.

A system of alerts for high PM₁₀ levels by direction has been set up to advise relevant personnel at Mountsorrel Quarry (and so that action can be taken). In addition, data from the device at the southern end of Hawcliffe Road has been utilised as part of a predictive PM₁₀ reporting tool as detailed above in Section 5.4.

The Osiris sampler at the southern end of Hawcliffe Road, alongside the Partisol 2025 it replaced is shown in Figure 5.



Figure 5: On-site Partisol 2025, Turnkey Osiris and CBC Partisol 2025 beyond, Stn 9 (Hawcliffe Road, Mountsorrel Quarry). A portable PM₁₀ monitor is also shown (see text for details)

Investigations at and around the quarry using a portable PM₁₀ monitor indicated that relative PM₁₀ concentrations were lower in most residential areas than near potential PM₁₀ sources (including off-site industrial activities).

A monthly site inspection, including a review of principal dust-generating activities and potential dust sources within and beyond the site is undertaken with the findings presented to the quarry management team so that appropriate actions can be taken.

7.6 Reporting

A monthly summary and review of the PM₁₀ and dust data, including the results of any investigations into potential nuisance or exceedances of the NAQS 24-hour mean objective for PM₁₀, will be prepared.

The findings will be passed to LCC, CBC and the EA within two weeks of Tarmac receiving the results and will be used to inform the need for any action or additional mitigation which may be agreed to ensure compliance with the NAQS or to avoid nuisance.

8 Emergency response

An emergency response procedure, to be followed in the event of a major dust emission, will be issued to all site personnel and the drivers of cement and filler tankers.

Laminated copies of the procedure will be posted at strategic points around the site including:

- processing plant control rooms;
- 'toast rack' and railhead control rooms;
- roadstone coating and concrete batching plant control rooms;
- silo inlet points; and
- workplace canteens.

For the purposes of emergency response, major dust emissions will be defined as including:

- visible dust crossing the site boundaries;
- fugitive dust from clad structures;
- fugitive dust from conveyor hoppers, transfer points and discharges;
- persistent fugitive dust when loading or tipping soils, rock or aggregates;
- visible emissions during silo deliveries;
- fugitive dust during roadstone or concrete loading operations;
- persistent fugitive dust from transport or plant movements; and
- persistent wind-blown dust.

The contact details of key personnel and organisations will be listed in the procedure and are reproduced at Appendix 1.

9 Complaints

All complaints will be recorded and reported to the Quarry Manager, who will investigate the circumstances and ensure that the necessary corrective measures are taken.

A prompt response will be made to the complainant and a record, including copies of all correspondence and telephone file notes, will be made in the complaints register.

LCC and CBC will be notified of any dust complaint received, together with details of the findings of the investigation and any corrective measures which have been taken.

In the event of any dust complaint substantiated after consultation with CBC the effectiveness of the dust management and monitoring plan will be reviewed.

10 Review and update

Quarterly meetings will be held with CBC to review the dust and PM₁₀ monitoring data and any specific actions which may be indicated by the results. Particular attention shall be paid to the results of any temporary or short-term monitoring results.

The continuing effectiveness of the dust management and monitoring plan will be reviewed in consultation with LCC and CBC every two years. The reviews will take into account the compliance records, complaints history, monitoring records and any recent sensitive developments on neighbouring land.

The plan will be amended as necessary, including any changes to the monitoring methods and control measures which may be agreed.

Reviews of the plan will also be undertaken in the event of:

- breaches of the NAQS 24-hour and annual mean objectives for PM₁₀;
- exceedances of the nuisance dust deposition and soiling rates;
- changes to the PPC permit regime; or
- following any reasonable request of CBC or the Mineral Planning Authority following changes to NAQS for PM_{2.5}.

Any agreed changes to the dust management and monitoring plan will be incorporated in the PPC permits and site EMS as appropriate.

DustScanAQ
September 2022

TABLES

Table 3: 'Routine' dust management and monitoring actions, Mountsorrel Quarry

| Routine actions | |
|-----------------|--|
| Frequency | Actions |
| Twice weekly | Deploy road sweeper on the access road, site entrance on Wood Lane, Granite Way and Loughborough Road (and as necessary) |
| Weekly | Inspect external conveyors |
| Monthly | Inspect cladding to crushing and screening processes |

| Monitoring | |
|-------------|--|
| Frequency | Actions |
| Twice daily | Visual inspections using trigger system (and if weather conditions vary) |
| Monthly | Collect dust deposition and soiling samples (by Socotec/ESG) |
| | Summarise and review PM ₁₀ and dust data |

| Management | |
|------------|--|
| Frequency | Actions |
| Monthly | Review and update Environmental Action Plan as necessary |
| Quarterly | Meet with Charnwood Borough Council and Leicester County Council to review monitoring data and actions |
| Biennially | Review and amend DMMP (more frequently as required) |

Table 4: ‘Process-specific’ dust management and monitoring actions, Mountsorrel Quarry

| Process-specific actions (part) | |
|--|---|
| Soil stripping, storage and reinstatement | Suspend soils handling if visible dust is carried towards a sensitive boundary |
| | Seal and seed soil storage mounds and replaced soils |
| Overburden removal, placement and storage | Suspend soils handling if visible dust is carried towards a sensitive boundary |
| | Consolidate and stabilise overburden storage mounds and replaced overburden |
| Drilling and blasting | Use drill rigs fitted with cyclones and filtrations systems |
| | Design blasting operations to avoid excessive breakage and fly rock |
| | Quarry Manager to assess risk of dust propagation from blasting according to wind speed and direction, and precipitation at upper levels |
| Mineral extraction, including loading and tipping | Control drop heights during loading and tipping |
| | Use water sprays at existing primary crusher; ensure atomisers correctly functioning at new primary crusher |
| | Minimise drop height onto existing primary crush surge pile (until replaced by covered surge pile) |
| | Spray dry surfaces of stockpiles with water |
| | Carry out loading and tipping operations in sheltered locations |
| | Use polymer sealant at railhead |
| Mobile plant and site haulage | Quarry Manager to assess risk of dust propagation from loading and tipping according to wind speed and direction, and precipitation at upper levels |
| | Keep site traffic to designated haul routes |
| | Adopt standard good practices for site haulage |
| | Locate site haul routes away from sensitive boundaries |
| | Spray and sweep internal paved surfaces as necessary, review road sweeping routes |
| Mineral processing (crushing and screening) | Carry out principal crushing and screening operations within clad structures |
| | Maintain rubber sealing strips to process building entries and exits |
| | Use dust suppression sprays during processing |
| | Use dust extraction system in secondary crusher house |
| | Keep throughput within capacity of plant |
| | Vacuum clean or damp down and sweep up any spillages |
| Materials handling (conveyors) | Replace any damaged or missing conveyor covers or weather boards |
| | Fit shrouding to transfer points and conveyor discharges |
| | Adopt standard good practices for conveyors |
| | Maintain foam dust suppression system in Phase 1 |

Table 3 (continued): ‘Process-specific’ dust management and monitoring actions, Mountsorrel Quarry

| Process-specific actions (continued) | |
|--|--|
| Materials handling (ballast rinsing plant) | Avoid loading fines in dry, windy conditions |
| | Ensure dust suppression is available when rinsing plant fines are being loaded into HGVs for removal from site |
| Materials handling (aggregates stocking) | Manage and treat surfaces of stockpiles |
| | Manage heights of open stockpiles in the vicinity of Bond Lane |
| | Maintain screening vegetation on perimeter bund |
| | Hydro-seed surface of outer slopes |
| | Manage high PSV stockpiles |
| | Continue to extend water spray system for high PSV stockpiles |
| | Clear spillages |
| Materials handling (road transport) | Sheet all aggregates lorries |
| | Use wheel-wash and inspect vehicle for cleanliness (drivers) |
| | Inspect and upgrade fixed sprays on access road |
| | Ensure correct operation of CCTV camera at wheel-wash |
| | Review road sweeping routes |
| Construction | Store and handle loose, dry and dusty materials appropriately |
| | Minimise drop heights |
| | Manage wastes appropriately |
| | Clear spillages promptly |
| | Minimise vehicle speeds on unpaved surfaces |
| | Ensure water bowser and road sweeper available as required |
| Wind-whip from bare ground and exposed areas (including | Remove or treat loose materials |
| | Apply water to loose bare surfaces |
| | Review opportunity for further screening planting |
| Roadstone coating | Comply with permit for process |
| | Check alarms, valves and filters before discharging fine powders into silos |
| | Attend controls throughout discharge operations (tanker driver) |
| Concrete batching | Comply with permit for process |
| | Check alarms, valves and filters before discharging cement into silos |
| | Continue to extend spray system across stockpiles and yard |
| | Attend controls throughout discharge operations (tanker driver) |
| Other matters | Use clean water for dust suppression |
| | Maintain high standards of house-keeping |
| | Train staff about the causes and prevention of dust |
| | Protect water supply against frost |
| | Review operation and settings of fixed water sprays |

Table 5: Long-term dust monitoring locations, Mountsorrel Quarry

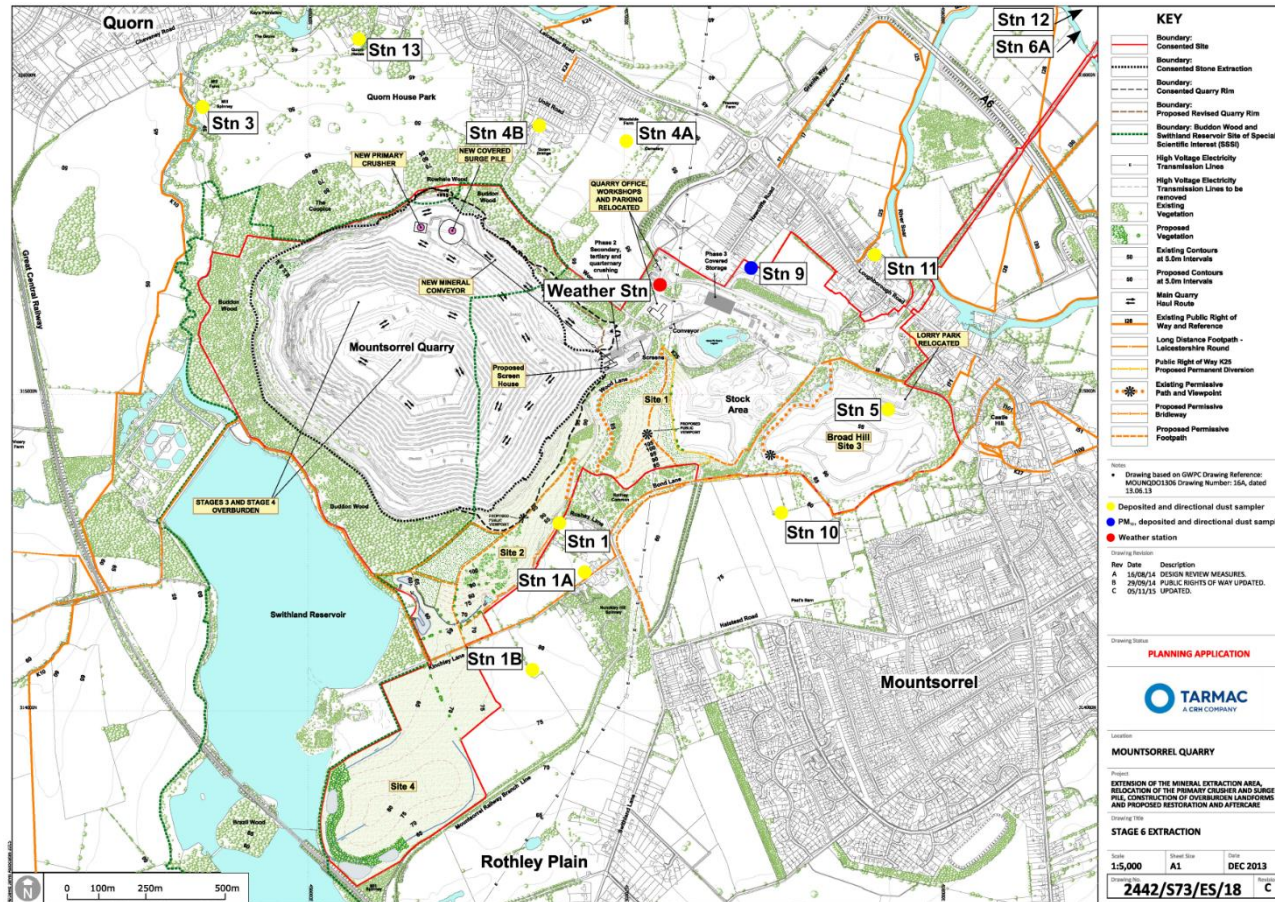
| Sampler reference | Easting | Northing | Locality monitored |
|--------------------------------------|---------|----------|---|
| Stn 1 | 456781 | 314577 | Swithland Lane; Rushey Lane; Kinchley Lane |
| Stn 1A | 456891 | 314436 | Swithland Lane; Rushey Lane; Kinchley Lane |
| Stn 1B | 456715 | 314109 | 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 | Sibley Road; Huston Close; Sibley Road (commercial) |
| Stn 9 (inc. PM₁₀) | 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 (inc. PM₁₀) | 456141 | 316075 | Quorn Park House |

Table 6: Summary of mineral process buildings and dust control status

| Phase | Building | Process | Dust extraction | Dust suppression | Cladding replaced | Status |
|---------|------------------------|-------------|-----------------|------------------|-------------------|--------|
| Phase 1 | Primary crusher | Crushing | N | Y | Y | Yellow |
| | Primary screening room | Screening | N | N | Y | Green |
| Phase 2 | Crusher building | Crushing | Y | Y | Y | Orange |
| | Screening building | Screening | Y | Y | N | Green |
| Phase 3 | Washing plant | Screening | N | Y | Y | Green |
| | Toast rack | Discharging | N | Y | Y | Green |

DRAWINGS

Drawing No. 1: Mountsorrel Quarry, showing approximate extent of aggregate recycling facility and ballast rinsing plant together with dust monitoring locations and consented extension



APPENDIX 1: contact details for key personnel and organisations

| Name | Position | Contact |
|------------------|---|--------------|
| Robert Lees | Area Operations Manager | 07787 555731 |
| Joanna Jones | Facilities and Compliance Manager | 07483 340300 |
| Josh Mason | Quarry Operations and Development Manager | 07484 010382 |
| Mathew Schlemmer | Process Manager (Phase 2) | 07483 175771 |
| Mustapha Nyass | Phase 3 Loadout, Asphalt and Sand Plant Manager | 07454 898998 |
| Abbey Withers | Railhead Manager | 07483 341737 |
| Paul Taylor | Nightshift Manager | 07872 672646 |
| Mick Stevens | Facilities and Estate Manager | 07803 953658 |