



# Hatfield Aerodrome (Appendix)

Town and Country Planning Act 1990,  
Section 78

Application for the establishment of a new quarry on land at the former Hatfield Aerodrome, including a new access onto the A1057, aggregate processing plant, concrete batching plant and other ancillary facilities, together with the importation of inert fill materials for the restoration of the minerals working

**Application Ref. 5/0394-16**

Section 78 Appeal against refusal of planning permission by  
Hertfordshire County Council.

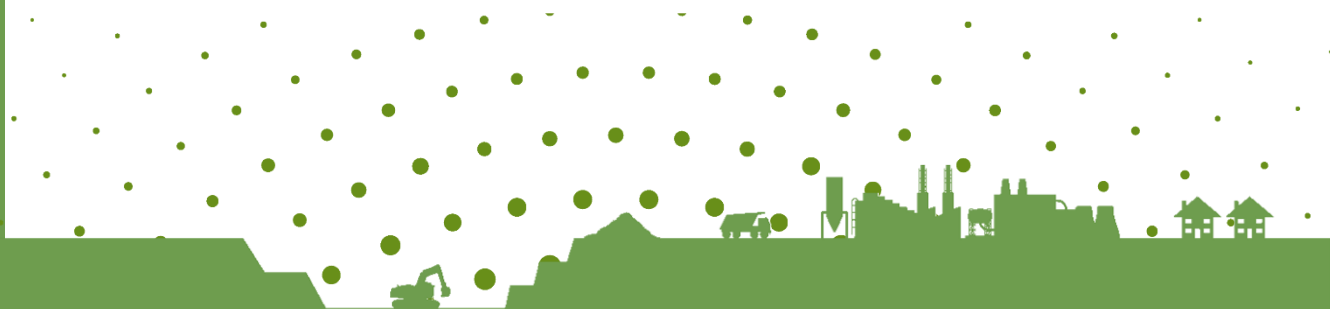
**Appeal Ref. APP/M1900/W/21/3278097**

Document BAL4/2

## **Air Quality Appendix – Dust Risk Assessment**

October, 2021

Brett Aggregates Limited





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## Appendix 1: Dust Risk Assessment

### Introduction

1. This technical note is written to set out the results of an IAQM minerals dust assessment undertaken by DustScanAQ for the proposed sand and gravel quarry at the former Hatfield Aerodrome site.
2. There is no standard method for carrying out dust assessments for minerals sites although this technical note has been prepared with reference to relevant documents and best practice guidance, including the National Planning Policy Framework (NPPF) and associated Planning Practice Guidance (PPG) relating to Air Quality<sup>1</sup> and guidance on dust and air quality assessments for minerals sites produced by the Institute of Air Quality Management (IAQM)<sup>2</sup>, together with guidance developed by Environmental Protection UK (EPUK) in conjunction with the IAQM<sup>3</sup>.

### Dust Sources

3. Potential sources or site activities that may give rise to dust as a result of the proposed development are:
  - Soil and overburden stripping, handling, storage and reinstatement;
  - Mineral extraction and handling;
  - On-site transportation;
  - Mineral processing; and
  - Wind scouring of exposed surfaces and stockpiles.
4. The potential dust sources are considered below. From these, the residual source emissions determined are stated per activity, which in turn are based on general knowledge of mineral processes. As stated by the IAQM minerals guidance (2016), estimation of residual source emissions is a matter of professional judgement based on knowledge of the site and its locality, the processes involved and how these might relate to corresponding activities at other minerals sites.
5. Dust control and mitigation measures that will be employed at the proposed site are set out in Table 9-1 of the 2016 Environmental Statement; these have been considered in this assessment.

### Soil and overburden stripping, storage and placement

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<sup>1</sup> Ministry of Housing, Community & Local Government (2014). *Guidance: Air Quality*. Available at <http://planningguidance.planningportal.gov.uk/blog/guidance/air-quality/>

<sup>2</sup> Institute of Air Quality Management (2016). *Guidance on the Assessment of Mineral Dust Impacts for Planning (v1.1)*

<sup>3</sup> Environmental Protection UK and the Institute of Air Quality Management (2017). *Land-Use Planning & Development Control: Planning For Air Quality (v1.2)*

6. There is potential for high levels of airborne and wind-blown dust propagation from soil stripping, storage and reinstatement although these are generally short-term, transient operations. There is also potential for moderate levels of dust emission during overburden removal, storage and replacement, although it can usually be worked at higher moisture contents than soils, thus reducing the risk of unacceptable dust emissions from this aspect of site operations.
7. Soils will be used in restoration and stored in screen bunds around the boundary of the site and extraction areas, whilst overburden will be used to restore previously worked phases.
8. The residual source emissions from soil and overburden stripping, storage and reinstatement after mitigation is applied are considered to be Small.

### **Mineral extraction and handling**

9. Minerals will be extracted wet. Consequently, there is a low risk of airborne dust propagation emissions from mineral extraction due to the method of extraction, the screening towards receptors, and the location of activities being within the quarry void. The residual source emissions from mineral extraction and handling are therefore considered to be Small.

### **On-site transportation**

10. There is a risk of dust propagation from transport on unpaved roads unless appropriate mitigation measures are applied. Extracted minerals will be transported to the plant site for processing. The internal haul route along the western boundary of the site will be screened from receptors to the west by existing vegetation.
11. The residual source emissions from on-site transportation are therefore considered to be Small.

### **Mineral processing and stockpile emissions**

12. Mineral processing and stockpiling will take place within the plant site. The IAQM Minerals Guidance (2016) states adverse impacts from sand and gravel sites are uncommon beyond 250 m. As there are no receptors within 250 m of the plant site, potential dust emissions from this area of the site have not been considered in this assessment.

### **Summary of residual source emissions (with mitigation)**

13. The estimated residual source emissions for proposed development are summarised below.

**Table 1: Summary of residual source emissions**

Activity	Residual Source Emission
Soil and overburden stripping, storage and reinstatement	Small
Mineral extraction and handling	Small
On-site transportation	Small
Mineral processing	n/a
Wind scouring of exposed surfaces and stockpiles	n/a

### **Meteorological data**

14. Meteorological conditions have a significant effect on the potential for dust propagation from a minerals site. Of particular importance are wind speed, wind direction and precipitation.
15. Dust can be carried from a source towards receptors (such as nearby homes and other businesses) according to the strength and direction of the wind. Precipitation is recognised to suppress dust and 0.2 mm of antecedent rainfall is considered sufficient to suppress windblown dust for a number of hours.
16. A wind rose showing the 'dry' hours<sup>4</sup> in 2015-2019 for Luton, the nearest appropriate reporting station, approximately 15 km to the north of the site, is presented below. This demonstrates that southwesterly winds are prevailing in this area, although winds from other directions do occur at lower frequencies. Data from Luton was used for this IAQM minerals dust assessment.

<sup>4</sup> 'Dry' hours are those with less than 0.2 mm liquid equivalent precipitation and are associated with an increased risk of dust propagation

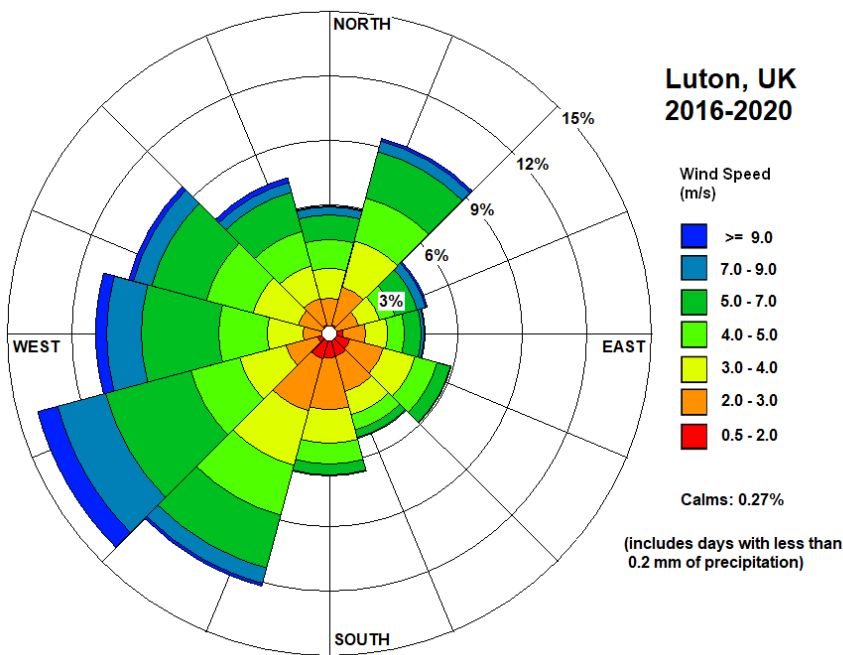


Figure 1: Wind rose, dry hours (five-year average), Luton 2016-2020

## Receptors

17. The IAQM minerals guidance (2016) sets out guidance regarding the sensitivity of human receptors to dust; for this assessment all residential properties are considered to have a High sensitivity and commercial receptors are considered to have a Medium sensitivity.
18. The IAQM minerals guidance (2016) also note that sensitivity to dust for ecological receptors may relate to international, national or local designation. There are no ecological receptors within 250 m with a specific sensitivity to dust.
19. Table 2 is a summary of receptors situated within 250 m of the site boundary, focusing on those included in previous assessments, along with the closest distance to dust-generating activities, and their sensitivity to dust soiling.

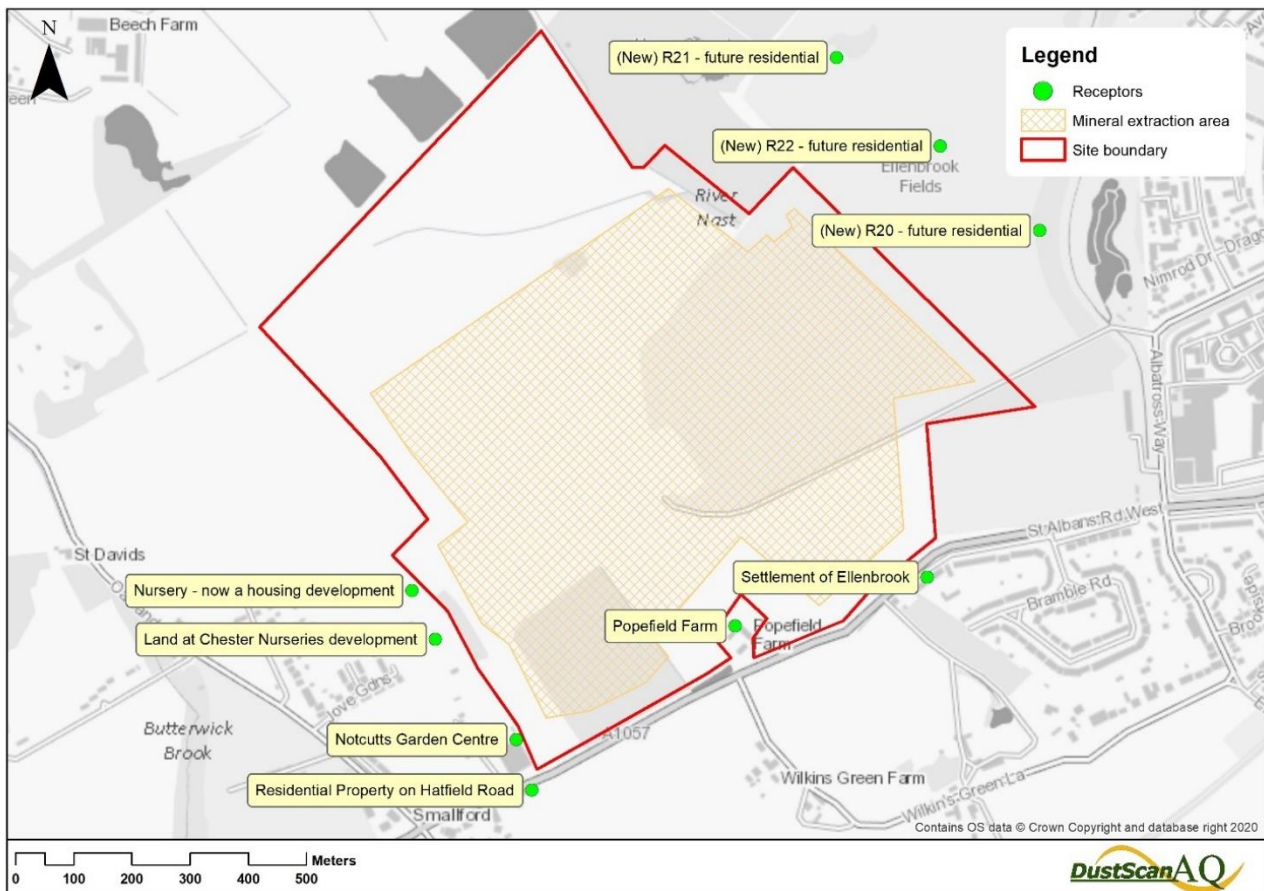
Table 2: Receptors

Receptor	Sensitivity	Nearest dust source location/s	Primary direction/s to dust sources (°)	Minimum distance to dust source (m)
Popefield Farm	High	Phases A, B, D, F, G and screening bunds	195 – 360 0 - 135	30
Settlement of Ellenbrook	High	Phase A and screening bund	255 - 015	45

Receptor	Sensitivity	Nearest dust source location/s	Primary direction/s to dust sources (°)	Minimum distance to dust source (m)
Nursery - now a housing development	High	Phase G and haul road	015 - 105	65
Land at Chester Nurseries development	High	Phase G and haul road	015 - 105	75
Notcutts Garden Centre	Medium	Phase G and haul road	015 - 075	60
Residential Property on Hatfield Road	High	Phase G and haul road	345 - 075	125
(New) R20 - future residential	High	Lagoon screening bund	195 - 255	220
(New) R21 - future residential	High	Lagoon screening bund	165 - 225	210
(New) R22 - future residential	High	Lagoon screening bund	195 - 255	205

20. The IAQM minerals guidance (2016) suggests that potential dust impacts arising from a minerals site may be considered in relation to the identified dust source activities and locations. From above, consideration is made of potential impacts to the receptors identified in Table 2 with regard to the dust sources set out above.





**Figure 2: Locations of receptors with respect to the proposed site and extraction area**

21. The distances shown in Table 2 are the minimum between any potential receptor and any given stage of site operations and thus can be considered to represent a 'worst-case' evaluation. Similarly, the directions to dust sources consider the maximum potential arc of direction, so are also considered to represent a 'worse-case' evaluation.

### Assessment criteria

22. The assessment has been carried out with reference to the IAQM minerals guidance (2016), as set out below.
23. IAQM suggest that minerals dust assessments are carried out in relation to three distance criteria, as reproduced in Table 3. These criteria have been applied to this assessment.

**Table 3: Categorisation of receptor distance from source (reproduced from IAQM, 2016)**

Category	Criteria
Distant	Receptor is between 200 and 250 m from the dust source
Intermediate	Receptor is between 100 and 200 m from the dust source

Category	Criteria
Close	Receptor is less than 100 m from the dust source

24. In addition to the above, wind speed is recognised to affect dust propagation. The IAQM minerals guidance (2016) suggests a range of wind speed criteria, as reproduced in Table 4. These wind speed criteria have been applied to this assessment.

**Table 4: Categorisation of frequency of potentially dusty winds (reproduced from IAQM, 2016)**

Frequency Category	Criteria
Infrequent	Frequency of winds (>5 m/s) from the direction of the dust source on dry days are less than 5%
Moderately frequent	The frequency of winds (>5 m/s) from the direction of the dust source on dry days are between 5% and 12%
Frequent	The frequency of winds (>5 m/s) from the direction of the dust source on dry days are between 12% and 20%
Very frequent	The frequency of winds (>5 m/s) from the direction of the dust source on dry days are greater than 20%

25. From this, the IAQM (2016) suggest that the effectiveness of the pathway for dust propagation may be evaluated by combining the distance/s to receptors and the frequencies of potentially dusty winds (as set out in Table 5). This method has been applied to this assessment.

**Table 5: Pathway effectiveness (reproduced from IAQM, 2016)**

		Frequency of potentially dusty winds			
		Infrequent	Moderately frequent	Frequent	Very frequent
Receptor Distance Category	Close	Ineffective	Moderately Effective	Highly Effective	Highly Effective
	Intermediate	Ineffective	Moderately Effective	Moderately Effective	Highly Effective
	Distant	Ineffective	Ineffective	Moderately Effective	Moderately Effective

26. The IAQM minerals guidance (2016) suggest that the 'risk of dust impact' may be assessed by considering the pathway effectiveness (from Table 5) with the residual source emissions (from Table 1), using Table 6. This approach has been followed for this assessment.

**Table 6: Estimation of dust impact risk (reproduced from IAQM, 2016)**

		Residual Source Emissions		
		Small	Medium	Large
Pathway Effectiveness	Highly effective pathway	Low Risk	Medium Risk	High Risk
	Moderately effective pathway	Negligible Risk	Low Risk	Medium Risk
	Ineffective pathway	Negligible Risk	Negligible Risk	Low Risk

27. Consequently, it should be recognised that these are wide ranging and therefore not prescriptive criteria and, as with all other aspects of dust assessment for minerals sites, rely on professional judgement based on the experience of the assessor.

28. From this, the magnitude of dust impacts may be extrapolated by combining the dust impact risk with the receptor sensitivity (noted above), as shown in Table 7. This approach has been followed for this assessment.

**Table 7: Descriptors for magnitude of dust effects (reproduced from IAQM, 2016)**

		Receptor Sensitivity		
		Low	Medium	High
Dust impact risk	High Risk	Slight Adverse Effect	Moderate Adverse Effect	Substantial Adverse Effect
	Medium Risk	Negligible Effect	Slight Adverse Effect	Moderate Adverse Effect
	Low Risk	Negligible Effect	Negligible Effect	Slight Adverse Effect
	Negligible Risk	Negligible Effect	Negligible Effect	Negligible Effect

29. Consequently, from the IAQM minerals guidance (2016) an assessment of the potential severity of dust impacts associated with the proposed development may be determined.

### Uncertainties, limitations and assumptions

30. As set out above, there is no standard method for carrying out a minerals dust assessment and the most recent guidance (IAQM, 2016) recognises the need for professional judgement in carrying out such an assessment. Consequently, an uncertainty associated with any minerals dust assessment is that the assessor's judgement is appropriate. The lead author of this assessment was suitably experienced

to carry out the assessment, and the assessment and calculations went through a rigorous internal review and approval protocol prior to issuing.

31. A limitation of any assessment is that it is carried out without the development in place, i.e. as a future scenario. Consequently, it is not possible to make any quantification of the potential impacts although every effort has been made to accurately assess any potential impact of the proposed development.
32. A limitation of this assessment is that it has been carried out with reference to weather data from beyond the site boundary. This is in accordance with the IAQM minerals guidance (2016).
33. It is assumed that the site will be developed and operated as described for the purposes of this assessment.
34. It is assumed that the receptors chosen will be representative of the worst-case receptors within the surrounding area.
35. It is assumed that there will be no change in the relevant AQO, or that any AQO or similar national or local objective, threshold or limit value will be introduced for disamenity dust.
36. It is assumed that the mitigation measures set out in the previous Environmental Statement will be adopted if planning consent is granted, and that the mitigation measures will be applied as recommended, and consequently that the residual source emission values determined in this assessment will be realistic estimates of dust emissions associated with the operations described.

## Assessment results

37. The results of the dust assessment and the potential impacts from the proposed quarry on nearby receptors are set out below.

**Table 8: Outcome of dust assessment for relevant receptors potentially affected by dust from the proposed development during site preparation (soil and overburden removal, handling and placement – estimated to take 6 weeks)**

Receptor	Sensitivity	Dust source location	Pathway Effectiveness	Dust Impact Risk	Magnitude of Dust Effects
Popefield Farm	High	Southern soil bund	Highly Effective	Low Risk	Slight Adverse Effect
Settlement of Ellenbrook	High	Phase A soil bund	Highly Effective	Low Risk	Slight Adverse Effect

Receptor	Sensitivity	Dust source location	Pathway Effectiveness	Dust Impact Risk	Magnitude of Dust Effects
Nursery	High	Phase G preparation	Moderately Effective	Negligible Risk	Negligible Effect
Land at Chester Nurseries development	High	Phase G preparation	Moderately Effective	Negligible Risk	Negligible Effect
Notcutts Garden Centre	Medium	Phase G preparation	Ineffective	Negligible Risk	Negligible Effect
Residential Property on Hatfield Road	High	Phase G preparation	Moderately Effective	Negligible Risk	Negligible Effect

**Table 9: Outcome of dust assessment for relevant receptors potentially affected by dust from the proposed development during mineral extraction (including mineral extraction and handling and on-site transportation)**

Receptor	Sensitivity	Dust source location	Pathway Effectiveness	Dust Impact Risk	Magnitude of Dust Effects
Popefield Farm	High	Phase A	Ineffective	Negligible Risk	Negligible Effect
		Phase B	Ineffective	Negligible Risk	Negligible Effect
		Phase D	Moderately Effective	Negligible Risk	Negligible Effect
		Phase F	Moderately Effective	Negligible Risk	Negligible Effect
		Phase G	Moderately Effective	Negligible Risk	Negligible Effect

Receptor	Sensitivity	Dust source location	Pathway Effectiveness	Dust Impact Risk	Magnitude of Dust Effects
Settlement of Ellenbrook	High	Phase A	Moderately Effective	Negligible Risk	Negligible Effect
Nursery	High	Phase G	Moderately Effective	Negligible Risk	Negligible Effect
Land at Chester Nurseries development	High	Phase G	Moderately Effective	Negligible Risk	Negligible Effect
Notcutts Garden Centre	Medium	Phase G	Ineffective	Negligible Risk	Negligible Effect
Residential Property on Hatfield Road	High	Phase G	Ineffective	Negligible Risk	Negligible Effect

38. The results of the assessment show that for all receptors, the magnitude of dust effects from the main mineral extraction period would be Negligible. The assessment also shows that there would be up to Slight Adverse effects during some site preparation works at Popefield Farm and the north-west of the settlement of Ellenbrook; however, this would be limited to the establishment of screening bunds to the south of the site, a transient activity.
39. It can therefore be summarised that there would not be significant impacts at offsite receptors from disamenity dust associated with the proposed development.