Dust Assessment

Sheffield IBA Facility

Blue Phoenix Limited

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Basis of Report

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1.0 INTRODUCTION

SLR Consulting Limited (SLR) has been instructed by Blue Phoenix Limited (BPL) to undertake a dust assessment in support of an Environmental Permit (EP) variation application for the expansion of the site area at the Incinerator Bottom Ash (IBA) Processing Facility at Beeley Wood Recycling Village (2 Beeley Wood Lane, Sheffield, South Yorkshire), hereafter referred to as the 'Site'. The Site is operated under an existing EP, reference: EPR/ZP3492EG.

The assessment describes the scope, relevant legislation, assessment methodology and the baseline conditions currently existing in the area. It then considers any potential dust impacts associated with the Site operations, and an evaluation of the significance of effects.

1.1 Proposed Development

The Facility processes IBA to produce Incinerator Bottom Ash Aggregate (IBAA), a secondary aggregate used in construction as an alternative to primary aggregate. The Facility recovers and recycles material that would otherwise be disposed of at landfill and puts it to beneficial use.

BPL propose to extend the Site boundary to expand the existing storage area and increase storage capacity at the Site and increase the permitted annual throughput at the Site to 300,000 tpa.

1.2 Scope and Objective

This report considers the potential for the Proposed Development to impact upon amenity and local air quality in the vicinity of the Site.

The scope of the assessment comprises the following components:

- Baseline Evaluation – Assessment of existing air quality in the local area; and
- Operational Phase – Assessment of potential dust impacts associated with the operational phase of the Proposed Development.

2.0 Relevant Legislation, Policy & Guidance

2.1 Air Quality Strategy

The Government's policy on air quality within the UK is set out in the Air Quality Strategy for England, Scotland, Wales, and Northern Ireland (AQS) most recently updated in July 2007. The AQS sets out a framework for reducing hazards to health from air pollution and ensuring that international commitments are met in the UK.

The AQS sets standards and objectives for ten priority pollutants. Standards are the concentrations of pollutants in the atmosphere which can broadly be taken to achieve a certain level of environmental quality. Objectives are policy targets often expressed as maximum concentrations not to be exceeded either without exception or with a limited number of exceedances within a specified timescale.

The strategy objectives for the pollutants considered in this report are shown in Table 2-1. Strategy objectives for other pollutants can be found in The Air Quality Strategy for England, Scotland, Wales and Northern Ireland, Volume 1 (2007).

2.2 Air Quality Regulations

The Air Quality Standards Regulations 2010 (the regulations) transpose the Ambient Air Quality Directive (2008/50/EC) and transpose the Fourth Daughter Directive (2004/107/EC) within UK legislation. The regulations include Limit Values, Target Values, Objectives, Critical Levels and Exposure Reduction Targets for the protection of human health and the environment (collectively termed Air Quality Assessment Levels (AQAL) throughout this report). Those relevant to this Air Quality Assessment are presented within Table 2-1.

Table 2-1 Applied Air Quality Assessment Levels (µg/m3)

Pollutant	Standard (µg/m^3)	Measured As	Equivalent percentile
Particles (PM_{10})	40	Annual Mean	-
	50	24-hour mean	90.41st percentile of 24-hour means (equivalent to 35 24-hour exceedances)
Particles ($PM_{2.5}$)	25	Annual Mean	-

2.3 Local Air Quality Management (LAQM)

Section 82 of the Environment Act 1995 (Part IV) requires local authorities to periodically review and assess the quality of air within their administrative area. The reviews have to consider the present and future air quality and whether any AQALs prescribed in regulations are being achieved or are likely to be achieved in the future.

Where any of the prescribed AQALs are not likely to be achieved the authority concerned must designate an Air Quality Management Area (AQMA). For each AQMA the local authority has a duty to draw up an Air Quality Action Plan (AQAP) setting out the measures the authority intends to introduce to deliver improvements in local air quality in pursuit of the AQAL. As such, Local Authorities (LAs) have formal powers to control air quality through a combination of LAQM and by use of their wider planning policies.

Defra has published technical guidance for use by local authorities in their LAQM work[1]. This

[1] Department for Environment, Food and Rural Affairs (DEFRA): Local Air Quality Management Review and Assessment Technical Guidance LAQM.TG(22), 2022.

guidance, referred to in this report as LAQM.TG(22), has been used where appropriate in the assessment presented here.

2.4 Industrial Pollution Regulation

Atmospheric emissions from industrial processes are controlled in the UK through the Environmental Permitting (England and Wales) Regulations (2016) as amended (the EP Regulations), and subsequent amendments. The EP Regulations seek to prevent or minimise emissions to air, water, and soil, as well as waste, from industrial and agricultural installations in the Community, with a view to achieving a high level of environmental protection.

Guidance Notes produced by the Department for Environment, Food and Rural Affairs (DEFRA) provide a framework for regulation of installations and additional technical guidance produced by the Environment Agency (EA) are used to provide the basis for permit conditions. The Proposed Development will be classed as a Part A(1) process under these Regulations, amongst other conditions of operation are emission limits for various pollutants produced by the process.

The EA has published 'Air emissions risk assessment for your environmental permit'[2] (the 'AERA' guidance) to assist operators for all types of permitted facilities to assess risks to the environment and human health when applying for a permit under the EP Regulations.

2.5 Assessment Guidance

2.5.1 Local Air Quality Management Technical Guidance

Defra Local Air Quality Management Technical Guidance[3] (LAQM.TG(22)) was published for use by local authorities in their LAQM review and assessment work. The document provides key guidance in aspects of air quality assessment, including screening, use of monitoring data, and use of background data that are applicable to all air quality assessments.

2.5.2 Dust Assessment Guidance

The Institute of Air Quality Management (IAQM) published the document '*Guidance on the Assessment of Mineral Dust Impacts for Planning*'[4] in June 2016. The structured methodology outlined in the guidance facilities the assessment of impacts and consideration of their significance through application of a Source-Pathway-Receptor (S-P-R) conceptual model.

Although this guidance is designed for the planning process of mineral developments, the guidance may be applied independent of the planning process. The guidance is focused around mineral extraction operations, however the majority of the associated processes are applicable for aggregate processing operations (i.e. mineral transportation, handling, stockpiling and processing).

[2] https://www.gov.uk/guidance/air-emissions-risk-assessment-for-your-environmental-permit.

[3] Defra Local Air Quality Management Technical Guidance, dated February 2018.

[4] IAQM, Guidance on the Assessment of Mineral Dust Impacts for Planning, V1.1, May 2016.

3.0 ASSESSMENT METHODOLOGY

The assessment of fugitive dust emissions from the Proposed Development has been undertaken on the basis of a S-P-R conceptual model as outlined per the IAQM Assessment of Mineral Dust Impacts for Planning. The conceptual model takes into consideration the potential dust sources, surrounding sensitive receptors and the pathway effectiveness between source(s) and receptor(s) in order to assess the magnitude of dust impact risk.

Specifically the following aspects are reviewed:

- the type of activities proposed on Site, including designed-in mitigation measures, in order to determine:
  - the potential magnitude of releases in general terms; and
  - the nature of that release;
- the location of receptors in the surrounding area with specific consideration of the type of receptor and therefore their potential sensitivity to dust; and
- the pathway between source and receptors incorporating the buffer distance between receptors and any mitigating features and the frequency of meteorological conditions likely to result in the dispersion of emissions towards receptors (i.e. dry periods where wind speeds are low).

Following determination of dust impact risk, the guidance provides a framework from which to determine impact significance. The key steps and detailed methodology are set out within the guidance available on the IAQM website[5].

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

4.0 BASELINE ENVIRONMENT

4.1 Site Setting and Sensitive Receptors

The Site is located between Wadsley Bridge and Oughtiley Bridge in northeast Sheffield at approximate National Grid Reference (NGR): x432120, y392080. The Site is located within the administrative area of Sheffield City Council (SCC) and is located within the Sheffield Citywide AQMA.

The Site is bounded by:

- woodlands to the south and west;
- agricultural land to the north;
- industrial/commercial land uses to the east;
- further industrial/commercial land uses extend to the northeast, southeast and west; and
- residential properties located along Middlewood Road to the south and west.

Primary vehicular access to the Site will be via the existing access point via an unnamed track off Beeley Wood Lane.

The Site setting and receptor locations (as described in the following sections) are presented in Figure 4-1. The Site boundary is presented in red, the site access route in blue, sensitive human receptors by red icons, footpaths as purple outlines and sensitive ecological receptors are outlined in yellow or green.

Figure 4-1 Site Setting

4.1.1 Human Receptors

The term 'sensitive receptors' includes any persons, locations or systems that may be susceptible to changes as a consequence of the potential dust emissions from the Site. The most sensitive receptors to dust emissions would be residential properties and amenity areas, with commercial or industrial receptors typically having a lower sensitivity due to the reduced frequency of occupation and amenity expectations.

Receptors in proximity to the Site with a sensitivity to dust have been identified and presented in Table 4-1; these are considered to present the closest receptor locations in each direction and are not considered to be exhaustive. The sensitivity applied to each receptor has been based on the relevant IAQM guidance.

Table 4-1 Human Receptors

Receptor		Receptor Type	Sensitivity to Dust	Direction from the Site Boundary	Distance from Site Boundary (m)
Public footpath		Recreational	Low	NW, W, SW	At boundary
A	Warehouse	Industrial / Commercial	Medium	S, SE, E	At boundary
B	Industrial Stone (UK) Limited	Industrial	Low	East	80
C	Abbey Forged Products	Industrial / Commercial	Medium	W	150
D	Middlewood Road	Residential	High	SW	210
E	Middlewood Road	Residential	High	SW	190
F	Middlewood Road	Residential	High	S	220
G	Greenhouse Childminding	Residential	High	S	240
H	Northwood Drive	Residential	High	S	320
I	WRD Ltd	Industrial/Commercial	Low	SE	220
J	Nutwood Trading Estate	Industrial/Commercial	Medium	E, NE	250
K	Underhill Lane	Residential	High	NE	250

4.1.2 Ecological Receptors

In line with relevant guidance, this assessment has considered sensitive ecological designations within 250m of the Site operations. The review was undertaken using the Magic web-based mapping service[6] and information published by the Sheffield Biological Records Centre[7] to identify designated sites of ecological or nature conservation importance required for consideration within the assessment. A number of sensitive ecological designations are present within 250m of the Site operations.

Ancient Woodlands (AW) bound the Site to the West, South and North. A majority of the AW areas to the West, South and North are also contained within the designated areas of the Upper River Don and Beeley Wood Local Wildlife Sites (LWS), as presented in Figure 4-1.

Sensitive ecological receptors in proximity to the Site are presented in Table 4-2;. The sensitivity applied to each receptor has been based on the relevant IAQM guidance.

[6]Natural England, www.magic.gov.uk, accessed November 2022.

[7] Sheffield Biological Records Centre, https://www.sheffield.gov.uk/parks-sport-recreation/sheffield-biological-records-centre, accessed November 2022.

Table 4-2 Ecological Receptors

Ecological Site	Designation	Sensitivity to Dust	Direction from the Site Boundary	Distance from Site Boundary (m)
Beeley Wood	AW	Low	S, W, N	At boundary
	LWS		NW, N	
Upper River Don	AW	Low	S, W	At boundary
	LWS			

4.2 Ambient Air Quality

Monitoring data collected prior to the COVID-19 pandemic (i.e. pre-2020) has been used to characterise the baseline environment, as pollutant concentrations monitored during 2020 and 2021 are expected to be atypical, and not representative of the local environment. This approach is in line with the IAQM position statement, which recommends the following:

> *"If you are carrying out an air quality study that includes validation against monitoring data, use 2019 monitoring data as the last typical year."*

The latest publicly available data for automatic monitoring stations at the time of writing is for 2021. Therefore the data presented for 2021 and 2020 were potentially impacted by the COVID-19 pandemic. As such, the 2021 and 2020 data have been presented for reference only, and have been discounted from further consideration.

4.2.1 Local Air Quality Management

The Site is located within the administrative area of SCC and is located within the Sheffield Citywide AQMA; declared due to exceedences of the relevant Air Quality Objectives for nitrogen dioxide and PM_{10}.

4.2.2 Automatic Air Quality Monitoring

SCC undertake continuous monitoring of PM_{10} at six locations within the Sheffield Citywide AQMA. Of these six monitoring stations, two are considered representative of the Site locale; Firvale School and Wicker. These two stations are positioned in an 'urban background' setting, similar to the locale of the Site, and located at distances of 5.0km and 5.4km, respectively.

PM_{10} concentrations are also monitored nationally through the 'Automatic Urban and Rural Network' (AURN). The closest AURN monitoring location to the Site is the Sheffield Devonshire Green monitor, located approximately 5.5km southeast of the Site (NGR: x434816, y386990). This AURN site is located within the confines of Sheffield, in an 'urban background' setting, similar to the Site.

The monitored PM_{10} concentrations are presented in Table 4-3 and can be seen to be below the relevant AQALs.

Table 4-3 Automatic Monitoring of PM_{10}

Monitoring Network	Monitoring Station	Distance and Direction from Site	Site Classification	Annual Mean NO_2 Concentration ($\mu g/m^3$)		
				2019	2020	2021
SCC LAQM	Firvale School	5.0km, ESE	Urban Background	14.6	14.2	12.7
	Wicker	5.4km, SE	Urban Background	16.7	15.1	14.1
AURN	Sheffield Devonshire Green	5.5km, SSE	Urban Background	14.9	14.4	12.1

4.2.3 Modelled Background Pollutant Concentrations

Background pollutant concentration data on a 1km x 1km spatial resolution is provided by Defra through the UK AIR website and is routinely used to support LAQM and Air Quality Assessments. Background pollutant concentrations for PM_{10} and $PM_{2.5}$ are based upon a 2018 base year and projected to future years[8] (2022 is presented below). The background concentration for the grid square containing the Site and nearby receptors is presented in Table 4-4.

Table 4-4 Annual Mean Background Concentrations (2022)

X, Y (NGR)	Pollutant concentration ($\mu g/m^3$)	
	PM_{10}	$PM_{2.5}$
432500, 392500	9.5	6.2

4.2.4 Complaints Data

The client has not received any dust complaints in recent years (no complaints received in the period January 2019 and November 2022). As such it can be inferred that adverse dust effects are not experienced at nearby sensitive receptors under the current Site operations.

4.3 Meteorological Conditions

The most important climatic parameters governing the release and dispersal of fugitive emissions from the Site are:

- wind direction which determines the broad direction of dispersal; and
- wind speed will affect ground level emissions by increasing the initial dilution of pollutants in the emission; and
- rainfall naturally supresses dust release (>0.2mm/day considered sufficient to suppress dust).

A windrose from the Emley Moor No.2 meteorological observation station (located approximately 22km northwest of the Site), providing the frequency of wind speed and direction, is presented in Figure 4-2 below. Winds from the west and southwest are most frequent, and winds from north and south are least frequent.

[8] Background mapping data for local authorities – http://uk-air.defra.gov.uk/data/laqm-background-home.

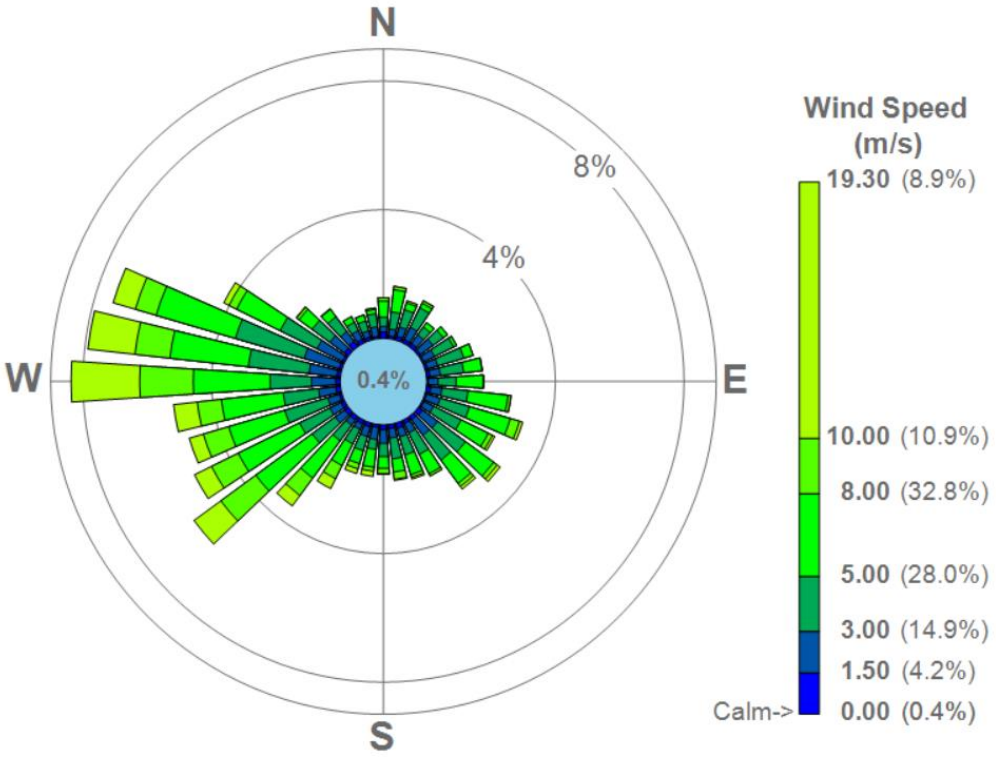


Figure 4-2 Windrose: Emley Moor No.2, 2019 Average

One of the most important meteorological factors to consider when undertaking assessment of dust is low wind speeds (winds below 5m/s). During periods of low wind speeds, the dispersion of airborne particles/odours is much less effective. Low wind speeds (below 5m/s) are relatively frequent at approximately 50% of hours in 2019, predominantly from the west. Moderate to high winds (above 5m/s) occur for the remaining hours (approximately 50%) in 2019, again predominantly form the west.

Rainfall is also an important climatological parameter supressing the generation of dust. Rainfall greater than 0.2mm per day is considered sufficient to suppress dust emissions.

Relevant rainfall data applicable to the Site has been obtained from the Meteorological Office website[9]. Utilising the map of climate averages from the met office, the number of days with rainfall greater than 0.2mm is between 180 and 200 days per year (~52%).

4.4 Baseline Conditions

A review of baseline conditions with respect to dust in the surrounding area has been undertaken by reviewing aerial imagery. Through review of aerial imagery the following potential sources of dust are identified in the Site locale:

- industrial/commercial activities, including
  - manufacturing (Abbey Forged Products);
  - waste management (WRD Ltd); and
  - aggregates processing (International Stones (UK)Ltd).
- agricultural activities, on arable land to the northeast.

[9] Meteorological Office, UK Climate Averages https://www.metoffice.gov.uk/research/climate/maps-and-data/uk-climate-averages/gcjs3tzpf. Accessed June 2022.

The manufacturing and waste management activities are not generally associated with a high dust potential. Furthermore, the manufacturing and waste management activities identified are undertaken within enclosed buildings. As such, the industrial/commercial activities identified at Abbey Forged Products and WRD Ltd are not anticipated to represent a significant potential source of dust emissions.

The aggregate processing activities are generally associated with a high dust potential. However, the size of the International Stones (UK) Ltd premises is small (in reference to aerial imagery) therefore indicating that the aggregate processing activities are limited. As such, in consideration of the limited nature of operations, the aggregate processing activities identified are not anticipated to represent a significant potential source of dust emissions.

Considering the infrequent nature of the agricultural activities identified, potential dust emissions from this source are not considered significant.

No existing sources of dust are considered to be significant and have not been considered further within this assessment.

5.0 OPERATIONAL PHASE ASSESSMENT

This section presents the potential impacts of dust emissions associated with the proposed operations at the Site.

5.1 Proposed Site Operations

The Site is currently operated as an IBA processing facility, with a maximum annual throughput of 200,000 tonnes per annum (tpa). The proposed revision to Site operations would extend the area of the existing Site boundary.

The proposed operations would comprise activities much the same as the current Site operations, but with an increased amount of storage on site at any one time. The proposed operations would involve the following:

- stockpiling of IBA in the designated outdoor area(s) located in the north-west of the Site;
- material handling activities would comprise the operation of three loading shovels, one excavator and one fork-lift-truck;
- the resulting separated sizes of IBAA are stockpiled within the outdoor designated area located in the east of the Site; and
- as required, IBAA is exported off-Site from the stockpiles, via road within enclosed or covered containers.

In addition to the operations outlined above, the revised operations would also include the addition of two weighbridges. Parking provision has been included for both on-Site staff and delivery vehicles.

The plant will operate between the hours of 07:00 and 20:00 on Monday to Friday, and between 07:00 and 16:00 on weekends and bank holidays.

Over a typical week it is anticipated that approximately 620 Heavy Goods Vehicles (HGVs) would visit the site for deliveries and/or collections (1,240 movements). This equates to approximately 177 HGV movements over a typical day.

5.2 Designed-In Mitigation Measures

The storage of IBAA has the potential to create dust emissions. A range of dust mitigation measures are successfully employed at the Site under the current operations. The existing mitigation measures in place at the Site under the current operations are as follows:

- the Site is fully concreted enabling the surface to be swept and effectively watered, with surface water captured for reuse;
- comprehensive dust suppression system (that covers the existing Site operations) ensures that all stockpiles and surfaces can be dampened down where required, to reduce the risk of wind-blown emissions.
- on-site sweeping is undertaken to maintain the open areas around the stockpiles, car park, entrance area and weighbridge;
- the dust suppression system is operated on either a timer or manual basis to allow consistent application of control and the ability to override where circumstances might require it;
- external stockpiles are stored within designated areas with retaining walls, to allow segregation of incoming and processed materials and assist with stockpile management to mitigate ‘wind-whipping’;

- a dedicated weather station is in place at the Site to facilitate accurate monitoring and recording of local meteorological conditions (wind speed, wind direction, rainfall, temperature, humidity, dew point, wind chill, and barometric pressure);
- the existing Site operations and dust management procedures are overseen by a dedicated management team which draws on many years of experience in operating IBA processing facilities specifically at this location and across the client's portfolio of 11 operational sites;
- daily site checks, visual inspections, formal monitoring and inspections from regulatory bodies (including the Environment Agency and Sheffield City Council) are undertaken; and
- the Site's Dust Management Plan[10] outlined further details of periodic monitoring, operational management and complaints procedures under the existing Site operations.

The existing mitigation measures outlined above would be maintained and/or bolstered under the proposed expansion to the Site, to ensure the continued effectiveness of designed-in mitigation measures applied at the Site. Under the proposed expansion, the designed-in mitigation measures which are to be bolstered are outlined below:

- all new operational areas would also be fully concreted;
- the dust suppression system would be extended to cover the expanded Site operations and would continue to ensure all stockpiles and surfaces can be dampened down to reduce the risk of wind-blown emissions;
- external stockpiles would continue to be stored within newly designated areas with retaining walls to allow segregation of incoming and processed materials and assist with stockpile management to mitigate 'wind-whipping'; and
- the Site's Dust Management Plan[11] would be updated (and maintained) to present the specific details of periodic monitoring, operational management and complaints procedures which would be undertaken.

The above designed-in mitigation measures for the proposed Site operations have been determined in consideration of the likely magnitude of dust effects anticipated as a result of the Site operations and reflect a proportionate approach to control dust from the proposed Site operations.

5.3 Dust Impact assessment

5.3.1 Assessment of Impacts – Screening Criteria

There are sensitive human and ecological receptors within 400m of the Site (See Figure 4-1). Therefore, further assessment for the potential impact of deposited dust and PM_{10} on human receptors and ecological receptors is required.

5.3.2 Dust Soiling Potential

In reference to the proposed IBA processing operations (as presented in Section 5.1), the following potential sources of dust are identified:

- on-site vehicle movements;

[10] Dust and particulate emission management plan, Blue Phoenix Limited, Version 1.0.

[11] Dust and particulate emission management plan, Blue Phoenix Limited, Version 2.0.

- materials handling;
- stockpiles; and
- off-site vehicle movements.

On-site Vehicle Movements

All routes on Site would be paved (concrete) and as such there would be no movements upon unpaved surfaces. A speed limit of 11mph is enforced on Site and vehicles would be regularly cleaned prior to leaving the Site during dry months. Therefore, the residual source emission for on-Site movements is considered small.

Materials Handling

Movement of IBA from the designated storage areas to the Processing Building is minimal (approximately 50m from stockpiles to Process Building). Only a small number of mobile plant operate for material handling activities (three loading shovels, one excavator and one fork-lift-truck). Furthermore, the Site is paved (concrete), therefore avoiding any plant movements on unpaved ground. Although IBA and IBAA has a high dust potential, the dust suppression system would ensure that all stockpiles and surfaces can be dampened down as required to reduce the risk of wind-blown emissions during dry conditions. On-site sweeping is undertaken regularly to maintain the open areas around the stockpiles. As such, in consideration of the designed-in mitigation measures, the residual source emission for material handling is considered small.

Stockpiles

IBA and IBAA stockpiles would be stored externally within designated areas in the proposed new storage area with retaining walls. IBA and IBAA stockpiles would be stored on paved (concrete) surfaces which enables the surface to be swept and effectively watered. The dust suppression system would ensure that all stockpiles can be dampened down as required to reduce the risk of wind-blown emissions (i.e. during dry conditions). As such, in consideration of the designed-in mitigation measures, the residual source emission for the storage of IBA and IBAA is considered medium.

Off-site Vehicle Movements

Over a typical day it is anticipated that there would be approximately 177 inward/outward HGV movements. The route from the local road network to the Site entrance/exit is approximately 600m in length and would be paved (hard standing). Vehicles would be regularly cleaned prior to leaving the Site during dry months. Therefore, the residual source emission for off-site vehicle movements is considered small.

Overall Residual Source Emission

In consideration of the above, and in adoption of a conservative approach:

- the overall residual source emission of the proposed on-site operations is considered medium; and
- the residual source emission of the proposed off-site vehicle movements is considered small.

5.3.3 Likely Magnitude of Dust Risk

In reference to the methodology outlined in the IAQM mineral dust guidance, the likely magnitude of dust effects has been determined by consideration of the residual source emission and the pathway effectiveness.

The pathway effectiveness between sources and receptors is presented in Table 5-1 and Table 5-2 below.

Table 5-1 Determination of Pathway Effectiveness: On-Site Operations

Receptor		Distance to Nearest Source (m)	Wind Sectors Affecting Receptor	% Wind Speed >5 m/s and Dry	Frequency Category	Pathway Effectiveness
Public footpath		20	NNE - S	4.4	Infrequent	Ineffective
A	Warehouse	15	WSW - ESE	13.8	Frequent	Highly Effective
B	Industrial Stone (UK) Limited	80	W - NW	3.4	Infrequent	Ineffective
C	Abbey Forged Products	150	E	3.1	Infrequent	Ineffective
D	Middlewood Road	210	ENE	2.7	Infrequent	Ineffective
E	Middlewood Road	190	NE	0.5	Infrequent	Ineffective
F	Middlewood Road	220	NNE	0.1	Infrequent	Ineffective
G	Greenhouse Childminding	240	N	0.3	Infrequent	Ineffective
H	Northwood Drive	320	N	0.5	Infrequent	Ineffective
I	WRD Ltd	220	NNW	0.8	Infrequent	Ineffective
J	Nutwood Trading Estate	250	WSW	10.4	Moderate	Ineffective
K	Underhill Lane	250	SW	5.4	Moderate	Ineffective
Beeley Wood AW and LWS		Adjacent	E - WSW	7.7	Moderate	Moderately Effective
Upper River Don AW		Adjacent	W - SSW	12.9	Frequent	Highly Effective

Table 5-2 Determination of Pathway Effectiveness: Off-Site Vehicle Movements

Receptor		Distance to Nearest Source (m)	Wind Sectors Affecting Receptor	% Wind Speed >5 m/s and Dry	Frequency Category	Pathway Effectiveness
Public footpath		20	NNE - S	4.4	Infrequent	Ineffective
A	Warehouse	15	All sectors	17.8	Frequent	Highly Effective
B	Industrial Stone (UK) Limited	10	ESE - WNW	15.2	Frequent	Highly Effective
C	Abbey Forged Products	280	ESE	3.7	Infrequent	Ineffective
D	Middlewood Road	360	E	3.1	Infrequent	Ineffective
E	Middlewood Road	285	ENE	1.8	Infrequent	Ineffective
F	Middlewood Road	270	NNE	0.1	Infrequent	Ineffective
G	Greenhouse Childminding	250	NNE	0.1	Infrequent	Ineffective
H	Northwood Drive	325	N	0.3	Infrequent	Ineffective
I	WRD Ltd	At boundary	E - NNW	17.4	Frequent	Highly Effective

Receptor		Distance to Nearest Source (m)	Wind Sectors Affecting Receptor	% Wind Speed >5 m/s and Dry	Frequency Category	Pathway Effectiveness
J	Nutwood Trading Estate	175	SW	5.4	Moderate	Moderately Effective
K	Underhill Lane	275	SSW	3.9	Infrequent	Ineffective
Beeley Wood AW and LWS		170	ESE - WSW	5.5	Moderate	Moderately Effective
Upper River Don AW		50	W - S	12.2	Frequent	Highly Effective

The results of the assessment are summarised in Table 5-3 and Table 5-4 below.

Table 5-3 Determination of Likely Dust Effects: On-Site Operations

Receptor		Residual Source Emissions	Pathway Effectiveness	Dust Impact Risk	Receptor Sensitivity	Magnitude of Dust effects
Public footpath		Medium	Ineffective	Negligible	Low	Negligible
A	Warehouse	Medium	Highly Effective	Medium	Medium	Slight Adverse
B	Industrial Stone (UK) Limited	Medium	Ineffective	Negligible	Low	Negligible
C	Abbey Forged Products	Medium	Ineffective	Negligible	Medium	Negligible
D	Middlewood Road	Medium	Ineffective	Negligible	High	Negligible
E	Middlewood Road	Medium	Ineffective	Negligible	High	Negligible
F	Middlewood Road	Medium	Ineffective	Negligible	High	Negligible
G	Greenhouse Childminding	Medium	Ineffective	Negligible	High	Negligible
H	Northwood Drive	Medium	Ineffective	Negligible	High	Negligible
I	WRD Ltd	Medium	Ineffective	Negligible	Low	Negligible
J	Nutwood Trading Estate	Medium	Ineffective	Negligible	Medium	Negligible
K	Underhill Lane	Medium	Ineffective	Negligible	High	Negligible
Beeley Wood AW and LWS		Medium	Moderately Effective	Low	Low	Negligible
Upper River Don AW		Medium	Highly Effective	Medium	Low	Negligible

Table 5-4 Determination of Likely Dust Effects: Off-Site Vehicle Movements

Receptor		Residual Source Emissions	Pathway Effectiveness	Dust Impact Risk	Receptor Sensitivity	Magnitude of Dust effects
Public footpath		Small	Ineffective	Negligible	Low	Negligible
A	Warehouse	Small	Highly Effective	Low	Medium	Negligible
B	Industrial Stone (UK) Limited	Small	Highly Effective	Low	Low	Negligible
C	Abbey Forged Products	Small	Ineffective	Negligible	Medium	Negligible
D	Middlewood Road	Small	Ineffective	Negligible	High	Negligible
E	Middlewood Road	Small	Ineffective	Negligible	High	Negligible
F	Middlewood Road	Small	Ineffective	Negligible	High	Negligible
G	Greenhouse Childminding	Small	Ineffective	Negligible	High	Negligible
H	Northwood Drive	Small	Ineffective	Negligible	High	Negligible

Receptor		Residual Source Emissions	Pathway Effectiveness	Dust Impact Risk	Receptor Sensitivity	Magnitude of Dust effects
I	WRD Ltd	Small	Highly Effective	Low	Low	Negligible
J	Nutwood Trading Estate	Small	Moderately Effective	Negligible	Medium	Negligible
K	Underhill Lane	Small	Ineffective	Negligible	High	Negligible
Beeley Wood AW and LWS		Small	Moderately Effective	Negligible	Low	Negligible
Upper River Don AW		Small	Highly Effective	Low	Low	Negligible

The likely dust effect as a result of the proposed Site expansion in consideration of the designed-in mitigation measures is predicted to be 'negligible' all sensitive receptors identified, with the exception of receptor A.

A 'slight adverse' dust effect is predicted at receptor A, a warehouse in close proximity to the existing and proposed Site operations. It should be noted that a 'slight adverse' dust effect would also be predicted in consideration of the current Site operations, as the proximity of operations to the receptor and the overall dust magnitude of existing and proposed operations would be categorised the same (in reference to the S-P-R method considered above). The proposed reconfiguration of operations to the north and northeast of the warehouse would not result in a change in pathway effectiveness to the receptor (northerly and north-easterly winds are highly infrequent, in reference to Figure 4-2). Furthermore, no dust complaints have been received by the client from this location (or any location) in recent years (see Section 4.2.4). In consideration of the above, it is concluded that the dust effect at receptor A is predicted to remain unchanged as a result of the proposed Site operations.

The likely dust effect as a result of the revised off-Site operations is predicted to be 'negligible' all sensitive receptors identified.

The likely significance of effects as a result of dust generation from the proposed Site expansion is therefore considered 'not significant' at all identified receptor locations in accordance with the IAQM guidance.

The mitigation measures that are either in operation as part of the existing, permitted development or those proposed as designed-in measures under the proposed Site expansion (see Section 5.2) are therefore considered to be appropriate. No further mitigation measures are considered to be required. It is advised that the Dust Management Plan remains an active document and is updated to take account of the revised operations.

5.3.4 PM10 Generation Potential

The assessment of PM_{10} follows the key elements as recommended within the IAQM Minerals guidance, whilst incorporating the AQAL for England. The likelihood of exceedance of the PM_{10} AQAL as a result of the Proposed Development has been assessed.

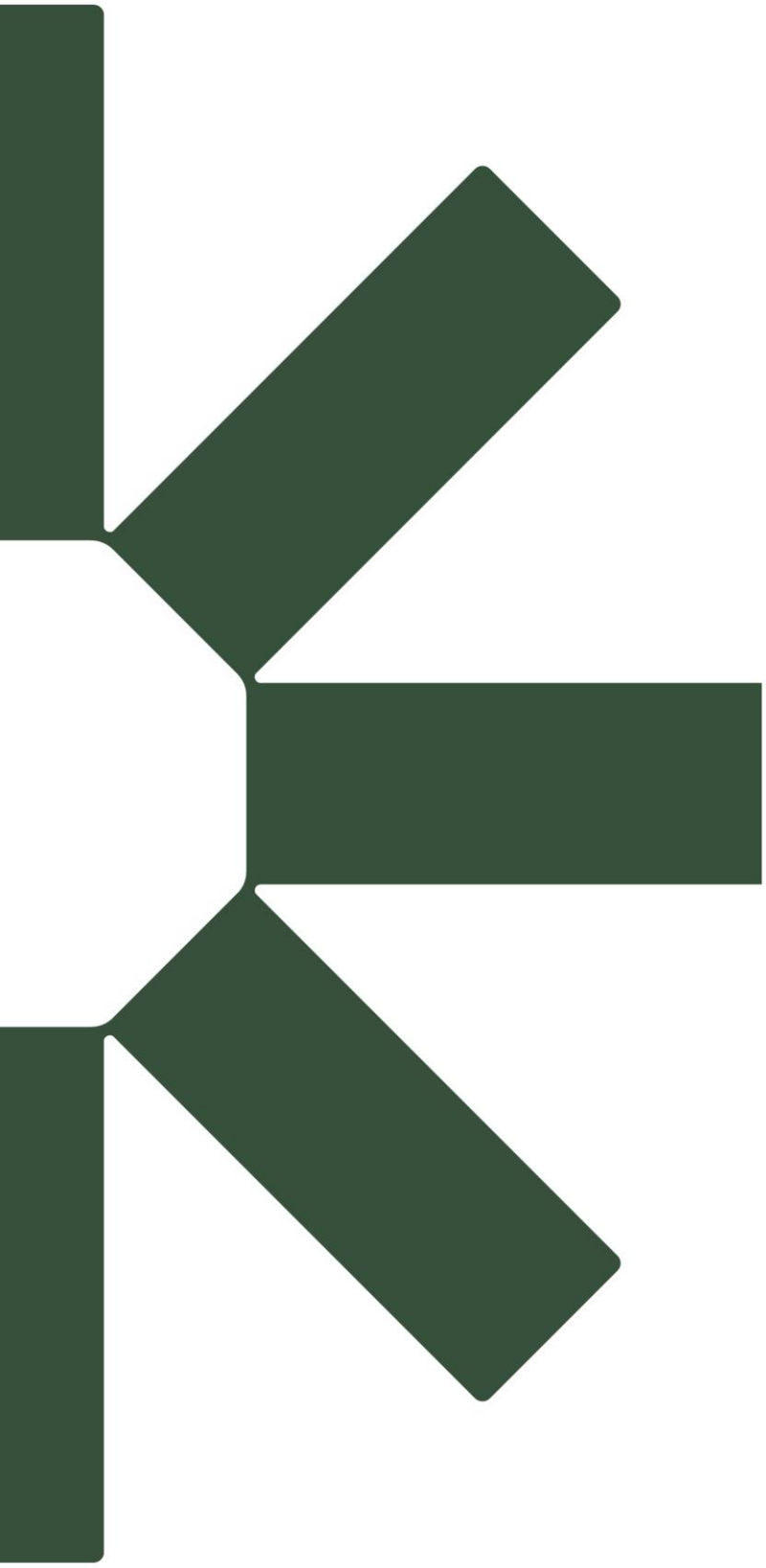
The IAQM minerals guidance states that if the PM_{10} background concentration is less than 17µg/m³ it is considered unlikely that any Process Contribution from the Proposed Development would lead to an exceedence of the annual mean AQAL.

The existing air quality, in terms of annual PM_{10}, has been taken from the Defra background maps in the absence of any background monitoring in proximity to the site. The maximum recorded annual average PM_{10} concentration from the recording stations considered in Section 4.2.2 is 16.7 µg/m³ (Wicker, 2019). It is therefore considered that in the absence of additional mitigation, the impact of proposed operations on human health from emissions of PM_{10} at the site will be negligible.

6.0 SUMMARY AND CONCLUSIONS

This dust assessment has assessed the potential impacts of dust on air quality and local amenity associated with the proposed expansion to the Site at the IBA Recycling Facility at Beeley Wood Recycling Village in Sheffield. The potential impact associated with dust emissions on human and ecological receptor locations within the Site locale have been assessed using methodologies as outlined within the IAQM mineral dust guidance.

The conclusions of the assessment are that the revised Site expansion proposed at the IBA Recycling Facility would result in a ‘not significant’ effect at sensitive receptors within the Site locale, in consideration of the existing and designed-in mitigation measures.



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