



# Retford Circular Economy Project Environmental Statement Addendum – Volume 3 Technical Appendices

Technical Appendix 13.7: Updated Dust  
Management and Monitoring Plan

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# Dust Management and Monitoring Plan (planning)

## Retford Circular Economy Project

### Lound Hive Ltd

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## Table of Contents

<b>Basis of Report</b> .....	<b>i</b>
<b>1.0 Introduction</b> .....	<b>1</b>
1.1 Overview of Proposed Operations.....	1
1.1.1 Site areas .....	2
1.1.2 Extraction scheme .....	3
1.2 Structure of the DMMP.....	6
1.3 Relevant Guidance .....	6
<b>2.0 Dust Sources and Influencing Factors</b> .....	<b>6</b>
2.1 Site Setting & Receptors.....	6
2.1.1 Human Receptors.....	7
2.1.2 Ecological Receptors .....	7
2.2 Meteorological Conditions.....	8
2.3 Potential Dust Emissions.....	9
2.3.1 Characteristics of PFA .....	9
2.4 Sources of Dust.....	10
2.4.1 Soil Stripping .....	10
2.4.2 PFA Excavation & Stockpiling .....	11
2.4.3 PFA Handling, Pre-Screening and Transfer.....	11
2.4.4 Stockpiling.....	12
2.4.6 Material (PFA) Transfer Off-Site.....	13
<b>3.0 Dust Control</b> .....	<b>13</b>
3.1 Designed in Measures – Site Setting.....	13
3.2 Dust Control Measures .....	16
<b>4.0 Monitoring</b> .....	<b>21</b>
4.1 Meteorological Conditions.....	21
4.2 Visual Dust Monitoring.....	21
4.3 Quantitative Dust Monitoring .....	22
4.3.1 Methodology.....	22
4.3.2 Monitoring Locations.....	23
4.3.3 Relevant Criteria.....	24
4.3.4 Reporting.....	25
<b>5.0 Dust Action Plan</b> .....	<b>26</b>
5.1 Contingency Plans.....	26
5.2 Dust Complaints Procedure.....	29
<b>6.0 Management</b> .....	<b>29</b>



6.1	Dust Control Responsibilities.....	29
6.2	Liaison with Community & Regulators.....	30
6.3	Record Keeping.....	30
6.4	Review and Update of DMMP .....	30

## Tables in Text

Table A: Human Receptors.....	7
Table B: Soil Stripping by Phase.....	10
Table C: Dust Control Measures .....	17
Table D: Public Response Levels to Surface Soiling.....	25
Table E: Contingency Plans.....	26
Table F: Dust Management Responsibilities.....	29

## Figures in Text

Figure A: Lagoon embankments plan.....	2
Figure B: Photograph of the norther lagoon embankment.....	3
Figure C: Example sub-phases.....	5
Figure D: Dust area of influence.....	5
Figure E: Dust Management Plan Process.....	6
Figure F: Site Setting.....	8
Figure G: Windrose from Doncaster, Sheffield Station.....	9
Figure H: Screen and hopper (orange) placed close to extraction face (black) .....	12
Figure I: Typical cross-section showing embankments .....	14
Figure J: Extraction at a lower level.....	14
Figure K: Embankments and wind direction.....	15
Figure L: Indicative locations for bund retention.....	15
Figure M: Additional screening in Low-Rise.....	16
Figure N: Indicative Monitoring Locations.....	24

## Appendices

### Appendix A Inspection Forms





## 1.0 Introduction

Lound Hive Limited ('LHL' or 'the Applicant') has instructed SLR Consulting Limited ('SLR') to prepare an Environmental Permit ('EP') application and also to provide specialist inputs on the planning application (submitted in March 2023) for the processing of pulverised fuel ash ('PFA') extracted from historic ash disposal lagoons associated with the former Cottam coal-fired Power Station, known as the 'Retford Circular Economy Project' ('RCEP') or the 'Proposed Development'.

The location of the RCEP, hereafter referred to as 'the Site' is approximately 500m south of the village of Lound; 400m south east of Sutton-cum-Lound and 1.5km north of Retford.

This version of the Dust Management and Monitoring Plan ('DMMP') has been prepared in support of the planning application. The implementation of the DMMP shall be under the control of the site management team. This plan shall be incorporated into the site procedures and shall be revised as necessary to ensure that it remains appropriate to the activities occurring at the Site and that any changes in conditions relating to dust management are dealt with as part of those revisions. In particular, the monitoring procedures and compliance actions will be updated as required by the procedures within the DMMP.

This report comprises the scheme for the management and monitoring of dust for the operation and mitigation methods for the Site. It comprises an update of the Dust Management Plan produced in February 2023 (SLR Ref No: 416.V5944.00001), providing significantly more detail, including a dust monitoring regime, and being more consistent with the higher level of information usually reserved by planning condition. It is also notable that the Applicant has revised the extraction scheme significantly since February 2023, to ensure further dust, noise and visual protection. Dust management is at the centre of all operational activities.

The contents of this report have benefitted from specialist input from Hatfield Site Services Ltd ('HSSL'), the contracting division of Roy Hatfield Ltd, who have over 20 years of experience operating mineral processing operations, including PFA recovery operations. HSSL has been engaged to provide further practical expertise on how best to mitigate dust generation and release from the RCEP. HSSL is actively managing operational PFA and resource recovery sites in the UK. The company is a highly regarded specialist in the area with a recognised track record, putting theory into practice and delivering. HSSL are currently carrying out all of the measures set out in this plan on numerous sites, where they are successfully managing fugitive dust impacts.

### 1.1 Overview of Proposed Operations

The RCEP comprises the extraction, processing, storage and transportation of PFA from the former ash disposal lagoons in order to produce a product that meets the 'end-of-waste' criteria required for its use in construction activities, including as a BS EN450 cement replacement product. The resultant lagoon voids will be progressively restored using the in-situ sandstone lagoon embankments and soils. It is not proposed to import any material specifically for the purpose of filling and raising levels; however, some restoration material may need to be imported for engineering and/or habitat creation purposes, e.g. clean, naturally occurring clay subsoil and/or soils.

Unless carefully controlled, fugitive nuisance dust emissions could be generated by the preparation, extraction, storage, primary processing and handling activities; the proposed methods of emissions control and elimination are therefore the key areas of focus in this report.



### 1.1.1 Site areas

The Site can be characterised as three connected areas:

- Area A: Main Operational Site;
- Area B: Link Conveyor and Haul Road (outside of Main Operational Site); and
- Area C: Main Processing Site.

The above areas are shown in the Site Area Plan, Figure 1.3, included in Volume 2 of the Environmental Statement ('ES') submitted as part of the planning application. Appendices 4.1 and 4.2 within Volume 3 of the ES show the location of the lagoons and geological cross sections of the Site, respectively. Appendix 4.3 includes a selection of photographs of the Site.

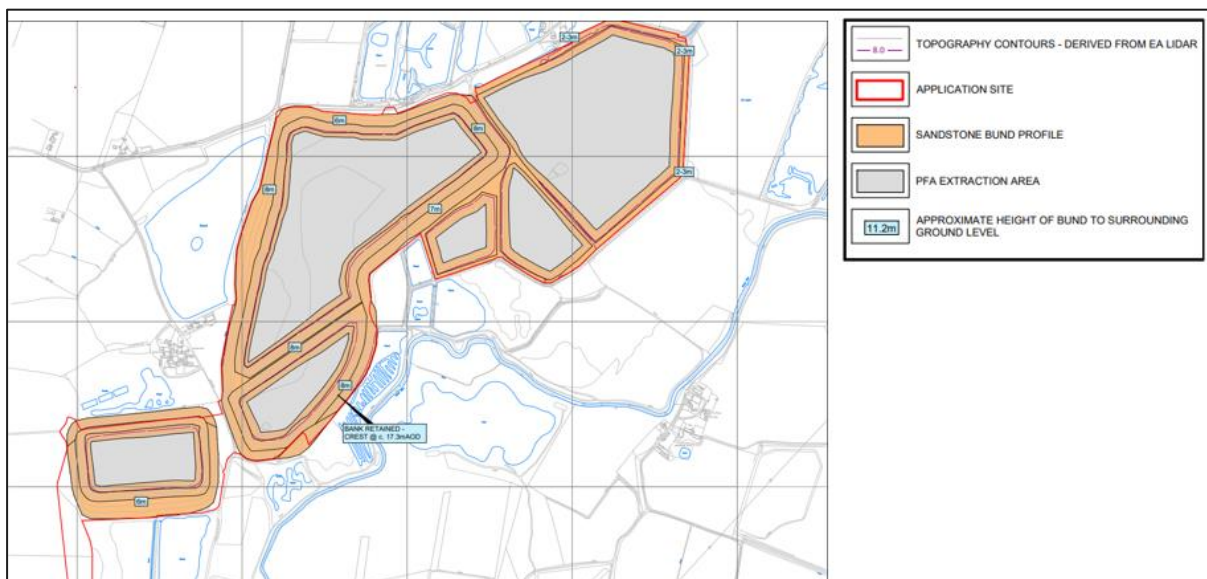
#### **Area A – Main Operational Site (the former PFA lagoons)**

This area is approximately 105.84 ha and comprises the former PFA disposal lagoons site raised with vegetated embankments around its perimeter, and currently largely contains grassland for grazing, though this is of relatively poor quality. The area has historically been subject to a significant amount of sand and gravel extraction and is therefore not alien to extractive industries. The vegetated embankments are man-made; constructed to contain the PFA as part of the former disposal lagoon land use. The embankments are constructed primarily from site-won sandstone and soils, and for the most part are around 6m, with the lowest around 2-3m high.

Figure A shows the significant sandstone embankments that contain the PFA and Figure B comprises a photograph of one of the embankments.

Area A is split between 'Low-Rise' to the east (7.5 – 11 m AOD) and 'High-Rise' to the centre and west (17 – 19 m AOD). The High-Rise is where the larger embankments (around 6-8 m high) are found, bounding the entire area.

**Figure A: Lagoon embankments plan**





**Figure B: Photograph of the norther lagoon embankment**



### **Area B – Link Conveyor and Haul Road**

This area is approximately 5.20 ha and includes a section of the conveyor and link road passing south from the Main Operational Site to the Main Processing Site, utilising farmland.

### **Area C – Main Processing Site**

Area C comprises approximately 2.51 ha of land at the Bellmoor Industrial Estate, accessed from the A638 via a dedicated priority turn junction. It currently accommodates a number of industrial uses, including a stonemason and concrete batching plant, and is therefore in daily operational use. It was historically used as the plant site for the former Bellmoor Quarry.

The industrial areas along Randall Way in the northern part of Retford are located approximately 620 m to the southeast. The east coast mainline railway passes by to the south at around 300 m at its nearest point. The Main Processing Site will be constructed on an area previously operated by Tarmac during the former quarrying operations. The majority of the site is hardstanding, being the old car parking area for the quarry offices. Currently the site is utilised for storage of vehicles, concrete road barriers and aggregates for the existing operations at the Industrial Estate.

## **1.1.2 Extraction scheme**

The extraction scheme, including the recent amendment, are very important from a fugitive dust emissions management perspective. The scheme has been designed with dust management at the centre of all operations, in accordance with IAQM and MIRO good practice guidance.

Extraction will commence from west to east through Area A, starting at HR P1 closest to Area C. The extraction process will commence by digging a cut into HR P1 and extracting at a lower level, using the in-situ lagoon embankments to provide screening and shielding from the wind. The embankment will only be removed, to be used to restore the void, when extraction in the previous sub phase has been completed.

PFA is extracted in Area A using an excavator or dozer (or similar). The use of motor scrapers has been removed from the scheme. PFA is then loaded into a mobile screen (with



shredder box) at or close to the extraction face, before being loaded onto an enclosed conveyor for transport to Area A.

The scheme has been designed to further limit open air handling of PFA. This includes using enclosed conveyor belts to transport PFA from the extraction face in Area A to the Main Processing Site in Area C. Importantly, once the PFA is fed into the conveyor hopper, the handling and processing – from this point on – is fully enclosed; comprising, amongst other things, a reception building under negative pressure, further covered conveyors, pneumatic pipework, enclosed drying plant, pneumatically fed silos, and product taken away in either enclosed powder tankers (for dry PFA) or covered articulated wagons (for conditioned PFA).

The above effectively provides a cut-off for dust generating activities at the conveyor hopper in Area A.

The revised scheme, following that submitted with the planning application in March 2023, has been designed so that extraction activities in Area A, including processing (shredding and screening), are concentrated in the smallest area possible at any given time, thereby reducing the area where fugitive dust emissions could potentially be generated, e.g. if excavated material is found to be dry, or has dried out, prior to entering the enclosed system.

Key revisions include the following:

- splitting each extraction phase into small Micro-Phases – where extractive will be focussed, accounting for around 1% (1 ha) of Area A at any given time;
- the semi-fixed Processing Areas 1-3 have been removed from the scheme – meaning remote processing would be limited to a single mobile screening operation;
- the covered main conveyor has been repositioned and an adjustable covered spur conveyor will be used to take the reception hopper as close as possible to the extraction face;
- the reception hopper is able to move up and down the spur conveyor; and
- the screen and conveyor hopper are able to move with the extraction face – positioned within the extraction void at a lower level and behind the lagoon embankments.

There will only be a single spur with a moveable hopper, with both repositioned periodically as extraction progresses; with no requirement for multiple spurs. This facilitates short distances between the extraction face, screen and conveyor hopper; meaning operations at higher risk of generating dust are confined to a very small and manageable area, making them simpler to control. The areas outside of the Micro-Phase will either be undergoing restoration, covered/treated/compacted, or not yet worked (retained grazing).

Figure C and Figure D illustrate an example of the revised working scheme and reduced area of influence for dust:

- extractive activities contained within a small area/Micro-Phase;
- conveyor hopper located close to the extraction face, with minimal travel distance (reducing distances by 100s of metres); and
- potentially dust generating activities contained within the red circled area, which makes it simple to manage with suitable dust suppression measures as necessary.

Note that, in the example in Figure D, all digging, screening and loading into hoppers is limited to the red circled area. It is envisaged that any temporary stockpiling will also be focussed in this area and limited, at most, to the wider phase boundary; all of which will be at a lower level and behind the lagoon embankments.



Figure C: Example Micro-Phases

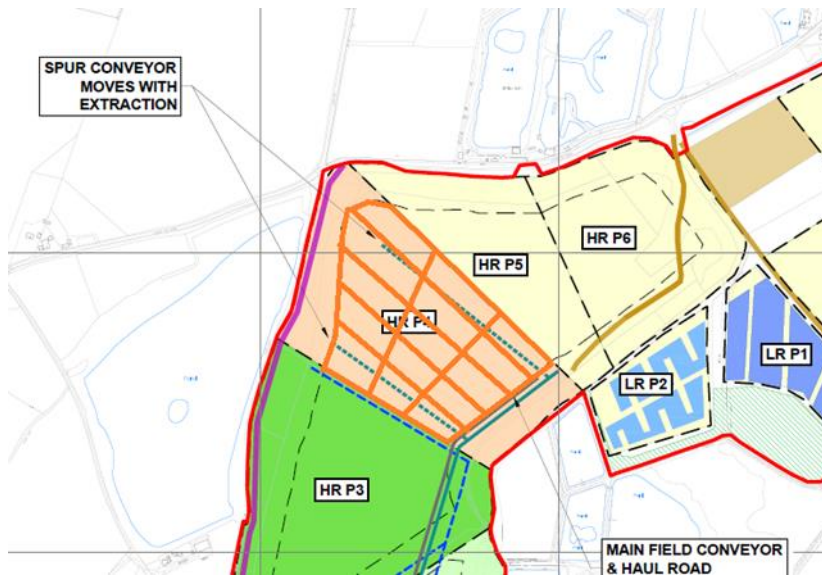
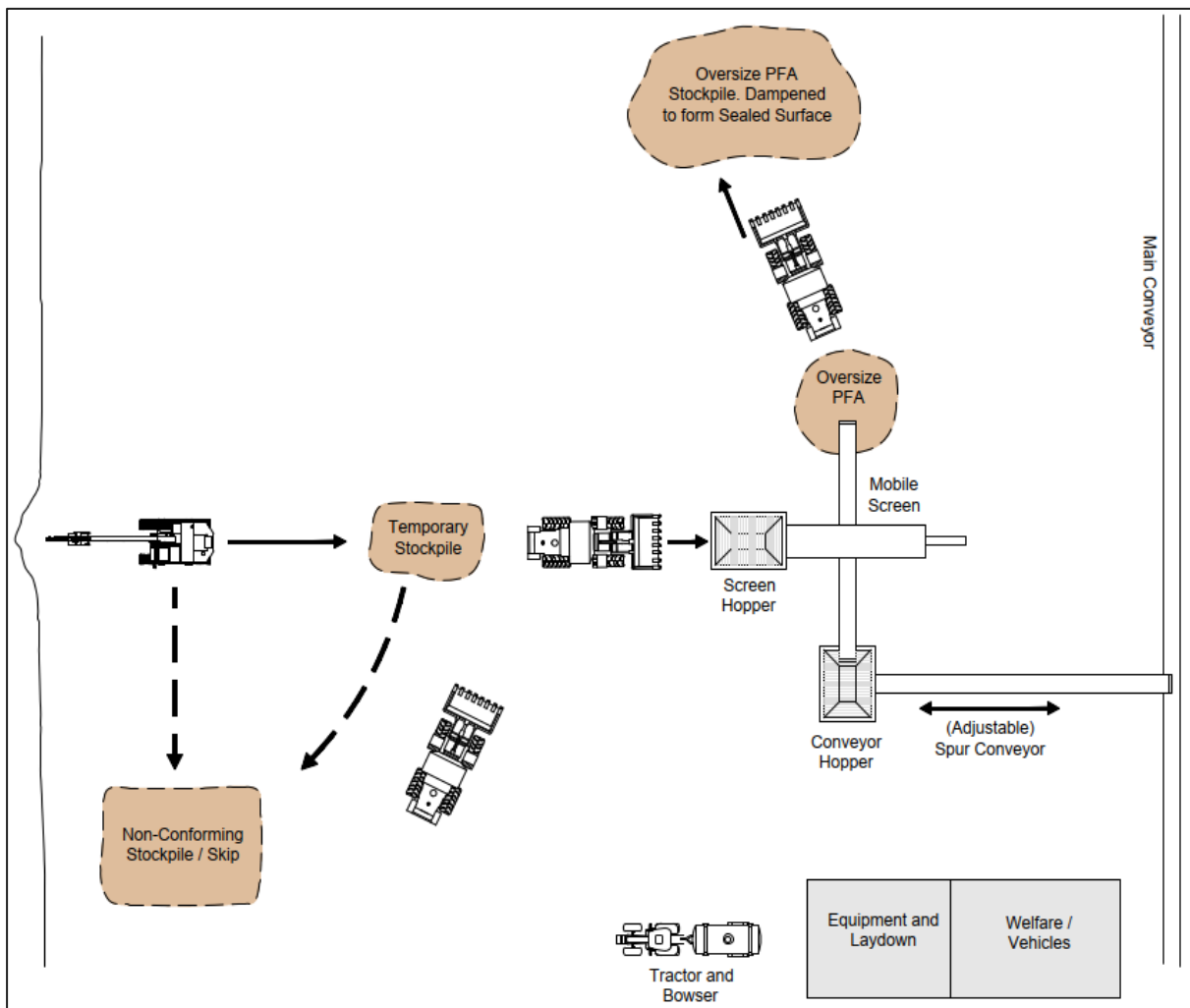


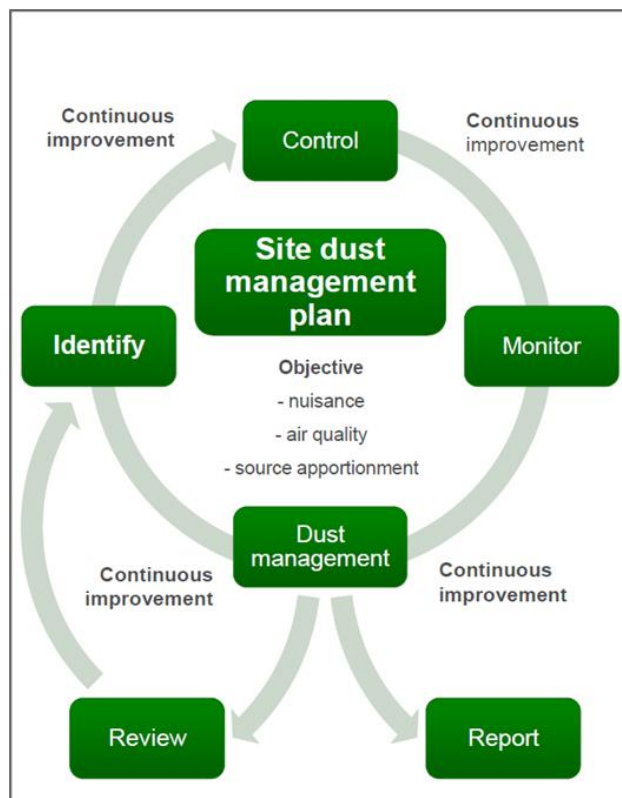
Figure D: Dust area of influence



## 1.2 Structure of the DMMP

The DMMP is an active document which requires periodic evaluation and updating as operations and circumstances change. The principal mechanisms of formulating and continually improving a DMMP are presented in Figure E.

**Figure E: Dust Management Plan Process<sup>1</sup>**



## 1.3 Relevant Guidance

In developing the DMMP key guidance documents that have been consulted include:

- Mineral Industry Research Organisation ('MIRO'), Good practice guide: control and measurement of nuisance dust and PM<sub>10</sub> from the extractive industries (2011). The guidance provides best practice in terms of dust control and content of DMPs; and
- Institute of Air Quality Management ('IAQM'), Guidance on the Assessment of Mineral Dust Impacts for Planning (2016). The guidance includes a methodology for risk assessment of dust from mineral sites which can be used as the basis for defining appropriate mitigation.

## 2.0 Dust Sources and Influencing Factors

### 2.1 Site Setting & Receptors

The Site is predominantly surrounded by low-lying agricultural land with isolated properties in the locale. The villages of Lound and Sutton-cum-Lound are located approximately 500m

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<sup>1</sup> Reproduced from MIRO



north and 400m north west respectively. The Site is located within the administrative area of Bassetlaw District Council (BDC) in a relatively isolated location within a predominantly flat, low-lying rural agricultural setting.

The River Idle runs to the south and east of the Site, with a number of large surface water features associated with former mineral workings alongside. The Wetlands Fishery is located to the north of the Site and the Idle Valley Nature Reserve is located to the north-east and south. The Sutton & Lound Gravel Pits Site of Special Scientific Interest ('SSSI') lies adjacent to the south of the Site. The Public Right of Way runs along the western perimeter and between HR P1 and HR P2 and will be retained during operation on a similar alignment.

### 2.1.1 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.

In line with the relevant IAQM guidance, receptors within 250m of the Site with a sensitivity to dust have been identified and presented in Table A and Figure F; these are considered to present the closest receptor locations in each direction and are not considered to be exhaustive.

**Table A: Human Receptors**

Receptor(s)		Receptor Type	Sensitivity to Dust	Direction from Site Boundary	Distance from Site Boundary (m)
HR1	South Sutton Lake	Residential	High	W	110
HR2	South Sutton Lake	Residential	High	W	130
HR3	Wetland Visitor Centre Lound Low Road	Residential / Commercial	High	N	40
HR4	Lound Low Road	Residential	High	N	40
HR5	Lound Low Road	Industrial/ Agricultural/ Residential	High	N	90
HR6	North Road, A638	Industrial	Medium	E	At Boundary
HR7	North Road, A683	Industrial	Medium	E	At Boundary
HR8	Northwood Drive	Residential	High	SW	240
HR9	Sutton Lane	Residential	High	W	230
HR10	Idle Valley Nature Reserve Car Park	Recreational	Low	SE	185
HR11	Public RoW	Recreational	Low	E / W	Onsite / Boundary

### 2.1.2 Ecological Receptors

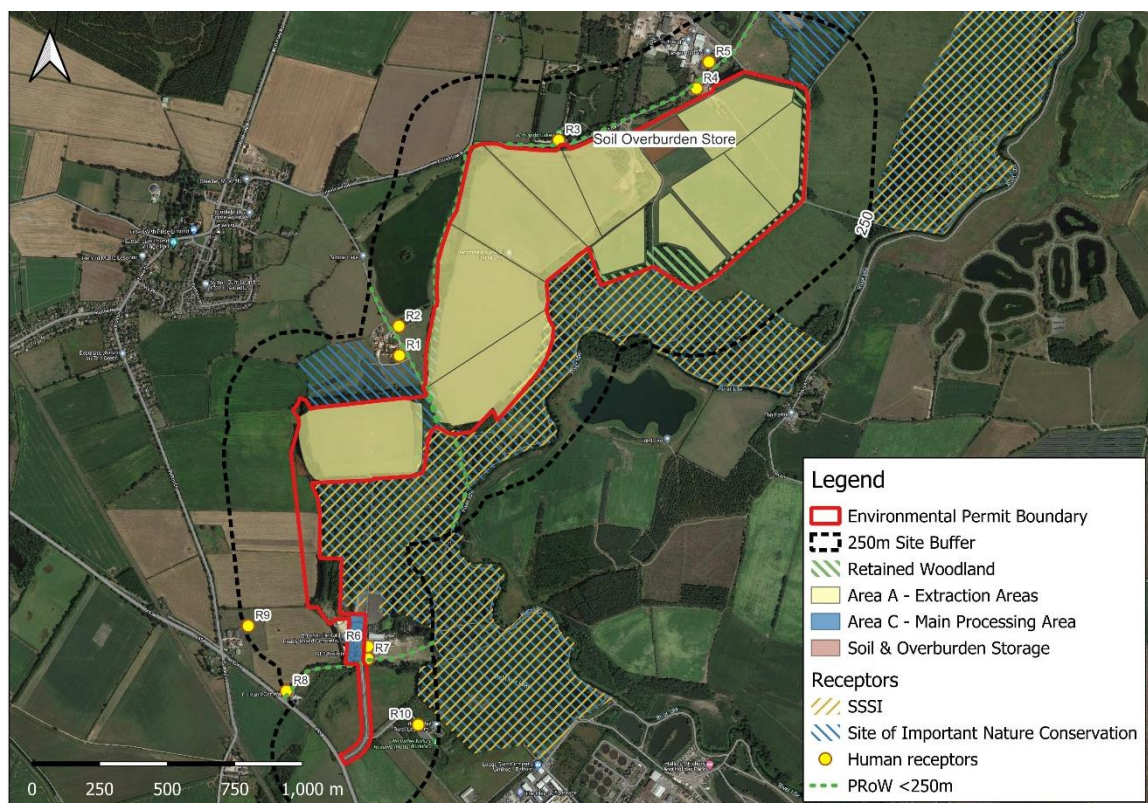
There is a single statutory designated site located within 250m of the Site operations; Sutton and Lound Gravel Pits Site of Special Scientific Interest (SSSI), located to the south and east. Non statutory designations within 250m of the Site include the T iln Wood grassland Site of Important Nature Conservation (SINC), also located to the south and alongside an





additional parcel of land which extends through Area A of the Site between working phases HR P1 and HR P2 and to a small parcel of land north of phase HR P1, as presented in Figure F.

**Figure F: Site Setting**



## 2.2 Meteorological Conditions

The most important climatic parameters governing the release and dispersal of fugitive emissions from the development are wind speed, direction and rainfall:

- wind direction determines the broad direction of dispersal;
- wind speed affects ground level concentrations by increasing the initial dilution of pollutants in the emission. It will also affect the potential for dust entrainment; and
- rainfall naturally suppresses dust release.

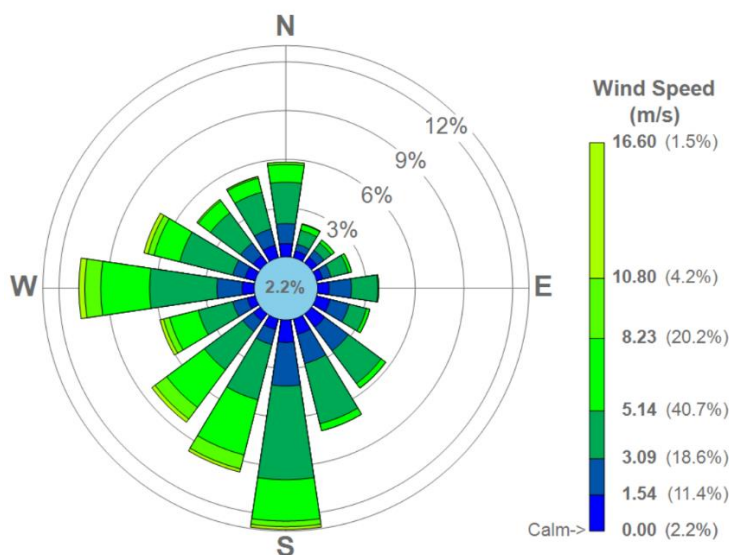
A wind rose from Doncaster, Sheffield Meteorological Station, located approximately 13.5km to the north-east of the Site, is presented in Figure G. It is evident that winds from the south-west quadrant are predominant in the area and winds from the north-east are infrequent. It is notable that the prevailing wind direction is away from the SSSI to the south and the residential properties at Bellmoor Farm.

Relevant rainfall data applicable to the Site has been obtained from the Meteorological Office website of UK mapped climate averages for 1991-2020. The average annual rainfall  $\geq 0.2\text{mm/day}^2$  for the area is 160 to 170 days per year, meaning that for 44% to 47% of the year there is sufficient rainfall to natural suppress any dust emissions without additional control measures.

<sup>2</sup> IAQM, Guidance on the Assessment of Mineral Dust Impacts for Planning, v1.1 2016.



**Figure G: Windrose from Doncaster, Sheffield Station**



## 2.3 Potential Dust Emissions

Unless carefully controlled, sources of dust could be generated by the preparation, extraction, storage, primary processing and handling activities; these are therefore the key areas of focus in this report.

### 2.3.1 Characteristics of PFA

The PFA that is to be extracted from the Site is saturated because it has been in the ground for many years. The Applicant, assisted by SLR, carried out a detailed drilling exercise to sample and test PFA from across the Site, including dozens of boreholes. This confirmed that the PFA has an in-situ moisture content of 18% to 47%, or an average of 31% across the Site. It will therefore have a very limited potential for dust generation when it is excavated and screened.

Notwithstanding the above, numerous management measures are proposed to ensure that the PFA that is to be moved and processed in the open air is kept moist and sufficiently managed. During operations, damping down with water is one of the main techniques used for dust suppression and there are a number of material characteristics of PFA that make this a very an effective technique, as described below.

PFA particles have a high degree of porosity and a large surface area, meaning they contain small pores and voids within their structure. This porosity contributes to the lightweight nature and readiness to absorb water which acts as a highly effective binding agent, suppressing the dust particles, making them heavier and preventing them from becoming airborne. By wetting the dust particles, either as they lay in a body of material or as they are picked up into the air, the weight of the particle is increased so they are less likely to become airbourne. The added moisture also increases the cohesive force of the material body itself, creating larger, heavier group of particles that are more difficult got moving air to carry them away.

PFA also generates electrostatic properties, which means it can acquire an electric charge when handled or transported. This charge can affect the behaviour of the dust during storage or handling, such as its tendency to adhere to surfaces.



## 2.4 Sources of Dust

Sources of dust potential from the Proposed Development are as follows:

- Area A (Main Operational Area)
  - Soil stripping;
  - Extraction;
  - Material handling, pre-screening and transfer;
  - Stockpiling;
- Area C (Main Processing Site)
  - Transfer off-site.

Following extraction, the main materials processing at the Main Processing Site (located at Bellmoor Industrial Estate – Area C) will involve screening and drying of the material through a fixed plant. All of this activity will be carried out within a building, pipework, covered conveyors and containerised drying modules. Processed material will be fed into silos through pipes, therefore keeping the material in an enclosed system at all times. Processing activities within Area C are not therefore considered to be a potential source of dust.

### 2.4.1 Soil Stripping

The top layer of topsoil (approximately 300mm) will be removed using a 360 excavator (or dozer in shallower areas) to expose the surface of the PFA. Importantly, it is not proposed to strip soils from each of the 11 extraction phases entirely in one go; rather, each phase will be split into a number of smaller Micro-Phases (see Figure C) that will be stripped and then extracted from progressively.

This significantly minimises the area of soil and PFA exposed at any one time. The Micro-Phases shown in Figure C are approximately 1 ha each in area, this means that less than 1% of Area A will be undergoing stripping or active extraction at any given time.

It should also be noted, importantly, that soil stripping will be limited to a small number of days in any given year. The requirement is therefore very periodic and limited. It is possible to strip around 3,500m<sup>2</sup> of soils per day on the basis that they average at around 300mm in thickness across Area A.

As such, an entire phase will be stripped in as little as 5 days (LP P2), as demonstrated in Table B below. The soil stripping in larger phases, such as HR P1, whilst requiring a larger number of days (12 days for HR P1), will be carried out over a three-year period; meaning only around 4 days per year. These days will be spread over the smaller Micro-Phases shown in the example in Figure C.

**Table B: Soil Stripping by Phase**

Phase	Tonnes	Years to work (@300k pa)	Size (ha)	Days to soil strip
HR P1	916,000	3.1	8.2	12
LR P1 – Soakaway Ponds	87,000	0.3	4	6
LP P2 – Filter Ponds	116,000	0.4	3.5	5
HR P2	584,000	1.9	7.5	11
LR P3	208,000	0.7	7	10
LR P4	344,000	1.1	7	10
LR P5	254,000	0.8	7	10
HR P3	583,000	1.9	7.5	11



Phase	Tonnes	Years to work (@300k pa)	Size (ha)	Days to soil strip
HR P4	1,323,000	4.4	7.5	11
HR P5	1,109,000	3.7	7.5	11
HR P6	933,000	3.1	7.5	11

It follows that the number of days where soil stripping will be required in close proximity to sensitive receptors is even more limited. It will also be possible completely rule out carrying out stripping during adverse weather conditions, e.g. during particularly dry or windy periods, and to work with sensitive ecological receptors.

Soils stripped from each phase will be stored in a designated area within the phase, for later replacement, or stored in the longer-term soil store adjacent to LR P5 if necessary. The use of the longer-term soil store will be minimised and only used when absolutely necessary, in order to reduce the need for onsite vehicle movements to transport soils.

Taking the above into account, soil stripping is considered to have the potential to be a small dust emission source in the absence of mitigation measures.

#### 2.4.2 PFA Excavation & Stockpiling

A crawler dozer or long reach excavator will be used to pick up and/or push layers of PFA down into the cut for loading by front end loader into a temporary stockpile, for purposes of waste acceptance checks, prior to loading into the pre-screening hopper. Temporary stockpiles would be cleared on a daily basis.

In the absence of dust control but taking account of the high moisture content of the PFA and the small Micro-Phases, the excavation of PFA and temporary stockpiling has the potential to be a small dust emission source.

#### 2.4.3 PFA Handling, Pre-Screening and Transfer

Material is loaded from the temporary stockpile into the primary screening equipment by front end loader and screened to <6mm using a mobile screening unit. The distance between the screening equipment and the working face will be very small (see the example in Figure H below). The material screened for further processing is transferred by an enclosed conveyor system to the Main Processing Site, or by covered vehicles in the case that any maintenance is being carried out on the conveyors. Therefore, the material is enclosed from the point at which the screen is loaded, as previously stated.

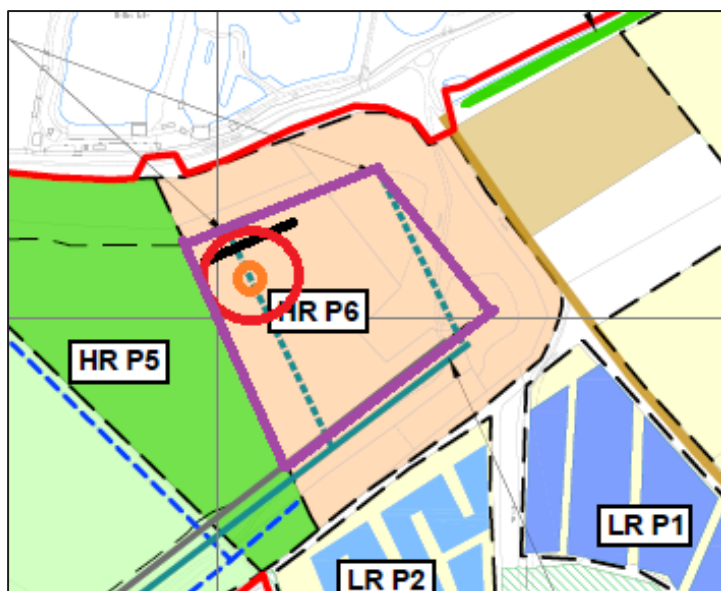
No screening will take place within 100m of the boundary of the Site boundary.

In the absence of dust control but taking account of the high moisture content of the PFA and the small working areas, the handling, pre-screening and transfer of PFA has the potential to be a small dust emission source.





**Figure H: Screen and hopper (orange) placed close to extraction face (black)**



#### 2.4.4 Stockpiling

Stockpiling requirements are minimal, for the following reasons:

- 1 The excavation and pre-screening operations are designed to be "just in time" meaning there is no requirement for intermediate stockpiles of PFA destined for the Main Processing Site in the lagoon area;
- 2 A small (max 3m high) temporary stockpile is needed for acceptance inspection during operational hours prior to feeding into the pre-screening hopper;
- 3 A small (max 3m high, 150m<sup>2</sup>) stockpile is needed for the oversized material from the mobile screening operation;
- 4 The enclosed building and silos at the Main Processing Site have sufficient capacity to hold PFA for 3–5 days of production capacity and no long-term stockpiling is therefore required; and
- 5 The final product is stored in silos and transferred pneumatically into vehicles for transport off-site.

There will be a requirement for the short-term lay-down of PFA immediately following extraction in a temporary stockpile to allow for the relevant material inspections for Waste Acceptance to be carried out in accordance with the EP. The temporary stockpile will be less than 3m high and once satisfied, will be transferred to the mobile pre-screen in Area A and would be a minimum of 100m from the Site boundary.

The small stockpile required for oversized material from the screening process would, on account of the size of material, be of limited dust potential. The stockpile location would, at all times, be a minimum of 100m from the Site boundary.

In the absence of mitigation measures, the storage of soils is considered to be a medium source of dust potential, reducing further once the storage bund is stabilised and vegetated.

Taking into account the high moisture content of the PFA and the size of material within the oversized post-screening stockpile, the dust potential for both the temporary lay-down stockpile and the oversized stockpile is considered to be small. There is considered to be a





negligible potential for dust from stockpiling of PFA once the material has been received at the Main Processing Site due to the building being completely enclosed and under negative pressure.

#### **2.4.5 Material Processing – Main Building**

Following extraction, the main materials processing at the Main Processing Site (located at Bellmoor Industrial Estate) will involve screening and drying of the material through a fixed plant. All of this activity will be carried out within a building and containerised drying modules. Processed material will be fed into a silo through pipes, therefore keeping the material in an enclosed system at all times.

Processing of PFA in the main processing site is considered to be a negligible source of dust.

#### **2.4.6 Material (PFA) Transfer Off-Site**

Road going HGV's will be loaded with final product via a silo, these will be fully enclosed powder tankers; or will be loaded with conditioned PFA into sheeted articulated trucks within the Materials Storage Building. There will be less than 100 HGV movements per working day, inclusive of trips required for exportation of PFA, maintenance requirements and importation of materials.

The road going HGVs will not access any unpaved areas of the Site and will access / leave using the >500m length of paved access road.

In the absence of dust control measures, the off-site transfer of material is considered to have a medium dust emission source; associated with the vehicle movements on the road surface. There is considered to be a negligible potential for dust emissions from the transfer of PFA.

### **3.0 Dust Control**

Measures for minimising, controlling and monitoring dust emissions from the Proposed Development are outlined in this section and have been based upon the stated guidance, the outcome of the risk assessment and the processes and equipment utilised on-site.

The key method of controlling dust emissions is through good site design, management practices and subsequent good housekeeping, i.e. 'avoidance' is the key method of controlling dust emissions.

The below dust control scheme has been developed to provide confidence that all activities have control measures against them and the risks of dispersion beyond the Site boundary has been properly assessed and mitigation measures identified and resourced for.

#### **3.1 Designed in Measures – Site Setting**

A typical cross-section through the Site is shown in Figure I and J. The extraction scheme proposes setting the extraction base at approximately 5m below the existing ground level surface in the High-Rise and approximately 2m below the existing ground level surface in the Low-Rise; working at a lower level and using the lagoon embankments to shield the extraction areas. The lagoon embankments will only be removed/lowered when extraction has been completed in each phase, as the material in the embankment will then be used to restore each phase (filling the void) as part of the restoration process.

#### **Figure K Figure J: Extraction at a lower level**



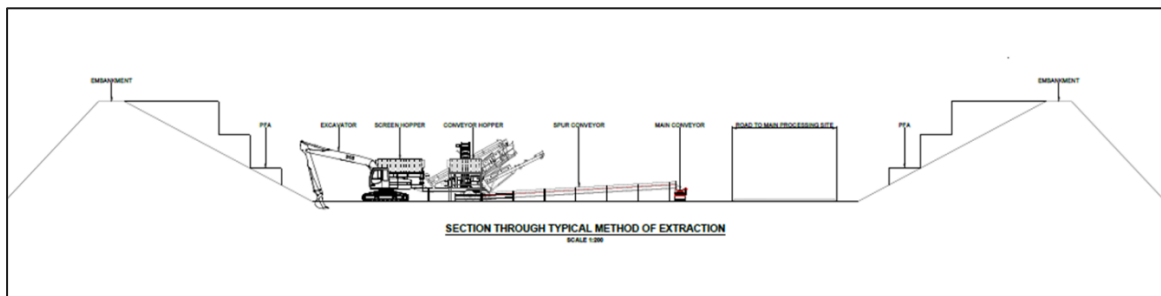


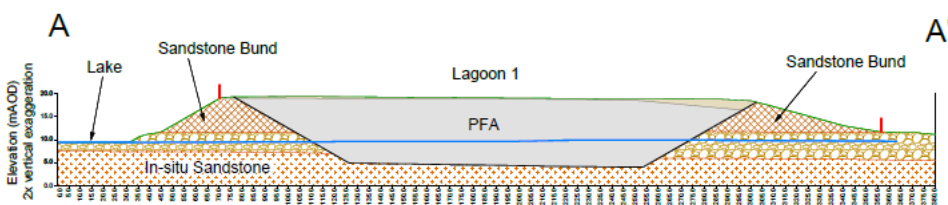
Figure K: below shows the High-Rise lagoon embankments in purple, approximately 6-8m high (above natural ground level), and the Low-Rise embankments in orange, around 2-3m high. The embankments coloured green will be retained in perpetuity. Figure K also shows the prevailing wind direction from the south and west.

It is also proposed to supplement the embankments in the Low-Rise with a 3m high earth embankment or acoustic fencing along the northern boundary and southern boundary, closest to sensitive receptors. The proposed locations are denoted by the orange and purple lines shown in Figure M. This mitigation will be provided for the duration of extraction in the Low-Rise and will effectively mean that circa 5m of screening is maintained at the points closest to the sensitive receptors; a combination of the 2m minimum extraction base and 3m of fencing/bund.

It is clear that the embankments and other measures offer significant screening to all phases from the south throughout extraction, and the vast majority are also screened from the west throughout extraction. It had been identified that when the lagoon embankments to the west of HR P3 are removed this could make HR P4 more susceptible to prevailing winds from the west. The same will be relevant for HR P5 and HR P5. However, this will be remedied by designing the extraction phases to provide shelter from the westerly winds, including by leaving a sealed screening bund along the western boundary of each of the phases until extraction has been completed, to work in tandem with the existing lagoon embankments.

Figure L and M shows HR P3-5, the western wind direction, and where sheltering bunds could be retained.

**Figure I: Typical cross-section showing embankments**



**Figure J: Extraction at a lower level**



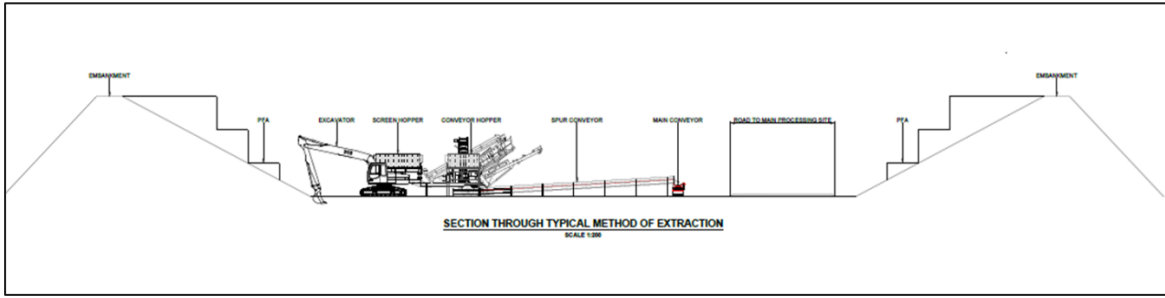


Figure K: Embankments and wind direction

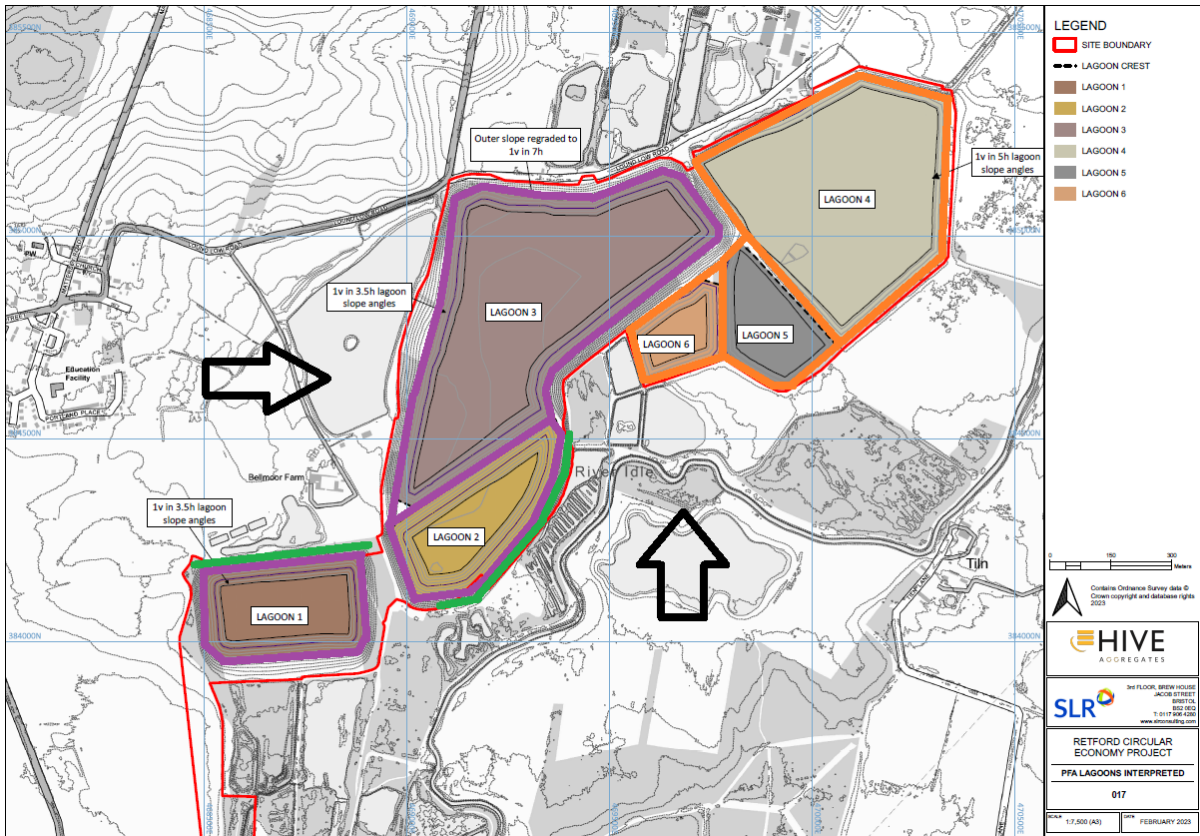
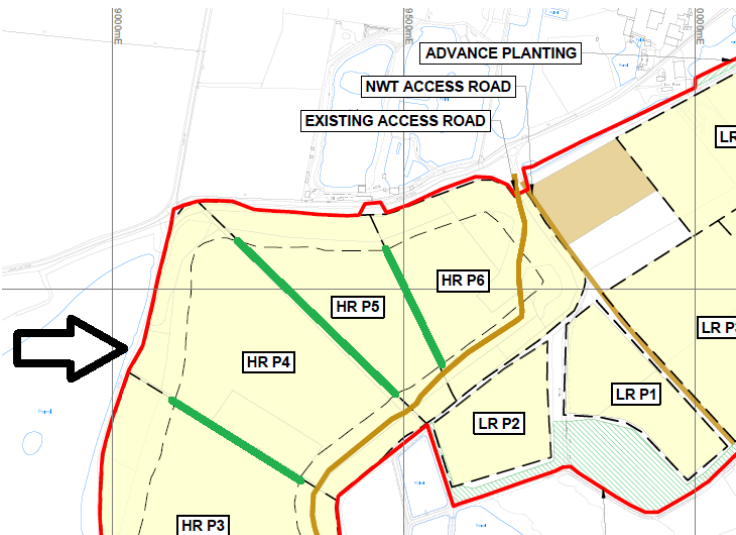
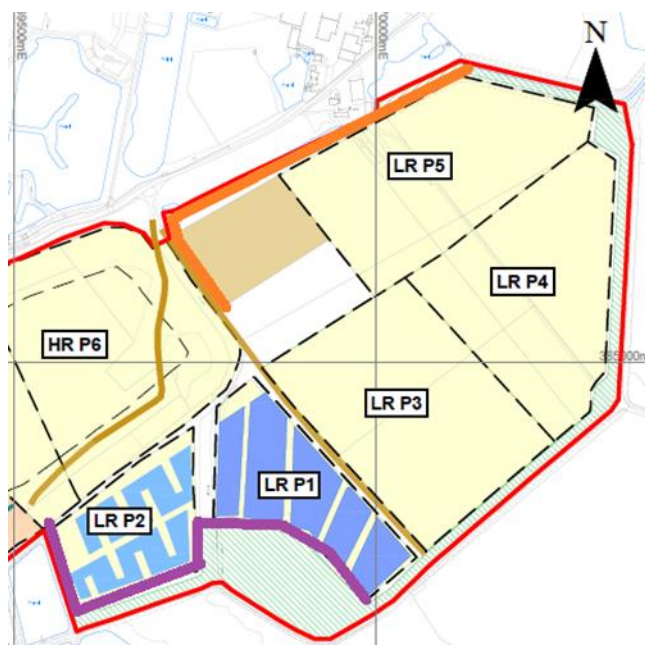


Figure L: Indicative locations for bund retention



**Figure M: Additional screening in Low-Rise**



### 3.2 Dust Control Measures

A range of dust mitigation measures that have either been incorporated into the scheme design or shall be implemented during day to day operations are summarised in Table C.

The activities with the potential to generate dust onsite comprise the small-scale working area (see Figure D) and the onsite haulage roads. On this basis, two water suppression systems shall be implemented on site to ensure dust control is optimum for the activity in question:

- Tractor and bowser for use on the haulage routes and access road (in addition to a road sweeper); and
- An automated fogging suppression system for use in the extraction, screening and stockpiling area (fogging uses significantly less water and therefore does not compromise the subsequent transfer and processing requirements of the PFA).

The fogging system is considered to provide the best results for the small scale area comprising the extraction, screening and stockpiling of the PFA, it acts as a combination of a wet scrubber and a fabric filter, encouraging agglomeration of the particles to create a large enough mass that will subsequently settle.

The fog suppression system would be designed as follows:

- Mains water would be available with filtration systems for the removal of suspended solids from the water;
- The system would be operational 24/7 and would be automated to ensure it is turned on during periods of low rainfall and/or high winds;
- The system would be designed to adequately cover (as per manufacturers guidelines) the dust sources identified in Figure D, relocating as operations progress within the Site.



**Table C: Dust Control Measures**

Operation / Area	Designed-In Control Measure	Additional Control Measures
General	<ul style="list-style-type: none"> <li>• Sandstone embankments surround the Site, some as high as 8m above ground, providing a further buffer.</li> <li>• Water availability at all times on site with a dust suppression system utilising a tractor and bowser, and static water sprays also if necessary.</li> <li>• Additional wind screening provided around the Low Rise (Figure M) and on the western edge of phases in the High-Rise (Figure L) where necessary.</li> <li>• Working of the Site on a phased basis – including small extraction sub-phases (less than 1% of the Site worked at any given time), with progressive restoration of all phases in order to minimise the exposed surface areas that may be subject to erosion and lead to dust generation.</li> <li>• All trees, hedgerows and shrubs on the periphery of the Site shall be retained and protected.</li> </ul>	<ul style="list-style-type: none"> <li>• Water suppression systems:               <ul style="list-style-type: none"> <li>○ tractor and bowser for access roads and internal haulage, to be used during working hours.</li> <li>○ Automated fogging system for use on the extraction, screening &amp; stockpiling PFA areas.</li> </ul> </li> <li>• Activities planned around prevailing weather conditions – the Main Processing Site benefits from around 3-5 days storage within the Materials Storage Building and silos, therefore the open air extraction operations can be completely shut down in adverse weather conditions whilst still exporting material from the Site at full production capacity.</li> <li>• Any accidental spillage of materials shall be cleared up as soon as possible and reused within the activity.</li> <li>• Maintain good standards for all plant and equipment, ensuring all servicing and routine inspections are undertaken as required and recorded in the site logbook.</li> </ul>
Soil stripping & handling	<ul style="list-style-type: none"> <li>• Small Micro-Phases stripped and worked to minimise exposed material.</li> <li>• Soil strips left until latest possible time to minimise the time spent whilst the PFA surface is exposed.</li> </ul>	<ul style="list-style-type: none"> <li>• Working areas are to be kept damp using automated fogging system, during both working and non-working hours;</li> <li>• Exposed areas to be cordoned off and sealed with soil cement (or similar) and/or compacted until excavation</li> </ul>
Excavation	<ul style="list-style-type: none"> <li>• Small Micro-Phases stripped and worked to minimise exposed material; around less than 1% of the Site worked at any given time.</li> <li>• Extraction phases to be designed to be sheltered from the prevailing wind conditions, using the lagoons embankments, retained bunds etc.</li> <li>• Working areas to be kept to a minimum.</li> <li>• Working areas to be kept smooth and free of undulations that can contribute to dust lift off.</li> </ul>	<ul style="list-style-type: none"> <li>• Working areas are to be kept damp using automated fogging system, during both working and non-working hours</li> <li>• Worked areas to be sealed and fenced/cordoned off immediately after extraction completed.</li> <li>• Working area to be sealed with soil cement or compacted overnight and on weekends during periods of dry weather.</li> </ul>





Operation / Area	Designed-In Control Measure	Additional Control Measures
	<ul style="list-style-type: none"> <li>Working area to be kept dampened down during operations and sealed with soil cement or compacted overnight and on weekends during periods of dry weather.</li> </ul>	
Pre-Screening	<ul style="list-style-type: none"> <li>Working area to be kept dampened down during operations and sealed with soil cement or compacted overnight and on weekends during periods of dry weather.</li> <li>Screening plant (mobile) located adjacent/close to the working face</li> <li>Water suppression bars on mobile screen plant and fitted canvas covers</li> <li>No screening within 100m of the Site boundary.</li> <li>Minimal stockpiling with continuous transfer to hopper.</li> </ul>	<ul style="list-style-type: none"> <li>Working areas are to be kept damp using an automated fogging system, during both working and non-working hours.</li> <li>Conveyor belt ends to be shrouded to prevent dust lift off from discharging material.</li> <li>Drop heights to be kept to a minimum when loading the screen.</li> <li>Screen box to be sealed to prevent dust lift-off from screening process.</li> </ul>
PFA Processing	<ul style="list-style-type: none"> <li>All processing plant will be subject to a strict preventative maintenance routine to ensure all handling equipment is regularly inspected and maintained to prevent any spillages.</li> <li>All processing plant fully enclosed, with exhausts from dryers passing through cyclone and fabric filters prior to release to atmosphere with a guaranteed emission limit value of 5mg/m<sup>3</sup>.</li> <li>Transfers of PFA within plant fully enclosed via covered conveyors / piping.</li> </ul>	<ul style="list-style-type: none"> <li>Strict housekeeping routines will be employed to ensure that the processing plant is kept free from dust spillage that could potentially become airborne</li> <li>Sweeper to be utilised to ensure all roadways are kept free from dust at all times.</li> </ul>
Material transfer PFA	<ul style="list-style-type: none"> <li>Field conveyors transporting PFA to Area A to Area C to be fully enclosed to prevent lift off from the conveying process.</li> <li>Transfers of PFA within processing plant fully enclosed via covered conveyors / piping.</li> <li>All material transferred off site contained either by powder tankers or auto-sheeted wagons.</li> <li>The loading chute extends into the wagon body during loading so that the material being loaded does not become exposed to the wind, when loading from silos.</li> </ul>	<ul style="list-style-type: none"> <li>All plant, machinery and duct work to be serviced, calibrated and maintained according to manufacturers instructions</li> </ul>



Operation / Area	Designed-In Control Measure	Additional Control Measures
	<ul style="list-style-type: none"> <li>HGV's will be accurately loaded onto a weighbridge so that there will be no requirement to tip off overloaded vehicles</li> </ul>	
Storage – PFA Inspection Laydown (Area A)	<ul style="list-style-type: none"> <li>Adjacent to working face, located within extraction void benefitting from screening afforded by lagoon embankments and soil bunds.</li> <li>Located a minimum of 100m from the Site boundary</li> <li>Maximum of 3m high and 150m<sup>2</sup>footprint</li> <li>PFA laid on an impermeable base</li> </ul>	<ul style="list-style-type: none"> <li>Stockpiles are to be kept damp using an automated fogging system, during both working and non-working hours.</li> <li>Area cleared at the end of each working day.</li> <li>Area shall be swept at the end of each working day to ensure clean standing overnight.</li> <li>Static water suppression system covering laydown area, to be used continuously on dry days (days &lt;0.2mm rainfall).</li> </ul>
Storage – Oversized PFA Stockpile (Area A)	<ul style="list-style-type: none"> <li>Located a minimum of 100m from the Site boundary, a maximum of 3m high and 150m<sup>2</sup>footprint.</li> <li>Located within extraction void benefitting from screening afforded by lagoon embankments and soil bunds.</li> <li>Material laid on an impermeable base</li> </ul>	<ul style="list-style-type: none"> <li>Shall be covered on days that material transfer operations are not required.</li> <li>Shall be covered at the end of each working day.</li> <li>Shall be dampened down twice daily using water suppression on dry days (days &lt;0.2mm rainfall).</li> </ul>
Storage – PFA (Area C)	<ul style="list-style-type: none"> <li>Material Storage Building fully enclosed, kept under negative pressure with extraction system to remove airborne dust.</li> <li>Final product stored in a silo or (for conditioned PFA only – 15% moisture content) within the Main Processing Building under negative pressure to prevent exposure to the wind.</li> <li>Silo fitted with high-level indication and auto cut-off's to prevent an overflow and release to atmosphere.</li> </ul>	<ul style="list-style-type: none"> <li>All plant, machinery and duct work to be serviced, calibrated and maintained according to manufacturers instructions</li> </ul>
Storage - Soils	<ul style="list-style-type: none"> <li>Designated areas on site.</li> <li>Compacted during construction</li> <li>Graded and vegetated at the earliest opportunity.</li> </ul>	<ul style="list-style-type: none"> <li>Unvegetated areas to be dampened down a minimum of twice daily on dry days (days &lt;0.2mm rainfall)</li> <li>Water suppression used during construction as necessary, until surface is vegetated and stabilised</li> </ul>
On-Site transportation (Contingency Method for PFA Transfer)	<ul style="list-style-type: none"> <li>Haul routes designed to maximise distance from off-site receptors and minimal changes in direction and gradient.</li> <li>Dump truck speeds to be maintained at a level to prevent lift – speed limit of 15mph across Site</li> </ul>	<ul style="list-style-type: none"> <li>Dump truck to only used designated / agreed haul routes</li> <li>Haul routes to be dampened a minimum of twice daily with tractor and bowser on dry days (days &lt;0.2mm rainfall).</li> </ul>



Operation / Area	Designed-In Control Measure	Additional Control Measures
		<ul style="list-style-type: none"> <li>• Dump trucks only loaded to the height of the body sides to prevent lift off during the haul.</li> <li>• Drop heights to be kept to a minimum when loading dump trucks.</li> </ul>
Off-site transportation	<ul style="list-style-type: none"> <li>• Areas accessible by off-site vehicles are hard paved to allow surface to be swept and effectively watered.</li> <li>• &gt;500m of hard paved access road between wheel wash and local road network.</li> <li>• Speed limit of 15mph on access road</li> </ul>	<ul style="list-style-type: none"> <li>• All vehicles exiting site to utilise wheel wash and rumble strips located adjacent to weighbridge.</li> <li>• Road sweeper on site for use on local road network, access road and main processing area, as required.</li> </ul>



## 4.0 Monitoring

### 4.1 Meteorological Conditions

Weather monitoring and forecasting plays a crucial part in managing site activities. The management team will monitor local weather forecasts 7 days in advance so that the prevailing conditions for the working week and weekend ahead are known and resources can be planned accordingly. Although no working will be undertaken during the weekend there might be requirements for dust suppression activities depending on the weather conditions.

The site management team will use the MetOffice weather forecasting website for accurate wind, temperature and rainfall forecasting. Days whereby it is likely that daily rainfall would be less than 0.2mm would be identified and relevant dust control measures planned for operation, including:

- Static water suppression system on temporary PFA laydown area;
- Twice daily (minimum) dampening down of oversized PFA stockpile;
- Twice daily (minimum) dampening down of any unvegetated / uncovered soil storage areas; and
- Twice daily (minimum) of application of water suppression on unpaved haul roads using tractor and bowser.

The use of soil cement to seal surfaces and/or the covering stockpiles would also be implemented if deemed necessary instead of or in addition to the above.

They will also use a dedicated on-site weather station to monitor live weather conditions on-site and will employ trigger levels that have been adapted from working on similar PFA recovery operations:

- 1 LEVEL 1: If the windspeed is >10mph, an additional bowser (2 minimum) will be deployed to dampen all working areas and roadways.
- 2 LEVEL 2: If the windspeed is >15mph, additional observations will be made. If any notable dust lift-off is visible within the site, operations must stop until it is under control. Soil cement (a water based sealant) will be added to the water mix to seal relevant areas (i.e. PFA storage / unvegetated and exposed soil areas).
- 3 LEVEL 3: If windspeeds reach >25mph all operations are to stop until the wind reduces.

It will be the Site Manager's, or Supervisor's responsibility to monitor and react to these Levels.

The weather station will be connected to a PC and the weather data will be recorded and logged for up to three years. This is required for audit purposes and to track that the necessary dust prevention resources were deployed in line with the prevailing weather conditions,

### 4.2 Visual Dust Monitoring

Dust monitoring will be undertaken visually by site personnel throughout the working day. In addition, the Site Manager will record observations and anything noteworthy in the Site Environmental Management Log Book. An example form for visual monitoring is provided in Appendix A.



Targeted visual dust monitoring will be undertaken in response to incidents or contingency actions as appropriate. Daily visual dust monitoring will be undertaken at locations along the Site boundary and the Site access. Observations are recorded in the Site Diary or Environmental Management Logbook. The following details are recorded:

- weather conditions (wind speed (qualitative i.e. strong/light), wind direction, rainfall);
- current site operations;
- identification of any significant dust on Site or dust dispersion beyond the Site boundary;
- the bowser and dust suppression operation; and
- additional mitigation measures put in place if required.

In the event of a complaint, more frequent or off-site visual monitoring will be undertaken, if required, until the issue is resolved as described in the Dust Action Plan contingency measures.

### 4.3 Quantitative Dust Monitoring

As a result of the dust control measures outlined in Section 3, there is considered to be a negligible to low risk of dust emissions from the development, with an insignificant effect on local air quality with regard to fine particles and disamenity dust. Therefore, it is considered that no quantitative dust monitoring would be required under the Best Available Techniques ('BAT') requirements of the Environmental Permitting Regulations.

However, in order to provide additional re-assurance that the proposed dust controls are operating effectively, the operator proposes to go 'beyond BAT' and undertake a quantitative dust deposition monitoring scheme at the commencement of full-scale operations at the Site.

A quantitative dust monitoring plan at boundary monitoring locations has been designed to assess the potential of onsite activities to cause impacts from dust deposition on human and ecological receptors offsite and to aid in the review and application of dust control measures.

#### 4.3.1 Methodology

Deposited dust and surface soiling will be monitored using dust deposition gauges fitted with adhesive directional dust samplers around the exterior. The samples will be collected on a monthly basis and sent to a UKAS accredited laboratory.

The dust deposition samples will be sent off to a UKAS accredited laboratory and analysed for the following:

- Mass of dissolved and undissolved solids to determine deposition rate as mg/m<sup>2</sup>/day using Method No.FD0: The determination of Fugitive Dust based on BS 872:2005 (mass of dust (mg) is the UKAS accredited test); and
- % Effective Area Covered (EAC) to determine surface soiling and direction of impact using Method No. FD05: The determination of reflectance values using a smoke stain reflectometer (% reflectance is the UKAS accredited result reported).

The gauges will be exchanged on a monthly frequency by a trained member of staff and will follow the protocol listed below:

- Liaise with the laboratory to obtain clean sample bottles in advance of sample collection;
- Ensure replacement bottles are clearly and correctly labelled with the 'Location ID' and 'sample collection period (start/end)';





- Upon arrival to a gauge location, check the gauge for any signs of disrepair or dislodgement;
- If there are deposits of dust settled on the gauge capture dish carefully direct the dust down into the sample bottle using a small brush and de-ionised water;
- On removal of the exposed sample bottles and adhesive strips ensure correct labelling;
- Install replacement bottle and adhesive strips; and
- Deliver the samples and supporting documents promptly to the UKAS accredited laboratory for analysis.

Monitoring will be undertaken for a minimum period of six months from the commencement of extraction activities, with an additional 2 months 'baseline' monitoring prior to any onsite works. A review of the results will be undertaken prior to equipment being dismantled and removed from the Site in order to provide a period of time for the operator to consult with local stakeholders. The six month period will ideally include a minimum of three 'drier' months of the year to account for worst-case conditions. In the event that this is unobtainable, the monitoring period may require a time extension.

### **4.3.2 Monitoring Locations**

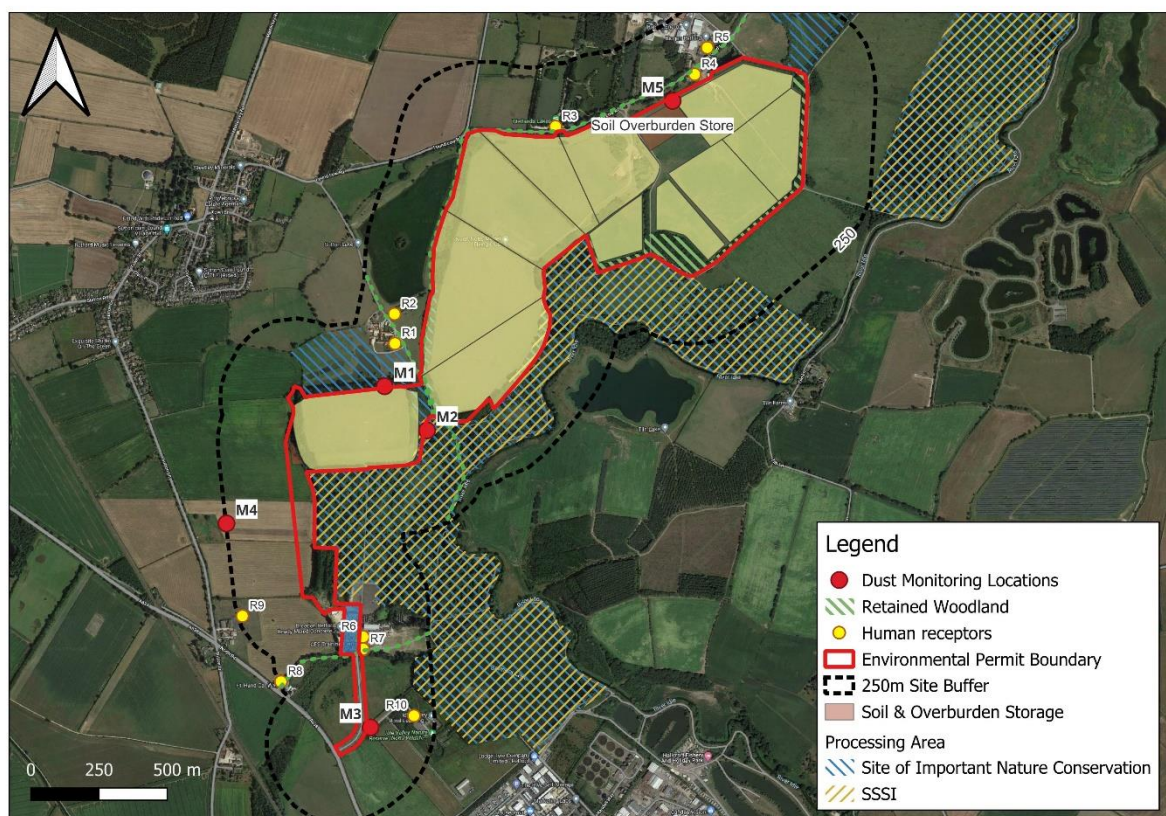
The identified receptors in Figure F along with the dominant meteorological conditions set out in Figure G and the location of onsite activities during the first 6 months of operations have informed the methods and monitoring locations applied within this monitoring scheme.

The monitoring locations are focussed around the excavation phases HR P1, the overburden and soil storage areas and the access road; thereby relevant to the primary on-site activities during the first 6 months of operations. Should phasing or associated timescales change, the monitoring locations will be revised.

The sampling equipment will be placed at the five locations around the perimeter of the Site, as presented in Figure N (unless site circumstances indicate that this will not enable a representative sample to be collected). Circumstances which might be encountered include crops being grown around a proposed monitoring point or being harvested nearby, overhanging trees, a change in the site access road location, etc. If this occurs advice will be sought from the Site Manager as to whether re-locating the monitoring point will be appropriate or whether the monitoring equipment will be set up in the original location or the monitoring abandoned for that point. If it is decided to continue with the monitoring at that point a note will be made to aid with interpretation of anomalous results.



**Figure N: Indicative Monitoring Locations**



The Location M4 will be determined on the availability of securing and accessing an off-site location. In the instance that this is not possible, an alternative background location would be sought, with a minimum distance of 250m from any on-site operations.

### 4.3.3 Relevant Criteria

#### 4.3.3.1 Human Receptors

The dust monitoring results will be compared to the benchmarks for the protection of amenity derived from Environment Agency (M17), Government sponsored best practice guidance<sup>3</sup>, and Institute for Air Quality Management guidance<sup>4</sup> on dust monitoring, specifically:

- For dust deposition, results are compared to the 'custom and practice' limit value of 200mg/m<sup>2</sup>/day (averaged over a monthly period); and
- For surface soiling, the results are compared to the public response nuisance thresholds as described in Table D.

<sup>3</sup> The Environmental Effects of Dust from Surface Mineral Workings, DETR (1995) Arup Environmental.

<sup>4</sup> IAQM, Guidance on Air Quality Monitoring in the Vicinity of Demolition and Construction Sites.



**Table D: Public Response Levels to Surface Soiling<sup>5</sup>**

% Effective Area Covered (EAC) per day	Outcome
0.2	Noticeable
0.5	Possible Complaint
0.7	Objectionable
2.0	Probable Complaint
5.0	Serious Complaint

#### 4.3.3.2 Ecological Receptors

Interim Advice Note (IAN) prepared as a supplement to the Design Manual for Roads and Bridges<sup>6</sup> suggests that only dust deposition levels above 1000 mg/m<sup>2</sup>/day are likely to affect sensitive ecological receptors. This level of dust deposition is approximately five times greater than the level at which most dust deposition may start to cause a perceptible nuisance to humans. Furthermore, it is stated that most species appear to be unaffected until dust deposition rates are at levels considerably higher than this<sup>7</sup>.

Deposited dust and surface soiling results for each gauge will be received from the laboratory undertaking the analysis and collated in order to assess areas in which deposited dust and surface soiling are above the 'custom and practice' thresholds.

#### 4.3.4 Reporting

Deposition rates (mg/m<sup>3</sup>/day) will be assessed against the relevant thresholds and if rates are above, then surface soiling data will be consulted to determine the likely direction from which the dust originating. If directional data indicates that deposited dust was likely to have originated from on-site, site management will look at operational schedules and activities to determine and resolve any causes of significant dust generation.

Monthly internal reports will be produced displaying deposited dust rates and directional data for each monitoring location. If exceedances are found, a summary document with conclusions as to potential sources of dust and any reactive actions taken to reduce concentrations will be created. Importantly, no exceedances are anticipated as a result of the control and management measures to be employed as part of this DMMP.

If dust gauges regularly report deposition rates above the relevant thresholds despite mitigation measures being undertaken, the boundary location should be investigated to determine if other local factors are influencing deposition rates at the particular gauge. If other local factors are impacting the dust gauge deposition rates, then this should be noted within the monthly report and an alternative location will be chosen. If however, it is considered that the dust collected is generated from on-site operations, a detailed investigation will be undertaken which may involve temporarily stopping specific operations until the investigation is concluded.

All laboratory analysis and monitoring results will be collated and stored on file by site management and procedures for reporting should follow the relevant sections below.

<sup>5</sup> Beaman, A. L. and Kingsbury, R. W. S. M. (1981) "Assessment of Nuisance from Deposited Particulates using a Simple and Inexpensive Measuring System", Clean Air, 11(2), 1981, pp77-81.

<sup>6</sup> Design Manual for Roads and Bridges, Volume 11, Section 3, Part 1, HA207/07, Annex F

<sup>7</sup> Farmer A.M. (1991) The Effects of Dust on Vegetation – A Review. Environmental Pollution 79. Pp 63-75



A summary letter of results will be submitted to the Local Planning Authority at the end of the respective monitoring period.

Following the review of outcomes from the initial 6-month operational monitoring period LHL in collaboration with the Local Planning Authority will determine whether it is appropriate to continue monitoring and revise this DMMP accordingly.

## 5.0 Dust Action Plan

### 5.1 Contingency Plans

The contingency plans have been defined to react to situations where monitoring (visual or quantitative) indicates that a potential dust source is not completely under control, control measures have failed, or that an adverse impact has/or may occur.

This includes incidents that have the potential to cause an unacceptable impact on the local community. Again, please note that including for contingency planning here is procedural and required by the statutory authorities. Importantly, no exceedances are anticipated as a result of the management measures to be employed as part of this DMMP.

Contingency measures for the following events have been defined in Table E:

- malfunction in water suppression units rendering them ineffective;
- failure in water supply;
- visual monitoring indicates dust generation in significant quantities, that is either likely to or is actually leaving the Site boundary in quantities likely to cause nuisance to sensitive receptors;
- quantitative dust monitoring indicating continuous exceedances of the relevant threshold criteria;
- Non-conforming material identified and stockpiled within extraction area;
- oversized PFA not able to exported as substitute aggregate or used onsite for progressive restoration, (i.e. risk of stockpile being greater than 450m<sup>3</sup>);
- weather monitoring indicates potential dust generation issues, i.e. prolonged dry spell followed by high winds; and
- complaints received from members of the public or neighbouring businesses.

Note however that exceedances and dust incidents are not anticipated, rather their addition is a matter of applying the most stringent process and complying with the requirement of the EA's guidance to ensure that contingency arrangements have been considered.

**Table E: Contingency Plans**

Event	Malfunction in water suppression units, rendering ineffective
Contingency Actions	Notify management of malfunction so repairs can be made, engineer called out, or plant hired. Determine whether the water suppression equipment is required that day given meteorological conditions. If not, continue operation but continually monitor operations and meteorological conditions. If dust is likely to leave the Site boundary in sufficient quantities as to be unacceptable apply further controls: as required, apply manual hosing, use of road sweeper on access road, hire dust suppression units from off-site, move operational area.





	If impact is considered likely to occur, then cease operations until dust suppression unit is available.
Comment	Record details in Site Environmental Management Log Book.
<b>Event</b>	<b>Water supply failure</b>
Contingency Actions	Determine through visual monitoring and weather forecast whether the application of water represents essential mitigation to continue operations. If 'yes' cease operations until a water supply is available. Notify relevant parties at earliest opportunity (site management, engineers, utility company)
Comment	Record details in Site Environmental Management Log Book.
<b>Event</b>	<b>Breakdown or maintenance of conveyor system</b>
Contingency Actions	Use of sheeted dumper trucks to transfer material onsite using designated haul routes. Frequent, regular use of tractor and bowser utilised as required.
Comment	Visual monitoring to be more frequent and extend to internal haul routes. Record details in Site Environmental Management Log Book. Maintenance of conveyor systems scheduled to avoid the 'drier' months of the year
<b>Event</b>	<b>Visual monitoring indicating dust leaving the Site boundary in quantities and direction likely to cause nuisance</b>
Contingency Actions	Notify management and record observations in Site Environmental Management Log Book (e.g. Pro-forma Appendix A). Continue to monitor situation by increased frequency of visual dust monitoring. Investigate and identify dust source. If dust is from a particular source (e.g. haul road, specific stockpile or loading area, loading shovel etc) then review mitigation options. Review application of dust minimisation control measures. Apply appropriate contingency measures as required e.g.: <ul style="list-style-type: none"> <li>• more frequent/effective application of water bowser units to problem areas;</li> <li>• more frequent, additional washing of the access road; and/or</li> <li>• review additional dust monitoring requirements (i.e. quantitative methods).</li> </ul> Ultimately cease identified operation if it cannot be effectively controlled.
Comment	Record details in Site Environmental Management Log Book. DMMP may require updating on the basis of results of investigations
<b>Event</b>	<b>Non-conforming material identified and stockpiled within extraction area</b>
Contingency Actions	Stockpile of non-conforming material to be transferred offsite within 48hours Stockpile to be covered as soon as practicable, alternatively dampened down using onsite tractor and bowser a minimum of twice daily on 'dry days'
Comment	Record details in Site Environmental Management Log Book.
<b>Event</b>	<b>Dust monitoring indicates potential dust generation issues</b>





Contingency Actions	<ul style="list-style-type: none"> <li>investigation by site manager into operations and dust control measures;</li> </ul> <p>If dust monitoring gauges show exceedance of relevant threshold for &gt;2 months, the LPA would be informed and involved with discussions on additional monitoring and/or analysis would be undertaken. Including but not limited to consideration of the following:</p> <ul style="list-style-type: none"> <li>inform LPA of monitoring results and proposed investigations / additional measures;</li> <li>Increase in dust monitoring gauges to ascertain extent of affected area;</li> <li>Compositional analysis of dust samples at the UKAS accredited laboratory;</li> <li>Increase in duration of dust monitoring scheme, until satisfied and demonstrated that dust generation is under control and monitoring results are consistently below thresholds; and</li> <li>Increase in visual monitoring at on-site and offsite locations deemed to be areas of potential exceedences.</li> </ul>
Comment	Record details in Site Environmental Management Log Book. DMMP may require updating on the basis of results of investigations
<b>Event</b>	<b>Oversized PFA not able to exported as substitute aggregate or used onsite for progressive restoration, (i.e. risk of stockpile being greater than 450m<sup>3</sup>);</b>
Contingency Actions	Excess oversized PFA would be transferred offsite for disposal, ensuring the stockpile for oversized PFA never exceeds the 150m <sup>2</sup> footprint or 3m height
Comment	Record details in Site Environmental Management Log Book.
<b>Event</b>	<b>Weather monitoring indicates potential dust generation issues</b>
Contingency Actions	<p>Anticipate the level of abatement required (i.e. water suppression, postponement of activities), including the hire of additional equipment if necessary.</p> <p>Increase frequency of visual dust monitoring; management to advise all staff of greater vigilance.</p> <p>If dust is seen to be crossing the Site boundary, follow contingency measures as detailed above.</p> <p>If water supply fails, follow contingency measures as detailed above.</p>
Comment	Record details in Site Environmental Management Log Book.
<b>Event</b>	<b>Complaints received from members of the public or neighbouring businesses</b>
Contingency Actions	<p>Notify management.</p> <p>Follow complaint reporting and investigation procedure.</p> <p>If persistent complaints are received, discussion with the LPA to re-institute dust monitoring with a / the gauge(s) suitably located to represent the receptor or area in question.</p> <p>If monitoring is undertaken, ensure results are reported back to the complainant.</p>
Comment	<p>Complaints will be reported to the relevant authorities in accordance with any relevant planning conditions.</p> <p>The addition of further / or reinstatement of, monitoring gauges will be discussed with the LPA in the first instance</p>



	DMMP may require updating on the basis of results of investigations.
<b>Event</b>	<b>Dust deposition monitoring indicates either unusually high levels or exceedances of 200mg/m<sup>2</sup>/day</b>
Contingency Actions	Investigate potential source of elevated emissions, e.g. review Site Log Book and activities being undertaken during monitoring period, meteorological conditions, and control measures being employed.
Comment	Implement remedial actions.

## 5.2 Dust Complaints Procedure

Upon receipt of a dust complaint the site management will aim to collect as much information as possible from the complainant including location, date, time, details of dust and any further site operational information which will aid an assessment of the complaint.

Once details have been determined, further assessment shall be undertaken to substantiate the dust complaint through:

- Review any dust mitigation measures in place during the time of the complaint;
- Review meteorological conditions (wind direction/wind speed/rainfall) from the onsite weather station during the complaint period to see if a pathway can be established between the site and complainant; and
- Review deposited dust and surface soiling results for the period in which the complaint was made.

If the complaint is received in a timely fashion from the event reported, reactive visual dust inspection of the site will be carried out by the site management. It should be noted that visual inspection is only of use soon after the event reported as conditions (both meteorological and/or operational) rapidly change. If required to substantiate a dust complaint, a visual inspection at the complaint location should be undertaken.

## 6.0 Management

### 6.1 Dust Control Responsibilities

There shall be a competent person on Site during working hours responsible for dust management measures. Responsibilities are allocated to specific personnel to ensure dust generation is effectively controlled (see Table F). The contact details for the Site Manager will be clearly displayed at the site entrance or on the perimeter fencing.

**Table F: Dust Management Responsibilities**

<b>Actions</b>	<b>Responsibility</b>
Monitoring Meteorological Forecast	Site Manager / Supervisor
Routine Visual Dust Monitoring	Site Manager / Supervisor
Quantitative Dust Monitoring	Site Manager / Supervisor
Application of Plant / Working Area Dust Suppression	Operatives
Record keeping	Site Manager
Liaison with Public and Regulator	Site Manager



## **6.2 Liaison with Community & Regulators**

The Site Manager (or nominated representative) will act as liaison with the LPA and local community for issues relating to dust nuisance.

## **6.3 Record Keeping**

The operator shall keep records of all dust monitoring, dust contingency actions, investigations, and complaints on Site in the Environmental Management Log Book in accordance with the DMMP.

## **6.4 Review and Update of DMMP**

The effectiveness of the measures and monitoring within this DMMP should be reviewed following the initial 6-month period of monitoring and thereafter on an annual basis. The reviews will take into account the monitoring results, any complaints received any introduction of sensitive developments in the site locale. A review of the DMMP will also be undertaken in the event of:

- Exceedance of the monitoring criteria;
- Dust complaints from nearby residents;
- Significant changes to site operations; or
- Introduction on new receptors within close proximity to the site.





# Appendix A Inspection Forms

## Dust Management and Monitoring Plan (planning)

Retford Circular Economy Project

Lound Hive Ltd

SLR Project No.: 416.59544.00001

21 December 2023

**Table A-1: Recording Form – Visual Inspection**

<b>BACKGROUND INFORMATION</b>			
Person Undertaking Inspection (& Position)			
Date:		Time:	
Description of Wind Strength (i.e. strong, gusty)			
Wind Direction			
Weather description (i.e. sunny, overcast)			
Temperature (°C)			
Ground conditions (dry, damp, wet, saturated)			
<b>Survey Results</b>			
Location	Are airborne dust (clouds/emissions) travelling beyond the boundary? (Y/N)	Potential Sources	Are Mitigation Measures in place? (Y/N)
If airborne dust is present in large concentrations, additional information is to be detailed below:			
<b>Further Actions</b>			
If during the inspection the dust is present in high concentrations any location on the site boundary, the following information requires completion regarding plant operation.			
Onsite processes	Has there been any changes to site processes or mitigation measures?		
	If yes, detail what has changed?		







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