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Edwin Richards Quarry – Soil Treatment Centre

Fugitive Emissions Management Plan for Dust

Waste Recycling Group (Central) Limited

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1 Introduction

1.1 Report Objectives

This Fugitive Emissions Management Plan for Dust (FEMP) supports an application by Waste Recycling Group (Central) Limited (WRG) to vary the current permit referenced EPR/HP3632RP to:

- Allow additional 30,000 tonnes per annum to be accepted at the facility and increase overall throughput to 180,000 tonnes per annum inclusive of either hazardous and/or non-hazardous waste.
- Remove the split of hazardous / non-hazardous waste treated at the facility from 89,998 tpa for hazardous waste and 60,002 tpa for non-hazardous waste to 180,000 tonnes per annum inclusive of either hazardous and/or non- hazardous waste. The amended ratio relates to the list of wastes in Table S2.2 and S2.3 of the permit (physical treatment of wastes and wastes for treatment in the bioremediation process respectively). This will impact the following listed activities:
    - AR1 S5.3A(1)(a)(ii) Physical treatment of hazardous waste
    - AR2 S5.3A(1)(a)(ii) Asbestos removal from soils
    - AR3 S5.4A(1)(a)(ii) Physical treatment of non-hazardous waste
    - AR4 S5.3 A(1)(a)(i) Bioremediation of hazardous waste for disposal
    - AR5 S5.3 A(1)(a)(i) Bioremediation of hazardous waste for recovery
    - AR6 S5.4A(1)(a)(i) Bioremediation of non-hazardous waste for disposal
    - AR7 S5.4A(1)(b)(i) Bioremediation of non-hazardous waste for recovery
- Addition of new soil treatment pad for biological treatment and soil washing.
- Addition of a point source emission to air to Table S3.1 to account for the biofilter from the new soil treatment area.
- Addition of soil washing activity for the soil washing of soils contaminated with heavy metals comprising the following listed activities and waste operations to be subject to the 180,000 tonnes per annum inclusive of either hazardous and/or non-hazardous waste.
    - S5.3 A(1)(a)(ii) – recovery of hazardous waste with a capacity exceeding 10 tonnes per day involving physico-chemical treatment via soil washing
    - S5.3 A(1)(a)(ii) – disposal of hazardous waste with a capacity exceeding 10 tonnes per day involving physico-chemical treatment via soil washing

  Associated waste operations will be:
    - Treatment of non-hazardous waste soils by soil washing for recovery.
- Amendment to Table S1.1 Activity AR8 regarding the temporary external storage of up to 20,000 tonnes to include soils contaminated with heavy metals (10,000 tonnes) and activities associated soil washing activity references in the limits of specified activity and waste types.
- Allow the use of a mechanical screener for the pre-screening of soils containing asbestos.

- Remove pre-operational condition 1 as listed in Table S1.3 of the Permit.
- Undertake mechanical screening of non-hazardous soils in the area currently used for storage of non-hazardous soils. It is proposed to use this area for storage and screening of non-hazardous soils. Screening is already regulated under activity reference AR3 physical treatment of non-hazardous waste.
- Amend drawing reference in Table S3.3 of the Permit to remove reference to plan 100993 – Asbestos DWG1 dated January 2018 and replace with reference to an Emissions Monitoring Plan.

The proposed changes to the Permit at the Soil Treatment Centre (STC) better reflect current market conditions and reflect the activities permitted by the extant planning permission.

It will also discharge Condition 3.a) of Planning Permission DC/21/66058 which approves the new soil treatment area. Condition 3.a) is reproduced below for reference.

> *Soil treatment works should not begin on this part of the site until information is submitted to and approved in writing by the local planning authority confirming the mitigation measures that will be employed to contain fugitive emissions of dust and odour from this activity. This information could be either a specific dust management plan or details of the conditions in the Environmental Permit issued by the Environment Agency which adequately demonstrates the measures in place to ensure that there will be no adverse impact on local amenity from dust.*

An Air Quality Management Plan relating to both odour and dust (Report Ref: 33012rr722i2, November 2016) was submitted with the previous planning application and a Dust and Particulate Management Plan (Report Ref: 4236/R/005/3) was submitted with the previous permit application. A Planning Statement (Report Ref: 2596-01, August 2021) was submitted with the planning application for the new soil treatment area and includes measures for air quality. These Reports have been utilised to develop this FEMP. Reference has also been made to Environment Agency Guidance[1].

The purpose of this FEMP is to address the current and proposed activities at the Soil Treatment Centre (STC) likely to cause a potential emission of uncontrolled dust and particulates and how these emissions will be minimised. A copy will be included in the Site Management System (or Working Plan) held at the Site Office and all members of staff will have access to this document.

[1] Air emissions risk assessment for your environmental permit - GOV.UK (www.gov.uk)

2 Site Operations

2.1 Current Site Activities

The STC is currently permitted to accept a mixture of hazardous and non-hazardous waste for treatment for recovery, pending disposal off-site at the directly adjacent Edwin Richards Landfill Site also operated by WRG or reused on site as restoration soils. The treatment technologies employed include pre-screening of soils, bioremediation of hazardous soils in biopiles and handpicking discrete fragments of asbestos material from soils (not contaminated with asbestos fibres).

The entirety of the area inside the current permit boundary, including inside the building comprises approximately 8.6 ha comprising a large hard surfaced level platform, which was used as part of the quarrying activities and now the STC. The STC is currently accessed via the entrance on Portway Road.

2.2 Proposed Activities

The proposed changes to the Permit at the Soil Treatment Centre (STC) better reflect current market conditions and reflect the activities permitted by the extant planning permission.

The Operator proposes to add a soil washing activity to the permit to allow soil washing of soils containing heavy metals. As a result of the addition of a soil washing activity on the proposed new area, a change to hazardous soils storage area is required to allow storage of 10,000 tonnes soils contaminated with heavy metals. 10,000 tonnes will remain as the storage limit on the adjacent area for soils containing asbestos.

The new soil treatment pad area will be able to treat 30,000 tonnes via either bioremediation or soil washing dependent on the contract. Soil will be treated on an impermeable surface with sealed drainage. It is occupied by an area of hard standing within the current permit boundary and will use the existing access road from Portway Road. The location of the new soil treatment area is shown on the Site Layout Plan. The Site Permit Boundary is shown on drawing reference K0182.1.002 and remains unchanged as part of this application.

A point source emission to air will be added to Table S3.1 of the permit to account for the biofilter from the new soil treatment area.

The Operator proposes to pre-screen the soils contaminated with asbestos fragments prior to handpicking to remove oversize aggregate materials which would otherwise damage the handpicking station and prolong hand picking works whilst oversized fragments are manually removed by site personnel. The limits applied to the asbestos content in the soil matrix will not change. Pre-screening will be undertaken in the Soil Treatment Building.

The Operator proposes to remove the tonnage split between non-hazardous waste and hazardous waste and increase the annual throughput by 30,000 tonnes per annum. The total annual

throughput will be 180,000 tonnes inclusive of either hazardous and / or non-hazardous waste. Although, the annual throughput will be increasing the quantity of waste onsite will continue to be limited by the treatment and storage capacities onsite.

Screening of non hazardous soils is already regulated under activity reference AR3 Physical treatment consisting of sorting, separation, screening and crushing of non-hazardous waste in the extant Environmental Permit. The screening of non-hazardous wastes is undertaken in the area utilised for storage. The location of the non hazardous soils storage and treatment area is centrally located to the Site away from sensitive receptors.

2.2.1 Acceptance

Strict waste acceptance procedures are in place to ensure that no non-conforming materials are accepted. If the soils are permitted and likely to be capable of treatment the customer will be issued with the terms and conditions for acceptance of the soils.

The materials will predominantly arrive at the Site in articulated vehicles. All vehicles would arrive sheeted and would only remove their sheets once at the point of material inspection / deposition.

All vehicles would pass over the existing weighbridge before travelling along the internal access road and entering the STC. Soils delivered to the STC would be visually inspected. If the soils are provisionally accepted based upon the initial visual assessment, chemical sampling would be undertaken by an accredited laboratory as deemed necessary by WRG. If the soils are rejected for treatment at the STC they would be required to be taken away by the customer for disposal at a suitable location. All activities would take place on the soil treatment pad, with the exception of the samples which are sent for chemical testing.

2.2.2 Bioremediation Process

The biological treatment process typically is between 8 to 16 weeks dependent on the contaminants present in the soil.

Bioremediation of soils is undertaken on a kerbed treatment pad comprising concrete and tarmac hardstanding. The treatment pad has an appropriate fall to allow all process water to be collected in a precast concrete covered gully which ultimately drains to the southern corner of the pad to be pumped out and either recirculated back into the biopile or discharged to the on-site foul water drainage system. A system of perforated aeration pipes run horizontally along the base of the biopile treatment pad.

Soils accepted at the STC and post-treated asbestos soils which require further treatment are transferred to the biopile treatment area via dump truck and/or excavator. The soils are arranged into biopiles and are managed using a system of lots which allows the waste to be trackable from the point of origin to its location on the treatment pad.

Bioremediation of soils refers to the biological treatment of contaminated soils by creating optimal conditions for biodegradation of contaminants. To enable biodegradation to occur the following parameters are monitored and manipulated:

- pH;
- temperature;
- moisture content;
- oxygen level; and,
- nutrient concentrations.

Decomposition of the organic contaminants is carried out by microorganisms in the soil. This can be enhanced by addition of inorganic nutrients such as ammoniacal nitrate and organic material such as woodchip. Moisture is also essential for microbial activity; low moisture content will inhibit microbial growth but excessive moisture restricts airflow. The perforated aeration pipes located beneath the waste extract air from the biopile. This allows effective control of the waste oxygen levels and moisture content in the waste to maintain aerobic conditions.

Biodegradation is optimised by maintaining a temperature in the biopiles 30 and 40°C to ensure the mesophilic microflora are predominately stimulated.

The stages of the bioremediation process are detailed below:

i. **Initial Placement**: The soil is placed on the treatment pad by a dump truck where an excavator will form the biopile.

ii. **Addition of Nutrients**: Based on the contaminants present within the soil, nutrients are added to facilitate the biological degradation of the hydrocarbon compounds.

iii. **Chemical Analysis**: Approximately every 4 weeks the soil is tested to analyse the contaminant concentrations to determine whether the biological treatment of the soil is adequately reducing the hazardous contaminants to non-hazardous concentrations. Additional nutrients and/or organic inputs may be added to expedite the process

iv. **Nutrients testing:** Every 2-4 weeks the soil is tested to analyse the levels of nutrients within the soil to ensure that there is sufficient inorganic and organic material to facilitate the biodegradation process. This is supported by the chemical analysis of the soil for contaminant concentrations. Soils are tested in accordance with Provectus procedure STC-F006-Soil Analysis.

v. **De-compaction of the soil**: Every 4-8 weeks the biopile will be turned to facilitate aeration of the soil.

vi. **Validation testing:** Once the soil meets the re-use criteria, the soil is removed from the treatment pad and transferred to the non-hazardous soils storage area or directly to the non-hazardous landfill void on site.

On receipt of validation testing that confirms the soil meets re-use criteria, it is transferred to the non-hazardous soils storage area, disposed in the adjacent Edwin Richards Landfill Site or reused on site as restoration soils. The treated soils are stored externally pending disposal or removal off-site.

The STC lies within the larger Edwin Richard Quarry/landfill site. The whole site is fully contained and bounded by a palisade security fence. The access has steel framed lockable double gates which will be kept locked at all times outside operational hours.

2.2.3 Asbestos Pre-Screening

The Operator proposes to pre-screen the soils containing asbestos fibres prior to handpicking. All soils containing asbestos accepted on site will be pre-screened within the building to allow the removal of oversized fractions which have the potential to damage the picking station and fines that can conceal smaller bound asbestos debris.

The pre-screening will increase the efficiency of the soil processing and will not result in airborne asbestos fibres above existing levels. It will also significantly decrease the timescales for picking thereby significantly reducing exhaust emissions from mobile plant. Waste Soil containing >0.1% w/w asbestos is classified as hazardous waste. The Operator restricts asbestos in soil to less than 0.1% w/w for chrysotile fibrous asbestos and 0.01% w/w for other forms of fibrous asbestos below the hazardous limit. This is to limit the potential for airborne respirable asbestos fibres which is limited to 0.01 fibres/ml. This concentration was determined as the concentration at where the generation of elevated levels of asbestos fibres was highly unlikely in laboratory conditions. Air monitoring will be undertaken to monitor any asbestos fibre emissions and dust suppression measures are available to ensure fibre generation is never above the air quality target of 0.01f/ml. Monitoring to date has demonstrated that the waste acceptance provisions have been entirely effective in preventing airborne asbestos fibres being elevated above the permit limits.

Monitoring of the soil treatment activity since the commencement of handpicking of soils containing asbestos in 2018 has demonstrated that the waste acceptance procedures have been effective in preventing airborne asbestos fibres exceeding the permit limits and airborne asbestos emissions have never exceeded the WHO air quality guidance level of <0.0005f/ml which is several orders of magnitude below the permit limit.

2.2.4 Asbestos in Soil Treatment

The STC is permitted to accept waste soils containing mixed forms of asbestos with soil fibre concentrations <0.01% w/w and chrysotile asbestos with soil fibre concentrations <0.1% w/w. The application of these soil asbestos fibre limits is to remove the potential for airborne emissions of asbestos fibres.

Once reception analysis is received to confirm that soils have no potential to generate airborne asbestos fibres they will be moved to the asbestos shed and screened. Any soils received that have the potential to generate airborne asbestos fibres above the detection limit of 0.01f/ml will be rejected from site. Hand-picking of small asbestos fragments is undertaken by suitably trained

operatives. The asbestos fragments are placed in individual polythene bags directly adjacent to each operative. When full the picking line conveyor is stopped, and the sealed bag placed into a second bag. The double bagged asbestos is placed in a designated container which will not exceed 10 tonnes at any one time.

On completion of hand-picking, the waste soils are deposited into a stockpile in designated bays within the building. Care is taken not to drop the material from excessive height to reduce potential for dust emissions. Each of the bays provides storage of material post hand picking awaiting compliance testing prior to further onward treatment or disposal. The bays have a storage capacity of 3,750 m^3/6,000t. Validation testing will be carried out prior to disposal or further treatment. If the soil meets the re-use criteria, then it will be retained on site for deposition in the Edwin Richards Landfill Site or sent off-site.

The Operator has advised that it is unlikely that soil accepted for treatment to remove asbestos fragments will also be contaminated with hazardous concentrations of hydrocarbons, as these waste streams are largely from different types of source sites. Processing material heavily contaminated with hydrocarbons through the screen / handpicking line is not envisaged as it presents significant operational difficulties such as contamination and protection of personnel and plant. Soil which has been subjected to screening and picking is unlikely to be contaminated with solvents or organic residues limiting the potential for VOC release if disturbed.

A conveyor belt is used on the picking station which will be set at the lowest height level.

The typical drop height is approximately 2.5m as the picking stations allow for deposit into large skips/or containers. The drop heights are generally determined by the picking station cabin height. An operative will inspect the stockpile soils and take samples for testing prior to a 360 excavator placing the handpicked soils into the final bay stockpile which will await the testing results prior to being removed from the final bay to a non-hazardous stockpile / adjacent void.

The deposit point from the picking station is used as one of the monitoring points to ensure the method does not result in asbestos fibres emissions.

2.2.5 Soil washing activity

The soil washing activity will comprise the treatment of up to 30,000 tonnes per annum. Soils contaminated with heavy metals will be bought in for treatment in the soil wash plant. The soil wash plant is to be located on an area of hardstanding as shown on the Site Layout Plan.

The conveyor belt which will load the soil into the soil washing process is fully enclosed. The site will ensure that regular housekeeping is undertaken to ensure that dust does not build up on the outsides of or underneath the conveyor.

Due to the activities undertaken as part of the soil washing process there is considered to be limited potential for agitation of soils resulting in fugitive emissions of dust.

Untreated soils awaiting soil washing) will be covered where appropriate with tarpaulins to prevent dust generation. The stockpiles can be treated with a dust cannon as an additional dust suppressant.

2.2.6 Screening of non-hazardous soils

The screening of non-hazardous wastes in the area utilised for storage is not considered to pose an additional risk of fugitive emissions to air. Dust controls are in place comprising the dust cannons which will be utilised during any screening activities as required. Regular housekeeping will be undertaken to minimise the spread of dust and ensure effective containment and all site staff, including contractors, will receive appropriate training in order to ensure that employees are conversant with the dust control and management procedures onsite. Screening of non hazardous soils is already regulated under activity reference AR3 Physical treatment consisting of sorting, separation, screening and crushing of non-hazardous waste in the extant Environmental Permit. The location of the non hazardous soils storage and treatment area is centrally located to the Site away from sensitive receptors.

2.2.7 Soil storage

The soil storage area for hazardous soils is to increase by 10,000 tonnes per annum to 20,000 tonnes in total to account for the soils containing heavy metals that are to be accepted for soil washing. The hazardous soil storage pad comprises a kerbed impermeable surface with sealed drainage. This storage area provides temporary storage for soils awaiting treatment. The soils awaiting treatment will be stored separately dependent on contaminants. Dust controls will be applied to the soil storage area as currently undertaken on Site.

3 Potential Dust Emission Sources

3.1 On-Site Sources

Fugitive dust and particulate emissions can potentially arise from the following Site activities:

- Delivery of waste to site and initial pre-acceptance assessment;
- Transfer of soils to appropriate storage area (biopiles, external and internal asbestos soils storage);
- Storage of soils pre and post treatment;
- Bioremediation of hydrocarbon contaminated soils including initial placement, aeration and turning;
- Soil washing of soils containing heavy metals;
- Screening of soils containing asbestos fragments;
- Screening of non-hazardous soils;
- Storage and transfer of residual material removed from screen; and
- Handpicking of asbestos fragments and subsequent storage prior to further treatment.

Fugitive dust may present a dust nuisance to surrounding human receptors or cause an adverse environmental impact if excessive deposits settle on sensitive habitats. Particulates pose a nuisance to human receptors, particularly as an added health risk by inhalation and could have adverse effects on sensitive habitats by smothering vegetation.

3.2 Off-Site Sources

Edwin Richards Landfill Site is located to the southwest and commercial premises are located to the south on Portway Road. There are several roads surround the Site including the B4171 (Dudley Road) 650 m to the southwest. The industrial / commercial facilities and the roads surrounding the Site have the potential for generating dust and particulates.

4 Control Measures for Fugitive Emissions of Dust

4.1 Overview

The bioremediation and physical treatment of soils has been undertaken at the Site since 2016. The Site is located at an elevated level behind a belt of mature trees. Existing Planning Permissions and Environmental Permits are in place onsite. A number of dust controls are already in place onsite and are outlined below.

4.2 Controls

4.2.1 Waste Acceptance Procedure

The Technical Standards Report (Document referenced: K0182-BLP-R-ENV-00004) details the waste acceptance procedure for the STC. Weighbridge will conduct assessment of waste inputs and impose controls and restriction on potentially dusty waste (e.g. bagging, rapid cover following placement, refusal to tip). All soils received at the STC are appropriately sheeted pending pre-acceptance checks. Once formally accepted, dependent on the contaminants present, the soils will be transferred to the appropriate treatment area.

4.2.2 Pre-screening and hand-picking of asbestos soils

Handpicking of soils containing asbestos is carried out within the Soil Treatment Building. Pre-screening of asbestos oils is proposed to be carried out within the Soil Treatment Building.

A permanently installed dust suppression system is present in the Soil Treatment Building and can be operated when required. Surfactant is added to the suppression system as a precautionary measure in the unlikely event of amphibole asbestos fibres being present (Amphibole fibres are hydrophobic (unlike chrysotile fibres) and this makes the fibres more difficult to remove from airborne suspension or likewise immobilise them on soil surfaces with water alone). In addition to the installed dust suppression system there are mobile atomisers and dust cannons. Dust suppression of stockpiles is proposed prior to screening.

The Operator has restrictions placed on soils contaminated with asbestos as stated in Table S2.4 of the permit. This is to limit the potential for airborne respirable asbestos fibres. Once reception analysis is received to confirm that soils have no potential to generate airborne asbestos fibres, they will be moved to the asbestos shed. Any soils received that have the potential to generate airborne asbestos fibres above the permit limits will be rejected from site. Soils containing asbestos accepted on site will then be pre-screened within the building to allow the removal of oversized and fine fractions which have the potential to damage the picking station along with the fines that can conceal smaller bound asbestos debris.

Only soils with a moisture content >15% are to be pre-screened. Generally, soil moisture content is ~20% or above on received soils. Soils are dampened down when required prior to pre-screening. This further limits any potential for liberation of fibres through handling / treatment.

The conveyor belt on the screener will be set at the lowest height level to limit the drop height of material after screening. The deposit point from the picking station is used as one of the monitoring points to ensure the method does not result in asbestos fibres emissions.

The pre-screening will increase the efficiency of the soil processing and will not result in airborne asbestos fibres above permitted limits. It will also significantly decrease the timescales for picking thereby significantly reducing exhaust emissions from mobile plant. Waste Soil containing >0.1% w/w asbestos is classified as hazardous waste. The Operator restricts asbestos in soil to less than 0.1% w/w for chrysotile fibrous asbestos and 0.01% w/w for other forms of fibrous asbestos below the hazardous limit. This is to limit the potential for airborne respirable asbestos fibres which is limited to 0.01 fibres/ml. This concentration was determined as the concentration at where the generation of elevated levels of asbestos fibres was highly unlikely in laboratory conditions. Air monitoring will be undertaken to monitor any asbestos fibre emissions and dust suppression measures are available to ensure fibre generation is never above the air quality target of 0.01f/ml. This process is monitored in accordance with the procedures and monitoring regime detailed in the Emissions Management and Monitoring Plan attached as Appendix B. Monitoring within the Soil Treatment Building has confirmed that the airborne asbestos emissions have never exceeded the WHO air quality guidance levels of <0.0005f/ml which is several orders of magnitude below the permit threshold.

The Soil Treatment Building in which the screen will operate is maintained with daily housekeeping. Areas are emptied of treated soil as soon as validation results are obtained to allow reuse elsewhere on site.

The screener, conveyor belt and associated plant are cleaned as required when accumulations of cohesive soils are observed on the screener decks during the working day.

4.2.3 Waste Storage and Non-Hazardous Screening

All surfaces used to treat or store waste comprise impermeable concrete hardstanding. There are no direct releases off-site other than via the engineered surface water management system. Waste is stored in designated bays or areas either outside or within the building. All bays are clearly marked and signed detailing the quantity and hazardous characteristics of the wastes stored therein. The screening of non-hazardous wastes in the area utilised for storage will only be undertaken where necessary with existing dust controls utilised to minimise the risk of fugitive emissions to air.

During particularly dry weather the storage areas will be dampened down with dust cannons as necessary using the dust suppression measures detailed below. Tarpaulins are used to cover external stockpiles if considered necessary however soils stored pending treatment are stored for short duration and subject to dust suppression. Current additional dust management and suppression measures comprise a permanent water spray system within the building.

4.2.4 Bioremediation Process

The moisture content of the biopiles is maintained at a constant level (~30%) to allow the bioremediation and subsequently minimise the dust potential. Operational controls during the bioremediation process are in place to ensure no turning of the biopiles is undertaken during high winds. Untreated soils not undergoing bioremediation are subject to dust suppression. The planning consent also imposes a 5m height limits.

4.3 Dust Suppression

Dust management and suppression measures comprise a permanent dust suppression system within the Soil Treatment building. Surfactant is added as a precautionary measure in the unlikely event of amphibole asbestos fibres being present (Amphibole fibres are hydrophobic (unlike chrysotile fibres) and this makes the fibres more difficult to remove from airborne suspension or likewise immobilise them on soil surfaces with water alone). Low levels of surfactant are added to water (1 part surfactant to 15 parts water) which is applied to the soil surface only. This mitigation measure is present for use but has not been shown to have been required within the asbestos shed due to the strict acceptance criteria and efficiency of pre-acceptance procedures employed at site. Dust cannons are available to be mobilised across the Site as and where required.

4.4 Housekeeping Practices

Regular housekeeping will be undertaken to minimise the spread of dust and ensure effective containment and all site staff, including contractors, will receive appropriate training in order to ensure that employees are conversant with the dust control and management procedures onsite.

4.5 Site Vehicles

On site vehicle speed limits are enforced to ensure that vehicle movements do not generate excessive dust. All vehicles would arrive sheeted and would only remove their sheets once at the point of material inspection / deposition to prevent dust nuisance along the access route and beyond.

All vehicles will use wheel wash to prevent mud / dust being trailed onto adjacent roads and creating a hazard / nuisance.

Drop heights will be minimised as far as practicable during the loading and unloading of materials to reduce the likelihood of dispersion and minimise the potential for dust release as a consequence of agitation.

All Site roads and surfaces will be inspected on a daily basis. A street sweeper will regularly clean site roads of any mud trailed on from site vehicles. Dampening of site roads / surfaces as necessary using a tanker during dry periods will minimise dust / odour.

5 Potential Pathways

5.1 Airborne Pathways

The potential pathways for dust and particulates to reach sensitive receptors are through the air. This will be determined by:

- The quantity of waste at source;
- Wind direction and speed;
- Intervening obstacles; and,
- Exposure of receptor to waste.

A wind rose generated at from Rowley Regis[2] has been used. The windrose indicates a wind direction from the prevailing south-south-east. Locations to the north-north-west of the STC are therefore most likely to receive potential emissions should they arise. The frequency the wind blows toward potentially sensitive receptors is detailed in Table 1. Met office data for Hayley Green[3] indicate the days where >1mm of rainfall occurring is 132.2 days out of 365 days (36% of the year).

The primary barrier to particulate emissions will be the mature line of trees abutting the northern, western and southern boundary of the STC. These may serve to disperse the wind flow potentially reducing the distance dust emissions could travel downwind causing this material to accumulate in the vegetation. The STC building may also act as a barrier trapping dust, however strong winds may still lift dust over the building.

[2] Rowley Regis Wind Forecast, West Midlands B65 9 - WillyWeather
[3] Hayley Green (West Midlands Conurbation) UK climate averages - Met Office

6 Potential Sensitive Receptors

6.1 Receptor Locations

When choosing the receptors, the closest or the most sensitive (if different from the closest) have been considered in each direction from the hazard. The Sensitive receptors are summarised in Table 1.

The most sensitive receptors are within 500 m radius of the STC making the assessment conservative for other potential receptors located further away. Account has been taken of the mechanism of transport to the sensitive receptor e.g. wind direction or a physical connection to the Site. Receptors are considered sensitive where people and habitats have the potential to be adversely affected by the dust emissions.

The probability of exposure is determined by the distance of the receptor to the Site and the likelihood of the hazard reaching the receptor (e.g. frequency of prevailing wind in that direction). This stage of the assessment assumes that exposure has resulted from an uncontrolled emission i.e. without mitigation.

The distance of these receptors to the Site boundary, their direction relative to the Site and the frequency of the wind blows in the direction of the receptor is detailed below. The sensitivity to dust of the individual receptor types identified in the third column of Table 1 is further detailed in Table 2.

Table 1 – Potential Sensitive Receptors

No.	Receptor Description	Receptor Type	Direction from Site	Distance to Building	Frequency downwind of site
1	Tower Road off Portway Hill	Residential properties	NNE	360 m	6.3 %
2	Dudley Golf Club House	Recreational facility	NNW	125 m	22.1 %
3	Portway Hill	Residential and Commercial Properties	NE	10 m	7.4 %
4	Old Portway House and Barn	Listed building	NE	10 m	7.4 %
5	Portway Road	Residential and Commercial Properties	E to S	10 m	5.5 % to 2.1 %
6	Warren Hall Country Park	Local Nature Reserve	W	610 m	0.7 %
7	Bumble Hole	Local Nature Reserve	W	990m	0.7 %
8	Rowley Hills	Local Wildlife Site	NE	225 m	7.4 %
9	Dudley Golf Course	Recreational	W to NW	40 m	0.7 % to 8.6 %
10	Rowley Regis Golf Course	Recreational	SE to S	120 m	3.6 % to 2.1 %

No.	Receptor Description	Receptor Type	Direction from Site	Distance to Building	Frequency downwind of site
11	Rowley Hall Primary School	School	SE	360 m	3.6 %
12	Grace Mary Primary School	School	NNE	420 m	6.3 %
13	Dudley Road	Residential and Commercial Properties	SW	440 m	4.2 %
14	Deciduous woodland, woodland & good quality semi-improved grassland (nonpriority)	Priority Habitats	NE, S & W	0-500m	4.2 % to 0.7 %

Table 2 – Types of Receptors Sensitive to Dust

Receptor Type	Sensitivity to Dust
Residential	High
Recreational	High
Commercial	High
Highway	Low
Habitat	High
School	High

6.2 Receptor Types

6.2.1 Residential, recreational, industrial, commercial and educational premises

The potential emissions from the STC are likely to have a similar impact on persons occupying residential, recreational, industrial, commercial or educational premises. Exposure of emission to persons at industrial or commercial premises may be lower as they are more likely to be inside during the working day or they may be transient visitors to the premises.

Fine dust particles may be able to travel further than larger particles that may settle on surfaces nearby. Finer particulates may elicit an unpleasant or harmful respiratory effect from sensitive individuals whilst settlement of dust may be unsightly or damaging by smothering sensitive flora.

The closest residential areas to the Site are Portway Hill, Portway Road and Dudley Road. Two primary schools are also within the 500 m radius of the Site. For conservatism this management plan assumes the residents and schools are occupied during the operational hours of the Site by members of the public most sensitive to emissions from the Site. It is considered that the operational controls, physical barriers (building, treeline and fences), and distance to the receptor prevent any emissions from reaching receptors.

6.2.2 Highways and footpaths

The transitory nature of highways means receptors using those locations will be exposed to potential emissions from the STC for shorter (albeit variable) periods of time than residences or businesses. Pedestrians will have longer and more direct exposure to emissions compared to vehicle users.

Highways and a number of footpaths are close to the STC. The highways and footpaths to the north east are upwind of the Site for the majority of the time, but are protected by the boundary fence and dense vegetation.

6.2.3 Habitats, watercourse and waterbodies

The deciduous woodland located from the northeast of the STC is classified as a protected habitat. The Environment Agency describes these types of habitats as contained nutrient sensitive vegetation which if depleted, may affect sensitive species dependent on that type of flora.

Uncontrolled fugitive dust and particulates are likely to affect adjacent habitats. The dense vegetation itself is expected to limit the transit of any such emissions far from the STC. In the unlikely event it was to occur, only the accumulation of significant quantities of dust in the vegetation may inhibit normal plant growth or animal behaviour.

There are no watercourses within the 500 m radius of the STC.

7 Dust Risk Assessment

7.1 Risk Assessment

The risk potential to each receptor as identified in Section 6 from dust and particulates generated at the Site is presented in Table 3 below. This table evaluates the unmitigated risk to sensitive receptors from uncontrolled dust emissions and the control measures to be implemented at the Site in order to minimise this risk, producing a revised risk to receptors.

Table 3 – Fugitive Emission (dust and particulates) Risk Assessment and Management Plan

Hazard / Pathway	Receptor				Probability of exposure	Unmitigated Consequence	Initial Risk / Reason	Risk Management	Mitigated Risk
	No.	Dist.	Direc.	Freq.					
Dust through air from: Vehicle movements. Waste storage. Pre-screening activity. Bioremediation process.	1	360 m	NNE	6.3 %	Medium – proximity to site, occasionally downwind	High - dust nuisance to residents	Medium –dust nuisance, proximity to site	On site vehicle speed limit enforced to ensure that vehicle movements do not generate excessive dust. Dust suppression system that directs a fine mist within the asbestos building and mobile units for general dust suppression for waste storage and treatment activities where required. Bioremediation management controls are in place including an air extraction system, biopiles only being turned during appropriate meteorological conditions. Weighbridge will conduct assessment of waste inputs and impose controls and restriction on potentially dusty waste (e.g. bagging, rapid cover following placement, refusal to tip). Daily visual inspection by appropriate site staff at suitable locations taking account of the prevailing wind direction. All vehicles will use wheel wash to prevent mud / dust being trailed onto adjacent roads and creating a hazard / nuisance. A street sweeper will regularly clean site roads of any mud trailed on from site vehicles. Dampening of site roads/surfaces as necessary using a tanker during dry periods.	Low
	2	125 m	NNW	22.1 %	High - close to site, frequently downwind	High - dust nuisance to users of golf course	High – dust nuisance		
	3	10 m	NE	7.4 %	High – close to site, infrequently downwind	High - dust nuisance to residents	High – dust nuisance		
	4	10 m	NE	7.4 %	High – close to site, infrequently downwind	High - dust nuisance to residents	High – dust nuisance		
	5	10 m	E to S	5.5 % to 2.1 %	High close to site, occasionally downwind	High - dust nuisance to residents	High – dust nuisance		
	6	610 m	W	0.7 %	Low - distant from site, occasionally downwind	High – dust nuisance and potential to smother vegetation	Low – significant distance, occasionally downwind		
	7	990m	W	0.7 %	Low - distant from site, occasionally downwind	High – dust nuisance and potential to smother vegetation	Low – significant distance, occasionally downwind		
	8	225 m	NE	7.4 %	Medium - proximity to site, infrequently downwind	High – dust nuisance and potential to smother vegetation	Medium – dust nuisance, proximity to site		
	9	40 m	W to NW	0.7 % to 8.6 %	High - close to site, infrequently to occasionally downwind	High - dust nuisance to users of open space	High – dust nuisance		
	10	120 m	SE to S	3.6 % to 2.1 %	High - close to site, occasionally downwind	High - dust nuisance to users of golf course	High – dust nuisance		
	11	360 m	SE	3.6 %	Low – distant from site, occasionally downwind	High - dust nuisance to students	Medium – dust nuisance, distant from site		
	12	420 m	NNE	6.3 %	Low – distant from site, occasionally downwind	High - dust nuisance to students	Medium – dust nuisance, distant from site		
	13	440 m	SW	4.2 %	Low – distant from site, occasionally downwind	High - dust nuisance to residents	Medium – dust nuisance, distant from site		
	14	0-500m	NE, S & W	4.2 % to 0.7 %	High – close to site and occasionally downwind	High – dust nuisance and potential to smother vegetation	High – dust nuisance		

8 Community Engagement, Reporting & Contingencies

8.1 Overview

Prevention will be viewed as the most effective means of controlling dust before an adverse impact occurs from uncontrolled emissions. The Source → Pathway → Receptor model determined above allows for the identification of the critical control points where dust can arise, how it can travel to a receptor and the likely impact.

The performance of a dust and particulate management system will ultimately be judged from the STC on the receptors. Should complaints be received, a procedure will be in place to effectively deal with the issue in a sensitive, efficient and auditable manner.

The controls for each source term are detailed in previous sections of this report. The management of those controls will be based on the on-going monitoring regime on Site. The monitoring regime can work as an early warning system against potential problems (e.g. meteorological monitoring) or a diagnostic tool to establish the cause of a dust event (e.g. perimeter monitoring).

8.2 Monitoring

The Site has an Emissions Management and Monitoring Plan in place for the prevention and control of dust, PM10 and asbestos fibres, attached as Appendix B. This includes monitoring procedures and management controls to limit the potential for dust, PM10 and asbestos fibres to be released. Monitoring requirements are set out in Schedule 3 of the permit and in the Emissions Management and Monitoring Plan. Table 4 summarises those relating to dust, PM10 and asbestos. The monitoring locations are shown on K1082.2.003.

Table 4 – Monitoring

Parameter	Frequency	Thresholds	Comments
Asbestos Transmission Electron Microscopy (TEM)	During the asbestos hand-picking works	<0.01f/ml	Method as described in M17 guidance and Table S3.3 of Permit
Asbestos Scanning Electron Microscopy (SEM)	Quarterly		Added reassurance to ensure baseline of asbestos emissions is not changing. Method is as described in M17 guidance
Dust	Monthly	200mg/m2/day	Frisbee dust gauge method as described in M17 guidance
Soil moisture content	Reception testing of soils as required	15% moisture content	To ensure soils received have low potential for dust release
Asbestos content in soils	Reception testing of soils	<0.1% chrysotile, <0.01% other types of asbestos fibres. No visible unbound asbestos or insulation	To ensure soils received cannot generate airborne emissions of asbestos above the method detection limit

Parameter	Frequency	Thresholds	Comments
PM_{10}	Weekly or as required if dust is suspected	250µg/m3/15 minute TWA*	Use of handheld nephelometer – not used for compliance against EU Directive Limit for PM10 as stated in EA Guidance M8 but provides real time results for implementing immediate mitigation if results are within 25% of threshold. A handheld mobile device for discrete monitoring around working areas. This method is preferred to support operational control of emissions rather than a fixed monitoring system for general air quality analysis at fixed locations (e.g. Filter Dynamics Measurement System/Beta Attenuation Monitor)

**Mitigation implemented if within 25% of threshold due to accuracy of nephelometer method Grey shading means the analysis results are already reported as required by the permit*

8.2.1 Offsite Monitoring

Regular visual inspections of the STC and perimeter will be undertaken by the Site Manager to identify any sources of dust and particulates and to establish whether any dust has left the STC. This will include dust arising from vehicles arriving at the STC.

All Site Personnel will be responsible for reporting dust and particulate problems as soon as practicable to the Site Manager or the next level of management if the Site Manager is not available.

The following locations will be targeted for dust monitoring by the nominated Site staff:

- Weighbridge or waste reception area (continuous monitoring of vehicles);
- Point of waste deposition;
- Bioremediation area, particularly during initial placement, aeration and turning; and
- Subject to prevailing wind direction (i.e. up and down wind), appropriate areas of the site perimeter.

The following information will be recorded during each round of monitoring:

- Name of assessor and position at facility e.g. weighbridge clerk etc;
- Nature of any problem identified including location, source, date, time, duration, prevailing weather conditions and likely cause;
- On-site activities and operational condition at the time of the monitoring visit (this should include any of the abnormal events detailed in Section 8.7 below);
- Records of the likely source of any dust, even if it is not from the STC; and,

- Details on the corrective action taken, realistic timeframes for remedial works and any subsequent changes to monitoring and operational procedures.

The Site Manager will be informed immediately of any findings of dust and particulates attributed to the site and will authorise remedial measures to be taken.

Dust will be monitored via frisbee gauges on a monthly basis. A limit of 200mg/m2/day should be applied.

8.2.2 PM10 Monitoring

Consideration has been given to carrying out total deposited dust and / or PM10 monitoring at the site. The main source of PM10 is considered to be releases from the treatment plant inside the asbestos building as a result of soil screener and 360 excavator.

PM10 is proposed to be monitored on a weekly basis as stated in Table 4 or as required if significant dust release is expected. This will be undertaken by handheld nephelometer such as a Dustmate or similar to provide real time results for implementing immediate mitigation if results are within 25% of threshold. This method is preferred to support operational control of emissions rather than a fixed monitoring system for general air quality analysis at fixed locations (e.g. Filter Dynamics Measurement System/Beta Attenuation Monitor).

8.3 Complaint Process

Any complaints received at the STC or via the Regulatory bodies including the Environment Agency and Local Authority, will be recorded using the Compliant Report Form contained in the Site Management System. On receipt of a compliant the Site Manager will be informed which will instigate further visual dust monitoring at the location of the complaint and on-site to determine the extent and location of the dust generating materials and/or process will be identified. Where possible, as much information and detail about the complaint will be recorded, whether this is from the relevant authority or complaint direct to site. This information will assist in the investigation and determining the source of the dust e.g. differentiating between potential dust from the Site or other off-site activities.

All complaints and queries will be logged in accordance with the management system as soon as is practicably possible. All complaints logged will be subject to investigation and complainants responded to within 48 hours of receipt, where possible.

In the event that a substantiated dust complaint is received arising from the site, additional monitoring will be undertaken at the nearest sensitive receptors to determine any off-site dust emissions.

Complaints regarding dust from the Site will be investigated in accordance with the protocol, and appropriate records maintained which may include:

- Complaints received including name and contact details of complainant (if known), and complainants description of the dust;
- Nature of problem including date, time, duration, prevailing weather conditions and cause of the problem;
- Onsite activities and operational condition at the time of the complaint;
- Records of the likely source of the dust even if it is clearly not from the Site; and,
- Details on the corrective action taken, and any subsequent changes to monitoring and operational procedures.

The Environment Agency will be informed by WRG of the complaint and WRG will confirm to the best of its knowledge the information described above.

WRG will ensure that the complainant has all the relevant contact details of the site (i.e. the Site Manager) and the officer responsible at the Environment Agency. WRG will be in regular contact with the complainant and the Environment Agency whilst the cause of the dust is being investigated and remediated.

An evaluation of the effectiveness of the techniques used will be carried out on completion of any remedial measures or if the complaints persist. Records of the above will be retained by site for future reference.

8.4 Means of Contact

The Site will be readily contactable to outside organisations and to members of the public. The Site signage board (placed in a readily visible location) will contain the necessary contact details for both the Site operations and Environment Agency. The company website also contains the necessary contact details for each individual Site.

Any complaints received directly to Site will be notified to the Environment Agency. Should an off-site issue arise, therefore, the complainant has a readily available means of getting in touch with WRG.

8.5 Complaint Screening

As part of each dust complaint received, these will be objectively assessed against the wider environment to ensure that the source of the emission is traced back to the correct source. It is essential that the source is correctly identified in order that mitigating measures can be applied effectively and correctly. The complaint will also be assessed against previous records to place the nature of the complaint into context.

If patterns in complaints emerge, community groups or individuals (subject to their agreement) will be called upon to act as an additional dust monitoring resource.

8.6 Complaints Investigation

In the event that dust is found to be causing a problem from the STC, as determined and confirmed by investigation into off-site complaints, or during routine monitoring; the following measures will be undertaken:

- Additional dust monitoring as detailed above to identify the extent of the dust emission and potential cause for the dust i.e. waste material and/or activity;
- Examination of the operational activities at the time of the dust complaint;
- Examination of the meteorological conditions at the time of the complaint;
- Carry out a review of the operational procedure and controls and instigate any control measures immediately following identification of the problem; and,
- Further monitoring will be carried out to ensure the issue has been addressed and to monitor the effectiveness of any control measures undertaken.

8.7 Abnormal Events

The FEMP assumes that the STC will be running under expected operational conditions. There are however circumstances that could result in a dust emission from the Site if not appropriately considered in advance.

8.7.1 Strong Winds

Daily visual inspection of the site infrastructure will be undertaken and recorded. Additional inspection for damage resulting from high wind events will also be undertaken and contingency actions identified below considered should high wind conditions result in escape of significant dust emissions.

8.7.2 Hot/Dry Conditions

The warmer the weather the greater the potential for wastes to become dry and dusty, particularly when stored outside and when agitated. Daily inspections will be undertaken to ensure soils delivered to the site are appropriately wetted down if required to reduce dust emissions. During prolonged periods of hot weather inspection frequency will be increased, and dust mitigation measures will be more readily utilised. Additionally, dust suppression may be employed if deemed necessary. Contingency actions plans are included in the Site Management System and are identified in Table 5. Those specific to the asbestos treatment building are summarised below.

Table 5 – Monitoring, Audits and Emergency Procedures

Activity	Measures Employed
Monitoring	If the dust suppression mist system is not operational then works will cease. In the unlikely event that airborne asbestos is >0.01 fibres/ml then airborne

Activity	Measures Employed
	monitoring will be repeated immediately and works stopped after samples are obtained until the second round of results are available. For external quarterly monitoring, the criteria are included in Table 2 of Appendix A for the lower detection limit implemented on a quarterly basis. Conduct monitoring and review of wind direction for potential off-site contributory factors with weather station data. Conduct review of waste input materials and resample potential source stockpiles for laboratory analysis. Conduct further operational checks on fugitive dust controls. Enter report in Site Log
Audits	The site is subject to regular audits by FCC quality staff to ensure that the works are implemented in accordance with accredited quality systems on site, the environmental permit and site-specific risk assessments and method statements. A quarterly review of all data is reviewed by the compliance section of FCC as part of their permit reporting requirements.
Emergency Procedures	All operations Stop – conduct urgent review of Asbestos Risk Assessment and Asbestos Plan of Work. Conduct review of wind direction for potential off-site contributory factors. Conduct comprehensive review of all input materials. Conduct comprehensive operational checks on fugitive dust controls. Submit retained sample filter(s) for urgent SEM-EDXA analysis. No commencement of operations until a safe system of work is established Implement any regulatory reporting required by the environmental permit

8.7.3 Implementation of the Contingency Plan and/or Emergency Plan

Unscheduled unavailability should only take place due to unscheduled maintenance, emergency situations and for Health and Safety reasons such as a fire at the site. In such cases the plant staff will initially inform the plant manager who will in turn inform service managers, the Authority and the Environment Agency. Site staff will implement measures to store or divert wastes as required.

8.7.4 Operator's Experience with contingency/emergency situations

WRG has Emergency / Incident Preparedness procedures which are implemented and continually reviewed to help improve procedures across the site's operations.

8.7.5 Review and Update of Contingency and Emergency Plans

The Emergency / Incident Preparedness procedures will be reviewed following any incident where they have had to be followed. They will be updated as necessary with any lessons learned.

8.8 Records and Reviews

A daily record relating to the management and monitoring of dust will be maintained. It will include the following details:

i. The results of inspections and visual monitoring carried out by installation personnel;

ii. Weather conditions including atmospheric pressure, wind speed and wind direction;

iii. Problems including date, time, duration, prevailing weather conditions and cause of the problem;

iv. Complaints received including address of complainant; and

v. Details of the corrective action taken, and any subsequent changes to operational procedures.

The FEMP will be reviewed on an annual basis with the scheduled review of the site management system or with every major increase, or alteration to the dust generated at site (i.e. a change to dust source term, pathways or receptors).

8.9 Communication tools

Stakeholders will typically include the Local Authority, the Environment Agency, Parish Councils and members of the local community. Other stakeholders may include local businesses should the facility be deemed to impact upon them. Local communities to be kept informed of general site activities, including working hours via the Edwin Richards Quarry Liaison Committee

In addition, and as covered within the complaints section, contact details will be made available so that any complaints can be directed to site and an investigation undertaken immediately.

Appendix A – Drawings

GENERAL NOTES

1. SURVEY INFORMATION SUPPLIED BY THE WASTE RECYCLING GROUP .
2. DO NOT SCALE
3. ALL DIMENSIONS ARE IN MILLIMETRES AND ALL LEVELS ARE IN METRES ABOVE ORDNANCE DATUM
4. ANY ANOMALIES ON THIS DRAWING ARE TO BE BROUGHT TO THE ATTENTION OF BYRNE LOOBY

KEY

- PERMIT BOUNDARY
- NEW BIOREMEDIATION AREA
- 85.0 / 86.0 EXISTING GROUND CONTOURS
- BUFFER ZONE
- 9 RECEPTOR MARKER

Rev	Date	Description	By	Chk	App
01	23/12	BOUNDARIES ADDED	GH	EG	CF

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CLIENT

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PROJECT

EDWIN RICHARDS QUARRY
SOIL TREATMENT CENTRE

DRAWING TITLE

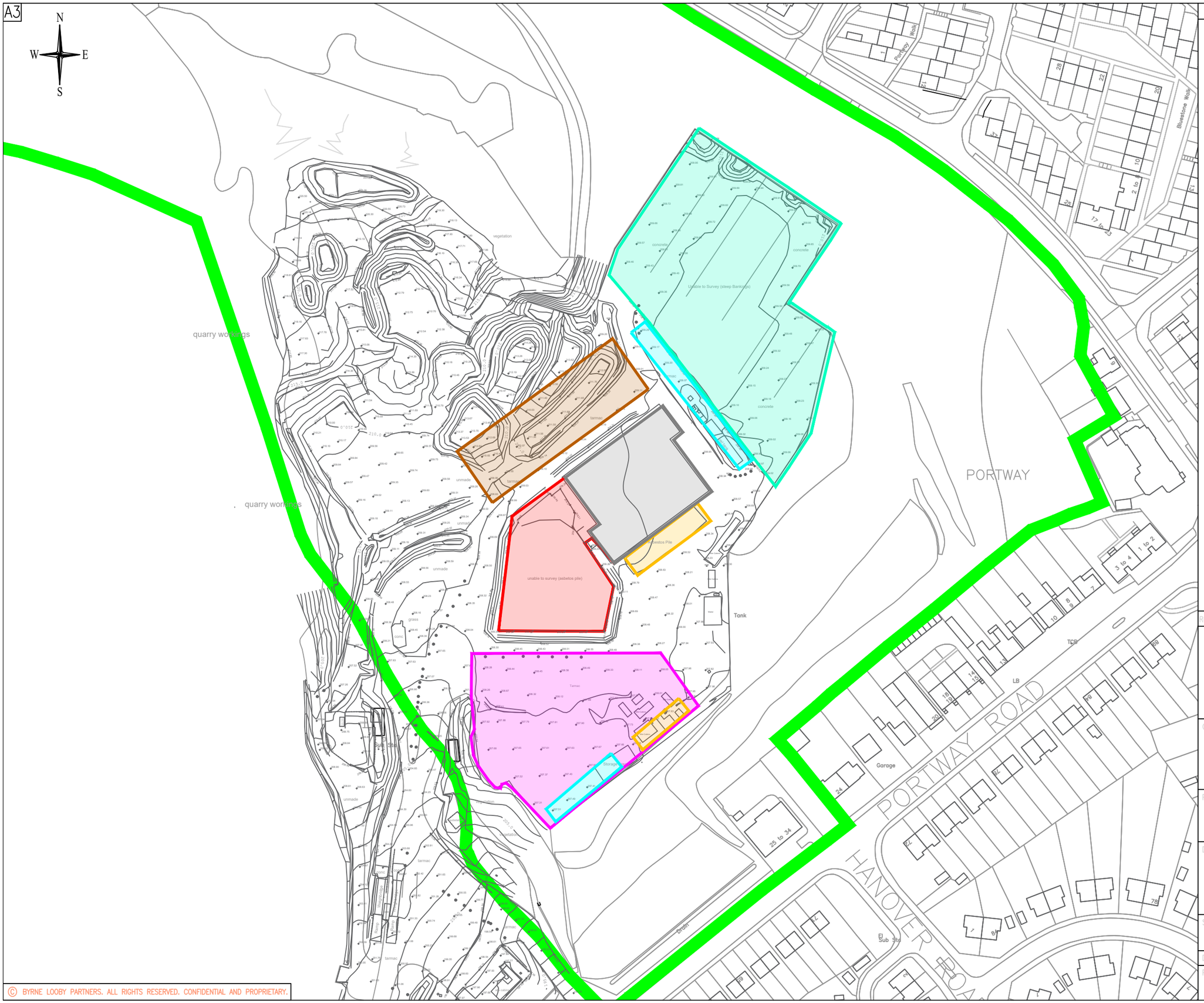
SENSITIVE RECEPTOR PLAN

STATUS

FINAL

Date: 21.12.22	Scale: N/A	Drawn: JM	Chk: JW	App: JW
Project No: K0182	Drg. No: K0182.1.001			Rev: 01

A3



GENERAL NOTES

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KEY

- PERMIT BOUNDARY
- NON–HAZARDOUS SOIL STORAGE AND SCREENING AREA
- BIOLOGICAL TREATMENT AREA
- BIOFILTERS
- HAZARDOUS SOILS STORAGE AREA
- BIOLOGICAL TREATMENT AREA/SOIL WASHING AREA
- WATER TREATMENT PLANTS
- SOIL TREATMENT BUILDING

Rev	Date	Description	By	Chk	App

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PROJECT

EDWIN RICHARDS QUARRY
SOIL TREATMENT CENTRE

DRAWING TITLE

SITE LAYOUT PLAN

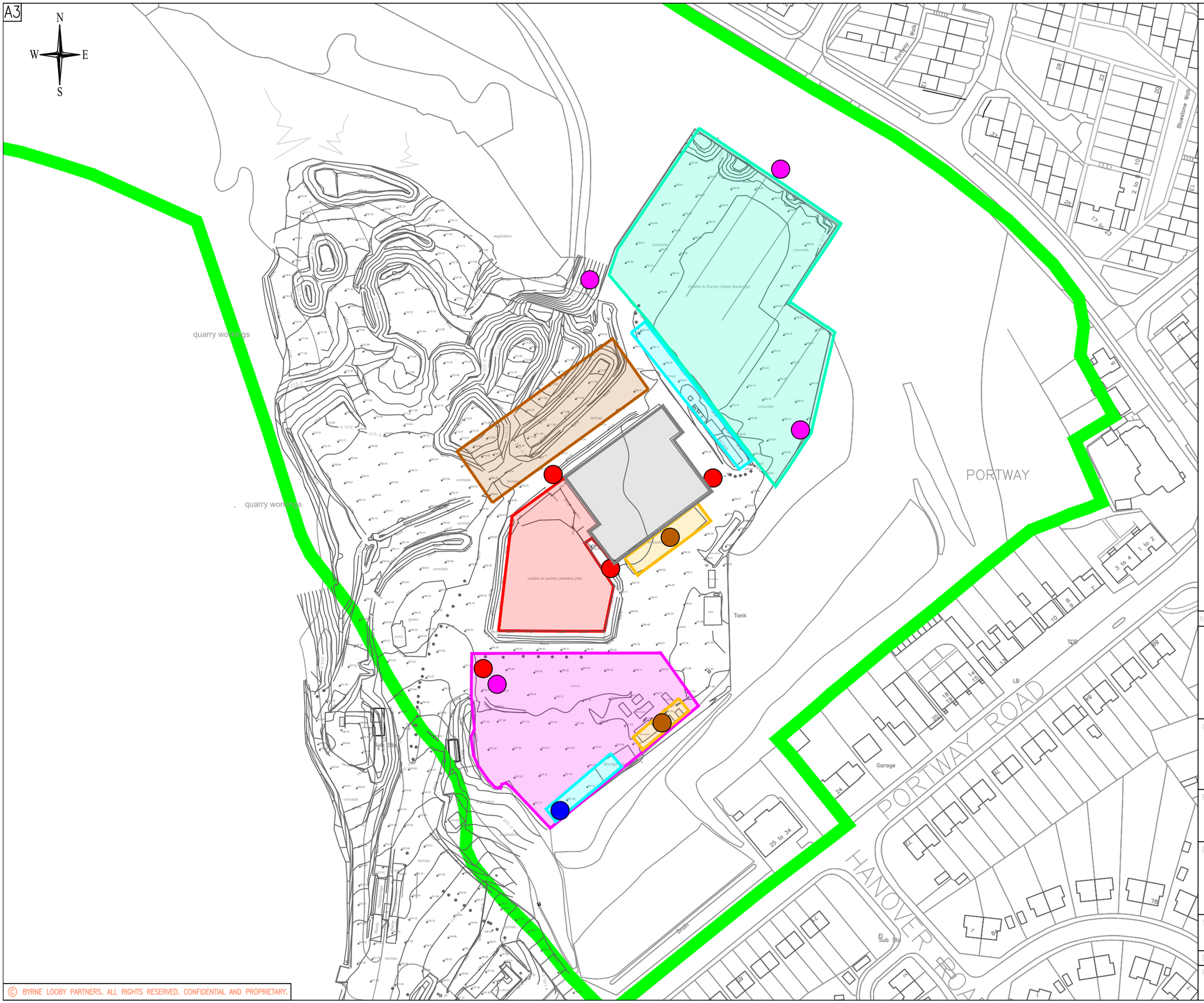
STATUS

FINAL

Date: 20.06.23	Scale: 1:1500	Drawn: JM	Chk: JW	App: JW

Project No:	Drg. No:	Rev:
K0182	K0182.2.002	01

A3



GENERAL NOTES

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KEY

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- NON–HAZARDOUS SOIL STORAGE AND SCREENING AREA
- BIOLOGICAL TREATMENT AREA
- BIOFILTERS
- HAZARDOUS SOILS STORAGE AREA
- BIOLOGICAL TREATMENT AREA/SOIL WASHING AREA
- WATER TREATMENT PLANTS
- SOIL TREATMENT BUILDING
- AIR SAMPLING: ASBESTOS/PM10
- AIR SAMPLING: TPH/BTEX/PAH'S
- AIR SAMPLING: DUST/NOISE/ODOUR
- WATER SAMPLING: SEVERN TRENT

Rev	Date	Description	By	Chk	App

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PROJECT

EDWIN RICHARDS QUARRY
SOIL TREATMENT CENTRE

DRAWING TITLE

EMMISIONS MONITORING PLAN

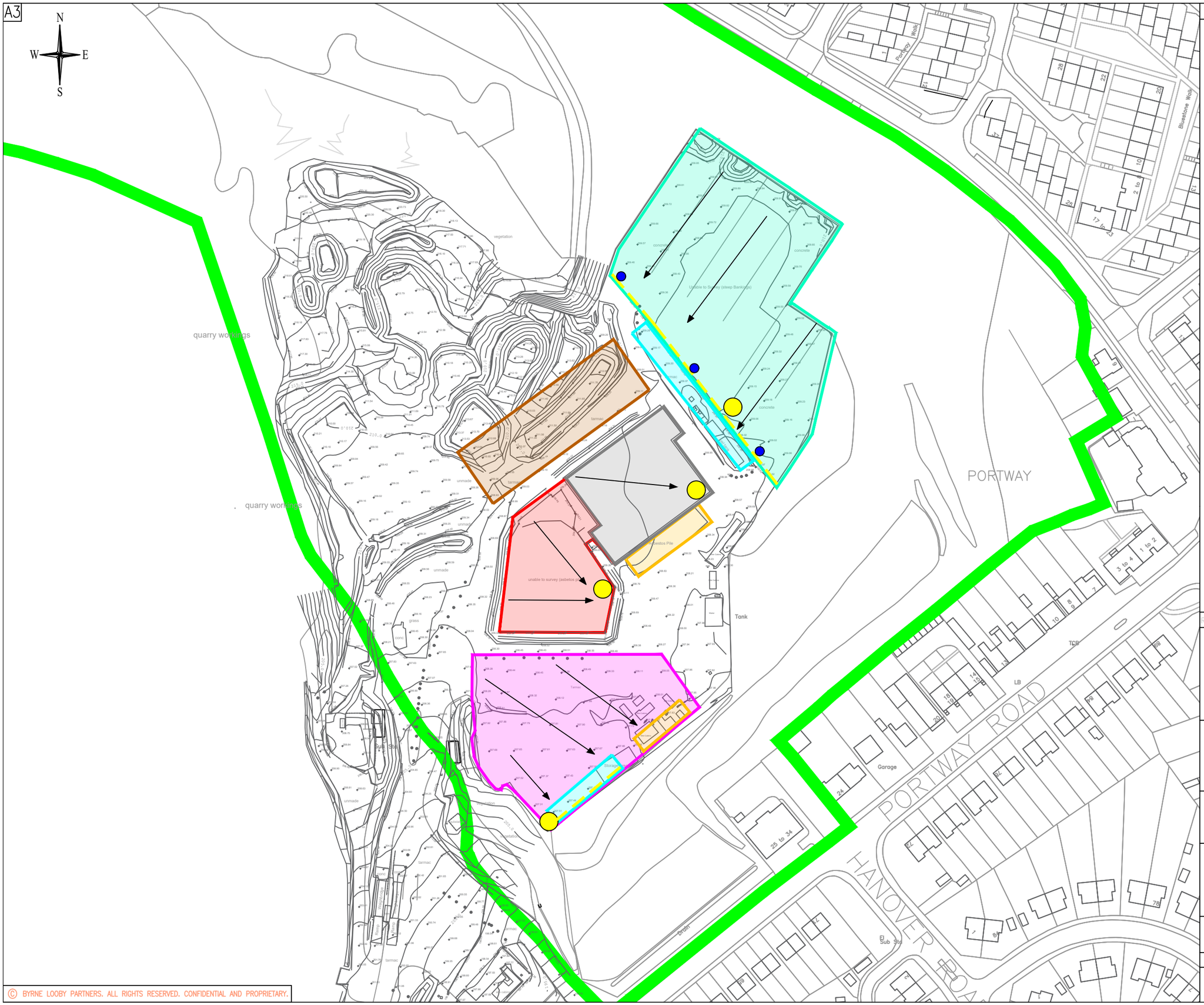
STATUS

FINAL

Date: 20.06.23	Scale: 1:1500	Drawn: JM	Chk: JW	App: JW

Project No:	Drg. No:	Rev:
K0182	K0182.2.003	01

A3



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KEY

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- NON–HAZARDOUS SOIL STORAGE AND SCREENING AREA
- BIOLOGICAL TREATMENT AREA
- BIOFILTERS
- HAZARDOUS SOILS STORAGE AREA
- BIOLOGICAL TREATMENT AREA/SOIL WASHING AREA
- WATER TREATMENT PLANTS
- SOIL TREATMENT BUILDING
- PUMPING CHAMBERS
- DRAINAGE GULLY
- DRAINAGE DIRECTION
- SURFACE WATER DRAINAGE PIPE

Rev	Date	Description	By	Chk	App

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PROJECT

EDWIN RICHARDS QUARRY
SOIL TREATMENT CENTRE

DRAWING TITLE

DRAINAGE PLAN

STATUS

FINAL

Date: 20.06.23	Scale: 1:1500	Drawn: JM	Chk: JW	App: JW

Project No:	Drg. No:	Rev:
K0182	K0182.2.004	01

Appendix B – Emissions Management and Monitoring Plan

Emissions Management and Monitoring Plan

This document has been prepared in response to the Schedule 5 notice dated 28/09/20 for the variation to permit reference EPR/HP3632RP/V003.

The document details the existing monitoring undertaken at site both for reporting against the permit conditions and the other monitoring undertaken as routine by the applicant to support effective emissions management at the site. This report includes some minor changes to sampling locations due to the change in layout of the site under the proposed permit variation. In preparing this document the following EA guidance documents has been reviewed:

- Technical Guidance Note (Monitoring) M8 – Ambient Air. Environment Agency, Version 2 (May 2011)
- Technical Guidance Note (Monitoring) M17 - Monitoring Particulate Matter in Ambient Air around Waste Facilities. Environment Agency, Version 2 (July 2013)

Potential Emissions at Edwin Richards Quarry Soil Treatment Facility

The following provides a list of potential emissions at the soil treatment facility

1. Dust
2. Volatile Organic Compounds
3. Odours
4. Surface Run Off
5. Noise and vibration
6. Drag out of mud/debris

Items 2-6 were addressed by the original H1 ERA prepared by Amex Foster Wheeler Environment & Infrastructure UK Limited (Amec) that was submitted and approved as part of the original permit application for the facility. The Amec H1 ERA considered which aspects of the operation were likely to cause a potentially harmful emission in terms of odour, noise and vibration, fugitive emissions (including dust and pests) and accidents. This also referenced the Best Available Techniques and Operating Techniques including details on the types and quantities of waste accepted, operating controls and pollution mitigation controls. An ERA prepared by TerraConsult (Report Ref: 3483/R/002/02) was submitted in November 2017 in support of an application to vary permit EPR/HP3632RP to allow the acceptance of soils containing asbestos and untreated woodchip. The ERA was updated with the permit variation application issued to the EA on 20 June 2019.

The Schedule 5 received on 28/09/20 requires a revised Emissions Management and Monitoring Plan for the whole site. It requests that we will need to include the following aspects:

1. You must use appropriate measures to prevent emissions of dust, PM10 and asbestos fibres.

2. You must design, operate and maintain all internal and external storage areas and treatment processes, including all associated equipment and infrastructure, in a way that prevents fugitive emissions to air, including dust, PM10 and asbestos fibres. Where that is not possible, you must minimise these emissions.

3. All internal and external storage areas and treatment processes must collect, extract and direct all process emissions to an appropriate abatement system for treatment before release. Where that is not possible, you must minimise these emissions.

4. To reduce point source emissions to air (dust, PM10 and asbestos fibres) from the internal and external storage areas, treatment processes and handling of waste, you must use an appropriate combination of abatement techniques, including one or more of the following systems: adsorption (for example, activated carbon), biofiltration, wet scrubbing, fabric filters, high efficiency particulate (HEPA) filtration, condensation and cryogenic condensation, cyclonic separation, electrostatic precipitation and thermal oxidation.

5. You must identify the main chemical constituents of the site's point source emissions as part of the site's inventory of emissions to air.

6. You must make an assessment of the impact of the substances emitted to air, following the Environment Agency's guidance; Control and monitor emissions for your environmental permit https://www.gov.uk/guidance/control-and-monitor-emissions-for-your-environmental-permit#dust-mud-and-litter

7. You must design, operate and maintain an appropriate monitoring system on site to ensure dust, PM10 and asbestos fibres releases are prevented, if not minimised, from leaving the site boundary.

The above seven points are now addressed.

You must use appropriate measures to prevent emissions of dust, PM10 and asbestos fibres:

Table 1. Sources of Emissions and Mitigation

Parameter	Source	Mitigation
Dust	Soil Inputs	Reception of soils with moisture content >15%. Generally soil moisture content is ~20% on received soils
	Dragout of mud onto road	Frequent road sweeping/damping down, daily visual inspections, speed limits on roads and designated traffic routes on hardstanding
	Soil Stockpiles/Biopiles	Limiting stockpile height within approved areas, sealing stockpile surfaces or covering, elevated soil moisture content >15% with reintroduction of treated water if required
PM10	Heavy duty vehicles	Traffic limits and routes, addition of soil screening to permit to enable tenfold increase in soil processing rates and reduction in plant time
	Soils	Unlikely with moisture content >15% and elevated clay content
Asbestos Fibres	Asbestos contaminated soils	Conservative waste acceptance criteria to prevent the acceptance of soils that can generate airborne asbestos fibres above the detection limit
		Moisture content in soils >15%. Dust suppression system on site
	Asbestos removed from soil	Double bagged and stored in locked skip

You must design, operate and maintain all internal and external storage areas and treatment processes, including all associated equipment and infrastructure, in a way that prevents fugitive emissions to air, including dust, PM10 and asbestos fibres. Where that is not possible, you must minimise these emissions.

Internal and external storage areas and treatment equipment are constructed on impermeable hardstanding with sealed perimeter kerbs and underground drainage and pumping chambers. Water treatment equipment is located within bunded areas with a minimum of 110% storage capacity. This ensures that there is no cross contamination to land or surface water from mobile contaminants or impacted surface water.

Biotreatment Area

The biopiles are operated using vacuum technology that means that >99% of volatile contaminants within soil pore spaces are collected and treated at the adjacent biofilter. The conversion of hydrocarbons to carbon dioxide and water vapour means that the soil moisture concentration in soils is elevated during treatment and is rarely, if ever below 15-20%. Soil in treatment does not give rise to visible dust or elevated dust concentrations during treatment.

Access Roads (biotreatment and asbestos treatment area)

Access roads and exposed areas of the treatment pads are potential sources of dust due to drag out of soil from vehicle movements which can dry out to a level which could post a dust nuisance. All traffic routes are regularly swept and damped down to prevent mud accumulation on internal roads or the public highway or be a source of dust during dry conditions.

Asbestos Treatment Area

The control of asbestos emissions is predominantly based upon only receiving soils that are proven to pose no potential for airborne emissions of asbestos fibres above the detection limit. The approach to achieving this has been stated in the previous permit variation approved in February 2018.

Soils with asbestos will be quarantined prior to formal acceptance even where in the majority of cases, soils have already been visually inspected and sampled prior to a formal offer for accepting the soils has been issued to the waste producer. The reception testing also includes for moisture content which will provide information on the dust potential in addition to the asbestos fibre quantification.

Reception testing will be undertaken at the receipt of soils and any soils that contain >0.1% chrysotile fibres, >0.01% other forms of asbestos fibres, or any form of unbound asbestos will be rejected from site. As an extra level of mitigation all externally stored asbestos contaminated soils will be covered prior to transfer to the internal building for screening and hand picking.

Within the asbestos soils storage and treatment areas, a dust suppression system is available to reduce dust and any particulate emissions. However, even without this operating and treatment activities operational there has never been an incidence of airborne asbestos being measured above the detection limit using Phase Contrast Microscopy (PCM) or if required to achieve a lower detection limit: Scanning Electron Microscopy (SEM) or Transmission Electron Microscopy (TEM).

PM10 emissions from vehicles

The main sources of PM10 emissions on site are from:

- Excavators

- Dump trucks
- Tipper/articulated lorries
- Hopper and Picking station

At present the use of the hand picking inside the building allows for the processing of approximately 50t/day. The picking station is regularly damaged as no removal of oversize inclusions is permitted and so there is significant amount of down time for asbestos processing plant. Also, the presence of soil fines in the matrix has the potential to conceal smaller asbestos debris meaning that the soils are generally handpicked twice to ensure compliance with the requirements to achieve a non-hazardous soil status. The existing approved method requires a significant amount of plant time for each tonne of asbestos contaminated soil and therefore is a source of elevated PM10.

On projects with a mobile plant license deployment a soil screener is added to the above list of equipment. This increases the throughput to approximately 500t/day, results in less downtime and due to the separation of the different soil fractions makes the hand picking significantly more effective with little or no double handling.

Therefore by adding the soil screening option, the efficiency is increased tenfold, so whilst there is a slight increase in PM10 levels as there is more plant present, it is for 10% of the existing timescales.

We have recently hired an electric hopper and picking station to review suitability which will offset PM10 emissions from the previous set of equipment. It is proposed to make this a permanent acquisition if the pre-screening is approved as it is only suitable for soils without large inclusions.

There will be no increase in asbestos fibres due to the strict waste acceptance criteria and we would anticipate a decrease in dust as the soil screener will be fitted with a spray rail for dust suppression. There would be a tenfold decrease in PM10 emissions from the soil processing due to the reduced plant timescales.

The additional storage areas will allow a one way traffic system to be employed and avoid the vehicle restrictions and delays during delivery into the asbestos building. This will significantly decrease the time the lorry is present on site and result in a reduction in PM10 emissions.

All internal and external storage areas and treatment processes must collect, extract and direct all process emissions to an appropriate abatement system for treatment before release. Where that is not possible, you must minimise these emissions.

The emissions from the biotreatment pad are collected by the undersoil pipework with liquids treated in the water treatment system and air treated by the biofilter. This approach is well established.

Asbestos fibres are not generated on site above the detection limit so no abatement system is required.

Dust generation is largely on haul roads and road sweeping/dust suppression is undertaken at source to prevent or minimise dust emissions occurring.

PM10 emissions are largely from heavy plant and vehicle traffic. Emissions from vehicles delivering soils to site are to be reduced by having external reception areas rather than the existing system of delivering inside a building which often leads to queuing vehicles.

The use of a soil screener in the asbestos processing will result in a tenfold reduction in PM10 emissions compared to the existing emissions.

To reduce point source emissions to air (dust, PM10 and asbestos fibres) from the internal and external storage areas, treatment processes and handling of waste, you must use an appropriate combination of abatement techniques, including one or more of the following systems: adsorption (for example, activated carbon), biofiltration, wet scrubbing, fabric filters, high efficiency particulate (HEPA) filtration, condensation and cryogenic condensation, cyclonic separation, electrostatic precipitation and thermal oxidation.

The majority of emissions described previously are prevented from occurring and do not require further mitigation after the initial suppression. Monitoring will provide verification to the effectiveness of the suppression works.

A water treatment plant is present on site to continuously treat water as it is collected from treatment areas.

A biofilter is used to treat continuous emissions from the biotreatment area and is deemed a point source emission and is currently monitored as per Table S3.1 of the permit.

Only the presence of PM10 that could accumulate inside the asbestos building is deemed to potentially require mitigation as a point source. This is released by the treatment plant from inside the asbestos building as a result of soil screener and 360 excavator. In the event that monitoring data shows that the emissions are within 25% of the thresholds in Table 3 then the building will have HEPA filters installed to mitigate point source emissions.

Mitigation of PM10 in a situation where concentrations are at 250µg/m3 or above, would comprise of using HEPA filters located near to the exhaust of the soil screener and on the ground close to the 360 excavator loading the screener. The type of HEPA filter utilised would allow 5,000m3/hr per unit and 2 units would be employed to allow for 10,000m3/hr flow rate. A typical HEPA filter employed on construction sites is shown below on the attached link.

https://www.dustarrest.com/product/dustblocker-5000-air-filtration-cleaner

You must identify the main chemical constituents of the site's point source emissions as part of the site's inventory of emissions to air.

Table 2. Chemical Constituents of Emissions

Source	Chemical Constituents
Biotreatment area	TPH, PAHs, BTEX, total VOCs
Asbestos building	PM10 from indoor soil screener and excavator unless electric or hybrid plant is used

All other sources are suppressed and therefore prevented from occurring. PM10 emissions from vehicles/plant outside of the asbestos building are not deemed to be point source emissions.

You must make an assessment of the impact of the substances emitted to air, following the Environment Agency's guidance; Control and monitor emissions for your environmental permit https://www.gov.uk/guidance/control-and-monitor-emissions-for-your-environmental-permit#dust-mud-and-litter

A historical assessment of the impact of substances to air was completed in 2016 by Amec in the Air Quality Assessment document for the treatment of 150,000t of soils at the treatment facility. This assessment has not changed despite the inclusion of asbestos contaminated soils to the permit. There are no additional emissions from this activity above those permitted in 2016 as the restrictions placed on waste acceptance prevents airborne asbestos emissions from occurring. The same standards will be maintained if the permit variation is approved with an improvement in air quality as a result of reduced plant use. There is a change however in areas of the site being used for soil treatment with the extension in use of the building and adjacent soil storage area. However, the measures detailed in Table 1 of this response are utilised to mitigate any emissions to the limits provided in Table 3.

You must design, operate and maintain an appropriate monitoring system on site to ensure dust, PM10 and asbestos fibres releases are prevented, if not minimised, from leaving the site boundary.

Table 3 provides detail of the existing monitoring undertaken on site for reporting as a permit condition, additional monitoring undertaken for internal management and control of emissions (but not required to be reported as a permit condition) with an update on locations in Appendix A to reflect the change in layout proposed for the site.

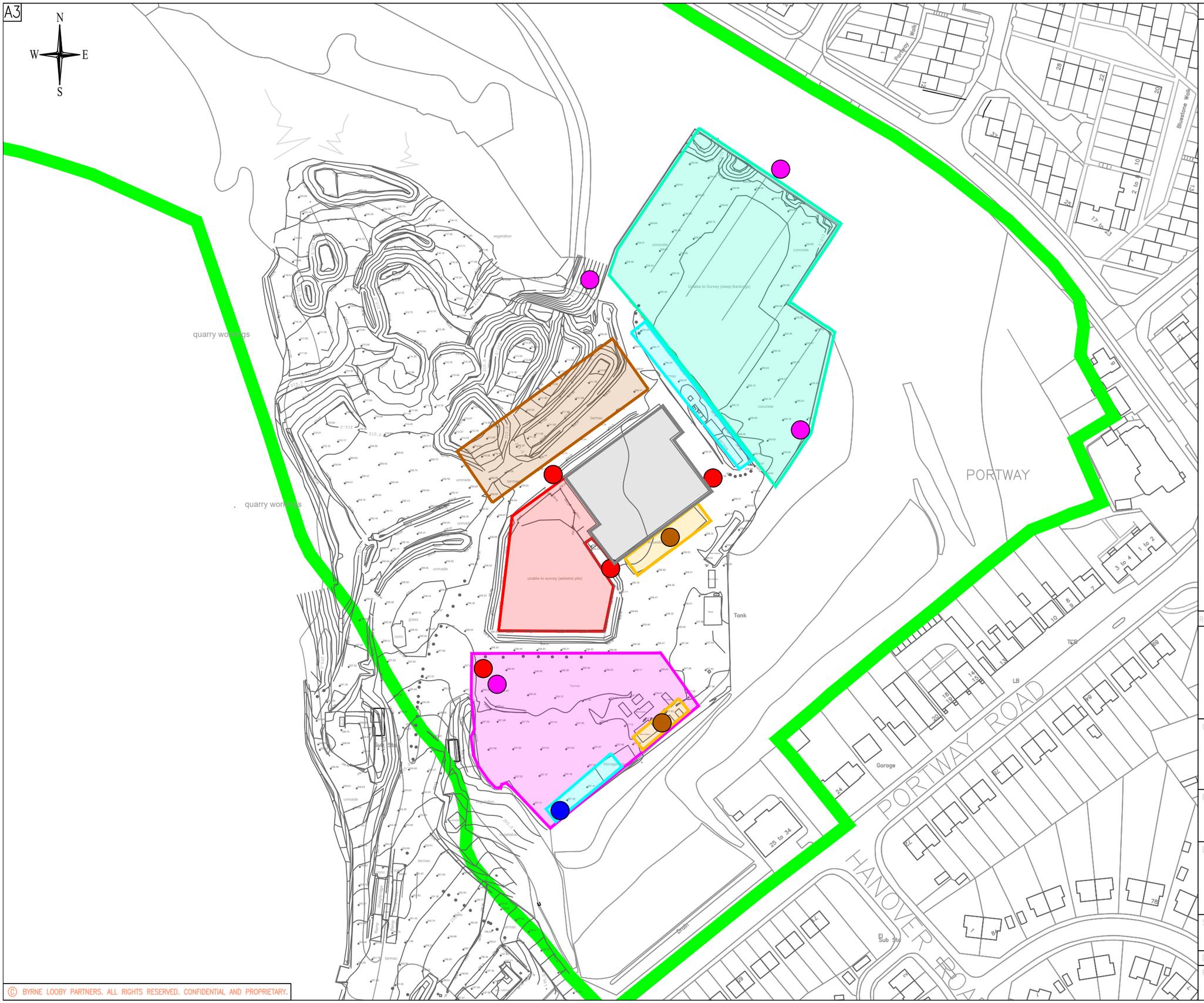
All equipment is calibrated at a frequency dictated by the manufacturer rather than a 4 monthly interval.

Table 3. Emissions Monitoring

Parameter	Frequency	Thresholds	Comments
Asbestos (TCM)	Daily during initial soil screening	<0.01f/ml	Proposed for permit variation to replace monitoring during hand picking. Method as described in M17 guidance and Table S3.3. This frequency is far in excess of other similarly permitted facilities.
Asbestos (SEM)	Quarterly		Added reassurance to ensure baseline of asbestos emissions is not changing. Method is as described in M17 guidance. Detection limit anticipated to be <0.0005f/ml. This monitoring is far in excess of other similarly permitted facilities.
Dust	Monthly	200mg/m2/day	Frisbee dust gauge method as described in M17 guidance.
Soil moisture content	Reception testing of soils as per	15% moisture content	To ensure soils received have low potential for dust release
Asbestos content in soils	Reception testing of soils	<0.1% chrysotile, <0.01% other types of asbestos fibres. No visible unbound asbestos or insulation	To ensure soils received cannot generate airborne emissions of asbestos above the method detection limit
PM_{10}	Weekly or as required if dust is suspected	250µg/m3/15 minute TWA*	Use of hand held nephelometer – not used for compliance against EU Directive Limit for PM_{10} as stated in EA Guidance M8, but provides real time results for implementing immediate mitigation if results are within 25% of threshold. A hand held mobile device for discrete monitoring around working areas. This method is preferred to support operational control of emissions rather than a fixed monitoring system for general air quality analysis at fixed locations (e.g. Filter Dynamics Measurement System/Beta Attenuation Monitor)
TPH/BTEX/PAHs	Monthly	None stated in permit	Biofilter Monitoring as described in Table S3.1
VOCs	Weekly or as required	1mg/m3 benzene	Use of calibrated PID around working areas on biotreatment pad. For ensuring RPE requirements are respected and biofilter is not overloaded with VOCs from incoming soils.
Odour	Daily	Absent	To ensure site activities do not cause nuisance
Noise	Monthly	85dBA	Occupational exposure monitoring in close proximity to working plant.
Treated water	Monthly	As required by trade effluent consent	Reported to Severn Trent to ensure compliance with trade effluent consent

*Mitigation implemented if within 25% of threshold due to accuracy of nephelometer method
Grey shading means the analysis results are already reported as required by the permit

A3



GENERAL NOTES

1. SURVEY INFORMATION SUPPLIED BY THE WASTE RECYCLING GROUP .
2. DO NOT SCALE
3. ALL DIMENSIONS ARE IN MILLIMETRES AND ALL LEVELS ARE IN METRES ABOVE ORDNANCE DATUM
4. ANY ANOMALIES ON THIS DRAWING ARE TO BE BROUGHT TO THE ATTENTION OF BYRNE LOOBY

KEY

- PERMIT BOUNDARY
- NON–HAZARDOUS SOIL STORAGE AND SCREENING AREA
- BIOLOGICAL TREATMENT AREA
- BIOFILTERS
- HAZARDOUS SOILS STORAGE AREA
- BIOLOGICAL TREATMENT AREA/SOIL WASHING AREA
- WATER TREATMENT PLANTS
- SOIL TREATMENT BUILDING
- AIR SAMPLING: ASBESTOS/PM10
- AIR SAMPLING: TPH/BTEX/PAH'S
- AIR SAMPLING: DUST/NOISE/ODOUR
- WATER SAMPLING: SEVERN TRENT

Rev	Date	Description	By	Chk	App

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CLIENT

waste recycling group

PROJECT

EDWIN RICHARDS QUARRY
SOIL TREATMENT CENTRE

DRAWING TITLE

EMMISIONS MONITORING PLAN

STATUS

FINAL

Date: 20.06.23	Scale: 1:1500	Drawn: JM	Chk: JW	App: JW

Project No:	Drg. No:	Rev:
K0182	K0182.2.003	01

STC – WI 014 – EMISSIONS CONTROL AND MONITORING

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Distribution:	Z/QMS/Work Instructions - STC		

Document Changes

Revision No:	Summary of Changes	Date
1	N/A	05/03/18
2	Addition of SEM testing detection limit	30/09/20
3	Inclusion of new treatment areas	06/06/22

Introduction

This Work Instruction (WI) sets out the measures taken to manage and control emissions of dust, PM10, asbestos fibres and VOCs/odours as part of permit requirements for Edwin Richards Soil Treatment Centre – EPR/HP3632RP/V003. This procedure is in addition to existing monitoring and measures undertaken by Provectus and FCC on site.

Principle of Operations

The main objective of the operation is to monitor, manage and minimise dust, PM10 and asbestos fibres from potentially being released at the soil treatment facility.
WI 007 – Environmental Monitoring outlines the sites current monitoring regime which includes dust and PM10 monitoring around the site. While *WI 011 – Processing of Asbestos Contaminated Soils* describes the measures in place with regards to ambient asbestos fibre monitoring in the air.

Procedure

All soils entering the Soil Treatment Centre (STC) undergo pre-assessment where the suitability is checked to ensure it meets the acceptance criteria such as asbestos type and fibre content.

Once on site soils are sampled for compliance and moisture content. Where soils are found to be too dry, they can be acted upon by damping down. For soils stored externally it is highly unlikely that they become dry enough to generate dust due to the UK climate.

Any soils that fail the compliance criteria shall be segregated and rejected from site and sent to an appropriately licensed facility.

Soils containing asbestos for picking are to either be placed directly in the asbestos shed or in the external storage areas shown on the attached drawing. Current monitoring undertaken within the asbestos shed has shown that fibres are not detected >0.01f/ml or >0.0005f/ml at any point (depending on what method is used for monitoring). When in use, the asbestos shed access road is to be routinely sprayed down with a propriety surfactant mixture. Dust levels on the roads in and around site are controlled through regular damping down and sweeping.

Externally, asbestos containing soils are to be covered with a tarpaulin or equivalent once formed into a static batch. If the soils are being moved to the asbestos shed, or being added to, then the tarpaulin can be temporarily removed.

Soil moisture content for exposed soils within the shed and also in the external storage area is to be checked to ensure moisture levels are above 15%. Soils with moisture content below 15% shall be dampened down using the irrigation system on site

Monitoring

Monitoring locations will be placed around the perimeter of site. These locations are to be monitored on a weekly basis for PM10 using a *Dustmate* – which will be calibrated as per the manufacturer's guidance. Action will be taken if dust results record levels greater than 250µg/m^3 over a 15 minute TWA, such as additional dust suppression on the roads via a water bowser, road sweeper or damping down soils with a pressure washer.

Additionally, frisbee dust gauges shall also be placed at these monitoring locations. This shall be sent to an accredited laboratory monthly for testing of deposited dust. Should levels of deposited dust exceed 200mg/m^2/day then actions as previously described, shall be taken.

Ambient asbestos fibre monitoring shall continue in the shed whilst activities are occurring to ensure compliance with the permit level of <0.01f/ml or the WHO levels of <0.0005f/ml. Additional monitoring shall take place externally around the storage area to confirm that fibres are not being released though site activities. This will be done via an accredited asbestos monitoring contractor. All of this monitoring is to confirm that no emissions are being generated on site.

Noise

The noise thresholds are contained within the noise assessment and are monitored on a weekly basis. It is not anticipated that the addition of the biotreatment pad will increase the noise levels at the site due to the acoustic insulation used on all equipment and previous monitoring that has shown that noise levels are not exceeding 5dB above background at the site boundary.

Odour

There is a low potential for odour at the site. Odour monitoring is undertaken on a daily basis with the target of no odour detected at the site boundary.

Biofilter Emissions

The point emissions from the STC biotreatment process to air are controlled through the site biofilter that is present on two separate biotreatment areas. On a monthly basis, sampling of the gases directly exhausted from the biofilter will be undertaken by an independent laboratory. The parameters to be tested are described in the site specific Environmental permit, typically this includes VOC's, TPH, BTEX and PAH. The biofilter is periodically changed or refreshed to ensure that it remains effective.

All results of monitoring shall be stored on the company server and/or site files.

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