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.

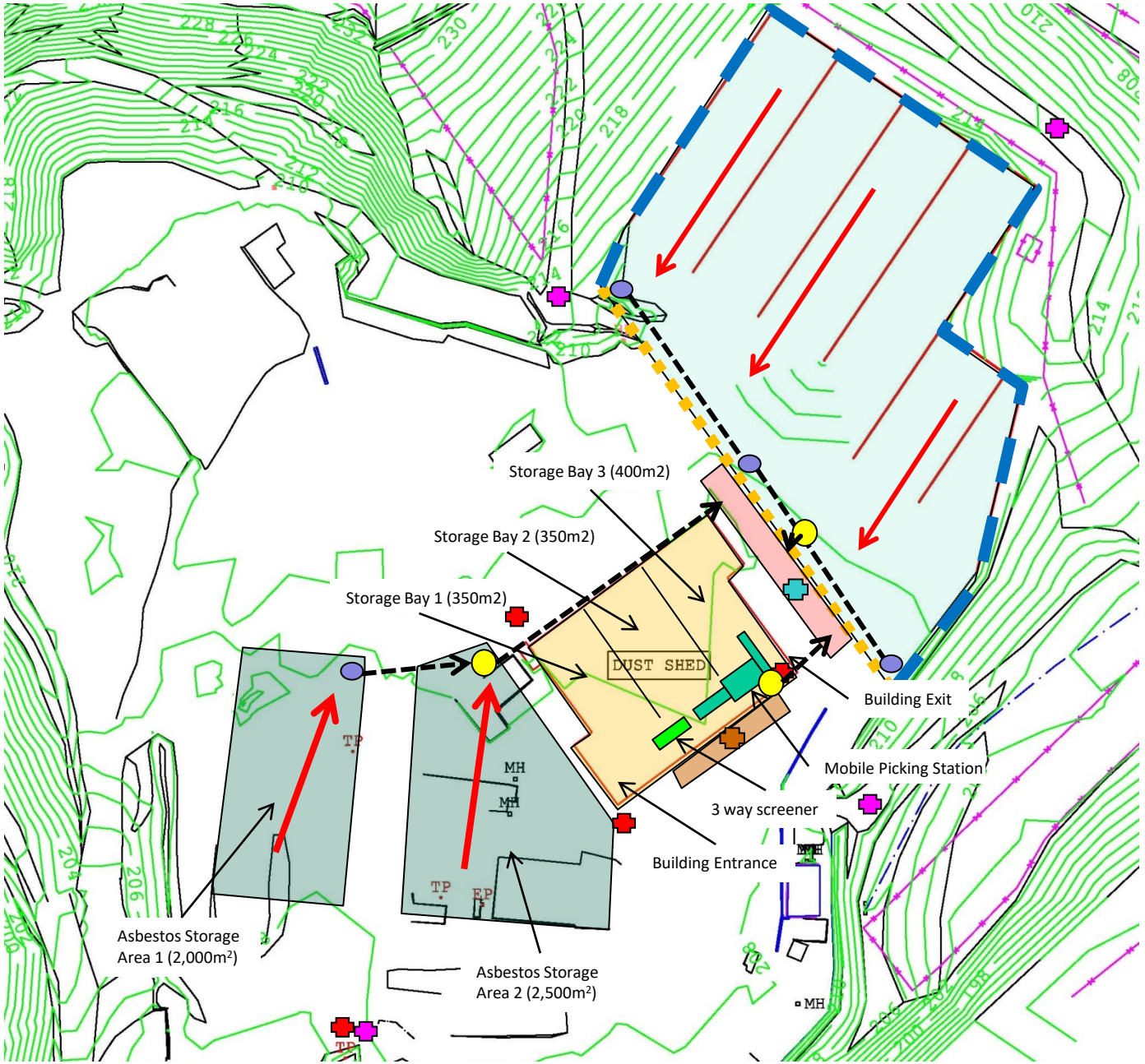
Table 3 provides detail of the existing monitoring undertaken on site for reporting as a permit condition, additional monitoring undertaken for internal management and control of emissions (but not required to be reported as a permit condition) with an update on locations in Appendix A to reflect the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



Fall of Pad Drainage

Underground drains

Asbestos Treatment Area

Biological Treatment Area

Water Treatment Plant

External Asbestos Storage (external bunding)

Biofilter

Air sampling: asbestos/PM_{10}

Air sampling: Dust/Noise/Odour

Air sampling: TPH/BTEX/PAHs

Water Sampling: Severn Trent

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