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Our ref: 3982-CAU-XX-XX-CO-V-9001-A0.C1
Your ref: EPR/NP3538MF/V009

1st October 2021

By e-mail

F.A.O. *Katie Dunmore, Permitting Officer*

Dear Katie

Re: *Schedule 5 notice for Daneshill Soils Treatment Facility (permit ref: EPR/NP3538MF/V009)*

I am writing on behalf of FCC Recycling (UK) Limited regarding the Schedule 5 notice issued for the permit variation application for Daneshill Soils Treatment Facility. Please see below our responses to your Schedule 5 and the attached relevant and updated documents to support our response.

1) Site Plan

Provide a revised site layout plan which shows the site infrastructure in great detail. The plan must be labelled and to scale and show how the site has been designed to ensure segregation of hazardous and non-hazardous waste along with asbestos contaminated soils. As a minimum it must include:

- *Waste stockpile locations*
- *Raw materials and fuels (including bunding)*
- *Key plant items such as screening plant and asbestos picking station (show how conveyors with inputs both in and out)*
- *Asbestos storage skips*
- *Vehicle wheel wash*
- *Storage of mobile plant such as excavators*
- *Asbestos decontamination areas and control zones*
- *Equipment wash down areas*
- *Water treatment compound*
- *Biofilter*

Please see attached drawing ref: 3982-CAU-XX-XX-DR-V-1807 'Soils Treatment Pads; 1,2 and 3 Site Layout Plan'

Drainage

2) ***Provide a revised drainage plan which shows how waters falling onto the wider site are captured and channelled. Site surfacing must be labelled and the location of the vehicle wheel wash and equipment wash-down areas shown along with an explanation of how these water are captured and contained. The plan must show any surface water discharge points from the STF area.***

Please see attached drawing ref: 3982-CAU-XX-XX-DR-V-1808 'Surface and Foul Water Locations'

3) ***Explain how the asbestos storage and treatment pad will be designed to ensure that surface water falling on the pad will be retained and channelled to the collection sump.***

Please see attached drawing ref: 3982-CAU-XX-XX-DR-V-1808 'Surface and Foul Water Locations'.

Treatment pads are designed to have a fall towards a main water collection drain to ensure that water is continually drained from the pads and directed towards a centralised pumping chamber for transfer to the water treatment system. Water is unable to leave the downgradient periphery of the pads by lateral flow due to the presence of a containment bund of 300mm height. Water is unable to migrate to underlying controlled waters due to the presence of an engineered pad with a geosynthetic clay liner that would have a design permeability of 1 x 10-9m/s as a minimum.

4) ***Explain how water will be transferred from the collection sumps to the water treatment system. Include any pipework on the revised drainage plan.***

Water will be transferred using a pump with integral level detection sensors from the collection sumps to the water storage tanks. Pipework connecting the pumping chamber to the primary collection tank will be HDPE pipework connected by butt fusion. The pipework will be commissioned, and pressure tested prior to operation to ensure that no leaks are present.

5) ***Explain the containment measures provided for the water treatment compound, waste, raw materials and fuel storage areas. Include these on the revised plan***

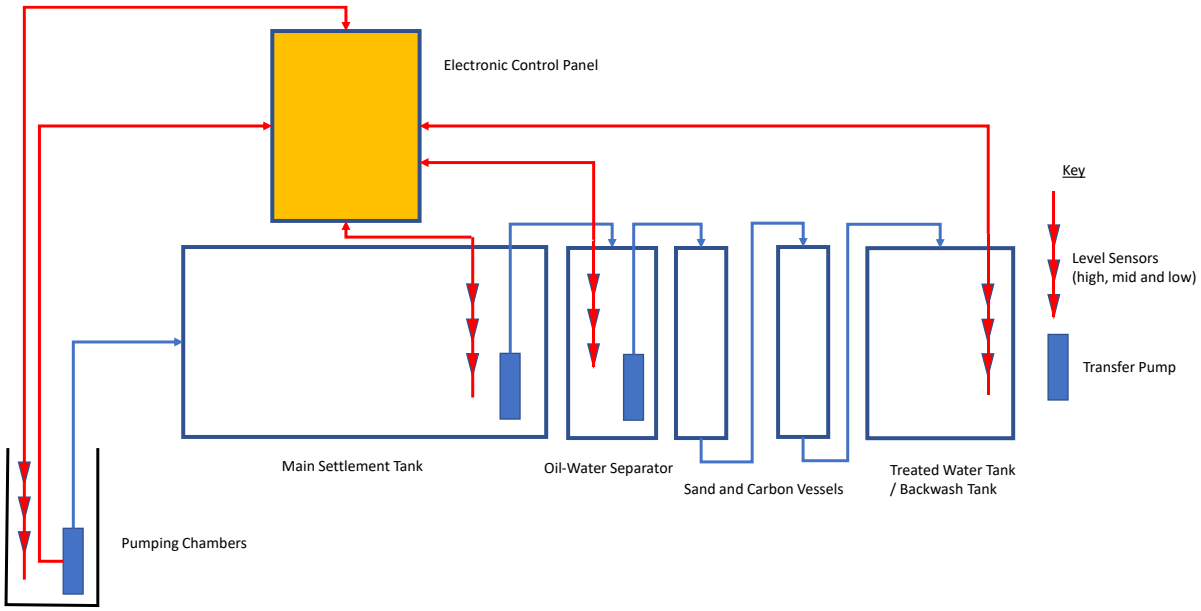
Water Treatment Compound – waste, raw materials and fuel storage areas as shown in drawing ref: 3982-CAU-XX-XX-DR-V-1809.

6) ***Explain any additional precautions proposed when dealing with water captured from the treatment pads including measures to prevent over pumping into the system.***

Waters captured from the treatment areas are pumped from the pumping chambers into the main water settlement tank. A schematic is shown in Figure 1 below.

The pumping system controls all the transfer pumps. The level sensors protect the pumps and protect from overfilling. The high level prevents further pumping into the receiving vessel. The mid-level activates the transfer pump. The low-level sensor prevents the water level from being below the level of the transfer pump.

Figure 1. Water Treatment Schematic



The main water settlement tank is installed with low level, mid-level and high-level sensors. If the high-level sensor is activated the control panel will prevent further pumping from the treatment areas into the main settlement tank. The mid and high-level sensors operate the settlement tank pump which transfers water through the sand and carbon filtration tanks to the treated water tank. The transfer pump in the main settlement tank will continue to pump until the water level reaches the low-level water sensor. However, if any of the high-level water sensors are activated the control panel will prevent further water to be pumped into the vessel.

The pumps in the collection sumps cannot pump water until water levels in the main settlement tank are below the high level. When the water level reaches the mid-level sensor the pump shuts down.

In addition to the level sensor protection of the tanks, there is a bund surrounding the water treatment system that also provides over pumping protection.

7) Provide details of any additional measures in place to deal with water captured from the asbestos treatment pad.

(reason – the water treatment proposed involves adsorption and settlement. Measure which will capture hydrocarbon contaminants and settle out sediments. They will however will not capture asbestos fibres. We are concerned any fibres present in surface water will past through the treatment plant and potentially be reused or enter the wider environment).

Asbestos is only accepted in a bound form. This means that it is encapsulated in a cement matrix as well as being present in soil. The presence of a bound matrix and soil has previously been expected to prevent the release of asbestos fibres into soil porewater. Fibre concentrations in soil are generally non-detect or below the detection limit of <0.001% in received soils. Water monitoring from asbestos process areas has not detected asbestos fibres to be present in effluent from asbestos processing areas. Therefore, no abatement of asbestos in effluent is required. (Appendix A for asbestos testing of water)

Questions 8 – 20 refer to asbestos soil treatment and some responses will need to be deferred until agreement is reached with Chris Hall, Richard Hadley and Clive Wall on the pre-operation condition relating to asbestos treatment at a site operated under permit reference EPR/HP3632RP. It is anticipated that this agreement will be achieved imminently (subject to further data collection).

Asbestos Soil Treatment

8) Are asbestos contaminated soils expected to be contaminated with hydrocarbons or other contaminants. Once treated will these be directed to the bioremediation process?

A low proportion of soils with asbestos accepted at our other facility are also impacted with hydrocarbons. Approximately 15% of inputs into our other permitted facility also contained hydrocarbons above 0.1%. These soils were all sent to the biotreatment area at the end of the asbestos treatment phase and validation testing to confirm that asbestos fibres could not be liberated from soils above the permit control limits for airborne emissions or >0.0005f/ml.

9) Do you require code 17 05 04 to also be included for asbestos treatment?

(reason – we consider soils contaminated with asbestos sheeting to be consigned under two waste codes, the base soil and separate asbestos sheeting. Provided waste acceptance confirms the fibre count to be below 0.1% and the material does not contain other hazardous components the separate non-hazardous code may be required)

At our other facility the hazardous waste consignment note contains 17 06 05 and 17 05 04 for asbestos inclusions in non-hazardous soil. The Operator are only treating the hazardous substances in this consignment.

10) Explain what compliance sampling and testing is undertaken prior to asbestos soil being accepted on site. This must include the parameters sampled and the parameters used. Please also confirm the frequency of testing. You must demonstrate your pre-acceptance cand acceptance procedures and testing can accurately identify the type and quantity of fibres present.

(reason – Its noted Section 2.2.2 of the Emissions Management Plan and other documents confirm waste will be accepted subject to satisfactory pre-acceptance checks and this is carried out to confirm free asbestos fibres are not above 0.1% for chrysotile asbestos and 0.01% for other forms. You must demonstrate how your procedures and testing can accurately identify the type and quantify of fibres present.

It is not clear if the Waste Acceptance Procedures provided with the BAT document also cover the acceptance of asbestos soils. It appears to be geared to the bioremediation process. You must provide full details of the acceptance criteria for asbestos contaminated soils)

The waste acceptance procedure has been updated in Appendix B (attached) to include asbestos as this was included separately in our operations manual.

11) Your waste acceptance procedures must be revised to explain how asbestos soils will be received and deposited into the quarantine and storage areas in a way that minimises dust emissions. You must also include details of the maximum quantity of waste stored at any one time for soils whilst awaiting treatment and post treatment.

(reason – Limited information has been provided regarding the measures in place to minimise emissions when handling soils. It's not clear if waste is stored in bay or mound. As detailed within our guidance storage areas should be clearly marked and signed. All bays or locations containing asbestos should be labelled and turnover periods for all waste stored prior and post asbestos picking activity detailed. You must also provide stockpile dimensions.

All soils with ACM are covered awaiting reception testing and soil treatment. The maximum storage amounts are included in the drawings from Question 3.

Soils are received on the treatment pad and sampled into discrete lots based upon the site of origin. Whilst the moisture content of soils with ACM is rarely low and previous experience demonstrates that asbestos emissions from soils have never been measured above 0.0005f/ml, the dust suppression system is employed and soils are covered by the end of the working day with tarpaulins to ensure that soils are suitably contained prior to the formal

reception analysis results being received. Once the results confirm that the waste acceptance criteria are achieved, then the soils will be uncovered and proceed to the soil treatment phase. The maximum quantity of soils awaiting treatment on pads 1 and 2 is 2,880t on each pad, and Pad 3 is 3,840t. Once the soils are treated, they no longer pose a risk to human health from asbestos emissions; these soils either move to the soil storage area awaiting reuse in the restoration scheme or are placed immediately into biotreatment should elevated TPH concentrations remain present that are either hazardous or above the restoration criteria. All emissions management as part of the biotreatment works will be undertaken as described in other sections.

12) ***Explain how asbestos soils are processed through the three way screen in a way that eliminates asbestos fibre release from the soil and asbestos fragments as they pass through the screen. You must detail all proposed abatement techniques and demonstrate how this meets BAT 14 with regards to the containment, collection and treatment of diffuse emissions.***

Soil screening and hand picking on mobile treatment licensed projects have always resulted in asbestos emissions being monitored below <0.01f/ml. The historic hand-picking operation undertaken at Edwin Richards Quarry has always been monitored to be below <0.01f/ml or where testing has been undertaken to lower detection limits, they have always been below <0.0005f/ml. The containment measures for the soil screener have been proposed to the permitting and compliance team (including Chris Hall) for agreement. Once the performance data for this containment system has been collected it will be sent at a later date for review.

13) ***Provide details of the measures in place to prevent dust and asbestos fibre emissions when loading asbestos waste onto the picking line. Is the conveyor covered?***

There is a spray rail on the conveyor loading the picking station. The conveyor is uncovered but within the areas subject to secondary dust suppression via surfactant and water misting systems. Air sampling on the conveyors of the picking station (without dust suppression) has always resulted in monitored concentrations <0.0005f/ml or <0.01f/ml depending on the sampling and analysis method chosen. A recent example of the monitoring of the picking station hopper and conveyors over 5 subsequent days without dust suppression is shown in Appendix D (attached).

14) ***Provide details of how waste soil following picking will be transferred to the post treatment storage location which minimises dust and fibre emissions.***

The treated soil once validated to meet the requirements for reuse in restoration areas does not pose an asbestos emissions risk. Normal dust mitigation will be applied if visual dust is occurring around the site in accordance with the measures highlighted later in this response for queries about fugitive dust emissions and suppression. If elevated hydrocarbons are present, then the soil will be transferred to the biotreatment area and formed to a biopile with the active vacuum system applied.

15) ***Explain the procedure in place for dealing with picked asbestos fragments. Are they double bagged on the picking line? How are the bagged pieces deposited within the skip?***

All asbestos removed from soil is removed from the picking station conveyor by the asbestos operatives, then placed into asbestos bags before being double bagged in the appropriate asbestos bag and sealed. Double bagged asbestos debris is placed in a dedicated lockable asbestos skip by the asbestos operative. Once the asbestos skip is full it is consigned as hazardous waste to an appropriately permitted landfill.

16) Explain if there is an emissions abatement in the picking booth. If not explain how airborne fibre emissions are captured and contained.

(reason – we have significant concerns that the asbestos soil storage, transfer and treatment activities as described do not meet BAT. There appears to be no specific mitigation or abatement proposed with stockpiles described as being deposited, screen and transferred to a picking station with door and windows, via conveyor and then further in open stockpiles.

The Emissions Management Plan states "asbestos fibres are not generate on site above the detection limit so no abatement system is required". We disagree, screening and dropping from height will agitate and may break asbestos materials and lead to release of fibres. Dust suppression and "wetting solution" alone is not considered sufficient mitigation. You must demonstrate through detailed working procedures how asbestos soils are stored, treated and handled to ensure the containment and collection of diffuse emissions. As stated in BAT we would expect techniques such as;

- *Storage and treatment in enclosed buildings and/or equipment*
- *Maintaining enclosed equipment under adequate pressure*
- *Collection and direction emissions to an adequate abatement system*

Further details of the approach proposed to Chris Hall, Richard Hadley and Clive Wall that meet the principles of BAT as well as guidance document: Chemical Waste: Appropriate Measures for Permitted Sites, November 2020 will be forwarded once agreed for implementation at Edwin Richards Quarry under the permit pre-operation condition. The measures are designed to meet WHO air quality guidance levels for asbestos of <0.0005f/ml rather than the expected permit target of <0.01f/ml.

17) Provide details of the asbestos decontamination procedures in place for both staff and equipment.

Reason – the measures described are not sufficiently detailed. You must explain the wet cleaning techniques used and how waters are captured etc. We would expect areas of the site dealing with asbestos contaminated materials to be clearly demarked, access restricted and clear techniques described for the decontamination of staff and equipment.

The decontamination provisions for the asbestos area are implemented in our other site and are appropriate with the provisions for notifiable works and include the following:

- Access restrictions to asbestos treatment areas;
- Provision of clean and dirty areas within a dedicated decontamination unit;
- Disposal area for used overalls and masks/overshoes/cleaning materials etc for bagging and subsequent disposal as asbestos waste;
- Contained washing provisions for personnel decontamination prior to leaving the clean area of the decontamination unit;
- Decontamination of plant is undertaken under the supervision of a Category B trained person. Any visible contamination is removed manually, then plant is wet cleaned externally. Cabins will be vacuumed with a H Class vacuum cleaner and all debris/cleaning materials will be bagged and placed in the locked asbestos skip. A clearance air test within the any internal operator's cabins would require undertaking prior to leaving the working area. This approach meets the standards described in the HSE NI document attached in Appendix E.

18) Clarify the post treatment sampling and testing undertaken on the asbestos soils. Explain how these samples are analysed and what thresholds dictate what happens next to the treated soils.

Reason – Section 2.5.1 of the BAT assessment details testing is undertaken but provides no further clarification. Its noted table 5 of the STC compliance testing and sampling document details output compliance testing is the same for inputs but again this appears specific to the bioremediation process. You must explain the fibre sampling specific to the asbestos soils to ensure treatment and handing has not increased fibre concentrations.

The work instruction on soil analysis STC WI006 Ver 4 is included in Appendix F. This provides the analysis suite for soil batches that are being validated for reuse. The sampling frequency used is 1/500t. The reason for this is that the soils that are treated at the site are from a number of sources and once reception sampling is completed these are combined into batches to form a heterogenous stockpile. Treatment is undertaken on the biopiles, and batch size can vary significantly with over 10,000t occasionally being tested for disposal as treatment is deemed completed when all samples in a batch meet the reuse criteria.

The asbestos treatment has more in common with a continuous process that is sampled on a 1/500t frequency. The reason why this sampling frequency is chosen is that it meets the general principles contained within EA guidance document 'dispose of waste to landfill' April 2021 (https://www.gov.uk/guidance/dispose-of-waste-to-landfill).

Due to the need to undertake a restoration risk assessment to identify suitable targets to protect controlled waters receptors and human health at the site the exact chemical suite and form of testing is subject to change. The site-specific risk assessment for the restoration area where treated soils are to be reused, including appropriate soil treatment targets is to be completed and agreed with the Environment Agency prior to the use of treated soils at the site.

19) Clarify the asbestos fibre monitoring proposed during soil screening activities. Explain if there are static monitoring points and if separate personal monitoring for staff is undertaken.

The asbestos monitoring is undertaken at the boundary locations specified. In addition, more frequent monitoring is undertaken at the source area during soil treatment works. The use of personnel asbestos monitoring was historically undertaken at another site with the same operator; however, there is no risk of the control limit being exceeded during soil treatment, and the detection limit is not sufficiently sensitive to meet our internal criteria due to the relatively low volume of air that can be practically sampled by equipment attached to an individual. Personnel monitoring has therefore been discontinued in preference to more frequent monitoring at the soil treatment location using sampling equipment operated for sufficient time to achieve a detection limit of <0.0005f/ml.

A drawing is included to include the sampling points around the soil treatment equipment will be shown on the drawing from question 3). This will be located immediately downwind of the treatment plant, so from day to day may slightly change from the location highlighted on the drawing.

20) Clarify if all asbestos monitoring locations have been identified on plan 3982-CAU-XX-XX-DR-V-1803. Revise the plan if necessary.

Reason – This plan details 4 boundary locations. Table 2 of the EMP confirms monitoring is also undertaken around the treatment area during screening. These locations must also be included.

In addition to drawing ref: 3982-CAU-XX-XX-DR-V-1803, Emissions Monitoring Plan for Dust Asbestos and VOCs, Drawing ref: 3982-CAU-XX-XX-DR-V-1812 shows sampling locations positioned to act as source area sampling points; it is to be noted that several sampling points will be pooled to form an individual sample due to the high volume of air (typically 1,440l) required to achieve the asbestos detection limit of <0.0005f/ml.

Bioremediation

21) Clarify the arrangements for waste acceptance verification testing specifically the frequency of reception sampling. You must also demonstrate that the site has sufficient space to isolate loads whilst they wait for acceptance analysis.

Reason – Table 1 of the BAT document copied from table 1 of the Provectus STC –FO03 details sampling at a different rate to Table 1 of the separate Waste Acceptance procedure STC document.

The annual capacity for hazardous waste is c. 30,000t over 52 weeks. The treatment areas combined, have a surface area 11,830m2. If 30,000t of soil was in treatment at any one time, it would require only 6,250m2 of treatment area (53% of the total) assuming an average stockpile/biopile height of 3.0m and dry density of 1.6t/m3. Therefore, the treatment areas are significantly oversized to allow for all inputs to be subject to reception testing prior to formal acceptance.

The STC FO03 document originally submitted has now been aligned to waste acceptance procedure reference document: STC – WI 003 – Soil Characterisation Procedure rev 7 dated September 2021 and has the same sampling criteria.

Table 1: Requirements for sampling:

Volume of soil (t)	No. of samples needed (before or during acceptance at STC)
< 100	1
100 - 500	2
500 +	2 + 1 for every 500t

22) Explain if the same screening equipment is used for hazardous, non-hazardous and asbestos containing waste. Explain the procedures in place to ensure hazardous and non-hazardous wastes are stored and treated separately. Detail the operating techniques in place to avoid cross contamination.

Reason – The cross-contamination and clean down procedures detailed in section 4.5 of the BAT document provide some discussion of the wet wash down procedures used to remove asbestos fibres when mobile machinery is removed from site. This however is not sufficiently detailed. You must provide clarification as to whether the same equipment is used for screening hazardous/non-hazardous and asbestos wastes, the decontamination procedures used and if its moved between working areas the measures to prevent cross contamination etc.

The Operator can confirm that the same screening equipment is not used for different waste types.

The three-way soil screener for asbestos contaminated soils will be kept separate from other waste types and so no cross contamination will occur. Swab samples will be taken prior to this soil screening plant leaving treatment areas as previously stated. Due to the bound nature of

ACM debris and the general absence of quantifiable asbestos fibres cross contamination of the screener has never been shown to occur.

The only other soil screening that will take place on site is for non-hazardous treated soils from the biotreatment area and this will be undertaken using a separate two-way screen to enable the material to meet the physical criteria for restoration soils.
There will be no soil screening of hydrocarbon contaminated soils prior to biotreatment.

23) ***Provide details of the management procedures in place to prevent fugitive emissions (dust, VOC and odour) resulting from waste handling and biopile turning operations. Include information on how additives are applied to the biopiles and how long biopiles are likely to remain open.***
Reason – You must demonstrate the measures in place meat BAT5. Waste handling techniques have not been adequately described. For example the soil turnover procedure details how this is undertaken but not how emissions are minimised. These techniques must also be clearly detailed in the EMP. See below for further clarification.
The Emissions Management Plan has been updated to reflect these techniques, Please See Section 7 'Control Measures'.
Fugitive emissions from biopile activities are extremely limited with the only measurable emissions generally occurring during the initial reception of soils from tipper lorries.

Table 2. Dust, VOCs and Odour Mitigation

Parameter	Mitigation
Dust	Soils are formed into 3-4m high biopiles with sealed sides. Turning is undertaken once every 3-4 weeks only for decompaction reasons and so overall soil movements are very limited. Soils in treatment have hydrocarbons converted to carbon dioxide and water. Increasing water content within soils during treatment has been shown to prevent dust emissions. Treated water can be used to irrigate dry soils at surface for dust suppression during prolonged dry and windy weather
VOCs and Odour	Site visits are undertaken prior to soils being accepted to ensure odours are not significant during soil reception. Daily cover of soil may be required for occasional loads of odorous soil The vacuum applied to soils shortly after receipt has been demonstrated to significantly mitigate odour release with 2-3 air exchanges in soil per hour. The biofilter is used continuously for soil gas effluents No turning of soils is undertaken until soil gas samples indicate low levels of total VOCs – typically <40ppm total VOCs

24) ***Provide details of the storage location, maximum storage time, volume and pile size of each waste material stored for use in the biopiles and biofilter - 17 02 01 - wood, 19 05 03 – off specification compost, 19 12 07 – wood and 20 03 03 – leaf litter. These locations must be labelled on the site plan. You must demonstrate there are appropriate procedures in pace for the storage of these combustible wastes.***

We may require you to produce a Fire Prevention Plan in line with our Guidance Link. An additional fee may be required.

Describe how each individual waste detailed above will benefit the remediation process. Clearly explain what it is, why it is added and provide a demonstration that the waste is necessary for treatment. You must explain the waste acceptance procedures to ensure the waste are suitable for the process and will not add further contaminants which may negatively impact the bioremediation process.

Provide details of the mixing ratios for all raw materials, both waste and non-waste
Reason – It's noted there is some description provided regarding the use of leaf litter.
Its noted woodchip will be added to clayey soils and stored in an articulated lorry. This however is not sufficient detail to assess the fire risk and detail remains patchy. No discussion has been provided regarding the use of off specification compost which is derived from municipal waste and highly variable in nature.

A maximum of 30m^3 of waste wood will be stored in a designated area on site for use in the biopiles. Leaf litter is accepted as incidental inclusions within soil and so will not be stored separately. The locations are shown on the detailed biopile layout drawing from question 1.

The biofilter will be formed of off-specification compost and approximately 1-2% of treated soil to provide a suitable inoculum for hydrocarbon competent microflora.

25) ***What are the treatment standards you are aiming to achieve by bioremediation for both hazardous and non-hazardous waste? At what concentration levels are the wastes considered treated?***

Reason – BAT is to set up and implement and output quality management system that ensures that the output of the treatment is in line with expectations and objectives prior to treatment. It's noted the objective of treatment is to provide a material suitable for restoration of the landfill and use within the access road. The quality standards aimed for however are not clear.

The waste is considered treated when it achieves:

- a non-hazardous concentration in accordance with an assessment of residual substances in accordance with WM3 (v1.1GB Jan 2021);
- contaminants meet the targets identified in a human health risk assessment and detailed quantitative risk assessment for controlled waters. This risk assessment is to be completed for the restoration areas of the site to ensure that any residual soil impact does not pose a risk to identified receptors at the site. No soil will be reused in the restoration/void areas until the proposed soil contaminant targets highlighted in this risk assessment is agreed.

26) ***Explain what contaminants are expected to be in the following wastes;***
EWC 05 01 15* spent filter clays, 17 09 03* Hazardous C&D waste and 17 09 04 Non-hazardous C&D. Explain how they will be treated and why this will render them suitable for reuse on site. Explain the sampling and testing proposed.

EWC codes 05 01 15, 17 09 03 and 17 09 04 can be removed. 17 09 03 and 17 09 04 were included due to a local enforcement officer facility insisting on another site that this would be required – but this was subsequently confirmed as not being required. 05 01 15 is not required due to the limited volumes available for treatment locally.

27) ***Clarify the biofilter monitoring proposed. Explain the parameters and the frequencies chosen.***

Reason - Provectus report STC – WI 007 states the biofilter will be monitored monthly through a lab for VOC, Spectated PAH and TPH plus bimonthly onsite sampling using a PID. This information however has not been replicated in Table 2 within the Emissions Management Plan which states biofilter monitoring will be 6 monthly for Ammonia, TVOC and Hydrogen Sulphide please confirm.

The biofilter monitoring proposed is:

Table 3. Biofilter Monitoring

Parameters	Unit	Detection limit	Action trigger limit
BTEX	mg/m^3	0.05	
TPH	mg/m^3	0.05	
Top 16 PAH	mg/m^3	0.05	
Moisture content	%		<60 or >80
Grain size	mm		<10 or >25
Total N*	mg/kg		<400
Total P**	mg/kg		<150
pH			<6.5 or >8.5

Mitigation Measures

The following actions are provided for parameters being out of optimal range:

- BTEX/TPH/PAHs elevated – reduce airflow and investigate moisture content/grain size/total N and P and pH
- Reduced moisture content – irrigate biopile
- Elevated moisture content – remove tarpaulin and turn pile
- Grain size <10mm – replace biofilter matrix
- Total N <400mg/kg and Total P <150mg/kg – add nutrients
- pH <6.5 or >8.5 – replace biofilter matrix

28) ***Clarify the process monitoring proposed for the biopiles.***

Reason - its noted pH, temperature, moisture content, Oxygen level and nutrient concentrations are monitored, please confirm how often.

The biopile monitoring undertaken is as follows:

Table 4. Biopile Monitoring

Parameter	Frequency	Reason
pH	Monthly or as required during soil turnovers	To ensure that the pH stays between 5-9
Temperature	Weekly	An indirect indicator of microbial respiration
Moisture content	Monthly or as required during soil turnovers	To identify if soils are waterlogged or have the potential for dust during a turnover
Oxygen levels	Weekly	To identify
Available Nitrogen	Fortnightly per batch	To ensure the presence of sufficient available nitrogen to support mineralisation of hydrocarbons
Vacuum pressure	Continuously	To ensure that oxygen levels in soil are always optimal at >10%. To provide continuous capture of any VOCs extracted from soil and treatment by biofilter to prevent fugitive emissions as far as practical
Soil contaminants	Monthly or as required during soil turnovers	To monitor when soils are suitable for use in the restoration scheme for the landfill

Water treatment system

29) Clarify what measures are in place to ensure the water treatment plants efficiency. Provide details of monitoring, measures to prevent over pumping into the system, alarms etc.

The water treatment system is inspected every week to ensure that each of the unit operations are working effectively.

This will ensure that the level sensors operate effectively at different water levels, high level alarms are activated correctly, pumps are working and operating within their normal range and pressure readings in vessels are within their normal operating range.

Further details of the water treatment plant set up are contained within response 6).

Should pressure readings be elevated, then treated water will be initially backwashed through the sand and carbon vessels to decompact sand and granular carbon within the filters. The pressure readings will then be monitored as water is then passed through the vessels into the treated water tank. If these remain elevated, then the sand and carbon will be replaced.

Sampling points are contained within the sand and carbon vessels to allow for samples to be obtained. Sampling the carbon vessel at different levels allows for early indicators that the carbon requires replacing prior to any breakthrough of contaminants into the treated water tank.

30) What are the size of the storage tanks? How do you know this is sufficient to contain runoff from the treatment pads?

A flood risk assessment has been conducted as part of the planning process. This requires a storage capacity for a 1 In 100 yr. storm + 40% CC to be 1,588m3 for all the treatment pads.

The treatment pads are made up of a lined area overlain with a 0.5m thickness of crushed concrete. With an average porosity of 30% this will provide a retention of 1,425m^3. There will also be a peripheral bund of minimum 0.3m depth that will provide up to an additional 532m^3

to 1,775m^3 of flood retention depending on soil coverage so in total a storage capacity of 1,957m^3 to 3,200m^3 of water storage capacity, so well in excess of the storage capacity recommended by the flood risk assessment.
A 50m^3 storage tank will be used for primary settlement, this is sized to provide sufficient settlement capacity for the effluent flow rates (generally ~2-4m3/hr) prior to treatment for off-site disposal.

31) Provide the design details of the tanks including pipework and containment.

The design details are shown on the drawing attached (to follow). The largest tank in the water treatment area is 50m^3 and so would require a minimum of 55m^3 of bunded capacity. The pipework between tanks comprises of 50mm fusion welded HDPE to ensure the highest possible leak protection.
The bund has a capacity of approximately 82.5m^3 will be constructed in accordance with CIRIA document: Containment systems for the prevention of pollution: Secondary, tertiary and other measures for industrial and commercial premises' (C736D; 2014).

32) Provide details of how asbestos fibres will be captured and contained.

Monitoring of the existing effluent from asbestos treatment areas has revealed that asbestos fibres are absent (examples of data in Appendix A). This is due to the acceptance of bound asbestos only and the absence of mobile asbestos fibres that could enter the water treatment system.

Asbestos monitoring will be continued to be undertaken on each batch of water that requires disposal to ensure the correct waste description is provided to any liquid effluent disposal contractor and that there is no cross contamination of the receiving disposal facility for the treated water.

Emissions Management Plan

33) The document must be revised to remove reference to a waste treatment building which has been referenced several times as mitigation for screening and hand picking.

References to a waste treatment building has been removed- please see attached revised Emissions Management Plan, document ref: 3982-CAU-XX-XX-RP-V-0307.A0.C2.

34) A site layout plan must be included within the EMP. This must be drawn to scale and include all detail as stated in the site layout request above along with visuals of suppression equipment such as nozzle heads and the spray arcs they reach.

Please see attached revised Emissions Management Plan, document ref: 3982-CAU-XX-XX-RP-V-0307.A0.C2. Updated drawings include: 'Suppression Systems Location'
Drawing ref: 3982-CAU-XX-XX-DR-V-1810 and 'Suppression System Spray Arcs', Drawing ref: 3982-CAU-XX-XX-DR-V-1811.

35) Provide details of the wheel wash. Is this a specifically designed wash of a jet washing area? Explain how waters are contained and disposed of. Explain what measures are in place to ensure the wheel wash has done its job.

Wheel washing on site will be provided by a heavy duty wheel wash and comprise of a high pressure washing system over rumble strips. Water will be recycled with primary settlement in a closed loop system. Any sediment removed from the wheel wash will be tested and treated prior to reuse as appropriate in order to meet the site specific risk assessment for the restoration area.

Prior to the tipper lorry leaving site or entering the wheel wash the tyres and external areas will be inspected to ensure that there are no residual contamination or significant solids on the wheels that could cause drag out onto the public highway. Once this check is undertaken the completed consignment note is returned to the driver.

36) Describe how the site infrastructure is designed to prevent dust and particulate emissions from leaving the site boundary.

Reason – The EMP does not provide any detail as to the passive pollution prevention measures in place. You must detail all measures in place through each activity. Include stockpile heights, storage bays, freeboard, stockpile orientation etc. Link to the revised site plan as requested above.

A number of aspects of the site infrastructure and procedures on site are designed to mitigate dust emissions.

Biotreatment

- Soils are received and sampled and then placed onto the vacuum system which will capture emissions whilst the initial soil testing is completed.
- Screening of contaminated soils is not required prior to biotreatment
- Soils are formed within their initial reception area into biopiles, and the surfaces sealed using an excavator bucket.
- The use of a static biopile reduces the amount of soil management to a minimum. In a typical treatment period, the soils are turned over twice.
- The mineralization of hydrocarbons results in elevated moisture content in soils reducing the potential for dust emissions
- The biopiles can be irrigated as a mitigation measure should surface dust be observed, albeit this is rarely required.

Asbestos

- Waste acceptance for soils with asbestos inclusions are limited to bound pieces and strict asbestos fibre limits that have been shown to not release airborne asbestos fibres above WHO air quality guidance levels of <0.0005f/ml
- Covering asbestos contaminated soils awaiting treatment with tarpaulins will prevent fugitive emissions
- Use of surfactant-water misting system in operational areas where there is the potential for uncovered soil processing works has been shown to supress dust and ensure that airborne asbestos monitoring below <0.0005f/ml
- The general stockpile orientation of west to east is generally parallel to prevailing wind direction
- The site is surrounded by woodland resulting in a more sheltered and less exposed position than other potential sites within the Daneshill waste management facility.

The EMP has been updated with the source pathway receptor table and the detail above included.

37) Considering the above, the EMP must be revised to include a detailed source pathway receptor table which identifies the mitigation measures to reduce the pathway to receptors.

Reason – The measures provided in the plan do not detail the infrastructure standards or waste handling measures expected. Section 4.2.2 identifies a number of potential emissions sources which are then not expanded upon in section 6. Remove reference to the construction phase of

the project. We are concerned with emissions from waste handling and treatment operations only.

Please see revised Emissions Management Plan which has been updated with the source pathway receptor table.

38) ***Provide details of the water based suppression system in more detail including:***

- ***Which stockpiles have water sprinklers (show these on the site plan)***
- ***If suppression is provided within the picking booth (6.1.23 indicates this but no further detail is provided)***
- ***Explain if the sprinkler on the screener is fixed into position or mobile***
- ***Explain if the stockpile sprinklers are fixed into position***
- ***Explain if they are fed from water storage or mains***

Demonstrate there is sufficient supply and pressure to provide water to all the sprinklers and cannons as necessary

If treated water from the site treatment system is to be used what is the testing criteria to ensure the water is suitable for use and will not result in contamination of the site.

Reason: The Emissions Management Plan makes reference to water suppression when handling asbestos contaminated soils and screening soils. We however would anticipate suppression to be in place for all soil handling operations and when screening hazardous and non-hazardous (non-asbestos soils) this should be made clear.

In addition to the soil treatment area, the stockpiles with uncovered untreated soils will be subject to dust suppression by water based dust suppression plant. Please see 'Suppression Systems Location'
Drawing ref: 3982-CAU-XX-XX-DR-V-1810 and 'Suppression System Spray Arcs', Drawing ref: 3982-CAU-XX-XX-DR-V-1811

These will be mobile dust suppression systems to ensure that if the screener/picking station is moved then the dust suppression system can be relocated and maintain coverage of the soil treatment areas as well as any stockpiles with uncovered and untreated soils.

Dust suppression nozzles in the form of a spray rail is located onto the conveyor delivering soil to the picking station. However, asbestos monitoring results at the location of the picking station (operated without dust suppression measures) have always been <0.0005f/ml. No additional dust suppression is included within the enclosed picking station, as this would interfere with the accuracy of any asbestos monitoring that the Operator may want to undertake within the picking station enclosure.

The water-based suppression system on the screener will be fixed onto the hopper and conveyors to ensure dust emissions are not elevated during operation.

A mains water supply will be used to fill storage tanks for the dust suppression to ensure that there is adequate supply during working periods. Due to the potential presence of suspended solids in treated water and potential for blocking nozzle heads the dust suppression system will only use mains water for operation.

For the soil reception area, a mobile dust suppression system (Figure 2) is used, each unit has a 15m diameter range for dust suppression. This is used for the inputs received per day as the soils are then covered with a tarpaulin. These use approximately 0.4m^3 per hour when used.

The soil treatment area uses high flow rate dust suppression systems that the Operator currently employ at the Edwin Richards Quarry. This is a 2.5bar pressure nozzle system with a 19mm water inlet and a spray diameter of 25m. The water use is 0.69m^3 per hour. T
The Operator have tested this system externally and whilst the spray diameter is 25m under very windy conditions this can reduced to 18m diameter. The 18m diameter influence has been used in the design and this requires 4 No. high flow rate dust suppression points. The Operator have also included 2 No. mobile bowsers (see Figure 2) which could be used during windy conditions to supplement dust suppression or used during deliveries of soils to the reception area prior to covering with tarpaulins.
Water use for the 4 No. high flow rate system is 2.8m^3/hr and over an 8hr period could use up to 22.4m^3/day for soil screening and 6.4m^3/day for the soil reception assuming 8hr use. An identical system used at Edwin Richards Quarry has required the use of a 6m^3 storage tank (Figure 3) which allows for the dust suppression system to be used and continuously refilled using automatic level sensors. The storage requirements at Daneshill will be calculated based upon the measured flow rate for the nearby water supply.

Figure 2 – Mobile Dust Suppression Unit

Figure 3. 6m^3 potable water storage tank inside locked enclosure

39) Provide details of the management procedures for fugitive emissions of (VOC, odour) resulting from waste handling, screening and biopile turning operations. How long are biopiles likely to remain open?

Reason – You must demonstrate measures in place meet the requirements of BAT 5. Waste handling measures have not been adequately described for example the soil turnover procedure details how this is undertaken but not how emissions are minimised.

The EMP provides little detail of the measures in place to prevent emissions of VOC from hydrocarbon contaminated soils particularly when screened.

Management procedures for fugitive emissions of odours are provided in the following table.

Table 5. Odour and VOCs Management

Source of Emissions	Mitigation options
Potential of odours/VOCs from details included in waste enquiry	• Site visit prior to input to assess the odour potential of soils • Only authorise if odours/VOCs are biologically treatable contaminants and can be mitigated easily on site, no residual unacceptable odour/VOCs could remain after treatment and air actively removed from soil can be treated by biofilter during treatment • Soils are only formally accepted subject to reception testing and compliance with the original waste description

Odour present upon receipt of waste load	• Review against original waste description and quarantine if required • Cover with tarpaulin/soil/woodchip prior to reception analysis results being received or formal rejection (use tarpaulin only for potential rejection) • Place on air extraction systems to capture vapours/odours
Odour/VOCs from biopile turning operations	• Monitoring of soil gases in extraction pipes to ensure total VOCs are below 40ppm/benzene below 1ppm prior to commencing soil turnover • Soil decompaction results in the opening of 3m wide sections of the biopile at any one time, this is to be sealed at the end of each working day • Biopile vacuum system to always maintain operation on pipes under stockpiled soil • Biofilter flow rates to be adjusted to increase retention time if there is odour potential at the biofilter during soil turnover
Odour/VOCs from screening soil	• No screening of high VOCs/potentially odorous soils is ever undertaken. No screening is required prior to, or during biotreatment • Only screen soils where odours are not present (i.e., completion of treatment is only complete when soils have no odour, are non-hazardous and meet the site reuse criteria)

40) ***Revise the PM10 emissions from vehicles section with reference to the Daneshill site. This is geared to deliveries with regards to a building and confirms a "tenfold reduction in PM10 emissions compared to existing". Please make it relevant to the activities at Daneshill. Provide details of the site specific measures here including details of haul routes and one way systems.***

Section 'PM10 emissions from vehicles' has been amended in the Emissions Management Plan (attached).

41) ***Provide clear details of the asbestos monitoring proposed at each separate stage of the process from storage, through treatment and final deposition post treatment. Include all detail within table 2 of the EMP.***

Reason – the details provided are vague. The EMP states monitoring will be undertaken hourly during screening and it will be also be undertake doing treatment of soils and hand picking. Specific detail is not provided. You must show the monitoring points on the site plan (see above). Provide details of how the monitoring is undertaken and if separate personal monitoring is undertaken.

Further details of asbestos monitoring will be provided subject to the pre-operation condition at Edwin Richards Quarry is agreed with Chris Hall, Richard Hadley and Clive Wall. The monitoring frequency is likely to increase in frequency to ensure works always achieve a <0.0005f/ml detection limit.

42) ***Explain the actions that will be undertaken if air testing during handpicking or screening shows exceedances of 0.01fibres/ml.***

Reason – its noted measures are included within the BAT document. For completeness they should also be included within the EMP.

A document prepared by an independent consultant (Steve Forster) is included for reference to actions taken at far lower trigger thresholds than the expected permit target of <0.01f/ml. This will prevent any potential for exceedance of the permit trigger level of <0.01f/ml. There has never been an occurrence of asbestos concentrations in air being elevated above <0.01f/ml in any of the operations the Operator have conducted under either the installations environmental permit or mobile treatment licence. This is included in Appendix G.

43) ***Provide details of the daily visual dust monitoring proposed. Include the locations on the emissions monitoring plan. Include the visual monitoring check sheet in the EMP. Explain what happens if visual monitoring identifies nuisance dust emissions.***

Nuisance dust emissions are not anticipated on treatment areas due to the measures previously described. However, the main potential for nuisance is anticipated from haulage routes around the site that are used to deliver soils to the treatment pads. These will be subject to standard dust suppression involving a bowser and a spray rail in accordance with the approach used on the adjacent landfill.

44) ***Revise the emissions monitoring plan to include the visual monitoring locations for dust, the locations of the Frisbee gauges and the VOC monitoring location. The locations of the asbestos pumps to be located around the working area during soil moving must also be included.***

See Emissions Monitoring Plan for Dust Asbestos and VOCs Drawing ref: 3982-CAU-XX-XX-DR-V-1812.

<u>Odour management Plan</u>

45) ***The OMP makes reference to 19 02 06 and 19 12 12 as potentially malodourous waste. These wastes however have not been included as proposed wastes in the main application documents, please clarify.***

The Odour Management Plan, document ref: 3982-CAU-XX-XX-RP-V-0308.A0.C2 (attached) has been updated. These waste codes are included in error and have now been removed.

46) ***Explain the waste pre-acceptance and acceptance procedures for these potentially malodourous wastes. Explain how their odour potential is assessed.***

Reason – The OMP indicates this information is available in the soil reception procedure however this document does not mention potentially odorous wastes.

These wastes are not to be accepted at the site. All odour/VOCs management in soil are as previously described in this response.

Attached documents:
Appendix A: Water quality monitoring results
Appendix B: STC WI 003, Soil Characterisation Procedure
Appendix C: STC WI 002, Soil Reception Procedure
Appendix D: Hopper and Conveyor monitoring results
Appendix E: Decontamination, asbestos plant
Appendix F: STC WI 006 Soil Analysis
Appendix G: Outline Air Monitoring Strategy

Emissions Management Plan, document ref; 3982-CAU-XX-XX-RP-V-0307
Odour Management Plan, document ref; 3982-CAU-XX-XX-RP-V-0307

Site Layout Plan, Soils Treatment Pad 1, 2, & 3
Drawing ref: 3982-CAU-XX-XX-DR-V-1807

Surface and Foul Water Locations
Drawing ref: 3982-CAU-XX-XX-DR-V-1808

Water Treatment Plant Design and Containment
Drawing ref: 3982-CAU-XX-XX-DR-V-1809

Suppression Systems Location
Drawing ref: 3982-CAU-XX-XX-DR-V-1810

Suppression System Spray Arcs
Drawing ref: 3982-CAU-XX-XX-DR-V-1811

Emissions Monitoring Plan for Dust Asbestos and VOCs
Drawing ref: 3982-CAU-XX-XX-DR-V-1812

I trust the responses above to your Schedule 5 notice are satisfactory to continue the determination of the permit variation for Earls Barton Quarry. Should you require any further detail, please do not hesitate to get in touch.

Yours sincerely

Kellie-Marie Pacifico Burston

Senior Environmental Consultant
On behalf of Caulmert Ltd

Appendix A

Eurofins Chemtest Ltd
Depot Road
Newmarket
CB8 0AL
Tel: 01638 606070
Email: info@chemtest.com

Final Report

Report No.:	21-30077-1		
Initial Date of Issue:	06-Sep-2021		
Client	Provectus Soils Management Ltd		
Client Address:	Regents House Bath Road Wolverhampton WV1 4EG		
Contact(s):	Andy Clee Charlie Gould Jon Owens Sam Gould		
Project	100993 Rowley Regis STC		
Quotation No.:	Q21-25188	**Date Received:**	31-Aug-2021
Order No.:	9/RR	**Date Instructed:**	31-Aug-2021
No. of Samples:	1		
Turnaround (Wkdays):	5	**Results Due:**	06-Sep-2021
Date Approved:	06-Sep-2021		
Approved By:			
Details:	Glynn Harvey, Technical Manager		

Results - Water

Project: 100993 Rowley Regis STC

Client: Provectus Soils Management Ltd			**Chemtest Job No.:**		21-30077
Quotation No.: Q21-25188			**Chemtest Sample ID.:**		1269261
Order No.: 9/RR			Client Sample Ref.:		Asb 1
			Sample Location:		Asb Water
			Sample Type:		WATER
			Date Sampled:		27-Aug-2021
Determinand	**Accred.**	**SOP**	**Units**	**LOD**	
Asbestos Fibres In Water	N	1185	in 100ml	N/A	Not Detected

Report Information

Key

U	UKAS accredited
M	MCERTS and UKAS accredited
N	Unaccredited
S	This analysis has been subcontracted to a UKAS accredited laboratory that is accredited for this analysis
SN	This analysis has been subcontracted to a UKAS accredited laboratory that is not accredited for this analysis
T	This analysis has been subcontracted to an unaccredited laboratory
I/S	Insufficient Sample
U/S	Unsuitable Sample
N/E	not evaluated
<	"less than"
>	"greater than"
SOP	Standard operating procedure
LOD	Limit of detection

Comments or interpretations are beyond the scope of UKAS accreditation
The results relate only to the items tested
Uncertainty of measurement for the determinands tested are available upon request
None of the results in this report have been recovery corrected
All results are expressed on a dry weight basis

The following tests were analysed on samples as received and the results subsequently corrected to a dry weight basis TPH, BTEX, VOCs, SVOCs, PCBs, Phenols

For all other tests the samples were dried at < 37°C prior to analysis
All Asbestos testing is performed at the indicated laboratory
Issue numbers are sequential starting with 1 all subsequent reports are incremented by 1

Sample Deviation Codes

A - Date of sampling not supplied
B - Sample age exceeds stability time (sampling to extraction)
C - Sample not received in appropriate containers
D - Broken Container
E - Insufficient Sample (Applies to LOI in Trommel Fines Only)

Sample Retention and Disposal

All soil samples will be retained for a period of 30 days from the date of receipt
All water samples will be retained for 14 days from the date of receipt
Charges may apply to extended sample storage

If you require extended retention of samples, please email your requirements to:
customerservices@chemtest.com

Eurofins Chemtest Ltd
Depot Road
Newmarket
CB8 0AL
Tel: 01638 606070
Email: info@chemtest.com

Final Report

Report No.:	21-31891-1		
Initial Date of Issue:	18-Sep-2021		
Client	Provectus Soils Management Ltd		
Client Address:	Regents House Bath Road Wolverhampton WV1 4EG		
Contact(s):	Andy Clee Charlie Gould Paige Lorrain Sam Gould		
Project	100993 Rowley Regis STC		
Quotation No.:	Q21-25188	**Date Received:**	15-Sep-2021
Order No.:	9/RR	**Date Instructed:**	15-Sep-2021
No. of Samples:	1		
Turnaround (Wkdays):	5	**Results Due:**	21-Sep-2021
Date Approved:	18-Sep-2021		
Approved By:			
Details:	Glynn Harvey, Technical Manager		

Results - Water

Project: 100993 Rowley Regis STC

Client: Provectus Soils Management Ltd			**Chemtest Job No.:**		21-31891
Quotation No.: Q21-25188			**Chemtest Sample ID.:**		1278758
Order No.: 9/RR			Client Sample Ref.:		Asb 3
			Sample Location:		Asbestos Water
			Sample Type:		WATER
			Date Sampled:		10-Sep-2021
Determinand	**Accred.**	**SOP**	**Units**	**LOD**	
Asbestos Fibres In Water	N	1185	in 100ml	N/A	Not Detected

Report Information

Key

U	UKAS accredited
M	MCERTS and UKAS accredited
N	Unaccredited
S	This analysis has been subcontracted to a UKAS accredited laboratory that is accredited for this analysis
SN	This analysis has been subcontracted to a UKAS accredited laboratory that is not accredited for this analysis
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I/S	Insufficient Sample
U/S	Unsuitable Sample
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All Asbestos testing is performed at the indicated laboratory
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Eurofins Chemtest Ltd
Depot Road
Newmarket
CB8 0AL
Tel: 01638 606070
Email: info@chemtest.com

Final Report

Report No.:	21-32698-1
Initial Date of Issue:	24-Sep-2021
Client	Provectus Soils Management Ltd
Client Address:	Regents House Bath Road Wolverhampton WV1 4EG
Contact(s):	Andy Clee Charlie Gould Paige Lorrain Sam Gould
Project	100993 Rowley Regis STC

Quotation No.:	Q21-25188	**Date Received:**	21-Sep-2021
Order No.:	9/RR	**Date Instructed:**	21-Sep-2021
No. of Samples:	1		
Turnaround (Wkdays):	5	**Results Due:**	27-Sep-2021
Date Approved:	24-Sep-2021		

Approved By:

Details: Glynn Harvey, Technical Manager

Results - Water

Project: 100993 Rowley Regis STC

Client: Provectus Soils Management Ltd			**Chemtest Job No.:**		21-32698
Quotation No.: Q21-25188			**Chemtest Sample ID.:**		1283034
Order No.: 9/RR			Client Sample Ref.:		Asb 4
			Sample Location:		Asbestos Water
			Sample Type:		WATER
			Date Sampled:		17-Sep-2021
Determinand	**Accred.**	**SOP**	**Units**	**LOD**	
Asbestos Fibres In Water	N	1185	in 100ml	N/A	Not Detected

Report Information

Key

U	UKAS accredited
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N	Unaccredited
S	This analysis has been subcontracted to a UKAS accredited laboratory that is accredited for this analysis
SN	This analysis has been subcontracted to a UKAS accredited laboratory that is not accredited for this analysis
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U/S	Unsuitable Sample
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The following tests were analysed on samples as received and the results subsequently corrected to a dry weight basis TPH, BTEX, VOCs, SVOCs, PCBs, Phenols

For all other tests the samples were dried at < 37°C prior to analysis
All Asbestos testing is performed at the indicated laboratory
Issue numbers are sequential starting with 1 all subsequent reports are incremented by 1

Sample Deviation Codes

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Sample Retention and Disposal

All soil samples will be retained for a period of 30 days from the date of receipt
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Charges may apply to extended sample storage

If you require extended retention of samples, please email your requirements to:
customerservices@chemtest.com

APPENDIX B

STC – WI 003 - SOIL CHARACTERISATION PROCEDURE

Author:	Jon Owens - STCM	**Approved By:**	Steve Langford - MD
Distribution:	Z/QMS/Work Instructions - STC		

Document Changes

Revision No:	Summary of Changes	Date
7	Slight change in wording	01.09.21

Introduction

This procedure relates to the measures to be undertaken for the sampling of soils received at the STC. See procedure STC – WI 002 Soil Reception for background information.

Objectives

The main objective of the operation is to ensure soils received at the Soil Treatment Centre (STC) are visually, structurally and chemically similar to those described by the waste producer during pre-acceptance, and therefore compliant with the Environmental permit and suitable for treatment and reuse. This will allow any non-conforming waste to be rejected.

Procedure

The sampling of soils will be performed by the STC technician or STC site manager. The procedure uses composite sampling methods as provided in BS812.

A minimum of at least one composite sample must be taken from each job (unique authorisation code/DW number) at the minimum frequency highlighted in Table 1 below. The STC site manager shall assess how many samples shall be sent to the laboratory for reception compliance testing, based on visual assessment, high risk job, knowledge of the client, material variation etc. Chemical testing is undertaken to ensure that the materials being tipped are consistent with the analysis and description provided by the client at the pre-characterisation stage.

Any additional samples taken which are not sent for chemical testing shall be stored in an appropriate storage place until the job/batch is disposed of.

Table 1: Requirements for sampling:

Volume of soil (t)	No. of samples needed (before or during acceptance at STC)
< 100	1
100 - 500	2
500 +	2 + 1 for every 500t

The general suite of analysis for soils shall include:

- pH

- CLEA Metals
- Total TPH
- Total PAHs
- Total Cyanide
- Phenols
- SVOCs and VOCs (where required)
- PCBs (where required)
- Asbestos (screen and stage 2/3 quantification where asbestos is identified)
- Moisture content

However, these parameters may be adapted by the STC operations manager due to prior knowledge of contaminants derived from client waste description, history and data.

All analysis will be undertaken by a UKAS/MCERTS accredited laboratory using accredited methods.

Once the analysis results are received, they will be assessed by a suitably qualified and experienced STC manager to confirm they meet the requirements for treatment. These results are to be stored electronically onto the STC server.

Wastes of a liquid oil phase are not permitted for treatment at the site.

The contaminant limits are for the receiving batches. The contaminant levels will be assessed from the reception analysis and the mass within the soil inputs calculated. This would be compared to the mass of contaminant within the receiving batch. This will ensure that the soils are suitable to be added to the receiving batch whilst respecting the average hydrocarbon concentration.

The receiving batch has contaminant limits (these are not contaminant limits for soil inputs which can vary and exceed the average batch limits). The hydrocarbons in the batches will be limited to an average as shown in Table 2.

Concentrations for inorganics to be reviewed in accordance with WM3 (Jan 2021).

Asbestos concentrations to be assessed using criteria in Table 3, stage 3 quantification results to be received prior to any form of soil treatment commencing.

Should the results not conform to the requirements for treatment the waste will be rejected following the formal rejection procedure.

Table 2. Maximum Average Contaminant Concentrations for Receiving Batch

Substance	Carbon Range	Lower Elimination Rate	Upper Elimination Rate	Maximum average batch concentration (lower level) - mg/kg	Maximum average batch concentration upper level) - mg/kg	Comments
Petrol range organics	C6-C10	95%	99%	20,000	100,000	Limited by odour potential
Diesel	C10-C25	60%	90%	2,500	10,000	Target of below 1,000mg/kg for reuse even though diesel is only hazardous at 1% (10,000mg/kg)
Lube Oils	C25+	40%	65%	1,667	2,857	Review age of spill and soil type before assessing which elimination rate to use
Unknown Oil	C10+	40%	80%	1,667	5,000	Review age of spill, source and soil type before assessing which elimination rate to use
PAHs	C10+	30%	90%	1,429	10,000	Limited by odour potential
Phenols	C6+	90%	99%	10,000	100,000	Limited by odour potential
Solvents	C2+	95%	99%	20,000	100,000	Limited by odour potential
VOCs	C2+	99%	99%	100,000	100,000	Limited by odour potential

Table 3. Maximum Asbestos Contaminant Concentrations for Treatment

Substance	Maximum concentration (%) - Stage 3 Testing	Comments
Chrysotile	<0.1%	Bound forms of ACM only
Amphibole ACM Types	<0.01%	Bound forms of ACM only
Asbestos insulation/unbound asbestos	Absent	No acceptance of any form of asbestos in friable/insulation form

APPENDIX C

STC – WI 002 - SOIL RECEPTION PROCEDURE

Author:	Jon Owens - STCM	**Approved By:**	Steve Langford - MD
Distribution:	Z/QMS/Work Instructions - STC		

Document Changes

Revision No:	Summary of Changes	Date
6	Inclusion of asbestos procedures	01.09.21

Introduction

This procedure relates to the measures to be undertaken for the assessment of data and inspection of waste received at the Soil Treatment Centre (STC). It allows rejection of non-conforming waste to ensure no untreatable contaminates are accepted into the STC, or which breach the list of permitted wastes as shown in the site's Environmental permit.

Principle of Operation

The inspection will allow the following to be assessed prior to acceptance:

- Presence of untreatable and hazardous materials (e.g. tars, clinker etc.) in the contaminated soil.
- Presence of excessive litter/debris in the contaminated soil.
- Compliance with the previously supplied chemical/physical analysis information (supplied by waste producer).
- Potential for the waste to behave as a liquid or have free water/oil in the waste.
- Inspect asbestos debris and visual appearance to ensure no unbound/insulation forms of asbestos are present

If the waste material is not compliant with the agreed conditions of the Environmental Permit or pre-acceptance assessment then the waste will be rejected.

Procedure

Pre-Acceptance Assessment

This is undertaken by Provectus to confirm treatability to meet the reuse criteria. A set of Terms and Conditions for acceptance are sent to the Waste Producer. These are agreed in writing between the Waste Producer and Provectus prior to an authorisation number (DW/enquiry number) being issued by FCC for deposit at the STC.

Where data gaps exist or queries remain about the suitability of material for treatment, Provectus will offer to attend the site of origin to undertake pre-acceptance analysis and visually inspect the material and obtain further information about the waste description.

In the event that the moisture content of the waste being in the range of 25-30% then the potential for free water or oil will be further reviewed. Where moisture contents are at this level or even higher and the material does not behave as a liquid, have the potential for releasing water/oil etc and is suitable for the biopile infrastructure then it would be accepted on a case by case basis.

Should either Provectus, or after consultation, FCC determine that there is the high potential for material to behave as a liquid or contain free water or oil then the waste will be declined for acceptance.

Duty of Care Documentation

No tipping on the STC will be permitted without relevant duty of care documentation from the waste producer. This must be checked on-site at the STC to ensure that the load is indeed destined for the STC, and that the documents are correctly completed. The consignee section of Consignment notes, for hazardous waste, and waste transfer notes, for non-hazardous waste, shall be completed by Provectus at the STC once the load has been deemed acceptable by the STC site manager.

Health and Safety

The STC site technician or STC site manager is to provide guidance to the tipper driver as to where to tip the load along with any relevant safety information, such as PPE requirements, prior to tipping. Site personnel must be at least 5m away from any moving plant or lorries on site at all times and must only approach if it is safe to do so and the driver has acknowledged them.

Visual Inspection: Waste Input

Each load of soil for inspection will be initially tipped onto the biopile/quarantine area. The STC site technician will inform the tipper driver to remain at the area until the inspection has been completed.

In the event of the material containing free water or oil, or any form of asbestos insulation/unbound asbestos types the load will be immediately rejected.

If available, an excavator will be used to expose any unsuitable materials and allow a comprehensive visual assessment. The STC site manager will determine the next action when this has been completed, this will comprise of the following:

- Waste is accepted and the tipper is permitted to leave the STC with the accompanying completed paperwork, or;
- Waste is not accepted and the unsuitable element of waste load, either partial or complete load is removed by excavator and placed back into the tipper. A rejection form is filled in on-site and both Landfill Manager (LM) and Sales Manager (SM) are informed. It is the duty of FCC to inform the Environment Agency of any rejected loads.

At the end of the waste acceptance procedure the soil will be placed into a stockpile for reception testing. All soils with bound asbestos debris to be formed into a stockpile covered with a tarpaulin prior to treatment. Co-ordination of soil treatment events is to be decided by the STC site manager.

Quarantining Loads: Procedure

In the event that a load is received that is suspected of containing non-conforming wastes or requires additional analysis that is detrimental to the reuse of the material post treatment, then this will be placed in the quarantine area on site. However, if the material is not at risk of being mixed with other inputs then it may be placed in an allocated biopile with its location recorded. The load(s) placed into quarantine will be segregated from other inputs. The stockpile will be labelled with a sign with the following information:

- DW Number
- Project Name
- Tonnage
- Date sampled

As soon as the chemical analysis is received it will be reviewed by the STC operations manager before being formally accepted or rejected from site.

Chemical Analysis: Waste Input

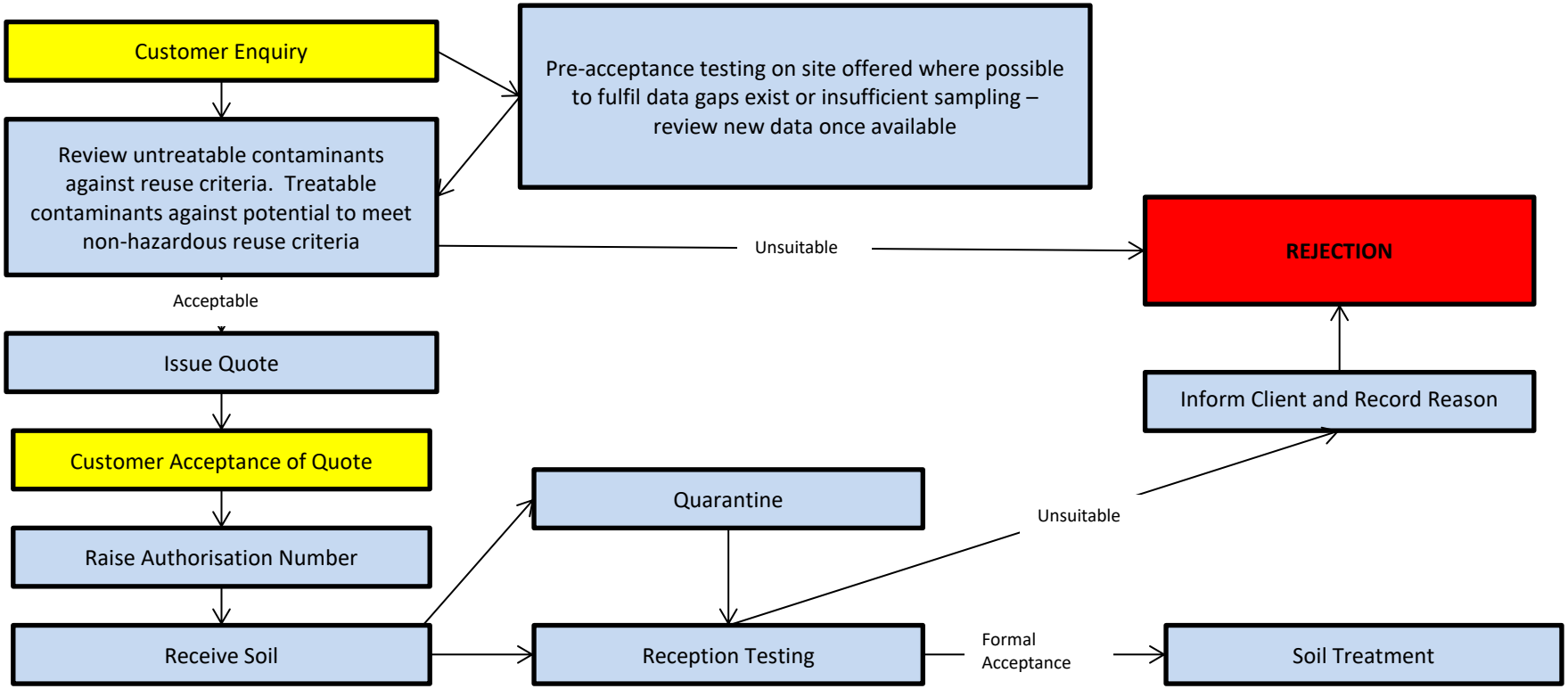
As a minimum, the sampling frequency for soils will be as per STC WI for each DW/enquiry. The STC site manager may increase the frequency of the sampling based on visual or olfactory evidence; Sampling will be undertaken on soils using composite sampling methods described in BS812.

The range of contaminants for analysis will be based upon the original contaminating substances. A copy of the analysis shall be checked by the STC site manager for verification against the original client data. In the event of non-conformity, the STC operations manager shall liaise with the STC project manager, and a decision on the next course of action will be taken.

The waste will only be formally accepted once reception analyses are received and approved in accordance with Soil Assessment Procedure illustrated in STC-PR02-V6 below.

STC-PR02-V6

Soil Assessment Procedure



APPENDIX D

CERTIFICATE OF ANALYSIS

ANALYSIS REQUESTED BY: Provectus Soils Management
Regent House
Bath Avenue
Wolverhampton
WV1 4EG

CONTRACT NO: S20825

DATE OF ISSUE: 20.09.21

DATE ANALYSIS REQUESTED: 16.09.21

DATE SAMPLES ANALYSED: 20.09.21

SAMPLES: Five airborne dust samples each supplied as two half gridded MCE membrane filters.

ANALYSIS REQUESTED: Fibre Counting using Scanning Electron Microscopy (SEM) with fibre identification by Energy Dispersive X-ray Spectroscopy (EDXS)

METHOD:

Each pair of half membrane filters is ashed in a low temperature plasma asher. The combined residue from each pair is recovered using filtered, distilled water and filtered through a 25mm, 0.4µm pore size polycarbonate filter. A portion of each polycarbonate filter is excised and mounted on a 13mm aluminium stub, coated with gold and examined by SEM. Each filter is searched systematically at 2000X magnification until an area of 1mm^2 has been examined or 50 whole fibres found. All respirable fibres (aspect ratio >3:1, length >5µm and diameter <3µm and including fibres in contact with particles >3µm diameter) detected are analysed by EDXS and identified as closely as possible, by comparing morphology and composition with standard reference materials. Fibre counting rules based on those of ISO14966:2019 were used.

The method used for analysis is documented in IOM instruction manual No.1 and is based on **International Standards Organisation (2019), International Standard 14966, Ambient Air: Determination of numerical concentration of inorganic fibrous particles - Scanning electron microscopy method.**

www.iom-world.org
Registered Address: Research Avenue North, Riccarton, Edinburgh, EH14 4AP, United Kingdom
Tel: 0131 449 8000 Fax: 0131 449 8084 Email: iom@iom-world.org
IOM CONSULTING LIMITED, registered in Scotland No. SC205670

UKAS TESTING
0374

CONTRACT NO: S20825
DATE OF ISSUE: 20.09.21

RESULTS:

Client Ref: PO – RR151

Sample No.	Volume (l)	(1) No. of Resp. Fibres Found	(1) No. of Fields Searched	Total Fibres *No. of Resp. Fibres/ Fibre Conc^{n} (fml^{-1})*	AMX Fibre *No. of Resp. Fibres/ Fibre Conc^{n} (fml^{-1})*	CMX Fibre *No. of Resp. Fibres/ Fibre Conc^{n} (fml^{-1})*	MMMF *No. of Resp. Fibres/ Fibre Conc^{n} (fml^{-1})*	NAM Fibre *No. of Resp. Fibres/ Fibre Conc^{n} (fml^{-1})*
ERQ 1+2	1440	0	150	0 / <0.0005*	0 / <0.0005*	0 / <0.0005*	0 / <0.0005*	0 / <0.0005*
ERQ 3+4	1440	0	150	0 / <0.0005*	0 / <0.0005*	0 / <0.0005*	0 / <0.0005*	0 / <0.0005*
ERQ 5+6	1440	1	150	1 / <0.0005*	0 / <0.0005*	0 / <0.0005*	0 / <0.0005*	1 / <0.0005*
ERQ 7+8	1440	1.5	150	1.5 / <0.0005*	0 / <0.0005*	0 / <0.0005*	0 / <0.0005*	1.5 / <0.0005*
ERQ 9+10	1440	0	150	0 / <0.0005*	0 / <0.0005*	0 / <0.0005*	0 / <0.0005*	0 / <0.0005*

AMX-Amphibole Asbestos **CMX-**Chrysotile Asbestos **MMMF-**Machine Made Mineral Fibres **NAM-**Non Asbestos Mineral

* DETECTION LIMIT

When no fibres of a given type are detected, the fibre concentration can be reported as less than the concentration equivalent to three fibres (the one sided upper 95% confidence limit of the Poisson distribution). Therefore, when 0, 1 or 2 fibres are detected, 2.99 is used in the calculation of fibre concentrations. It expresses the 95% confidence detection limit for airborne fibre concentrations. When a volume of 1440 litres is used the 95% confidence limit is 0.0005 fml^{-1} for the number of fields searched.

CONTRACT NO: S20825
DATE OF ISSUE: 20.09.21

COMMENTS:

No asbestos fibres were detected during the analysis of any of these samples.

Any organic fibres present on the original samples would be destroyed during plasma ashing.

Each sample supplied for analysis comprised two half membrane filters. These were combined during plasma ashing to form single samples with combined sample volumes of 1440 litres.

(1) UKAS accreditation for this work is limited to results obtained directly from the analysis. Calculated results based on sampling information provided by the client are out with the scope of this accreditation.

Any opinions and interpretations expressed herein are out with the scope of our UKAS accreditation.

IOM Consulting cannot accept responsibility for samples sent for analysis that have been incorrectly collected or despatched.

AUTHORISED BY: 

S Clark
Mineralogy Section Manager

Appendix E

Decontamination of asbestos contaminated plant.

This memo is produced by HSENI to provide information and guidance to duty holders.

What needs to be done?

a. Plant or machinery which has been used in the removal or disturbance of asbestos containing material (ACM), whether deliberate or accidental, is likely to be contaminated with asbestos debris and fibres. Depending on the degree of disturbance of the original material, the plant will be contaminated to a greater or lesser extent. Before it can be returned to service or the hire company, it must be thoroughly decontaminated to a high standard of cleanliness, such that there is no subsequent spread of asbestos or any exposure of persons to asbestos dust. In addition to obvious gross debris, disturbance of ACMs can produce very fine airborne asbestos fibres which can penetrate into the inner parts of the machine on air currents and deposit there.

b. The plant/vehicle should not be moved outside the contaminated area due to the risk of spreading asbestos contamination. Where a vehicle must be moved, the justification for this must be recorded in the Method Statement, together with steps necessary to prevent the spread of asbestos contamination.

c. It is not acceptable merely to power-wash the plant.

Establish how much.

d. To establish how contaminated a machine is may require the help of an accredited analyst, especially if there has been an excessive amount of disturbance of the ACM or disturbance of AIB / insulation; breakage or degradation/delamination of AC.

e. In any event, the person carrying out the assessment must be competent, have appropriate training, personal protective equipment and face-fitted respiratory protective equipment (see below). The risk of fibre release is greater if the disturbance was accidental and there were no controls in place. The assessment should involve a thorough visual examination with a bright torch, looking into trapping spaces, tyres, underneath etc. These should be detailed in the survey/risk assessment. The assessment should begin with the area surrounding the plant and, if necessary, an uncontaminated path to the machine should be established.

A risk assessment and plan of work (POW) are required.

f. A risk assessment should be carried out to establish the requirements for preventing the spread of ACM and exposure to asbestos dust during remediation and a POW (also known as a method statement) developed to describe how the work is to be done safely. In addition to the surface of the machine, consideration should be given to the possibility that asbestos fibres may have been drawn into the cab ventilation system and could potentially be emitted when the system is in operation. It may be necessary to erect an enclosure.

The risk assessment and POW will establish whether a licensed asbestos removal contractor (LARC) will be required to carry out the work. In general, if the contamination consists of 'licensable materials' – asbestos insulation board (AIB), thermal insulation or limpet, then a LARC will be required. Also in cases where there has been significant degradation of asbestos cement products, such as aggressive removal or fire damage, a LARC will be required.

Carrying out the procedure.

g. The persons carrying out the decontamination procedure must be trained at least to the appropriate level i.e. trained to work with non-licensable ACM, or, trained to work with licensable ACM where the contamination contains licensable material. Asbestos awareness training is **not** sufficient.

h. They must wear appropriate protection to avoid being exposed to asbestos fibres. This will normally consist of Type 5 disposable coveralls, P3 respiratory protective equipment (RPE) and non-laced footwear.

i. They must have Employers Liability Insurance which specifically covers working with asbestos containing materials.

j. The area surrounding the vehicle should be delimited by a cordon and hand-picked and visually cleared of ACM. A vacuum cleaner fitted with a HEPA filter may be required.

k. The exterior of the vehicle is likely to be most contaminated, and should be cleaned first. This would involve hand picking all material, ACM and non-ACM that is visible, and paying attention to less obvious places such as trapping places, tyres and the underside. The collected material should be double bagged and disposed of appropriately as asbestos waste.

l. The air intake filters to the engine should be replaced and the contaminated filters disposed of as asbestos waste.

m. The cleaned vehicle should then be wet-wiped and the rags disposed of as asbestos waste. At this point the exterior of the vehicle should be free from ACMs.

n. Consideration should then be given to the cab. The two probable mechanisms whereby asbestos could have penetrated the cab are by being carried in on clothing or footwear, or, by transport through the air, either directly into the cab through the doors or via the ventilation system. The air intake filters should be removed and disposed of as contaminated waste and clean filters fitted. Initially, a small capacity NPU unit should be run in the cab with the engine and the ventilation switched on. This should have the effect of dislodging and removing any fibres from the system and capturing them on the NPU filter.

Remediation would then require thorough cleaning of all surfaces, using appropriate means e.g. wet wiping or vacuuming (using a class H vacuum cleaner) or a combination of both prior to inspection. Moveable items which cannot be cleaned should be disposed of as asbestos waste.

Air sampling should be undertaken inside the cab with disturbance and the ventilation system running.

Certifying.

o. The ‘clearance’ of the plant for recommissioning or removal from the site must be carried out by a competent person. Where the work involved licensable material or degraded AC, and was carried out by a LARC, then the clearance should be carried out by an accredited analyst. A written declaration that the plant is free from asbestos contamination should be based on a thorough visual inspection of all parts of the machine, including ‘trapping’ places and air sampling in the cab if appropriate.

p. Assuming that the visual inspection and air test in the cab are satisfactory, the pathway across the ground to the site exit should be visually inspected and cleared of any ACM. When this has been completed, the competent person may release the plant. Care should be taken to ensure it does not become re-contaminated e.g. by the wheels running over material on the ground.

q. Once the plant has been moved, the ground underneath should be assessed for contamination and a method of work devised to decontaminate and clear this area.

NOTE

All work with asbestos needs to be carried out in accordance with the requirements of the Control of Asbestos Regulations (Northern Ireland) 2012 and the associated Approved Code of Practice ‘Managing and Working with Asbestos’ (L143 second edition)

Further information is available as follows:

- Asbestos essentials http://www.hse.gov.uk/pubns/books/hsg210.htm
- Managing and working with asbestos, Control of Asbestos Regulations 2012. Approved Code of Practice and guidance http://www.hse.gov.uk/pubns/books/l143.htm
- www.hseni.gov.uk
- www.hse.gov.uk/asbestos/

APPENDIX F

STC – WI 006 - SOIL ANALYSIS

Author:	Jon Owens - STCM	**Approved By:**	Steve Langford - MD
Distribution:	Z/QMS/Work Instructions - STC		

Document Changes

Revision No:	Summary of Changes	Date
4	Minor alteration to wording	01.09.20

Introduction

This procedure relates to the measures to be undertaken for the testing of soils treated at the Soil Treatment Centre (STC). This ensures that soils are suitable when received, are maintained in optimal treatment ranges and are validated in accordance with the permit. Once treatment is complete soils treated at the STC may be reused in several possible ways depending on the site. Namely, as soil for the quarry access road, restoration soils for the quarry backfill works or restoration soil for the landfill site.

Principle of Operation

The main objective of the reuse of soils is to ensure, in accordance with the Environmental Permit, that any material treated by Provectus is reused in a safe and environmentally acceptable manner. Quality control measures are implemented in order to prevent the reuse of soils to destinations either unintended, or unsuitable for the receipt of such soils. This operation is performed in conjunction with FCC, who operates the site where the soils shall be reused.

In-treatment batches of soil are monitored periodically as described in STC WI 004, when a batch of treated soil displays strong chemical evidence of meeting a non-hazardous reuse standard, a ‘validation’ sample is to be taken to generate a data report. This is to be reviewed by the STC operations manager and can then be sent to FCC to be formally approved for disposal.

Validation sampling should be carried out by the STC site technician or site manager, using a grid formation sampling plan. As a general rule one composite sample should be taken for every 500t.

The reception and validation samples should be submitted for the following analytical tests –

- Metals (As, B, Cd, Cr, Cu, Pb, Hg, Ni, Se & Zn)
- pH
- Speciated TPH (including BTEX)
- Speciated PAHs
- Phenols
- Total Sulphate
- Elemental sulphur
- Free Cyanide
- Total Cyanide
- Asbestos screen

Dependent on the contaminants of concern it may be necessary to request further parameters for testing on validation. Leachate analyses are required for reuse of soils in the restoration part of the landfill in accordance with the agreed risk assessment.

Procedure

Once the soil batch has been analysed by an accredited laboratory, and the results reviewed by the STC operations manager; a validation report shall be complied with information regarding soil volumes, validation analysis results, soil origin and ultimate destination. This shall be communicated to both the FCC Waste Assessment team and to the FCC site manager for approval and so that provisions can be made for the transfer of soils to the approved destination. The validation report and any supporting information shall be stored on the STC server.

Appendix G

APPENDIX A

OUTLINE ASBESTOS IN AIR MONITORING STRATEGY AND METHODOLOGY

1. Outline Air Monitoring Strategy for Asbestos-Contaminated Soil Processing Operations at the Daneshill Soil Treatment facility (STF)

2. Respirable asbestos fibres have the potential to cause serious health affects if inhaled in significant concentrations. This potentially could have an impact upon both exposed Site operatives and visitors to Site, in addition to people outside of the Site who may become exposed to significant fugitive emissions.

3. In order to demonstrate that the operational controls that will be put in place to mitigate the potential risks of exposure to respirable asbestos fibres are sufficient to eliminate significant risk, FCC will undertake monitoring for respirable asbestos fibres to check that fibres are not being released into the atmosphere on- and off-site.

4. In most circumstances, however, it is recognised that the extent of dilution in the environment of the very low levels of fugitive respirable asbestos fibres in air that may be anticipated from the proposed operation of the Site, will be considered sufficient to discount any significant exposure to members of the public over 100m from a potential source of any fugitive emissions arising from routine operations at the Site.

5. Asbestos in air monitoring will be undertaken generally in accordance with the provisions of HSE document 'HSG248'[1] by a laboratory accredited by UKAS to SO/IEC 17025 at the Site as identified below:

    a. Baseline ambient monitoring conducted on the proposed site of the proposed STF (baseline activity monitoring)

    b. Baseline ambient monitoring conducted at selected locations on the boundary of the Site, both upwind and downwind of the proposed STF (baseline boundary monitoring)

    c. Routine ambient monitoring conducted adjacent to potential dust-generating activities during representative periods of operation of the STF

    d. Routine ambient monitoring conducted at selected locations (as in b. above) on the boundary of the Site, both upwind and downwind, during representative periods of operation of the STF (operational activity monitoring)

6. Since it is highly unlikely that any employee carrying out operations on the Site will be subjected to elevated airborne asbestos concentrations approaching or exceeding the Control Limit of 0.1 fibres/ml averaged over four hours, or the Short-Term Exposure Limit of 0.6 f/ml over any 10-minute period, the need for personal sampling may be discounted.

[1] Health and Safety Executive. Asbestos: the analysts' guide for sampling, analysis and clearance procedures. HSG248. 2006. HSE.

7. It is recognised that boundary monitoring has its limitations; the primary emphasis when mitigating potential risks should be on ensuring control of exposure and spread of asbestos **at source** during operations that could potentially generate fugitive emissions.

8. Consequently, FCC will place significant reliance on ensuring that the operational controls that are set out in the Asbestos Plan of Work (APOW) and based on the Asbestos Risk Assessment (ARA) are monitored effectively and that any perceived failure or reduction in performance of these will trigger a 'Work Stop' action and a comprehensive of the ARA and APOW.

9. Consequently, less reliance will be placed on boundary monitoring results to flag when a review of controls is required, rather the monitoring will be conducted as a means of providing reassurance to management, the regulators (Environment Agency and the Local Planning Authority) and members of the public that operations are being sufficiently well-controlled in accordance with the **As Low as is Reasonably Practicable** (ALARP) principle so as to present negligible risk.

10. It is anticipated that both baseline and operational boundary monitoring samples will be collected from a maximum of four boundary locations representative of potential off-site receptor risks, to be determined.

11. It is anticipated that baseline and operational activity monitoring samples will be collected from a minimum of two locations representative of on-site activities, to be determined.

12. <u>Outline Sampling and Analytical Strategy</u>

13. The objective of the sampling strategy is to permit most samples taken on-site during the course of a day to be analysed on-site same day by the Analyst.

14. The sampling methodology implemented by the Analyst based on this outline strategy will be such that the Limit of Quantification (LOQ) of the method used for sampling and analysis on site, for a total of 20 fibres counted using phase contrast optical microscopy (PCOM), will be no greater than 0.002 fibres/ml for baseline and routine activity monitoring samples and 0.0005 fibres/ml, the WHO guideline value[2], for baseline and routine boundary monitoring

15. The LOQ is expected to be achieved by using a sample pooling approach, nominally with the following variable sampling and analysis parameters:

<u>Baseline and routine activity monitoring</u>

a. Number of filters per pooled sample – 2
b. Sample flow rate – 15 litres/minute
c. Sample duration – 80 minutes
d. Litres per sample filter – 1,200
e. Minimum average graticule areas counted per sample filter – 200

<u>Baseline and routine boundary monitoring</u>

f. Number of filters per pooled sample – 4
g. Sample flow rate – 15 litres/minute
h. Sample duration – 160 minutes
i. Litres per sample filter – 2,400
j. Minimum average graticule areas counted per sample filter – 200

[2] WHO. Air quality guidelines for Europe. WHO Regional Publications, European Series, No. 91. 2nd edition. 2000. WHO Regional Office for Europe

16. The Analyst will verify that the minimum LOQ can be achieved by reference to HSG248 and specifically calculate and report the final result in accordance with the formula and requirements of Appendix A1.35.

17. Routine activity monitoring will be undertaken at representative locations close to the activities being carried out, but not in such close proximity as to increase the potential for sample filters to become occluded by dust particles, or for the operations themselves to interfere with the safe operation of the sampling pumps.

18. Routine boundary monitoring will be undertaken at three locations downwind and one location upwind of the operations being carried out. Sampling locations must be selected to ensure that there is minimal possibility for members of the public to interfere with the safe operation of the sampling pumps.

19. Samples will be taken at a height of 1.5 to 2m above ground. The sampling flow rate will be set to achieve a minimum sample volume over a specified time period as above.

20. The monitoring at each location will comprise the use of a reliable battery-operated high-volume flow-compensated air-sampling pump and a 25mm diameter mixed ester of cellulose or cellulose nitrate membrane filter of 0.8 to 1.2um pore size with a printed grid mounted in a thoroughly cleaned sampling head and cowl all in accordance with the provisions of HSG248.

21. Pumps must be capable of:

    - giving a smooth airflow;
    - having flow set to within ±5% for flow rates >2 litres.min^{-1};
    - maintaining this flow rate during the period of sampling.

22. The pump's battery must have sufficient power to operate within the specified flow limits for the duration of the measurement.

23. <u>Outline Analytical Strategy – Extended Analysis</u>

24. The PCOM fibre counting method does not distinguish between asbestos fibres and other fibres that may be present in the air (e.g. gypsum, mineral wool, fibreglass, cellulose etc.).

25. Accordingly, provision will be made by the Analyst to retain one half of each sample filter to be sent off-site for analysis by scanning electron microscopy coupled with energy-dispersive x-ray analysis (SEM-EDXA), should the need arise due to elevated PCOM total fibre counts, to positively identify asbestos fibres to a quantification limit of less 0.0005 fibres/ml.

26. <u>Quality Assurance</u>

27. FCC will ensure that an effective quality assurance/quality control (QA/QC} system will be put in place to ensure high-quality results and to eliminate invalid data.

28. <u>Operational Monitoring and Response Standards</u>

29. In order to serve as a cross-check on the efficiency of operational controls, in the absence of any perceived failure or reduction in performance of these, the thresholds in Table 1 will be adopted:

Table 1 – Monitoring Thresholds and Alert Levels

Routine activity monitoring		**Routine boundary monitoring**	
Green Alert	<0.002 fibres/ml < 5 fibres counted	**Green Alert**	<0.0005 fibres/ml < 5 fibres counted
Amber Alert	<0.002 fibres/ml > 5 and <10 fibres counted	**Amber Alert**	<0.0005 fibres/ml > 5 and <10 fibres counted
Red Alert	<>0.002 fibres/ml >10 fibres counted	**Red Alert**	<=>0.0005 fibres/ml >10 fibres counted

30. For routine activity monitoring:

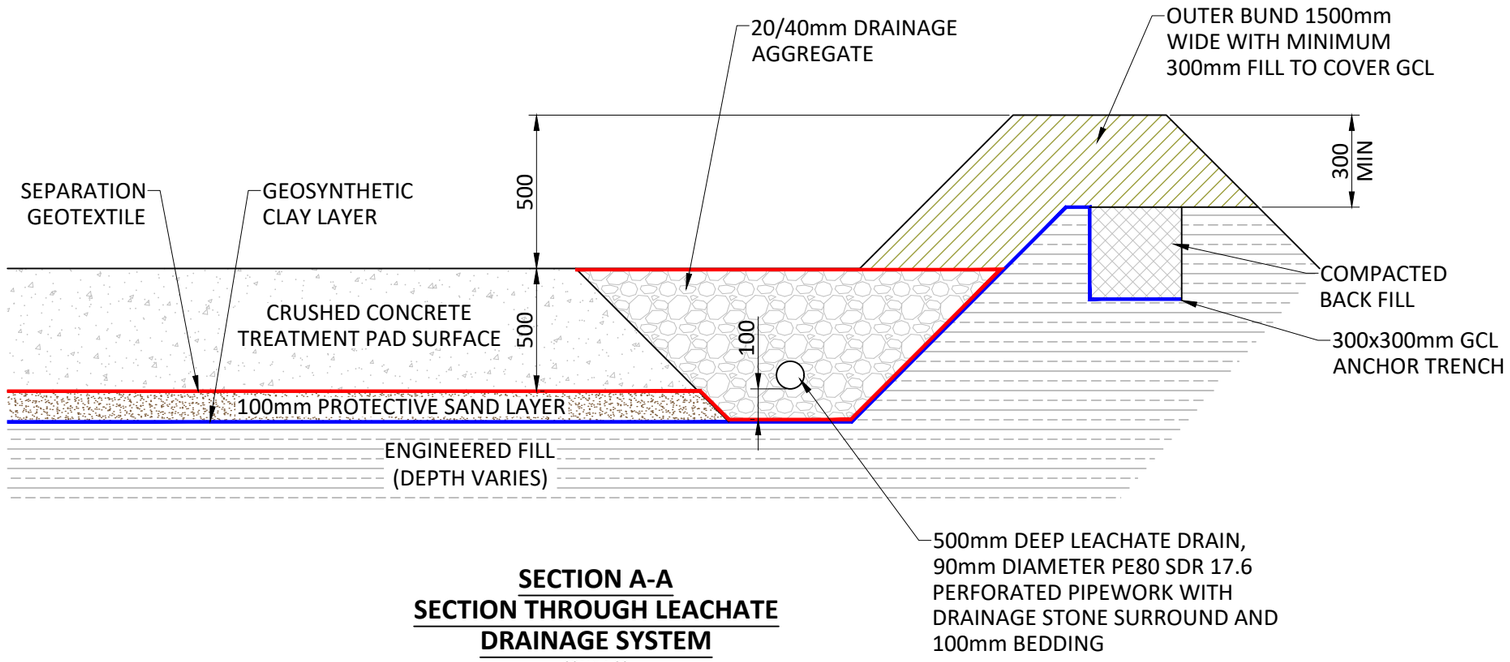
Table 2 – Monitoring Alert Levels and Actions

Routine activity monitoring and Routine boundary monitoring	
Green Alert	Normal operational state.
Amber Alert	Conduct review of wind direction for potential off-site contributory factors. Conduct review of waste input materials. Conduct operational checks on fugitive dust controls; increase as necessary. Initiate repeat sampling as appropriate. Enter report in Site Log.
Red Alert	All operations Stop – conduct urgent review of Asbestos Risk Assessment and Asbestos Plan of Work. Initiate repeat sampling as appropriate. Conduct review of wind direction for potential off-site contributory factors. Conduct review of input materials. Conduct operational checks on fugitive dust controls. Amend Asbestos Risk Assessment and Asbestos Plan of Work as required. Enter initial report in Site Log. Submit retained sample filter(s) for urgent SEM-EDXA analysis. Review Asbestos Risk Assessment and Asbestos Plan of Work as required. Update initial report in Site Log.

31. Reporting

32. All monitoring data will be held on site in an accessible format for the purposes of regulatory inspection and compilation of management reports.

Drawings



SECTION A-A
SECTION THROUGH LEACHATE DRAINAGE SYSTEM
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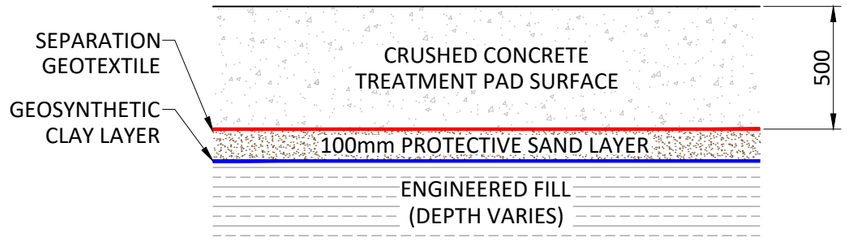

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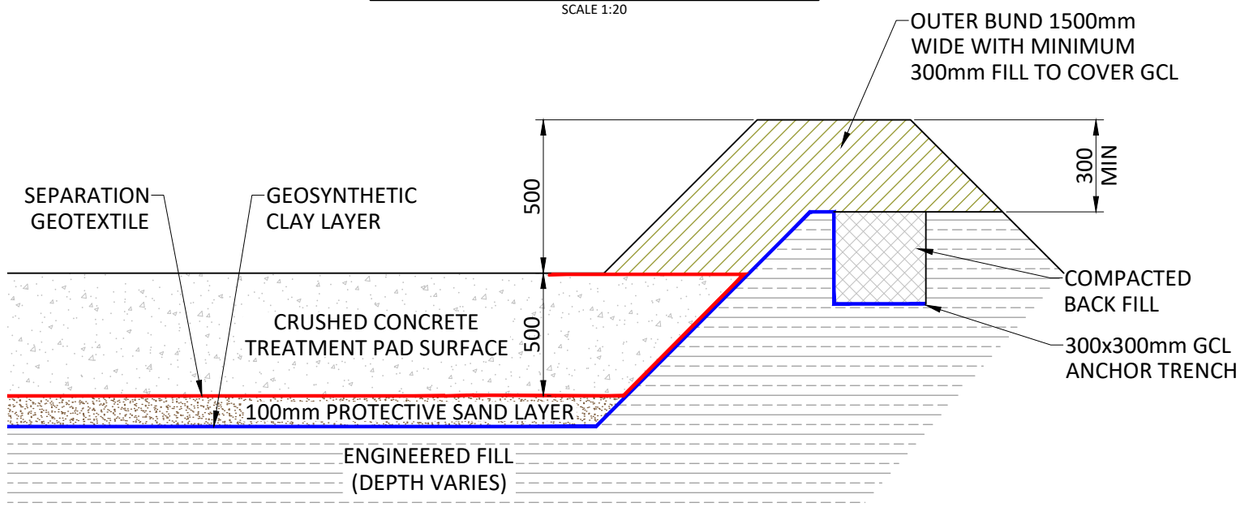

SECTION C-C
SECTION THROUGH TREATMENT PAD & EDGE BUND
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NOTES

1. DO NOT SCALE FROM THIS DRAWING, WORK FROM FIGURED DIMENSIONS ONLY. ALL DIMENSIONS ARE IN METRES AND ALL LEVELS ARE IN METRES ABOVE ORDNANCE DATUM UNLESS NOTED OTHERWISE.

2. THIS DRAWING IS TO BE READ IN CONJUNCTION WITH ALL RELEVANT ARCHITECTS, ENGINEERS AND SPECIALIST DRAWINGS AND SPECIFICATIONS.

3. SECTIONS POSITIONS SHOWN ON DRAWING 3982-CAU-XX-XX-DR-V-1808

REV	MODIFICATIONS	BY	RE	AP	DATE
P02	AMENDED TO ENGINEERS COMMENTS	EJD	KB	KB	01.10.21
P01	ISSUED FOR INFORMATION	EJD	AS	AS	06.02.20

PURPOSE OF ISSUE: FOR INFORMATION
STATUS: S2

CLIENT: FCC Environment

PROJECT: DANESHILL SOILS TREATMENT FACILITY

TITLE: SECTIONS DRAWING

DESIGNED BY	DRAWN BY	REVIEWED BY	AUTHORISED BY
JC	EJD	JC	JC

DATE	SCALE @ A3	JOB REF:	REVISION
05.02.2020	AS SHOWN	3982	P02

DRAWING NUMBER: 3982-CAU-XX-XX-DR-C-1806

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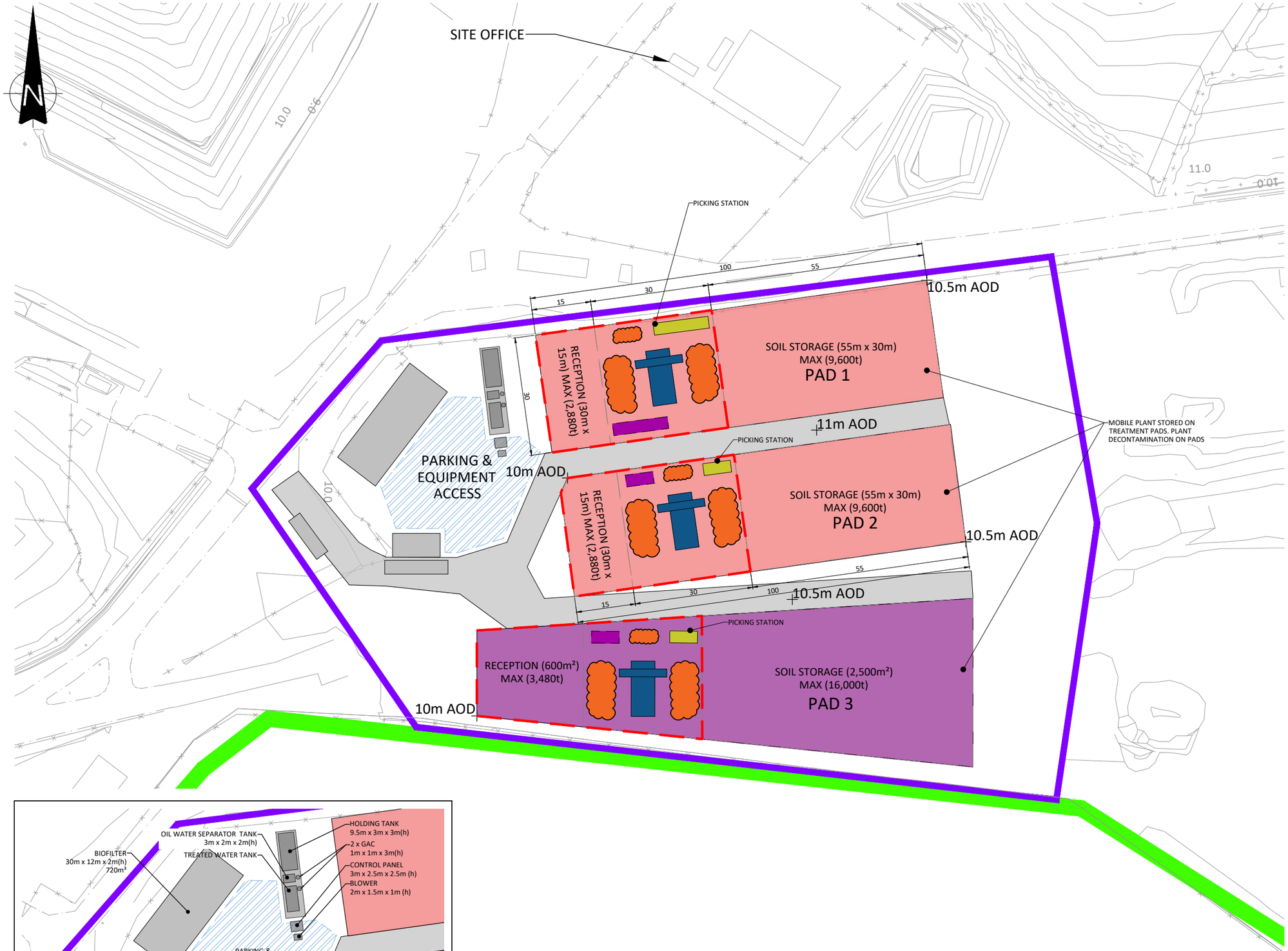

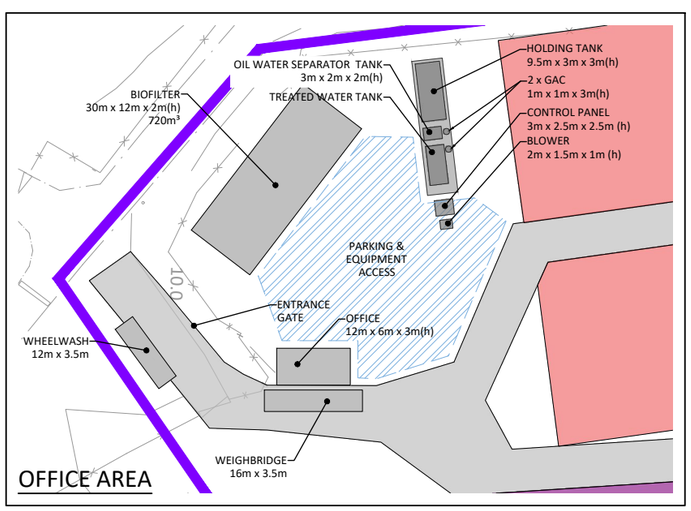

NOTES

1. DO NOT SCALE FROM THIS DRAWING, WORK FROM FIGURED DIMENSIONS ONLY. ALL DIMENSIONS ARE IN METRES AND ALL LEVELS ARE IN METRES ABOVE ORDNANCE DATUM UNLESS NOTED OTHERWISE.

2. THIS DRAWING IS TO BE READ IN CONJUNCTION WITH ALL RELEVANT ARCHITECTS, ENGINEERS AND SPECIALIST DRAWINGS AND SPECIFICATIONS.

3. DESIGN BASED ON PROVECTUS DRAWING - DANESHILL 1

LEGEND

- AREA OF PROPOSED ACTIVITY
- ASBESTOS CONTROLLED WORKING AREA
- ASBESTOS SKIP
- DECONTAMINATION AREA
- FINES, OVERSIZE AND MID RANGE FRACTIONS
- SOIL SCREENER

P02	WHEEL WASH POSITION AMENDED	EJD	KB	KB	01.10.21
P01	ISSUED FOR INFORMATION	EJD	KB	KB	30.09.21
REV	MODIFICATIONS	BY	RE	AP	DATE

PURPOSE OF ISSUE: FOR INFORMATION
STATUS: S2

CLIENT: FCC Environment

PROJECT:
DANESHILL
SOILS TREATMENT
FACILITY

TITLE:
SOILS TREATMENT
PADS 1 / 2 / 3
SITE LAYOUT PLAN

DESIGNED BY	DRAWN BY	REVIEWED BY	AUTHORISED BY
KB	EJD	KB	KB
DATE	**SCALE @ A3**	**JOB REF:**	**REVISION**
29.09.2021	1:1000	3982	P02

DRAWING NUMBER
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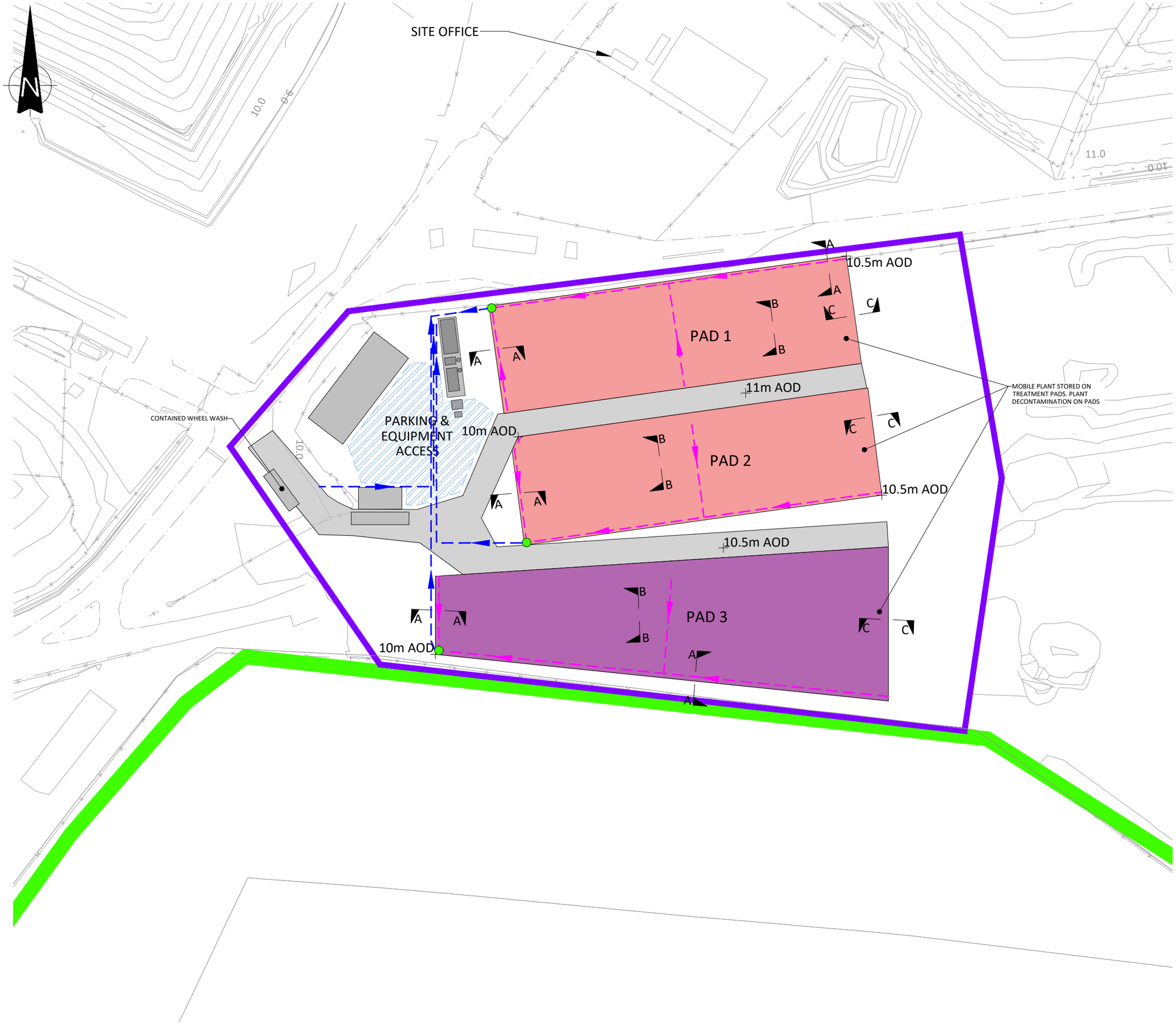

NOTES

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2. THIS DRAWING IS TO BE READ IN CONJUNCTION WITH ALL RELEVANT ARCHITECTS, ENGINEERS AND SPECIALIST DRAWINGS AND SPECIFICATIONS.

3. DESIGN BASED ON PROVECTUS DRAWING - DANESHILL 1

4. SECTIONS SHOWN ON DRAWING 3982-CAU-XX-XX-DR-C-1806

LEGEND

- AREA OF PROPOSED ACTIVITY
- LEACHATE & DRAINAGE FLOW DIRECTION
- CONNECTION BETWEEN PUMPING CHAMBER AND WATER TREATMENT SYSTEM
- WATER COLLECTION & PUMPING CHAMBER

P01	ISSUED FOR INFORMATION	EJD	KB	KB	30.09.21
REV	MODIFICATIONS	BY	RE	AP	DATE

PURPOSE OF ISSUE: FOR INFORMATION

STATUS: S2

CLIENT: FCC Environment

PROJECT:

DANESHILL
SOILS TREATMENT
FACILITY

TITLE:

SURFACE AND FOUL
WATER LOCATIONS

DESIGNED BY	DRAWN BY	REVIEWED BY	AUTHORISED BY
KB	EJD	KB	KB

DATE	SCALE @ A3	JOB REF:	REVISION
29.09.2021	1:1000	3982	P01

DRAWING NUMBER: 3982-CAU-XX-XX-DR-V-1808

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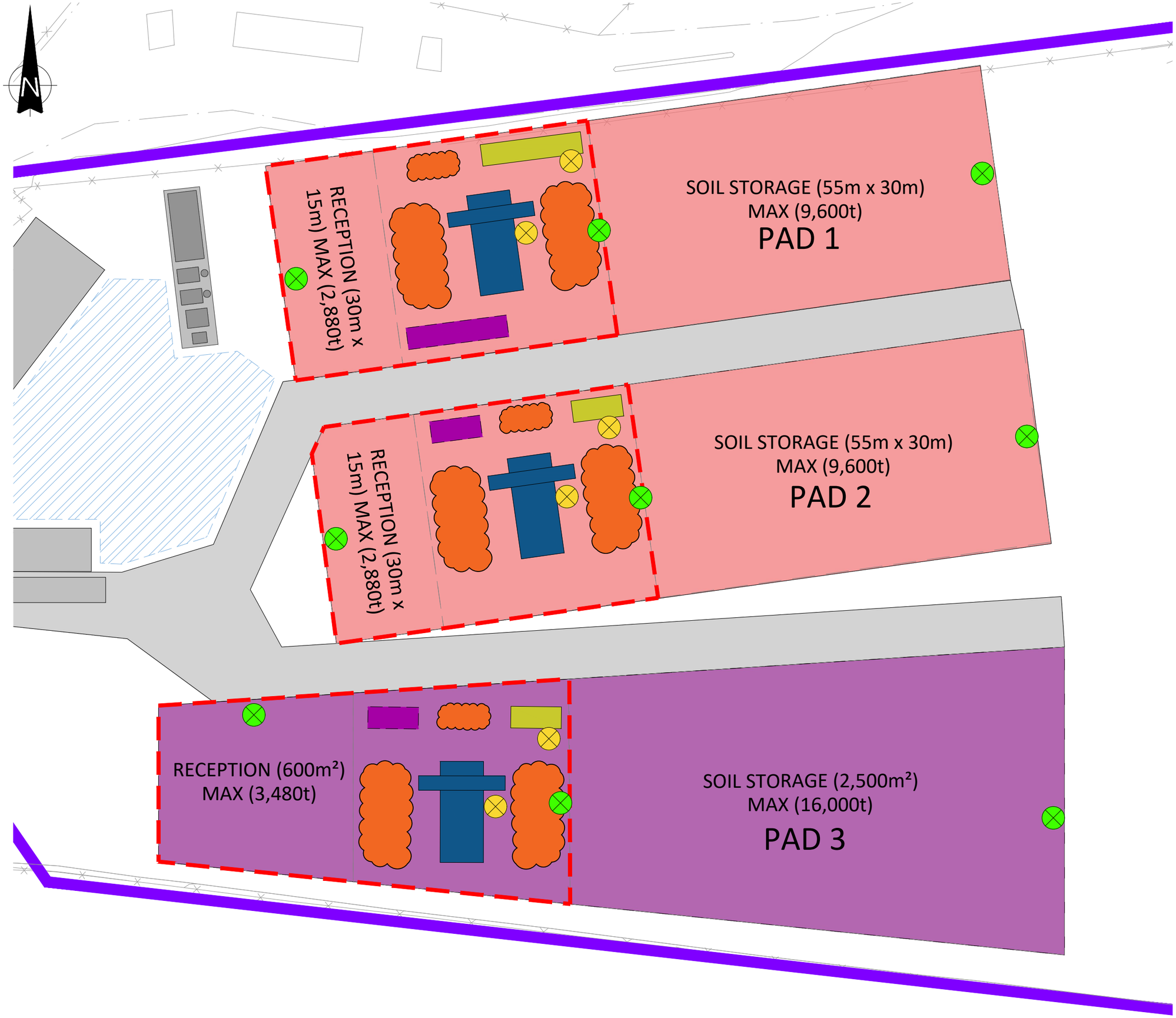

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3. DESIGN BASED ON PROVECTUS DRAWING - DANESHILL 1

LEGEND

- AREA OF PROPOSED ACTIVITY
- ASBESTOS CONTROLLED WORKING AREA
- ASBESTOS SKIP
- DECONTAMINATION AREA
- FINES, OVERSIZE AND MID RANGE FRACTIONS
- SOIL SCREENER
- <0.0005f/ml ASBESTOS MONITORING POINT
- HAND HELD VOC's (PID) AND DUST MONITORING (NEPHELOMETER) LOCATIONS INCLUDING RECORD OF VISUAL DUST

REV					
P01	ISSUED FOR INFORMATION	EJD	KB	KB	30.09.21
REV	MODIFICATIONS	BY	RE	AP	DATE

PURPOSE OF ISSUE: FOR INFORMATION

STATUS: S2

CLIENT: FCC Environment

PROJECT:
DANESHILL
SOILS TREATMENT
FACILITY

TITLE:
EMISSIONS MONITORING PLAN
FOR DUST, ASBESTOS AND VOC's
PADS 1 / 2 / 3

DESIGNED BY	DRAWN BY	REVIEWED BY	AUTHORISED BY
KB	EJD	KB	KB
DATE	**SCALE @ A3**	**JOB REF:**	**REVISION**
29.09.2021	1:500	3982	P01

DRAWING NUMBER
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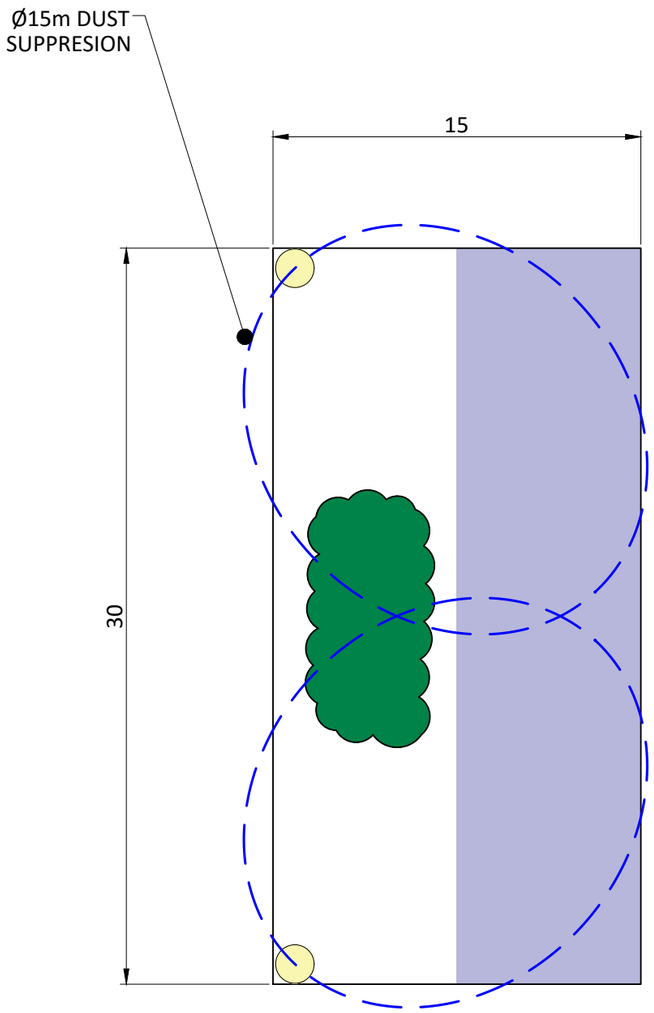
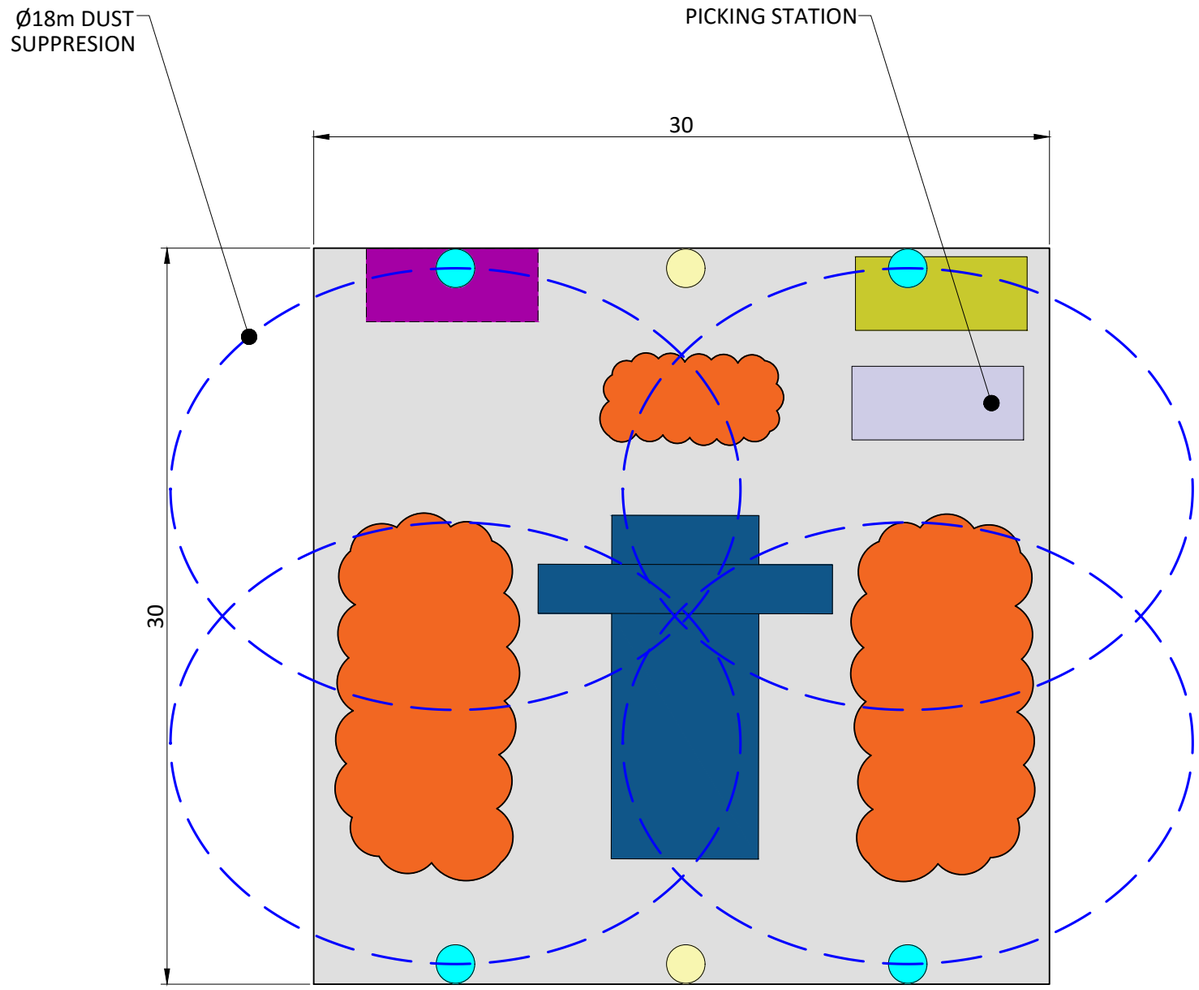


SOIL RECEPTION AREA



SOIL TREATMENT AREA

NOTES

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3. DESIGN BASED ON PROVECTUS DRAWING - DANESHILL 1

LEGEND

- ASBESTOS SKIP
- DECONTAMINATION AREA
- FINES, OVERSIZE AND MID RANGE FRACTIONS
- UNCOVERED SOILS (DAILY INPUTS)
- COVERED SOILS AWAITING RECEPTION TESTS
- SOIL SCREENER
- HIGH FLOW RATE DUST SUPPRESSION SYSTEM
- BOWSER DUST SUPPRESSION SYSTEM
- SUPPRESSION SYSTEMS SPRAY ARCS

REV	MODIFICATIONS	BY	RE	AP	DATE
P01	ISSUED FOR INFORMATION	EJD	KB	KB	30.09.21

PURPOSE OF ISSUE: FOR INFORMATION
STATUS: S2

CLIENT: FCC Environment

PROJECT:
DANESHILL
SOILS TREATMENT
FACILITY

TITLE:
SUPPRESION SYSTEM SPRAY ARCS

DESIGNED BY	DRAWN BY	REVIEWED BY	AUTHORISED BY
KB	EJD	KB	KB

DATE	SCALE @ A3	JOB REF:	REVISION
29.09.2021	1:250	3982	P01

DRAWING NUMBER
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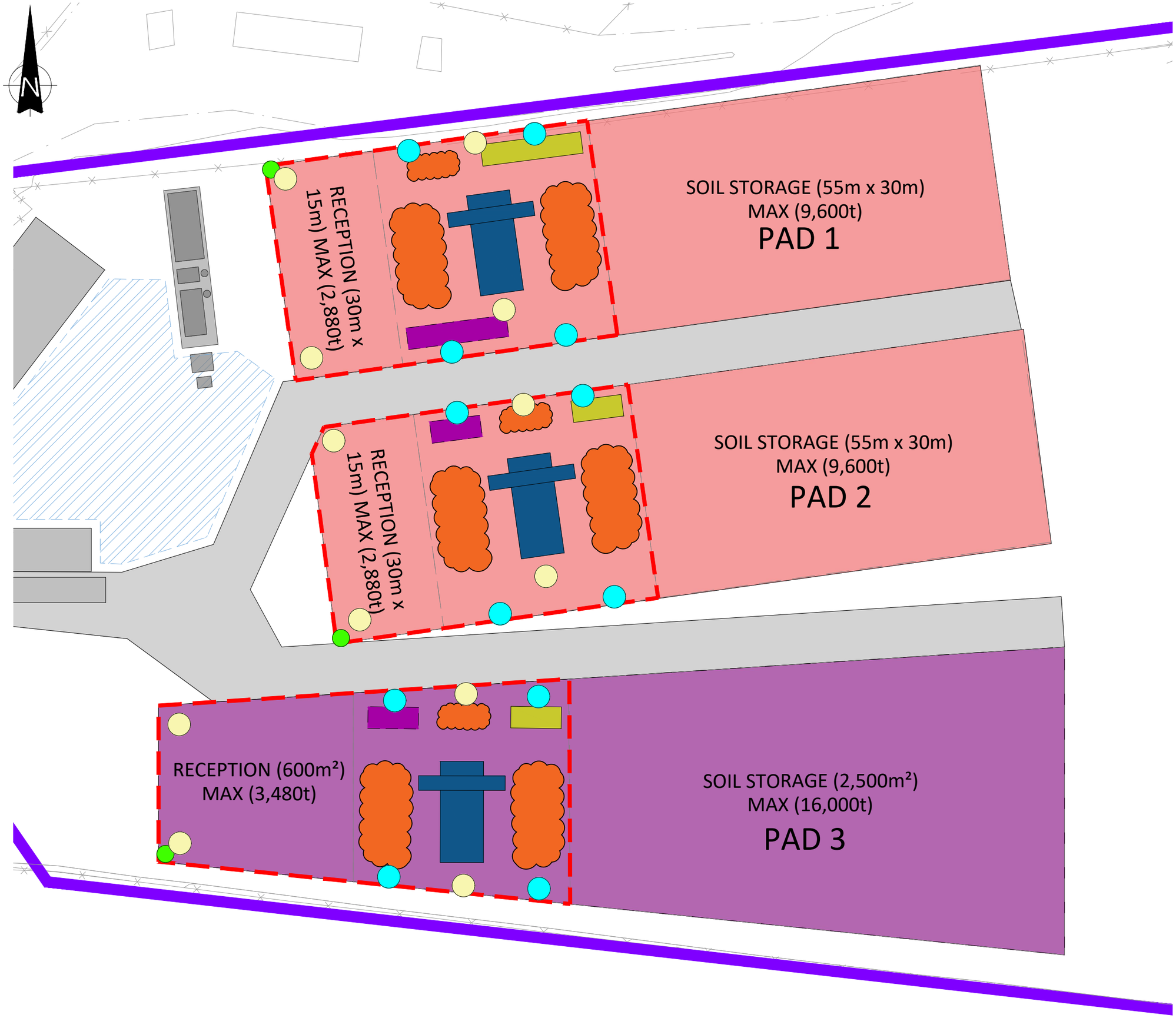

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3. DESIGN BASED ON PROVECTUS DRAWING - DANESHILL 1

LEGEND

- AREA OF PROPOSED ACTIVITY
- ASBESTOS CONTROLLED WORKING AREA
- ASBESTOS SKIP
- DECONTAMINATION AREA
- FINES, OVERSIZE AND MID RANGE FRACTIONS
- SOIL SCREENER
- HIGH FLOW RATE DUST SUPPRESSION SYSTEM
- BOWSER DUST SUPPRESSION SYSTEM
- WATER COLLECTION AND PUMPING CHAMBERS

REV					
P01	ISSUED FOR INFORMATION	EJD	KB	KB	30.09.21
REV	MODIFICATIONS	BY	RE	AP	DATE

PURPOSE OF ISSUE: FOR INFORMATION

STATUS: S2

CLIENT: FCC Environment

PROJECT:
DANESHILL
SOILS TREATMENT
FACILITY

TITLE:
SUPPRESSION SYSTEMS LOCATION
FOR TREATMENT
PADS 1 / 2 / 3

DESIGNED BY	DRAWN BY	REVIEWED BY	AUTHORISED BY
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DATE	**SCALE @ A3**	**JOB REF:**	**REVISION**
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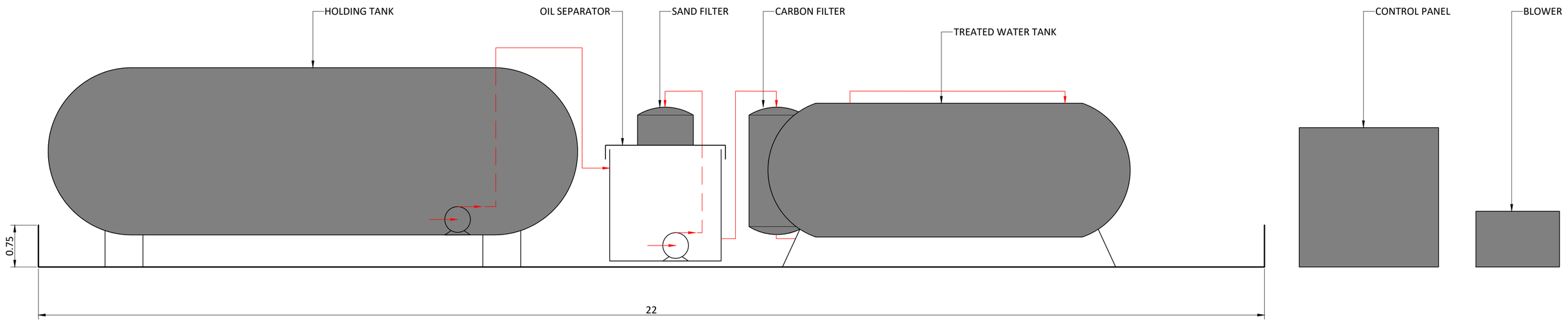

REV	MODIFICATIONS	BY	RE	AP	DATE
P01	ISSUED FOR INFORMATION	EJD	KB	KB	30.09.21

PURPOSE OF ISSUE: FOR INFORMATION

STATUS: S2

CLIENT: FCC Environment

PROJECT:
DANESHILL
SOILS TREATMENT
FACILITY

TITLE:
WATER TREATMENT PLANT
DESIGN AND CONTAINMENT

DESIGNED BY	DRAWN BY	REVIEWED BY	AUTHORISED BY
KB	EJD	KB	KB

DATE	SCALE @ A2	JOB REF:	REVISION
29.09.2021	1:50	3982	P01

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