FICHTNER
Consulting Engineers Limited

Northacre Renewable Energy Facility

Northacre Renewable Energy Limited

Schedule 5 Response

ENGINEERING CONSULTING

Document approval

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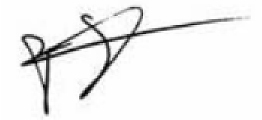
Prepared by:	James Sturman		Lead Consultant	29/07/2021
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Contents

1 Schedule 5 Questions

1. **Provide a revised version of AQ report table 33.**

   There are errors in the calculation of the PEC both in metals emitted at combined limit and in the no worse than permitted facility columns.

   Following review of the spreadsheets which was used to undertake the metals assessment (Table 32 – Long-term Metals Results and Table 33 – Short-term Metals Results), it can be confirmed that:

   a. The methodology to predict the impact of emissions of metals from the Facility is in accordance with the Environment Agency's metals guidance, as set out in the Dispersion Modelling Assessment.

   b. The calculations for the predicted long-term impacts (Table 32) for Process Contribution (PC) and PEC Predicted Environmental Concentration (PEC), in the column titled '*Metals emitted at combined metal limit*', are correct. Furthermore, the calculations for the PC assuming that '*Metals emitted no worse than a currently permitted facility*', are also correct. Therefore, the predicted long-term impact of emissions of Group 3 metals from the Facility is correct applying the most conservative assumption.

      However, for the assumption that '*Metals emitted no worse than a currently permitted facility*' the process contribution was applied for each metal to calculate the PEC, i.e. the combined impact of emissions from the Facility and the existing background concentration.

   c. The calculations for the predicted short-term impacts (Table 33) for Process Contribution (PC), in the column titled '*Metals emitted at combined metal limit*' are correct. Furthermore, the calculations for the PC assuming that '*Metals emitted no worse than a currently permitted facility*', are also correct. Therefore, the predicted short-term impact of emissions of Group 3 metals from the Facility is correct applying the most conservative assumption.

      However, for both scenarios the wrong process contribution was applied for each metal to calculate the PEC, i.e. the combined impact of emissions from the Facility and the existing background concentration.

   The error in the spreadsheet has been corrected and Tables 32 and 33 have been updated and are provided in Appendix A. Whilst this has meant that the numerical results have changed, it does not change the overall conclusions of the metals assessment.

   d. For long term impacts, the conclusions are unchanged. If it is assumed that the Facility would perform no worse than a currently operating facility, the PC is below 1% of the long term AQAL for all pollutants with the exception of annual mean arsenic and nickel. The PEC for arsenic was reported corrected originally and the PEC for nickel remains below the long term AQAL. The PEC is only predicted to exceed the long term AQAL for chromium (VI), as before, and this is due to the high background concentrations. The PC for chromium (VI) is less than 1%. It can still be concluded that '*there is no risk of exceeding the long-term AQAL as a result of emissions of Group 3 metals from the Facility*'.

   e. For short term impacts, the conclusions are again unchanged. The PC is below 10% of the short term AQAL and the PEC is below the short term AQAL for all pollutants for both scenarios.

   Therefore, there is no potential for significant pollution associated with emission of Group 3 metals from the Facility.

2. **Provide a revised site plan for inclusion in the draft permit, based on drawing S2862-8000-0002 and including;**
    - **the installation boundary in green,**
    - **the layout of the proposed waste conveyor from the adjacent MBT plant.**
    - **the emission points to air, designated A1, A2 ..etc.,**
    - **emission points to water, designated W1, W2 etc.**
    - **emissions points to sewer, designated S1, S2 etc.,**
    - **an indication of the direction of North,**

    The original drawing does not include all the above.

    An updated emission points drawing, including all of the items requested, is presented in Appendix B.

3. **Explain how the environmental impact of the incinerator will be affected by operation with waste at the expected minimum calorific value shown on the firing diagram.**

    The dispersion modelling is based on the thermal capacity/input to the boiler of 90 MWth. This is the thermal capacity of the boiler as shown in the Firing Diagram presented in Appendix A of the EP Application. As stated in section 6.3 of the Air Quality Assessment, the model inputs which correlate with the 'nominal design capacity' were '*based on the combustion of 32.5 tonnes per hour of residual waste with a net calorific value of 10.5 MJ/kg*' – this equates to a thermal input of 90 MWth.

    As shown in the firing diagram, the boiler is designed to process waste with a range of NCV's (8 - 14 MJ/kg). These variations in NCV have been allowed for within the design basis of the combustion calculations which have been used to determine the model inputs. Therefore, assuming that the Facility receives waste with an NCV at the lower end of the range (i.e. 8 MJ/kg), it will be capable of processing up to 41.1 tph of waste. This is equivalent to a thermal input of 90 MWth. Therefore, whilst the minimum NCV shown on the firing diagram has not been specifically modelled, it is within the design parameters which have been used to determine the model inputs.

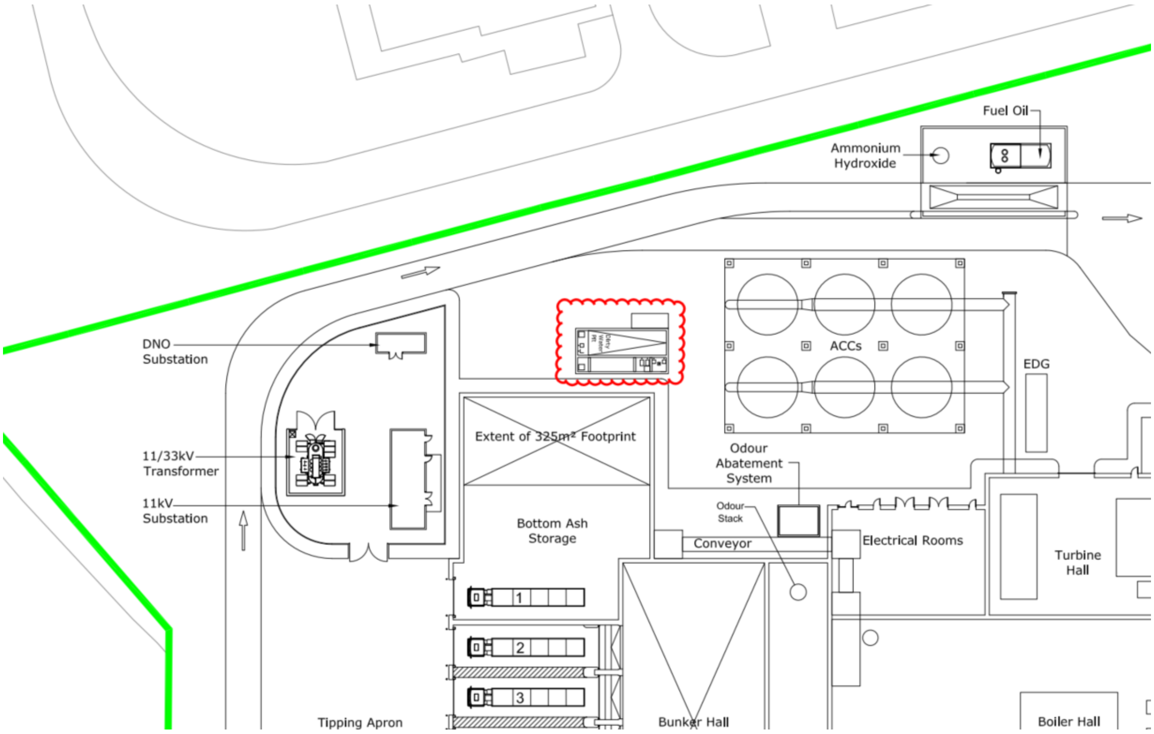
    Fichtner has previously undertaken sensitivity analysis for various points of a firing diagram. This has shown that there is a very small change (<1%) to the air quality impacts associated with a range of NCV waste at the thermal capacity/input to the boiler. The change in NCV of the waste can be due to changes to any of the following three parameters:

    a. moisture content of the waste;
    b. ash content of the waste; or
    c. composition of the combustible fraction.

    Depending on which parameter is changed to achieve the relevant NCV, the air quality impacts can increase or decrease slightly as the NCV changes. Therefore, Fichtner does not consider that it is appropriate to assume that a higher throughput (at a lower NCV) will necessarily result in an increase in air quality impacts.

4. **Provide details of the dirty water pit, including location, capacity, pollution prevention measures, controls and monitoring arrangements.**

    An extract of the Installation boundary drawing, highlighting the location of the dirty water pit, is presented below.



The design of the dirty water pit will be subject to detailed design by the chosen EPC Contractor. Therefore, it is proposed that all of the details referred to below are subject to review/confirmation via a pre-operational condition.

The dirty water pit will be designed for the containment of approximately 120m^3 of process effluent, with excess effluent being discharged to the Wessex Water foul water drainage systems and subsequent treatment in a wastewater treatment works. It is acknowledged that a Trade Effluent Consent will be required from Wessex Water for the discharge of process effluent to its foul water drainage systems, and Wessex Water has been engaged separately on this.

The dirty water pit will be designed as an underground water retaining structure in accordance with BS EN 1992-3: Eurocode 2: Design of concrete structures - Part 3. Therefore, the dirty water pit will be designed to prevent the ingress and egress of water into and out of the pit. During construction and commissioning, quality assurance checks will be undertaken to prove the structural integrity of the drainage systems prior to them being put into operation.

The dirty water pit will be subject to a periodic preventative maintenance programme. On a periodic basis, the dirty water pit will be cleaned and inspected to identify and damage which may have occurred to the pit during operations. Where there is potential for the integrity of the dirty water pit to have been compromised, suitable remedial repairs will be undertaken. These measures will ensure that potentially contaminated effluents are not able to leak from the drainage pits/vessels and contaminate the underlying groundwater.

For clarity, the dirty water pit will not collect surface water run-off from building roofs and areas of hardstanding, as this will be collected in a separate drainage system, prior to discharge to the surface water systems for the Northacre Trading Estate.

5. **Provide details of the IBA storage area, including location, size, pollution prevention measures, controls and monitoring arrangements. Provide details of the oversize material and metal separation systems, the storage of them and the arrangements for pollution control measures.**

   The IBA storage area is designed as a fully enclosed area with four walls and a roof, fast acting roller shutter door entry, and an air extraction and filtration system to maintain negative pressure and prevent dust egress. The storage area is designed for the storage of up to the equivalent of 5 days of continuous IBA production. The flooring of the IBA storage area will be a concrete pad, which will be designed to ensure that leachate from the IBA is diverted to the dirty wastewater pit to be re-used in the ash quench system.

   Ash will be transferred from the ash quench system to the IBA storage area via an enclosed conveyor. The IBA will drop from the end of the conveyor and collected in a pile within the IBA storage area. The IBA will then be moved into piles, within a designated storage area by a front end loader.

   IBA collection vehicles enter the IBA storage areas via roller-shutter doors. Once the vehicles are in the IBA storage area, the roller-shutter doors are closed and the IBA will be loaded into the IBA collection vehicles using a front-end loader. The IBA collection vehicles will then exit the building via the roller-shutter doors.

   It is acknowledged that section 2.9.3 of the Supporting Information states that the Facility will include for oversize and metals separation systems. However, following further development of the design of the Facility, as the fuel/waste which will be processed at the Facility will consist of pre-processed RDF and C&I waste it is not anticipated that there will significant quantities of metals or oversize materials within the incoming waste. Therefore, it is no longer proposed to include for oversize and metal separation from the IBA within the design of the Facility.

6. **Explain how the mixing of fuels from different suppliers within the waste bunker will be carried out to improve the homogeneity of fuel input to the furnace.**

   Incoming waste will be received from different waste suppliers and transferred from the waste delivery vehicles into the waste bunker. Bunker management procedures will be employed to ensure mixing of the different incoming waste sources to improve the homogeneity of the fuel fed into the furnace and to increase the fuel efficiency of the waste incineration process.

   These management procedures will include mixing and turning of incoming wastes using trenching and stacking by the crane grab within the waste bunker to blend the incoming waste. The blended incoming waste will be loaded from the waste bunker to the furnace using the crane grab which will transfer the incoming waste to the furnace feed hopper.

   The mixing and turning process will also help to prevent development of anaerobic conditions and decomposition within the waste bunker, which could generate further odorous emissions.

7. **Provide details of the firewater/raw water storage tank, including capacity and arrangements to ensure that the firewater capacity is adequate at all times.**

   The designs of the firewater tank are in accordance with the requirements of the fire insurers, which require that the capacity of the fire water tank exceeds the minimum requirements of NFPA 850. To comply with the requirements of NFPA850, the towns water supply rate is required to be sufficient to fill the firewater tank within an 8-hour period.

In accordance with NFPA850, the tank will be designed so that the raw water off-take from the tank is located at a level such that it cannot draw on the fire water reserve. The firewater off-take will be located at the bottom of the tank so that the required volume of water is available for fire-fighting purposes in the event of a fire.

8. **Provide details of the air extraction system for combustion air from the storage building including justification that the building can be maintained under suction during periods when the doors are open to allow access. Provide details of the proposals for determining that the system is effective.**

The design of the air extraction system will subject to detailed design of the Facility. However the odour abatement systems will include for the following:

- Enclosure of the potentially 'odorous' of waste reception areas, which includes all incoming waste storage and handling areas, namely the Waste Tipping Hall and Waste Bunker.
- During normal operations, waste reception areas will be maintained under negative pressure, to ensure that no odours are able to escape the building. The negative pressure will be created by drawing process air from the waste reception areas and combusting the potentially odorous air within the combustion process, destroying the odorous compounds and releasing the combustion products via the main stack.
- During periods of start-up/shutdown, and also to cover periods of commissioning, a standby odour control system will be installed which will be used to maintain the negative pressure in the waste reception areas, with the potentially odorous air passing through a series of carbon filters to abate odorous compounds prior to release to atmosphere via a dedicated odour control stack.
- Furthermore, a building management system will be installed which will:
    - monitor negative pressure within the potentially odorous waste reception areas;
    - control the opening and closing of doors and louvres within the potentially odorous waste reception areas to maintain negative pressure; and
    - initiate the operation of the odour control system to maintain negative pressure within waste reception areas during periods of start-up and shutdown.

Periods of Normal Operation

Air will be extracted from waste reception areas, and combusted within the waste incineration process as primary combustion air. This will destroy any odorous chemicals which are present within these areas. The waste incineration process is designed to consume approximately 96,500 Nm^3/h of primary combustion air.

The volumes of the waste reception areas are approximately as follows:

- Tipping Hall – 12,200m^3;
- Bunker (height of the Tipping Hall to the feed hopper) – 20,000m^3; and
- Bunker void above the feed hopper – 11,900m^3.

Therefore, the total volume of the waste reception area is approximately 44,100m^3.

Allowing for the total volume of the waste reception, storage and handling area, the extraction system at the Facility is designed for approximately 2.2 air changes per hour.

Periods of Start-up and Shutdown

The standby odour control system will be designed to treat up to 132,000 Nm^3/hr of air. As stated previously, the total volume of the waste reception area is approximately 44,100m^3.

Therefore, allowing for the total volume of the waste reception, storage and handling area, the extraction system at the Facility is designed for approximately 3 air changes per hour.

Additional odour mitigation measures during commission and normal operations

The building management system will manage door and louvre opening such that only 1 roller shutter door (including delivery doors and maintenance and access roller shutter doors) can open at a time, and when no roller shutter doors are open, ventilation louvres in the same wall as the delivery doors will open to maintain the directional flow of air from the area of the inlet doors, across the waste reception area, bunker and waste handling area, to the air extraction duct(s) beyond. Taking this into consideration, it is considered that the design of the Facility will ensure negative pressure is maintained in waste reception areas, and that that odour will be contained within the building and extracted during periods of waste deliveries and other periods when doors and vents are open.

An Air Emissions Management Plan (AEMP) is provided in Appendix C. The AEMP provides details of the odour and dust management systems which will be implemented at the Facility during operations to mitigate any off-site impacts associated with fugitive and point source emission of odour and dust from the Facility.

Testing the odour abatement systems

During commissioning, the Facility will be subject to a Take-Over Test. This will include a demonstration that the building compartmentalisation is effective, that the building management system effectively controls the negative pressure from the 'odorous area' and that the abatement systems are effective, including those associated with the abatement of odour. Therefore, as part of the Takeover Test for the Facility, appropriate testing will be undertaken to ensure that the building control and odour control and abatement systems are sufficiently effective at abating odour from the Facility.

9. Provide details of the stand-by odour abatement system including an explanation of the design air flow rate and proposals for monitoring the exhaust.

As explained in response to Q8, during periods of normal operation, the Facility includes for provision of odour abatement by extracting air from potentially 'odorous' waste reception areas into the boiler to ensure that negative pressure is maintained within these areas.

The stand-by odour abatement system will be subject to detailed design, but will provide odour abatement from waste reception areas during periods of shutdown. The stand-by odour abatement system is a carbon filtration system designed for the treatment of 132,000 Nm^3/hr of air.

As stated in response to Q8, the total volume of the waste reception area is 44,100m^3. Therefore, the odour abatement system is designed to provide 3 air changes per hour. This will ensure that potential odour from waste reception areas will be abated prior to release to atmosphere.

The stand-by odour abatement system will comprise the following:

- An automatic bag filter system for dust filtration. The filtration system will be designed for the primary air flow volume (132,000 Nm^3/hr).

- A carbon filtration system with a minimum empty bed residence time of 2 seconds. The carbon filtration system will consist of 2 duty and 1 standby carbon filtration vessels so that maintenance/repair of the vessels can be undertaken without impacting on the performance of the abatement system whilst it is operational.
- Duty and standby ID fans, to provide redundancy to the system in the event of failure of the ID fan. The duct work, carbon filtration system, and ID fan will be designed for the extraction of 132,000 Nm^3/hr of air from waste reception areas, which will provide the equivalent of 3 air changes per hour during periods of shutdown. The treated air from the waste reception areas will be released via a dedicated odour treatment system stack.

An Air Emissions Management Plan (AEMP) is provided in Appendix C. The AEMP provides details of the odour and dust management systems which will be implemented at the Facility during operations to mitigate any off-site impacts associated with fugitive and point source emission of odour and dust from the Facility.

10. Provide an expanded assessment against the BAT conclusions to include consideration of the following:

- **BAT options listed in BAT 20 rows b, e and i.**

To increase the energy efficiency of the plant, BAT 20 requires an appropriate combination of techniques as stated in the BREF to be implemented. As described in section 2.7.2 of the Supporting Information, the Facility will implement techniques (c), (d), (f)and (g) to increase the efficiency of the process.

Technique (b)

Technique (b) relates to reducing the flue gas flow rate through either an improvement in primary and secondary combustion air distribution, or through using flue gas recirculation (FGR). This is being partly implemented. The Facility will be designed to optimise both primary and secondary combustion air distribution to improve the efficiency of the combustion process. The volume of both primary and secondary air will be regulated by a combustion control system. Primary combustion air will be optimised and improved through the continuous monitoring of process variables, including combustion air flow. Secondary combustion air distribution will be optimised through the use of Computational Fluid Dynamics (CFD) modelling, which will be used to select and optimise the location of secondary air inputs into the combustion chamber, to increase the efficiency of the SNCR system for NOx abatement. The optimisation of combustion air, as described above, will reduce the resulting flue gas flow rate by reducing air intake, hence lowering the oxygen content within the furnace and reducing the air output at the boiler exit. However, to ensure that the combustion process remains stable, it is important to maintain a balance between the air intake and the resulting flue gas flow rate. The provision of some excess oxygen is essential to cover any fuel spikes and avoid incomplete combustion, reducing the risk of any spikes in carbon monoxide emissions.

FGR has the potential to improve the performance and efficiency of combustion systems, with some grate suppliers gaining benefits of reduced NOx generation from the use of FGR. However, other grate suppliers have focussed on reducing NOx generation through the control of primary and secondary air and the grate design, and these suppliers gain little if any benefit from the use of FGR. Adding FGR may even have the potential to cause additional problems relating to the availability of the plant, which would reduce the overall efficiency through reduced power generation and an increase in the number of shutdowns.

As stated in section 2.6.2 of the Supporting Information, it is considered that the use of SNCR (with or without FGR)is considered to represent BAT for NOx abatement for the Facility. The proposed designs do not currently include for FGR. However, it is proposed that a pre-operational condition is included within the permit to allow the details of the system to be developed and confirmed during the detailed design of the Facility.

Technique (e)

Technique (e) is to use low-temperature flue gas heat exchangers to recover additional energy from the flue gas at the boiler exit. The recovered heat could then be used for heating purposes and/or internally for preheating of boiler feedwater. It is acknowledged that the use of this technique must be applicable within the constraints of the operating temperature profile of the flue gas treatment (FGT) system. Section 4.4.10 of the BREF states that at temperatures below 180°C, when using low-temperature heat exchangers, there is an increased risk of corrosion in the economiser and of the piping upstream of acid gas scrubbing. Corrosion risks can arise from HCl and SOx in MSW flue gases, which can attack the steel in the (cool) metal tubes of the heat exchanger. The boiler design assumes a flue gas temperature, at the exit of the boiler i.e. prior to the hot gases passing to the flue gas treatment system, of between 140 and 180°C. As the temperature of the flue gases at the boiler will be less than 180°C, this introduces a higher possibility for corrosion risks. It is acknowledged that it is possible to use enamel coated heat exchangers to reduce corrosion, or to design the cycle to use a separate waste heat boiler after the main boiler to avoid corrosion conditions. However, this would require significant redesign of the boiler and would introduce additional capital costs, which would be difficult to justify given the predicted efficiency of the Facility is high (31.73% gross) and it is not anticipated that this would increase significantly through the implementation of low-temperature flue gas heat exchangers.

In addition to the above, when considering the use of heat exchangers, it is important to ensure that the flue gas temperature is not lowered enough to impact the operation of the FGT system. The BREF states that a dry FGT process, such as that proposed for the Facility, is suitable for flue gas temperatures of between 130–300°C, with bag filters generally requiring temperatures in the region of 140–190°C. As the temperature of the flue gases at the boiler exit will be between 140 and 180°C, and assuming a minimum required temperature of 130°C for the FGT process, this would only allow for a maximum temperature 'loss' of 50°C for the flue gases when passing through the heat exchanger. When accounting for efficiency losses in the heat exchanger, this would result in a very low exchange of heat overall. Furthermore, reagent consumption in the FGT system will increase as the temperature of the flue gases decreases due to reduced reaction rates. Should the flue gases be required to be reheated before entering the FGT system, this would be counterproductive from an energy efficiency point of view, allowing for the additional losses from the heat exchanger.

Additionally, lower flue gas temperatures at the stack, from the use of additional heat exchangers, could affect plume buoyancy and dispersion of emissions and will result in more visible condensed plumes. The Landscape and Visual Impact assessment submitted in support of the planning application concluded that the visible plume from the proposed design would '*not lead to significant adverse visual effects*. More visible condensed plumes from the use of low-temperature flue gas heat exchangers could invalidate the conclusions of the assessment and result in an unacceptable impact from visible plumes.

Finally, the results of the Cost-Benefit Analysis (CBA) presented within the CHP assessment (refer to Appendix H of the EP Application) concluded that exporting heat from the Facility is not economically viable at this time. However, the economic feasibility of the scheme will be reassessed in the future when there is further certainty regarding heat loads and considering any subsidies that might be available at that time that support the development of heat networks in the area.

Therefore, the use of a low-temperature heat exchanger will enable a small amount of additional low-grade heat to be recovered from the flue gases, but it is not considered to represent BAT for the following reasons:

- corrosion risks;
- potential to increase capital costs without providing discernible environmental improvement;
- potential to affect the efficiency and operation of the FGT system;
- potential to affect dispersion and introduce an unacceptable visual impact; and
- considering the current unviable opportunities for heat export from the Facility.

Technique (i)

Technique (i) relates to dry handling of bottom ash using ambient air for cooling, with useful energy subsequently recovered by using the cooling air for combustion. It is acknowledged that this technique is applicable to grate furnaces, such as proposed for the Facility, and can improve energy efficiency and reduce water consumption. However, dry bottom ash handling can introduce a risk of fugitive dust emissions associated with the bottom ash handling systems compared to a wet bottom ash handling system which is proposed for the Facility. This has the potential to increase the capital costs associated with bottom ash handling whilst not providing any environmental benefits.

Furthermore, in a dry bottom ash handling system, the bottom ash discharger may be required to be flooded with water occasionally to prevent fire hazards.

Finally, using air from the bottom ash storage area will reduce the quantity of combustion air required to be extracted from the bunker and tipping hall areas, subsequently reducing the level of negative pressure that can be obtained in the bunker and tipping hall areas, and associated odour abatement from potentially odorous areas (see response provided to Q8). Therefore, implementing this technique would have potential to increase fugitive odour emissions from reception areas and/or require the odour abatement systems to operate more frequently.

Taking the above into consideration, the use of a dry bottom ash system is not considered to represent BAT for the Facility. Overall water use will be minimised by recycling process effluent (including any leachate or effluent from bottom ash treatment) back into the process.

- **BAT 27 row c, as to whether boiler sorbent injection in addition to the proposed acid gas abatement system would provide additional benefits.**

As stated within section 2.7.1 of the supporting information, in response to BAT 27, direct boiler sorbent injection involves the injection of the reagent directly into the flue gas stream within the boiler. This only achieves partial abatement of the acid gases and does not eliminate the need for additional FGT stages. It is acknowledged that using a combination of both boiler sorbent injection and the additional acid gas abatement system could potentially provide a higher level of abatement than either system alone. While, the operating and maintenance costs would be significantly higher, combining the systems would provide very limited environmental benefits given the predicted air quality impacts as presented in the Dispersion Modelling Assessment provided in Appendix E of the EP Application.

As explained within section 2.6.3 of the supporting information, the use of a dry sorbent injection system to abate acid gases is considered to represent BAT for the Facility. The dry system would be designed to ensure that the Facility operates in accordance with the relevant ELVs, assumed to be the BAT-AELs, without the requirement for any additional abatement measures.

- **BAT 29 and 30; include consideration of catalytic filter bags either in place of or in addition to the SNCR system.**

Catalytic filter bags have the potential to reduce emissions of dioxins and furans, as well as NOx when used in combination with a source of ammonia. It is stated within the BREF that the temperature of the flue gas when entering the filter bags should be above 170 –190°C for effective destruction of dioxins and furans, and above 180 –210°C for the effective destruction of NOx. However, as stated above, the temperature of flue gases at the boiler exit is expected to be approximately 160°C, and further down the process (after FGT and when leaving the stack) the flue gases are expected to be at a temperature of approximately 130°C, as confirmed within the Dispersion Modelling Assessment provided in Appendix E of the EP Application.

Therefore, to achieve the flue gas temperatures required for the effective abatement of particulates and the effective destruction of dioxins and furans would require the flue gases to be reheated using a further energy source – either steam which will reduce the efficiency of the Facility or from the combustion of fossil fuels with the associated emissions of carbon dioxide.

The implementation of catalytic filter bags would either reduce the energy efficiency of the Facility or result in additional emissions of carbon dioxide. However, given the overall air quality impacts associated with the Facility, NREL does not consider that these ‘additional’ impacts associated with catalytic filter bags represent BAT.

- **BAT 33 row d**

BAT 33 (d), relates to dry bottom ash handling to reduce water usage and prevent wastewater generation. As described within the response to BAT 20 (i) above, dry bottom ash handling is not considered to represent BAT for the Facility. Water usage (and wastewater generation) will be minimised through other techniques implemented at the Facility, such as the use of dry sorbent injection in the FGT system and recycling of water and wastewater within the process.

11. Provide details of the proposed waste conveyor delivering waste from the adjacent MBT plant. Explain how the conveyor will be controlled and explain the waste acceptance and pre-acceptance procedures.

Transfer Conveyor from MBT Plant to Adjacent EFW Plant.

Overview.

The MBT Plant processes municipal and other solid wastes, which it removes moisture from, stabilises and refines. The waste outputs from the MBT plant are as follows:

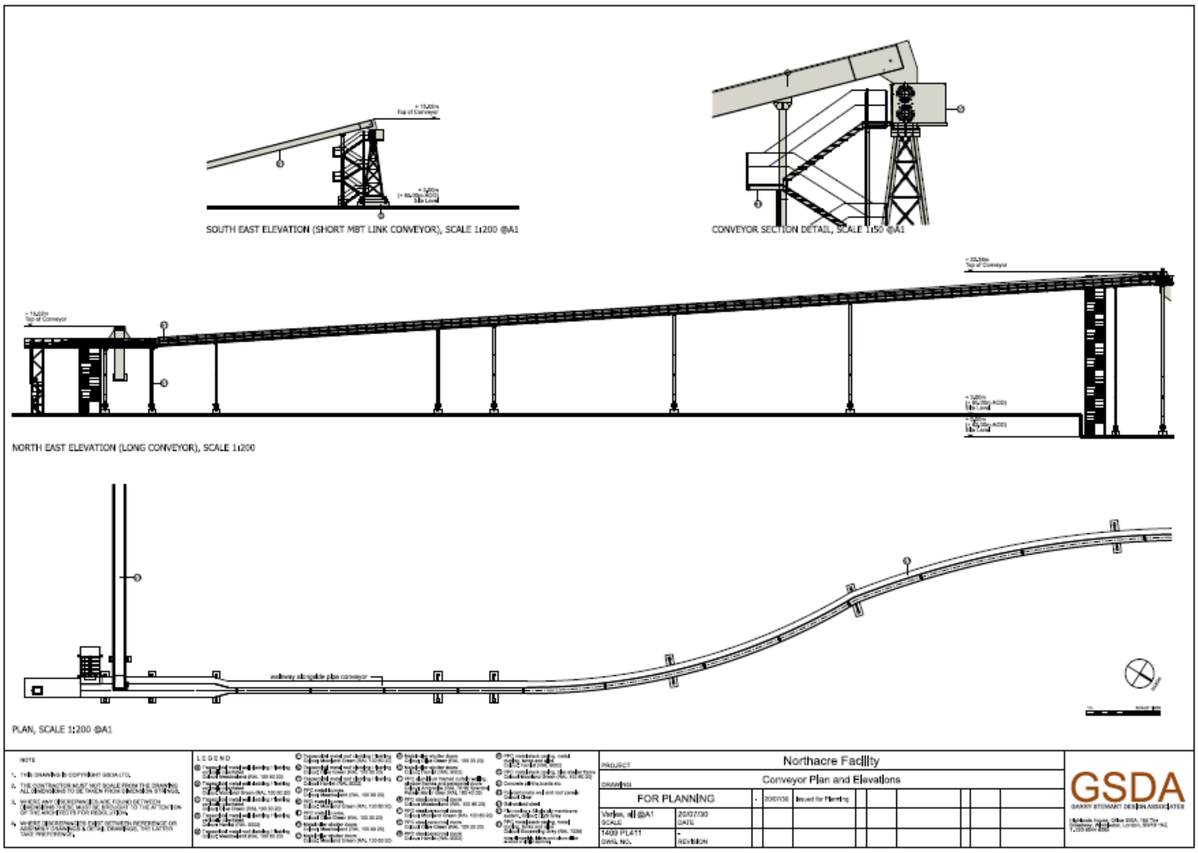
- Up to 45,000 tonnes per annum of SRF;
- Up to 17,000 tonnes per annum of MBT Fines; and
- Up to 12,000 tonnes per annum of MBT Non-Ferrous Heavies.

The fines and heavies are currently collected in 30m^3 containers at the MBT Plant, and are transferred off-site for disposal. The SRF is baled and transported to Europe by road for recovery.

NRE and Hills Waste Solutions Ltd (Hills) are proposing to use a high-level transfer conveyor to transport some or all of these waste outputs directly from the MBT Plant to the Facility for disposal, without the use of vehicles. It should be noted that Hills Waste Solutions Ltd will be the 'Operator' of the conveyor, and it will not be implemented until a variation to the EP for the MBT Plant has been granted by the EA for its operation. A sperate application for an EP variation will be submitted by Hills Waste Solutions Ltd for the operation of the conveyor, and it is not intended to form part of this application.

Whilst the design of the conveyor is subject to detailed design, an indicative drawing of the transfer conveyor concept is provided below.

High Level Transfer Conveyor Concept.



Description of the conveyor system

To allow for implementation of the conveyor, the waste collection and transfer arrangements for each of the waste outputs from the MBT plant will need to be modified to add a facility to divert each of the materials directly to the Facility via the transfer conveyor, or to load fines and heavies into containers. The system will allow for sample points to be included for each of the MBT output streams to maintain monitoring of the individual waste outputs.

The waste outputs from the MBT plant will be conveyed to a single elevating conveyor which starts within the MBT building, and elevates the materials to the start of the high-level conveyor, at the top of a support tower with staircase access and lifting access. The elevating conveyor will be fully enclosed. The waste outputs will be transferred from the elevating conveyor to the high-level transfer conveyor at an enclosed transfer point, and conveyed to the Facility.

The high-level transfer conveyor will end at a support tower adjacent to the Facility, complete with staircase access and lifting access. At the support tower, the material will be transferred from the high-level transfer conveyor to an enclosed transfer conveyor or conveyors which will transfer the waste outputs to the via a feed hopper(s) into the waste bunker. There will be a weighing belt and a manual sampling point in the conveyor system between the high-level transfer conveyor and the bunker to enable monitoring of the quantities of waste received from the MBT facility and to enable sampling of the incoming waste from the MBT plant.

All external conveyors will be enclosed or covered, with air extraction from transfer points to minimise dust and odour release, and all conveyor belts will be fitted with return belt cleaning systems within the extracted transfer points to minimise debris. Areas of the transfer conveyor requiring maintenance access will have access walkways either side of the conveyor.

Control of the transfer conveyor will primarily be at the MBT plant end, with a communications link from the Facility indicating its operational status, for the control of the transfer conveyor system.

There will be a heat detection system linked to a fire isolation barrier in the elevating conveyor from the MBT Plant, and in the conveyor from the high-level transfer conveyor into the EFW Plant. In the event that the heat monitor in either location reaches the alarm set point, an alarm will be raised and simultaneously the conveyor system will stop, the fire isolation barriers will be deployed and fire suppression along the conveyors will be initiated.

The high-level transfer conveyor will be a belt type conveyor and therefore quiet in operation. External conveyors will either be belt conveyors or chain conveyors with composite paddles and noise attenuation as required.

The transfer conveyor will have a dedicated air extraction system which will extract potentially odorous air from above the conveyor to the waste bunker within the Facility. The extraction system will minimise odour and dust emissions from the conveyor. This potentially odorous air will subsequently be treated within the Facility (either as combustion air, or in the standby odour treatment plant).

As (a) the output materials from the MBT Plant will have been processed in the MBT biohall and refinement area, prior to entering the transfer conveyor; and b) the waste outputs will not be retained in the transfer conveyor, it is not anticipated that there will be pest control issues associated with the transfer conveyor system.

Waste Pre-Acceptance & Acceptance Checks

Waste pre-inspection will be undertaken in the MBT plant, by Hills, to ensure that it is suitable for transfer and processing within the Facility. Samples of the output waste will be taken manually from an appropriate location within the MBT Plant, and will be routinely visually inspected for conformity. In the event that it does not conform, it may be rejected on the basis of this inspection. Samples will be taken [daily] and visually inspected, and periodically analysed for physical, chemical and combustion parameters in an accredited laboratory.

Waste inspection procedures will be carried out by NRE prior to the waste output being transferred into the bunker. The waste be visually inspected [daily] for conformity, and may be rejected on the basis of this visual inspection. Samples will be taken manually from the transfer conveyor system prior to the waste being deposited in the waste bunker and periodically analysed for physical, chemical and combustion parameters in an accredited laboratory.

12. Provide an assessment of the impact of the facility on the nearby bat roosts.

The nearby bat roosts to the Facility have been considered within the planning regime and reviewed by the Senior Ecologist at Wiltshire Council within the ongoing review of the planning application. The report from the Senior Ecologist states:

> *The site does lie within one of the consultation zones for Greater Horseshoe bats associated with the Bath and Bradford on Avon Bats SAC, in this case centred around a summer roost site at Westbury Leigh. Within this consultation zone, proposals that include removal of vegetation potentially used by bats for either foraging or commuting, are required to undergo Appropriate Assessment under the Habitats Regulations. The Ecological Survey Report by AD Ecology, submitted in support of the states that the site is located on an area of hardstanding on which a mosaic of ruderal vegetation has started to develop. However, the existing vegetation is of poor diversity, unlikely to support the number and diversity of invertebrate species on which bats feed. Removal of vegetation as indicated in the proposal will therefore not affect bat foraging or commuting and I am happy to record that the site is screened out of Appropriate Assessment because there is no mechanism for adverse effect. Furthermore, I am happy that the site will provide improved opportunities for bat foraging and commuting as a result of tree and shrub planting, which will contribute to primary connectivity in the wider landscape area.*

The 'Ecological Survey Report by AD Ecology', as referenced in the report from Wiltshire Council is referring to the 'Ecology and Nature Conservation Chapter' of the Environmental Statement submitted in support of the planning application. This report has already been provided to the EA within the electronic planning application documents provided in Appendix J of the EP Application.

As can be seen from the report from the Senior Ecologist at Wiltshire Council, the potential impacts on the bat roosts from the Facility are associated with the construction phase of the Facility and not the operational phase which will be regulated by the EP.

Furthermore, as acknowledged by Wiltshire Council, the Applicant is proposing to plant trees and shrubs as part of a scheme of landscaping which has formed part of the planning application which will provide '*additional opportunities for bat foraging and commuting*'.

On the basis of the information presented in the planning application, Wiltshire Council is '*happy to record that the site is screened out of Appropriate Assessment because there is no mechanism for adverse effect.*'

A Updated Table 32 and Table 33

Table 32: Long-Term Metals Results – Point of Maximum Impact

Metal	AQAL	Background conc.	Metals emitted at combined metal limit				Metals emitted no worse than a currently permitted facility				
			PC		PEC		Metal as % of ELV (1)	PC		PEC	
	ng/m³	ng/m³	ng/m³	as % AQAL	ng/m³	as % AQAL		ng/m³	as % AQAL	ng/m³	as % AQAL
Arsenic	3	1.10	2.71	90.23%	3.81	126.90%	8.33%	0.23	7.52%	1.33	44.19%
Antimony	5000	-	2.71	0.05%	-	-	3.83%	0.10	<0.01%	-	-
Chromium	5000	39.00	2.71	0.05%	41.71	0.83%	30.67%	0.83	0.02%	39.83	0.80%
Chromium (VI)	0.2	7.80	2.71	1353.4%	10.51	5253.4%	0.04%	0.00	0.59%	7.80	3900.59%
Cobalt	-	0.92	2.71	-	3.63	-	1.87%	0.05	-	0.97	-
Copper	10000	33.00	2.71	0.03%	35.71	0.36%	9.67%	0.26	<0.01%	33.26	0.33%
Lead	250	16.00	2.71	1.08%	18.71	7.48%	16.77%	0.45	0.18%	16.45	6.58%
Manganese	150	36.00	2.71	1.80%	38.71	25.80%	20.00%	0.54	0.36%	36.54	24.36%
Nickel	20	14.00	2.71	13.53%	16.71	83.53%	73.33%	1.99	9.93%	15.99	79.93%
Vanadium	5000	1.70	2.71	0.05%	4.41	0.09%	2.00%	0.05	<0.01%	1.75	0.04%

Notes:
(1) Metal as maximum percentage of the group 3 BAT-AEL, as detailed in Environment Agency metals guidance document (V.4) Table A1.

Table 33: Short-Term Metals Results – Point of Maximum Impact

Metal	AQAL	Background conc.	Metals emitted at combined metal limit				Metals emitted no worse than a currently permitted facility				
			PC		PEC		Metal as % of ELV [(1)]	PC		PEC	
	ng/m³	ng/m³	ng/m³	as % AQAL	ng/m³	as % AQAL		ng/m³	as % AQAL	ng/m³	as % AQAL
Arsenic	-	2.20	63.80	-	66.00	-	8.33%	5.32	-	7.52	-
Antimony	150,000	-	63.80	0.04%	-	-	3.83%	2.45	<0.01%	-	-
Chromium	150,000	78.00	63.80	0.04%	141.80	0.09%	30.67%	19.56	0.01%	97.56	0.07%
Chromium (VI)	-	15.60	63.80	-	79.40	-	0.04%	0.03	-	15.63	-
Cobalt	-	1.84	63.80	-	65.64	-	1.87%	1.19	-	3.03	-
Copper	200,000	66.00	63.80	0.03%	129.80	0.06%	9.67%	6.17	<0.01%	72.17	0.04%
Lead	-	32.00	63.80	-	95.80	-	16.77%	10.70	-	42.70	-
Manganese	1,500,000	72.00	63.80	<0.01%	135.80	0.01%	20.00%	12.76	<0.01%	84.76	<0.01%
Nickel	-	28.00	63.80	-	91.80	-	73.33%	46.79	-	74.79	-
Vanadium	1,000	3.40	63.80	6.38%	67.20	6.72%	2.00%	1.28	<0.01%	4.68	0.47%

B Updated emission points drawing

C Air Emissions Management Plan

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