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Schedule 5 Response

Document approval

	Name	Signature	Position	Date
Prepared by:	Katie Hampton		Environmental Consultant	30/03/2021
	Stuart Nock		Associate Senior Consultant	30/03/2021
Checked by:	James Sturman		Lead Consultant	01/04/2021

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1 Air quality assessment

1. In tables 23 and 24 of the air quality report some of the figures for hydrogen chloride and hydrogen fluoride appear to have become mixed up. Please check the figures and provide an amended table.

The corrected rows from tables 23 and 24 for hydrogen chloride and hydrogen fluoride are presented below.

Table 23: Dispersion Modelling Results – Point of Maximum Impact - Daily BAT-AELs

Pollutant	Quantity	Units	AQAL	Background conc.	Process Contribution (PC)					Max PC		PEC	
					2015	2016	2017	2018	2019	Conc.	as % of AQAL	Conc.	as % of AQAL
Hydrogen chloride	Hourly mean	µg/m ³	750	1.42	1.30	1.28	1.27	1.31	1.29	1.31	0.17%	2.73	0.36%
Hydrogen fluoride	Annual mean	µg/m ³	16	2.35	0.01	0.01	0.01	0.01	0.01	0.01	0.05%	2.36	14.73%
	Hourly mean	µg/m ³	160	4.70	0.22	0.21	0.21	0.22	0.21	0.22	0.14%	4.92	3.07%

Table 24: Dispersion Modelling Results – Point of Maximum Impact - Short-Term ELVs

Pollutant	Quantity	Units	AQAL	Background conc.	Process Contribution (PC)					Max PC		PEC	
					2015	2016	2017	2018	2019	Conc.	as % of AQAL	Conc.	as % of AQAL
Hydrogen chloride	Hourly mean	µg/m ³	750	1.42	13.0	12.8	12.7	13.1	12.9	13.1	1.74%	14.49	1.93%
Hydrogen fluoride	Hourly mean	µg/m ³	160	4.7	0.87	0.85	0.84	0.87	0.86	0.87	0.54%	5.57	3.48%

Note:

All emissions at the half-hourly ELVs.

2. In table 31:

- some of the environmental standards (ES) for short term metals are not correct.
- As and Cr(VI) are included even though these only have long terms ES.

Provide an amended table.

A corrected version of table 31 is presented below. Although a number of Group III Metals do not have long-term environmental standards, the PC and PEC for all metals has been reported for completeness.

Table 31: Short-Term Metals Results – Point of Maximum Impact

Metal	AQAL (ng/m ³)	Background conc. (ng/m ³)	Stage 1 assessment			
			PC		PEC	
			ng/m ³	as % AQAL	ng/m ³	as % AQAL
Arsenic	-	2.20	65.34	-	67.54	-
Antimony	150,000	3.60	65.34	0.04%	68.94	0.05%
Chromium	150,000	78.00	65.34	0.04%	143.34	0.10%
Chromium (VI)	-	15.60	65.34	-	80.94	-
Cobalt	-	1.84	65.34	-	67.18	-
Copper	200,000	66.00	65.34	0.03%	131.34	0.07%
Lead	-	36.00	65.34	-	101.34	-
Manganese	1,500,000	72.00	65.34	0.004%	137.34	0.009%
Nickel	-	48.00	65.34	-	113.34	-
Vanadium	1,000	3.40	65.34	6.53%	68.74	6.87%

2 BAT conclusions

3. **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) 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). 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 NO_x 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 NO_x generation from the use of FGR. However, other grate suppliers have focussed on reducing NO_x 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 NO_x abatement for the Facility. The proposed designs do not currently include for FGR. However, it is requested that a pre-operational condition is included within the permit to allow the details of the system to be confirmed during the detailed design of the Facility.

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 SO_x in MSW flue gases, which can attack the steel in the (cool) metal tubes of the heat exchanger. The design boiler has assumed a flue gas temperature of approximately 160°C at

the exit of the boiler, prior to the hot gases passing to the flue gas treatment system. As this temperature is below 180°C, this introduces a higher possibility for corrosion risks. It is acknowledged that it is possible to use heat exchangers made of special materials such as enamel 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 the system to be re-designed and may introduce additional capital costs.

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, can accept flue gas temperatures of around 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 is expected to be approximately 160°C, and assuming a minimum required temperature of 130°C for the FGT process, this would only allow for a maximum temperature 'loss' of 30 °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 exit resulting from the use of additional heat exchangers may affect plume buoyancy and dispersion of emissions, result in more visible condensed plumes and introduce the risk of stack corrosion.

Finally, the results of the Cost-Benefit Analysis (CBA) presented within the CHP assessment (refer to Appendix G of the Application) concludes 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 export of heat.

Taking the above into consideration, the use of a low-temperature heat exchanger is not considered to represent BAT due to the corrosion risks, potential to increase capital costs, potential to affect the efficiency and operation of the FGT system, potential to affect dispersion and introduce a visible plume, and taking into account the current unviable opportunities for heat export from the Facility.

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.

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. This could result in increased odour emissions and odour risks from waste during periods of shutdown.

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 would provide a higher level of abatement than either system alone, however the operating and maintenance costs and also reagent consumption would be higher.

It is considered to represent BAT to use a dry sorbent injection system to abate acid gases, as justified within section 2.6.3 of the supporting information. 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; include consideration of catalytic filter bags either in place of or in addition to the SNCR system. [note: you considered them under BAT 30 but not BAT 29]**

Catalytic filter bags have the potential to reduce emissions of dioxins and furans, as well as NO_x 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 NO_x. 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 135°C, as stated within the Air Quality Assessment submitted with the application. Therefore, the flue gases would not be at a high enough temperature for treatment in catalytic filter bags regardless of what stage in the FGT process they are used.

- **BAT 33 row d**

Technique (d) within BAT 33 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.

3 EPR 5.01

4. Confirm whether the reception hall doors will be self-closing.

The entry and exit doors to the tipping hall will be fast-acting folding or roller shutter doors. The doors will be kept closed except when a vehicle is travelling through them. The doors will be controlled automatically by the traffic management system; and, therefore, will be self-closing. It will also be possible to manually override the doors from the plant control room if required.

5. For boiler design. Confirm whether the following will be used and justify if not:

- **Section 2.10, point 4, bullet 1**

Point 4 relates to good design and operation of the boiler to ensure sufficient dioxin control, through maximising the rate of decrease of gas temperature. Bullet 1 states this can be achieved by *“ensuring that the steam/metal heat transfer surface temperature is a minimum (around 170°C) where the flue gas is in the de novo synthesis temperature range, subject to acid dew point considerations”*. It can be confirmed that the design of the boiler will ensure this criteria is met.

- **Point 6 bullet 1**

Point 6 relates to control methods for reducing boiler deposits which would otherwise catalytically enhance dioxin formation. Bullet 1 describes design features to maintain critical surface temperatures below the ‘sticking’ temperatures, including optimising the arrangement of cooling surfaces and avoiding peak combustion temperatures through good waste mixing, uniform waste feed and good primary and secondary air control.

It can be confirmed that the boiler will be designed to optimise the arrangement of cooling surfaces. Waste will be mixed within the bunker to ensure a homogeneous fuel feed to the furnace. Finally, primary and secondary air control will be optimised, as detailed within the response to question 3. Therefore, it is understood that the Facility will meet the requirements detailed in EPR5.01

- **Point 6 bullet 3 in relation to on-line cleaning**

Online boiler cleaning will be achieved through the installation of cleaning systems within the boiler that are capable of operating when the Facility is in operation. The exact specifications of the boiler cleaning systems will be subject to the detailed design of the Facility; however, it is expected that these will include the following elements:

1. water spray cleaning in the radiative passes;
2. pneumatic rapping systems for cleaning of any horizontal boiler sections; and
3. shockwave generators or soot-blowers for cleaning of any vertical boiler sections.

Additional off-line boiler cleaning will also be undertaken as part of scheduled maintenance activities.

4 Water emissions

6. **Provide an H1 risk assessment for the water discharge to sewer for hazardous pollutants. [Note: This is to cover risk of pollutants from bottom ash either as solids or dissolved being emitted to sewer]**

As stated in section 1.4.6 of the Supporting Information, it is currently intended to discharge any excess process effluents to sewer in accordance with a Trade Effluent Consent. Discussions with the Sewerage Undertaker are ongoing. If a consent cannot be obtained, the excess effluents will need to be tankered off-site for treatment at a suitably licensed facility. Therefore, the arrangements for the discharge of process effluents will be subject to detailed design of the Facility.

It is acknowledged that process effluents could include run-off from the ash handling and storage areas. Effluents from the ash handling and storage areas would be significantly diluted by other process effluents such as washdown water that are present in the wastewater pit. Therefore, the amount of process effluent resulting from ash handling discharged to sewer would be minimal compared to the overall volume of effluent discharged to sewer and would be highly diluted.

Notwithstanding the above, an H1 assessment has been undertaken for the discharge of process effluents to sewer from the Facility – refer to Appendix A. The values and substances used in the assessment have been derived from representative data for a comparable EfW plant. It should be noted that the monitoring data reports concentrations of total chromium; to ensure that the assessment is suitably conservative it has been assumed that chromium III and IV are released at the monitored concentration value for total chromium.

Sewage treatment reduction factors (STRF) have been applied to the concentrations associated with the release of the effluents in accordance with Appendix B of EA guidance document H1 Annex D. It has been assumed that the process effluent discharged to sewer will be treated in a nearby wastewater treatment works before being discharged to the nearby River Don.

The monitoring data also included for the following substances which have not been included within the H1 assessment as no Environmental Quality Standards (EQS) are available for these substances:

- Chemical Oxygen Demand (COD);
- Oils and grease;
- Suspended solids; and
- Phosphate.

The assessment assumes continuous discharge of process effluent from the Facility at the maximum allowable flow rate from the reference monitoring data. This results in a highly conservative assessment as process effluents will not be discharged continuously from the Facility.

During normal operation, the Facility will not generate process effluents and will be a net consumer of water. Excess process effluents are only likely to be generated (and discharged) during periods of shutdown, maintenance and emptying of the boiler. Therefore, long-term impacts are not considered to be applicable to the proposed arrangements for the discharge of process effluent from the Facility. Nevertheless, the long-term impacts have been included to allow for a conservative assessment.

Test 1 of the assessment determines whether the concentration of the substance in the discharge exceeds 10% of the EQS. The test is designed to quickly screen out substances that cannot cause more than 10 percent deterioration in the watercourse, even if it receives no dilution.

The results of Test 1 of the H1 assessment (for discharges to rivers) are presented in the table below:

Table 1: H1 assessment results – Test 1

Substance	Annual average EQS			Short-term (MAC) EQS		
	Release concentration (µg/l)	EQS (µg/l)	Release <100% EQS?	Release concentration (µg/l)	MAC (µg/l)	Release <100% EQS?
Ammonia	3210	300	Fail	3210	-	N/A
Chromium III	4.16	4.7	Fail	4.16	32	Fail
Chromium VI	4.16	3.4	Fail	4.16	-	N/A
Copper	5.44	1	Fail	5.44	-	N/A
Cyanide	6.4	1	Fail	6.4	5	Fail
Iron	1400	1000	Fail	1400	-	N/A
Nickel	11.88	20	Fail	11.88	-	N/A
Silver	0.8	0.05	Fail	0.8	0.1	Fail
Sulphate	34800	400000	Pass	34800	-	N/A
Zinc	24.7	8	Fail	24.7	-	N/A

Note: Concentrations include STRF

As can be seen from the results above, all pollutants fail Test 1 with the exception of sulphate. Therefore, these pollutants have been carried over onto the next stage of assessment.

Test 2 determines whether the process contribution (PC) exceeds 4% of the EQS and takes into account the dilution available in the receiving watercourse. PC is the concentration of a discharged substance in the receiving water after dilution.

The PC is calculated as follows:

$$PC = \frac{(EFR \times RC)}{(ERF + RFR)}$$

where:

- PC = Process Contribution (µg/l);
- EFR = Effluent Flow Rate (m³/s);
- RC = Release Concentration of the pollutant in the effluent (µg/l); and
- RFR = Q95 River Flow Rate (m³/s).

Data on river flow rates was obtained from the National River Flow Archive (NRFA) for the Don at Doncaster monitoring station.

The results of Test 2 of the H1 assessment are presented in the table below:

Table 2: H1 assessment results – Test 2

Substance	Annual average EQS				Short-term (MAC) EQS			
	EQS (µg/l)	PC (µg/l)	% PC of EQS	<4% ?	MAC (µg/l)	PC (µg/l)	% PC of MAC	<4%?
Ammonia	300	4.725	1.58	Pass	-	4.725	-	Pass
Chromium III	4.7	0.006123	0.13	Pass	32	0.006123	0.0192	Pass
Chromium VI	3.4	0.006123	0.18	Pass	-	0.006123	-	Pass
Copper	1	0.008008	0.8	Pass	-	0.008008	-	Pass
Cyanide	1	0.009421	0.94	Pass	5	0.009421	0.189	Pass
Iron	1000	2.061	0.21	Pass	-	2.061	-	Pass
Nickel	20	0.01749	0.09	Pass	-	0.01749	-	Pass
Silver	0.05	0.001178	0.24	Pass	0.1	0.001178	0.118	Pass
Zinc	8	0.0364	0.46	Pass	-	0.0364	-	Pass

As can be seen from the table above, for all pollutants the PC is less than 4% of the EQS/MAC, and the substances can be screened out as insignificant in accordance with the H1 guidance.

5 Fire protection plan (FPP)

7. Provide an updated FPP to cover:

- i. Managing fire water in section 13 of the FPP. Please clarify what provision of drainage for minimum of 10 minute operation of hoses and suppression systems means.**
- ii. Confirm whether fire watches of 1 per day or shift will be carried out as a minimum**

An updated Fire Prevention Plan is presented within Appendix B.

6 Back-up generator

8. For the back-up generator confirm:

i. Whether a black start or emergency generator is proposed

As stated in section 2.8.1 of the Supporting Information, a back-up emergency diesel generator will be provided to safely shut down the Facility and to provide a minimum emergency power supply to the rest of the Facility, in the event of a loss in grid connection.

The Facility will not have “black-start” capability. Black start capability would allow for start-up of the Facility without reliance on imported electricity from the local distribution network (i.e. in the event of a total loss in grid connection). A black start generator would be able to provide the full auxiliary load and hence the Facility would not need to be shut down in the event of a loss in grid connection. However, as stated, the Facility would not have this capability, and would hence require a shutdown in the event of a loss in grid connection.

ii. The size (thermal input) of the unit

The exact sizing and type of emergency generator to be used will be subject to detailed design of the Facility. However, it is expected that the generator will have a thermal capacity of approximately 6 MWth.

iii. The fuel

It is proposed to use diesel as the fuel for the emergency back-up generator.

7 Noise

9. Provide an updated version of section 2.4.6 to provide less non-committal responses. [*The current version contains statements such as ‘insulted if necessary’ and ‘noise level checks may be carried out’*].

2.4.6 – Noise

A noise assessment for the Facility is presented in Appendix C [*of the supporting information*]. The design layout and design measures have been considered to minimise the noise impacts associated with the design of the Facility.

‘Noisy’ plant items at the Facility will be installed within the main building and equipped with noise insulation appropriate to the type of plant. The air-cooled condensers have been designed to reduce noise and tonal components. Doors to the building will be kept closed when not in use in order to prevent noise emissions. A sound attenuator will be fitted to the exhaust of the flue gas ID fan to minimise noise emissions. In addition, vehicle movements at night will be limited, and regular maintenance of plant items will be undertaken.

Any mobile plant will be operated and maintained in accordance with the manufacturer’s instructions, whilst complying with the latest standards including those on noise emissions.

Noise level checks will be carried out regularly in operational areas where high noise levels are present, with early warning of increasing noise levels resulting in a noise reduction or mitigation program.

8 Odour

10. Provide an updated version of section 2.4.7 to provide less non-committal responses. [*The current version sets out measures that 'may' be used*].

2.4.7 – Odour

The storage and handling of waste is considered to have potential to give rise to odour. The Facility will be designed in accordance with the requirements of EA Guidance Note H4: Odour. The Facility will include a number of controls to minimise odour during normal and abnormal operation.

All wastes received at the Facility will be unloaded inside an enclosed waste reception hall. The waste reception hall and waste bunker area will be retained at negative pressure. Air from waste bunker area will be used as combustion air within the process. Negative pressure within the waste reception areas will minimise odorous emissions escaping the Facility.

During normal operation of the Facility, regular inspections will be undertaken to monitor for odour. Inspections will include for the following:

- olfactory checks for odour in the waste reception areas and external installation boundary;
- monitoring the positions of louvres (e.g. keeping doors shut when no waste deliveries are occurring); and
- monitoring combustion air flow, with odorous air extracted via the boiler and the stack.

During periods of shutdown, alongside the odour abatement system (described in further detail below), the frequency of the above inspections will be extended, including monitoring combustion air flow if the ID fan operation can be maintained, for instance during periods of maintenance. In addition, during shutdown, a daily 'sniff test' and inspection around the boundary of the Facility will be conducted. In the event that odour is detected outside the building, the odour abatement system will be inspected to confirm its integrity and maintenance performed as necessary.

During normal operation, bunker management procedures will be employed to avoid the development of anaerobic conditions and decomposition in the waste bunker, which could generate further odorous emissions. These management procedures will include the frequent mixing and rotation of waste to ensure regular and well distributed turnover of waste. The process also results in a more homogeneous fuel, which would increase fuel efficiency in the incineration process. During periods of shutdown, the bunker management procedures will not normally be implemented, to avoid the generation of odorous emissions especially when waste volumes within the bunker are low.

Prior to periods of planned maintenance, bunker management procedures will reduce the amount of material in the bunker before shutdown. In the event of an extended unplanned shutdown, if odour can be identified at the installation despite the abatement system being in place, the waste will be unloaded from the bunker for transfer off-site to a suitably licensed waste management facility.

Should odour be deemed an issue, for example during periods of shutdown, an odour abatement system utilising carbon filters will be implemented. This will extract potentially odorous emissions from waste storage areas and treat the air prior to release from a dedicated odour abatement stack. Further detail on the odour abatement system is provided in section 2.6.6 of the Supporting Information.

9 Containment

11. Please provide further information on the Process water storage pit:

i. Is it subsurface

The process water storage pit (or 'dirty water pit') will be a subsurface structure with the base of the pit being 1.2 m below the ground level of the pit.

ii. What measures will be used to ensure its integrity?

The process water storage pit will be designed and constructed as a concrete structure in accordance with 'Eurocode 2 – Design of Concrete Structures –Part 3 : Liquid retaining and containment structures'. The pit will have sufficient capacity to contain the quantities of process effluent expected to be generated, with additional buffer capacity provided for contingency. During construction and commissioning of the drainage systems, quality assurance checks will be undertaken on the process water pit.

Furthermore, during the operational phase of the Facility, preventative maintenance will be undertaken on the pit, which will include for emptying it and undertaking visual inspections of the concrete. Where it is identified that damage has occurred to the structure repairs will be undertaken to ensure that its integrity is suitably maintained.

12. Provide an updated version of section 2.4.5 to provide less non-committal responses. [*The section is vague on whether hardstanding and bunds will be used*]

2.4.5 – Contaminated water

All chemicals will be stored in an appropriate manner. Suitable secondary and tertiary containment will be incorporated, with further containment details for specific materials presented within section 2.2 of the Site Condition Report. External areas of hardstanding will have kerbed containment to minimise the potential for any spills to cause pollution of the ground/groundwater and surface water. The potential for accidents, and associated environmental impacts, is therefore limited.

Deliveries of all chemicals will be unloaded and transferred to suitable storage facilities. Areas and facilities for the storage of liquid hazardous materials will be situated within bunding. Bunding of liquid chemicals will have capacity to contain whichever is the greater of 110% of the tank capacity or 25% of the total volume of materials being stored, in case of failure of the storage systems.

Tanker off-loading of fuel oil and chemicals (e.g. lime, ammonia) will take place within areas where the drainage is contained with the appropriate capacity to contain a spill during delivery. Areas of hardstanding in these areas will have falls to a gully and/or sump.

Adequate quantities of spillage absorbent materials will be made available at easily accessible location(s), where chemicals are stored. A site drainage plan, including the location of process and surface water drainage will be made available on-site following completion of detailed design.

Process water drains within the Facility will drain to a 'dirty water' pit prior to re-use within the process, for example within the ash quench. Should excess process effluents be generated, these will either be discharged to sewer in accordance with a trade effluent consent or tankered off-site for treatment/disposal. The arrangements for the discharge of process effluent will be confirmed during detailed design of the Facility.

Any spillage that has the potential to cause environmental harm or to leave the installation will be reported to the site management and recorded in accordance with installations inspection, audit and reporting procedures. The relevant regulatory authorities (Environment Agency / Health and Safety Executive) will be informed if required in accordance with the Facility's documented management procedures.

In the event of a fire, contaminated water used for fighting fires will be collected through the drainage systems. The primary source of firewater containment will be the waste bunker. Site drainage for external areas will be fitted with an isolation valve to prevent the discharge of contaminated water from the surface water drainage system in the event of a fire. Sufficient storage capacity for external firewater will be available from both site kerbing and the underground SUDS storage.

In accordance with the emergency response procedures which will be developed for the Facility, spillages will be reported to the site management and a record of the incident will be made. The relevant authorities (Environment Agency / Health and Safety Executive) will be informed if spillages/leaks are significant. The effectiveness of the emergency response procedures will be subject to Management Review and will be revised and updated as appropriate following any major spillages.

13. Bunker and groundwater risk assessment:

i. Please clarify whether bunker design has changed since the 2013 groundwater risk assessment

The dimensions of the 2013 bunker design and current bunker design are as follows:

- 2013 bunker design: 30m length x 24m width x 8m depth.
- Current bunker design: 37.5 m length x 25m width x 8m depth.

As can be seen from the dimensions above, the layout of the bunker has undergone some minor changes since 2013, however the designs of the overall structure are comparable. The depth of the bunker into the underlying geology and groundwater has not changed.

ii. Submit a copy of the risk assessment if still valid

Although the dimensions of the bunker have changed slightly since the 2013 design, the depth of 8m has remained the same. Therefore, details pertaining to the underlying geology and hydrogeology outlined in the groundwater risk assessment are still considered to be applicable to the proposed design.

The conceptual hydrogeological site model set out within the assessment, which adopts the source-pathway-receptor approach, does not change with the updated dimensions to the bunker.

In addition to the above, the following bunker design details outlined in the groundwater risk assessment remain valid with the updated design of the Facility:

- construction materials and impermeability;
- strength;
- constructability;
- handling and management of stored materials;
- maintenance; and
- excavation and construction precautions.

Taking the above into consideration, it is considered that the conclusions of the 2013 groundwater risk assessment are still applicable to the updated design of the Facility. As requested, a copy of the risk assessment is attached for reference – refer to Appendix C.

10 Capacity

14. For plant capacity please confirm:

- i. **The maximum plant capacity in tonnes per hour. [Section 1.3 of the supporting document states 384,000 tonnes per year for 8,000 hours which equates to 48 tonnes per year but the firing diagram shows a maximum of 48.7 tonnes per year]**

An error was made in the Supporting Information when calculating the capacity for the Facility. In accordance with the maximum hourly throughput on the firing diagram, the capacity should be calculated as follows:

$$48.7 \text{ tonnes per hour} \times 8,000 \text{ hours} = 389,600 \text{ tonnes per annum}$$

Therefore, the capacity of the Facility should be 389,000 tonnes per annum, assuming an NCV of 7.5-9 MJ/kg and an operational availability of 8,000 hours per annum.

- ii. **Whether the dispersion modelling accounts for running at 48.7 tonnes per hour with the lowest CV.**

The dispersion modelling is based on the thermal capacity/input to the boiler of 120 MWth. This is the thermal capacity of the boiler as shown in the Firing Diagram presented in Appendix A of the Application. As stated in section 6.3 of the Air Quality Assessment, the model inputs were 'based on the combustion of 37.6 tonnes per hour of residual waste with a net calorific value of 11.5 MJ/kg' – this equates to a thermal input 120 MWth.

As shown in the firing diagram the boiler is designed to process waste with a range of NCV's (7.5-14 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. Assuming that the Facility processes 48.7 tph of waste with an NCV of 9MJ/kg, the boiler will have a thermal input of 120MWth. Therefore, whilst a processing capacity of 48.7 tph has not been specifically modelled, it is within the design parameters which have been used to determine the model inputs.)

A H1 assessment

B Updated Fire Prevention Plan

C 2013 Groundwater Risk Assessment

ENGINEERING  CONSULTING

FICHTNER

Consulting Engineers Limited

Kingsgate (Floor 3), Wellington Road North,
Stockport, Cheshire, SK4 1LW,
United Kingdom

t: +44 (0)161 476 0032

f: +44 (0)161 474 0618

www.fichtner.co.uk