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GENT FAIRHEAD & CO LIMITED
RIVENHALL IWMF
SCHEDULE 5 RESPONSE

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

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1 ENVIRONMENTAL RISK ASSESSMENT

(1) The Applicant states that the treated water from the waste water treatment plant (WWTP) is to be analysed prior to release to the Upper Lagoon. Please state what parameters will be tested, the limits proposed and the frequency of testing.

Treated water from the wastewater treatment plant (WWTP) will be analysed by on-line instrumentation supplemented for key operational parameters and verified by spot sampling for calibration purposes and flow weighted composite sampling prior to storage in the WWTP holding tanks and subsequent release to the Upper Lagoon (or recirculated into the Pulp Plant). The testing regime will focus on parameters that affect supply quality requirements for the Pulp Plant's de-inking process and the WWTP's delivery of treated water to the closed loop process. Treated water will be fed into Upper Lagoon from one of three interchangeable WWTP holding tanks,

In the unlikely event that the treated water does not meet the required quality standards, the out of specification water will be stored in the Holding tank(s) and returned through the WWTP for further treatment.

The WWTP facility will be equipped with an on-site laboratory to perform analyses for instrument calibration and routine spot sample. Some parameters will be analysed on a more frequent basis following a risk-based approach as necessary to assure compliance.

The composite sample of treated water will be tested on a daily basis for the parameters and quality limits set out in Table 1.

Table 1 – Quality limits for treated waters released from the WWTP into the Upper Lagoon

Parameter	Units	Quality Limits
Major ions		
pH	pH Units	7-9
Conductivity at 20C	US/cm	850
Chloride	mg/l	60
Sulphate as SO4	mg/l	75
Alkalinity to pH 4.5 as CaCO3	mg/l	100
Calcium	mg/l	75
Magnesium	mg/l	9
Sodium	mg/l	50
Potassium	mg/l	7
Organic indicators		
Chemical Oxygen Demand (COD)	mg/l	20
BOD 5 Day ATU	mg/l	2
Aesthetic etc		
Temperature range/ Set-point	deg. C	15 max.
Solids, Suspended at 105 C	mg/l	15

Table 1 – Quality limits for treated waters released from the WWTP into the Upper Lagoon		
Parameter	**Units**	**Quality Limits**
Turbidity	NTU	5
Colour, Filtered	Hazen	12.5
Silica, as SiO2	mg/l	5
Nutrients		
Ammoniacal Nitrogen as N	mg/l	0.10
Nitrate as N	mg/l	10
Total phosphorus, as P	mg/l	0.20
Toxic anions		
Fluoride	mg/l	0.3
Cyanide as CN	mg/l	0.003
Metals		
Aluminum	ug/l	250
Antimony	ug/l	0.4
Arsenic	ug/l	1
Barium	ug/l	35
Cadmium	ug/l	0.03
Chromium	ug/l	0.5
Copper	ug/l	2.5
Iron	ug/l	600
Lead	ug/l	0.9
Manganese	ug/l	40
Mercury	ug/l	0.01
Molybdenum	ug/l	1.5
Nickel	ug/l	2
Selenium	ug/l	0.5
Thallium	ug/l	1
Tin	ug/l	2
Vanadium	ug/l	2
Zinc	ug/l	10
Trace organics (1)		
Biocides etc eg FAS	ug/l	0.1
Surfactants	ug/l	0.1
Polymeric coagulants	ug/l	0.1
Notes: NTL = Non- Toxic limit		

In addition to the above, continuous on-line analysis supported by spot samples will be recovered and tested by the WWTP operator at various stages of the water treatment process. This will allow the wastewater treatment process to be reviewed and refined with any abnormalities detected early to assure compliance with the required process quality standards.

(2) Given the proximity of the CHP plant and the AD facility, please describe the risk assessment that will be undertaken under the Dangerous Substances and Explosive Atmospheres Regulations (DSEAR). How will the recommendations be incorporated into the final site accident management plan?

Reason for question: The information is not provided in the Application.

The integrated environmental management system (EMS) for the IWMF will include an accident management plan that will follow Health & Safety Executive (HSE) guidance. The accident management plan will be part of the Emergency Preparedness and Response Plan described in section 4.4.7 of GFC's draft EMS manual presented in Annex 11 of the EP Application. This will include:

- Identifying what dangerous substances are present on the IWMF and the risks associated with them;
- Identifying and implementing the control measures to either remove the risks or control them to within acceptable limits;
- Putting controls in place to reduce the effects of any incidents involving dangerous substances;
- Creating and putting in place plans and procedures to deal with accidents, incidents and emergencies involving any dangerous substances;
- Ensuring that employees are properly trained and informed on the control of the risks from the dangerous substances identified; and
- Identifying and classifying areas of the Facility where explosive atmospheres may occur and ensuring that no ignition sources are present in those areas

The IWMF will be subject to a detailed site wide DSEAR (The Dangerous Substances and Explosive Atmosphere Regulations 2002) study to ensure that the engineering and process design complies with the appropriate regulations that cover dangerous substances and explosive atmospheres. This will be incorporated into the various independently chaired HAZOP (Hazard and Operability) studies that will be necessary to ensure that risks are eliminated or mitigated to acceptable levels by good layout design.

The recommendations of the risk assessment and HAZOP study will result in the appropriate designation of explosion zones, and the detailed specification for any equipment that has to operate within such areas to be appropriately ATEX (Atmosphères Explosibles) rated. This will also feed into O&M (Operations and Maintenance) plans, and the need for site operational procedures (SOPs), including special works permits and method statements, developed and incorporated into O&M manuals for the different waste treatment processes. The SHEQ Manager (refer to the draft GFC Organisation Structure in Annex 11 of EP Application) will be responsible for incorporating the results of the studies into the accident management plan described above. Operation and maintenance staff will be trained in such procedures and made specifically aware of any residual risks that could not be fully eliminated by design.

2 PEST MANAGEMENT PLAN

(3) Please confirm the frequency of the periodic visits /inspections by the specialist pest control contractor to identify potential indicators of pest infestations and fly monitoring.

Reason for question: It is not clear in the Application.

Planned visits/inspections by the Ecological Clerk of Works and specialist pest control contractor will be on a monthly basis.

In addition to the monthly planned visits by the pest controller, daily site checks will be undertaken by site operatives. If the daily checks identify that there is an infestation of pests, the frequency of planned visits will be increased until the infestation has been controlled and the cause of the infestation removed.

3 BACK-UP GENERATOR

(4) Please confirm whether the back-up generators referred to in sections 1.3.4.6 and 1.3.7.2 are the same.

The back-up generator(s) referred to in section 1.3.4.6 are the same as the generator(s) referred to in section 1.3.7.2.

(5) It is stated in the application that the thermal input of the back-up generators is 5 MW. How many back-up generators are proposed for the installation?

Reason for question: It is not clear in the Application.

The current design is for a single back-up generator rated at 2 MVA, however it should be noted that this is subject to detailed design and there may be multiple smaller generators. At full load, thermal input from diesel fuel will be approximately 5 MW.

There may be a single generator or multiple smaller generators, depending on detailed design of the IWMF. The design of systems will ensure that there will be sufficient back-up power to energise all control systems for all the waste treatment facilities to ensure a safe shut down and continuing environmental control in the event of loss of grid connection.

4 CHP PLUME MANAGEMENT

(6) Please provide the CHP plume management plan referred to in the application.

Reason for question: The information is not provided in the Application.

The CHP Management Plan for Plume Abatement ("CHP Plume Management Plan"), is a requirement of Condition 17 of the planning permission. The current CHP Plume Management Plan was approved by Essex County Council (ECC) on 26 February 2016.

The design of the flue gas abatement system has recently been changed from sodium bicarbonate to hydrated lime – as per the design set out in the EP application – and this took place after the current CHP Plume Management Plan was approved. The operational proposals associated with the CHP Plume Management Plan have been updated to reflect the change to hydrated lime within the flue gas abatement system and will be submitted to ECC to vary Condition 17 to ensure there is no visible plume from the stack.

The CHP Plume Management Plan which will be submitted to ECC to reflect the latest proposals to mitigate the visual plume from the installation is presented in Appendix A. Please note that, for planning permission purposes, this CHP Plume Management Plan is subject to approval from ECC following submission of an application to vary the currently approved CHP Plume Management Plan under Condition 17. The Environment Agency will be a Statutory Consultee during this process.

5 SITE SURFACE WATER STREAMS

(7) Please provide clarification on section 2.3.4 – separate process effluent and storm water systems (surface drainage). What is the destination of storm waters? Where does storm waters collect and discharge to?

Reason for question: It is not clear in the Application.

The following should be read in conjunction with the subsequent answers to Questions 8 to 10, all relating to water use at the IWMF.

It is confirmed that, the proposed 'zero discharge to water' referred to in section 2.3.4, means that there will be no point emission to controlled waters (particularly the River Blackwater – direct or indirect), groundwater or public sewer from the IWMF.

This is achieved by two principal means:-

(1) controlled abstraction of water from the River Blackwater to supplement process water from the Upper Lagoon only when necessary; (the answer to Q9 below explains in more detail how excess river abstraction water is available above that which is actually required, so abstraction quantities can be controlled/reduced to suit IWMF process needs dependent upon available water in the Upper Lagoon);

(2) in the event of potential storm-water rainfall exceeding the process use of water from the Upper Lagoon, the Lagoon has been designed with a freeboard capacity in excess of that needed to retain a 1 in 100 yr storm event (also explained in more detail in answer to Q9 below).

As stated in section 2.4.4 of the Supporting Information:

> *The IWMF will give rise to surface water run-off from roads, vehicle parking areas, building roofs, hard-standings and hard landscaped areas. Surface water run-off from these areas will be discharged to the Upper Lagoon which is adjacent to the IWMF.*

The drainage plans, as approved by ECC, were presented in Annex 1 of the EP application (they are re-produced in Appendix B for reference). As can be seen from these drawings, surface water run-off (storm water) will be collected in the site drainage system and pumped from the surface water drainage collection sump (reference: SPS2) into Upper Lagoon, from where it is used in the IWMF processes. The treated process water from the WWTP is transferred from its holding tanks to the Upper Lagoon via a dedicated pumped main, for later recirculation back into the process.

6 DISCHARGES TO CONTROLLED WATERS – RIVER BLACKWATER

(8) The Application is for a "closed loop system" with respect to water use and handling at the IWMF. Please confirm that there will be no discharges of any "water streams" from the IWMF to the River Blackwater. Water streams mean uncontaminated rainwater from roofs, site surface run-off, treated and untreated process water /effluent).

Reason for question: It is not clear in the Application.

It is confirmed that, the proposed 'zero discharge to water' referred to in section 2.3.4, means that there will be no point emission to controlled waters (particularly the River Blackwater – direct or indirect), groundwater or public sewer from the IWMF.

As stated in section 2.3.4 of the Supporting information:

> *'The water system will be designed to ensure that there are 'zero' discharges to water from the installation.'*

Furthermore, the EP application also explains the arrangements within the facility for the treatment of process effluent generated by the facility, with the treated effluent from the wastewater treatment plant being discharged into the Upper Lagoon to enable it to be reused within the IWMF. There will be no discharge of treated effluents from the IWMF into the River Blackwater.

In response to some earlier planning queries GFC confirmed the zero discharge to controlled waters (as above) but explained that the option to apply for a discharge licence always exists. In the event an application for a discharge licence is submitted to the EA, it would be subject to a detailed assessment, and would require further planning approval in conjunction with any new EA licence. These are not the subject of the current applications. Any discharge application (for any UK site) has to comply with the European Water Framework Directive, whereby any discharge must not have a detrimental effect on the receiving bodies, i.e. it would need to be of an equivalent or better water quality standard than the water that already flows down the River Blackwater.

7 WATER USE

(9) Given that the total available supply of water exceeds the water demand, please explain your contingency plan in the event that there is continuous water surplus at the IWMF. How will excess water be managed at the facility?

Abstraction of water from the river will be demand led, and carefully managed to eliminate as far as possible the circumstances where there will be excess water at the IWMF. Water will be managed at the facility by controlling and limiting pumping operations between the River Blackwater to New Field Lagoon, and from New Field Lagoon to Upper Lagoon. The design of the Installation and the Upper Lagoon have taken full account of extreme weather rainfall events.

Water for use within the facility is sourced and supplied from the River Blackwater under Abstraction Licence Serial No: AN/037/0031/001/R01 and stored in New Field Lagoon.

The conditions of the abstraction licence are:

- Water abstraction at NGR TL 8343 2223 from a pumping sump with two pumps with a combined capacity of not more than 100l/sec, which will be used for filling reservoirs for the subsequent purpose of process water for waste treatment, processing and recycling;
- The maximum quantity of water to be abstracted up to:
  - 360m^3/hr;
  - 8,640m^3/d; and
  - 250,000m^3/yr.
- No abstraction of water is permitted when the flow in the River Blackwater (as gauged by the Agency) at Appleford Bridge gauging station (NGR TL 845 158) is equal or less than 1,309l/sec (1.309m^3/s).
- No abstraction of water can take place until the Licence holder has provided a storage facility, capable of storing at least 250,000m^3 of water which is constructed or lined so that it remains impermeable. (i.e. New Field Lagoon)

Water that is held in New Field Lagoon is pumped into Upper Lagoon as the IWMF process demands. Upper Lagoon will provide the day-to-day water required by the IWMF, and will have a storage capacity of approximately 25,000 m^3 at its operational maximum water level of 32mAOD.

The design of Upper Lagoon considered a storm event 24-hr in duration with an annual probability of occurrence of 1% (e.g. the 100-yr event) with an additional allowance of 10% for climate change. The design includes storm water attenuation (freeboard) in excess of the required 20,481m^3 of storm water storage above its maximum operating level of 32mAOD. This freeboard capacity will prevent flooding of the adjacent roads and floors of the IWMF.

In the event of a continuous storm, water is managed by stopping the abstraction and pumping operations from the River Blackwater and the New Field Lagoon, and storm water flood attenuation storage is provided within Upper Lagoon for the IWMF site.

There will be no point source emission to controlled waters (particularly the River Blackwater – either direct or indirect), groundwater or public sewer from the IWMF.

There will be no gravity or pumped discharge from New Field Lagoon into the River Blackwater, nor any other local public surface water systems, as there is considerable freeboard available in New Field to attenuate 1 in 100 yr storms without flooding the adjacent access road, or the IWMF, the quarry processing area or any of the surrounding land.

Following a storm water event, no water will be pumped from the River Blackwater or New Field Lagoon into Upper Lagoon until water levels within Upper Lagoon have returned to normal operating level of 32 m AOD.

(10) The water flow diagram indicates that 88.8 m^3 per day will be used for the quenching of incinerator bottom ash (IBA). Please explain how the resultant water used to quench IBA is managed. What is the destination of this resultant water stream following quenching of IBA?

Reason for question: It is not clear in the Application.

Water is supplied from the ash water basin to maintain a constant level in the IBA extractor/quench bath. This cools the IBA prior to it being conveyed to the ash bunker. The heat transferred from the IBA to the water will cause some of the water to evaporate. This will be fed into the furnace from where it is released at the stack with the combustion flue gases. The rest of the water will be absorbed into the IBA. Some residual moisture will evaporate inside the CHP Plant as the IBA is conveyed to the ash bunker. This water vapour will be drawn into the secondary air intake at the top of boiler house as part of the combustion air for the boilers. If there is any free water which accumulates at the IBA bunker, this will drain into the IBA drainage system and be recirculated back into the ash water basin, as shown in the drainage drawings presented in Appendix B.

During maintenance operation when quench water needs to be cleared, it will be tankered off site to a licensed facility.

8 STACK HEIGHT ASSESSMENT – ANNEX 12

All of the questions in this section are addressed in the revised Stack Height Justification Annex, included as Appendix C. In order to provide appropriate context for the answers, please note that we have made some additional amendments to the Stack Height Justification Annex. In particular, due to the addition of some information and the removal of other information, we have reordered section 2 of the Annex so that the document has a clearer flow, which means that some of the tables have been renumbered, and we have added some additional figures. However, the conclusion of the assessment remains unchanged.

Please provide a revised stack height assessment (Appendix 12) to address the following points:

(11) The figures given for the NOx annual mean process contribution (PC) as a percentage of the ES for the 40 metres stack height in Tables 2.1 and 2.2 are different. Please provide an explanation with respect to the different figures. If this is an error, please provide the corrected figures.

The figures in the original Table 2-1 (now Table 2-4) included the gas engines but the figures in the original Table 2-2 (now Table 2-1) did not. This has been corrected so that all figures include all emission sources. Both Tables present information relating to the wider range of stack heights and appropriate values are now both the same.

(12) Please revise the costs associated with the stack and provide:

- **The total capital costs (including the bottom 20 metre of the stack and the foundations) associated with building the stack) at each respective height (25 metres to 95 metres); and**
- **The associated maintenance costs.**

In your response, please do not include the SNCR reagent costs. We would like to see one set of consistent figures used in all parts of the assessment (Appendix 12) and the accompanying spreadsheet.

The costs already included the points requested. The SNCR costs have been removed from the assessment. In addition, the ammonia consumption and global warming potential sections have been simplified, as these do not change with the stack height. The assessment is now only focussed on the stack height.

(13) Following on from question 12, assuming that the total capital and maintenance costs are the only costs associated with the stack itself, provide the annualised costs using a discount rate (described in the application as rate of return) of 3.5% over a period of 30 years. The annualised costs should be worked out for each height (25 metres to 95 metres) with the marginal abatement cost calculated as the difference in total annualised costs between each stack height.

The original stack height justification had used a discount rate of return of 9% to be consistent with the EA guidance H1. The assessment has been updated to include a discount rate of return of 3.5% as requested. The revised annualised costs can be found in the new Table 2-3 and all figures and analysis have been updated to use the new costs.

(14) Following on from question 12, please provide an explanation for the difference in the stack height costs in Appendix 12 between Tables 2.1 and 2.3 and the accompanying spreadsheet. Please also check the calculation in Table 2.3. In your response, please present the costs in pounds sterling (£) with the exchange rate made clear.

The inconsistencies were due to revised quotations being received just before the document was released, and inconsistencies in the exchange rate. All costs are now consistent, with a consistent exchange rate.

(15) Please include stack heights of 65, 75, 85 and 95 metres above surrounding ground level in the additional analysis undertaken in sections 2.2 to 2.4.

This has been done. The new information is included in the new Table 2-1 and Table 2-2.

The marginal cost assessment section was originally used to screen out stack heights above 55 metres from the additional analysis. To enable the additional stack heights to be considered in the additional analysis, we have moved the marginal cost assessment from section 2.1 to section 2.4, as well as adding some further explanation of the analysis approach to this section. We have also included information on stack heights of 25m and 30m in Table 2-1 and Table 2-2 for completeness and for consistency with the response to question 12.

(16) We have compared Figure 4 and 5 in the previous and most recent version of the Appendix 12 document. Whilst the stack height of the proposed facility has been amended to include the total height, the stack heights of other plants have remained unchanged. Please provide a revised Figure 4 and 5 using "stack heights above surrounding ground levels" for all plants instead of "total heights".

Reason for question: The information is not provided in the Application.

Section 3.4 of the stack height justification document has been expanded to include the information requested, but the original information has also been retained as these are important to illustrate the explanations offered in the report. Additional figures have been added, showing both "stack heights above surrounding ground levels" and "total heights". Since an additional Figure has been added earlier in the stack height justification annex, Figure 4 in the original stack height justification annex has been replaced with Figures 5 and 6, and Figure 5 in the original annex has been replaced with Figures 7 and 8 in the revised annex.

In addition, we have added Figure 9 to further illustrate and explain the relationship between building height and stack height.

9 BAT ASSESSMENT – ANNEX 6

(17) The Applicant states in section 2.4 of Annex 6 that the dry acid abatement has a lower GWP, water consumption and annualised cost. However, Table 2-6 does not seem to show this. Please review and revise this section of the BAT assessment.

A revised BAT Assessment is presented in Appendix D. There was an error in Section 2.4 of the BAT Assessment. This has been corrected. The information presented in section 2.4 is now consistent with the conclusions of the assessment.

(18) In your consideration of acid gas abatement, only sulphur dioxide and hydrogen chloride have been considered. Please include hydrogen fluoride in your assessment and resubmit.

A revised BAT Assessment is presented in Appendix D. Table 2-1 has been updated to consider hydrogen fluoride within the assessment. This has not changed the conclusions of the assessment and they remain valid.

(19) Please revise Table 4-6 to include the cost of NOx abated per tonne (in £) for both the SCR and the SNCR option.

A revised BAT Assessment is presented in Appendix D. Table 4-6 has been updated to include the cost of NOx per tonne for both SCR and SNCR options as requested.

(20) Please provide a comparison of the predicted GWP of the combustion technologies considered (Grate and Fluidised bed) incorporating the NOx and acid gas abatement as follows:

- **Moving grate + SNCR**
- **Moving grate + SCR**
- **Fluidised Bed + SNCR**
- **Fluidised Bed + SCR**

As presented in the updated BAT assessment (refer to Appendix D), the GWP for each of the technologies stated is as follows:

- Moving grate: - 135,000 tonnes carbon dioxide equivalent per annum
- Fluidised Bed: - 133,000 tonnes carbon dioxide equivalent per annum
- SNCR: 2,800 tonnes carbon dioxide equivalent per annum
- SCR: 7,400 tonnes carbon dioxide equivalent per annum

The global warming potential for the combination of combustion and NOx abatement technologies is presented in the table below:

Table 2 – Global Warming Potential of different Technology Combinations	
Technology Combination	**GWP (tonnes carbon dioxide equivalent per annum)**
Moving grate + SNCR	-132,200
Moving grate + SCR	-127,600
Fluidised Bed + SNCR	-130,200
Fluidised Bed + SCR	-125,600

Taking the above into consideration, the use of a moving grate with an SNCR system is considered to have the most beneficial global warming potential when considering combinations of technology for the combustion of fuels and the abatement of NOx. As this is the proposed technology combination for the IWMF, this supports GFC's position that the technologies proposed represent BAT for the combustion of RDF and abatement of NOx from the CHP plant within the IWMF.

(21) In the BAT assessment for the abatement of NOx emissions, you state that the use of SCR increases the annualised costs by approximately £2.8 million, therefore SCR is not BAT for this installation. However, in Appendix 12, you state that the increase in annualised costs (£120,000) from a stack height of 40 metres to 55 metres (with a reduction of annual NO2 from 3.8% to 2.3% of the ES) is insignificant.

Following your response to question 12, please revise your BAT assessment for NOx abatement and compare the annualised cost of increasing the stack height from 55 m to 95 m using SNCR (with a reduction of annual NO2 from 2.4% to 0.9% of the ES) and the use of SCR with a stack height of 55 m.

Reason for question: The information is not provided in the Application.

The Stack Height Assessment has been updated to exclude the SNCR Reagent costs as requested.

Using information presented in the updated BAT Assessment and Stack Height Assessment documents, the annualised costs of increasing the stack height have been compared with the annualised cost of changing from SNCR to SCR. Table 3 shows these annualised costs, the change in annualised costs compared to the base option of SNCR and a 55m stack, and the predicted process contribution to annual average NO_2 concentrations.

Table 3 - Comparison of Costs for Stack Height and NOx abatement technology							
NOx abatement technology		**SNCR**					**SCR**
Stack Height	m	55	65	75	85	95	55
PC as % of EAL	µg/m³	2.40%	1.81%	1.40%	1.12%	0.91%	1.12%
Annualised stack cost	£ p.a.	209,457	260,268	311,531	361,435	411,793	209,457
Annualised NOx abatement cost	£ p.a.	1,397,000	1,397,000	1,397,000	1,397,000	1,397,000	3,761,000
Total annualised cost	**£ p.a.**	1,606,457	1,657,268	1,708,531	1,758,435	1,808,793	3,970,457
Annualised cost compared to base case	£ p.a.		50,811	102,074	151,978	202,336	2,364,000

The selection of 55m as the height that qualifies as BAT is described in the attached revised Stack Height Assessment report. It can be seen from the summary table above that the use of SCR with this height of stack will give a ground level process contribution of 1.12% of the EAL. To achieve this ground level concentration using SNCR will require a stack height of 85m. The annualised cost of increasing the stack height to 85m is £152,000 and that for adopting SCR at the proposed height is an additional £2.4 million. Neither increasing the stack height to 85m, nor adoption of SCR are therefore justified.

10 QUANTITATIVE AIR QUALITY IMPACT ASSESSMENT

(22) Please explain how the plumes (CHP plant, pulp plant, gas engines and biofilters) have been combined in the quantitative air dispersion modelling and provide justification for your approach.

Reason for question: The information is not provided in the Application.

The flues from the CHP plant, pulp plant, gas engines and biofilters are in close proximity to each other and contained in a common windshield. The plumes will, therefore, interact and act as a single plume with combined source characteristics rather than five individual sources. In ADMS, the combined flues option can be used in this instance. This option is switched on using the additional input file (aai) which was supplied with the models for AQMAU review. This approach is typical and will have been reviewed by AQMAU during their audit of the air quality assessment.

11 IMPACT OF ODOURS

(23) Section 4.2.2 of the odour management plan states that sludges from the WWTP will be dewatered, loaded into skips and transferred to the CHP plant for incineration. Section 4.2.4.8 states that sludges from the WWTP will be dewatered prior to land spreading as a soil conditioner.

- **Please address this discrepancy.**
- **Please describe the odour containment and abatement strategy for emissions from the WWTP processes.**

Reason for question: The information is not provided in the Application.

The statement made in section 4.2.4.8 is an error. Only the sludge from the Pulp Plant is dewatered prior to land spreading as a soil conditioner. The sludge produced by the WWTP will be transferred to the CHP plant for incineration. The Odour Management Plan has been updated to reflect this, refer to Appendix E.

12 SITE DRAWINGS

(24) A number of drawings provided with the Application are marked as "preliminary" or "indicative only and may be subject to further design development".

- **Please explain what is meant by these terms.**
- **To what extent will any further changes to the drawings be made prior to the commissioning and commercial operation of the IWMF if a permit is granted?**
- **Explain the significance of any further changes to the drawings and how this will affect the emissions profile and impact on the environment and on human health.**

Condition 19 of the planning permission states:

> *No works to install process equipment or plant within the IWMF shall commence until details of the IWMF process layout and configuration have been submitted to and approved in writing by the Waste Planning Authority. The development shall be implemented in accordance with the approved details.*

Therefore, until any of the process layouts and configurations have been approved by ECC, they can only be described as 'preliminary'.

The final design of the IWMF will be in accordance with the physical size and dimensions of the drawings as approved through condition 2 and any approved details.

The final designs of the IWMF will be in accordance with the emissions profiles stated within the environmental assessments submitted in support of the EP and planning applications. Hence, there would be no subsequent impact on the environment or human health as a result of internal process layout changes.

(25) Please provide a revised site plan with the Rivenhall IWMF installation boundary marked in red and the Rivenhall IWMF AD Facility (standard rules) site boundary marked in green.

Reason for question: It is not clear in the Application.

A revised site plan showing the extent of the boundary for the AD Facility is presented in Appendix F. As requested the Installation boundary is marked in red and the AD (standard rules) boundary is marked in green.

13 ENERGY EFFICIENCY

(26) Please provide evidence (including associated calculations) that demonstrates the energy efficiency and justification of the CHP status of the installation taking into account the proposed abatement system and the temperature of the flues in the stack.

The CHP Quality Assurance programme (CHPQA) is a government initiative, administered by the Department of Business, Energy & Industrial Strategy, providing a practical, determinate method for assessing all types and sizes of Combined Heat & Power (CHP) schemes throughout the UK. CHP, the simultaneous generation of heat & power in a single process, provides one of the most cost-effective approaches for making carbon savings and plays a crucial role in the UK Climate Change programme.

The CHPQA certificates confirming that the Rivenhall IWMF CHP scheme has been formally validated by the Department of Business, Energy & Industrial Strategy, and the associated application (and calculation) form F3 are presented in Appendix G. These set out the calculations based on preliminary design information received from HZI and Andritz for the CHP Plant (using a lime-based FGT system) and the Pulp Plant respectively.

The design cases assessed by HZI were for a range of temperatures in the stack of the mixed incineration flue gases and exhaust air from the Pulp Plant. These temperatures are varied according to the external ambient temperature at set out in plume management plan.

The application was scrutinised under the CHPQA programme prior to issue of the CHPQA certificates.

(27) Please provide further explanation of the Sankey diagram to clearly identify the following aspects:

- **Energy input**
- **Energy losses (electricity and steam – please include what part of the CHP plant energy is lost); and**
- **Energy output (electricity and steam)**

An Energy Flow Diagram showing the inputs and outputs from the CHP plant is presented in Appendix H. The diagram shows the energy input, where energy is lost (electricity and heat), and the energy output (electricity and heat).

It should be noted that the information contained within the Energy Flow Diagram is also presented in Annex 1 of the EP application. For reference, they are also contained in Appendix H.

(28) The Sankey diagram shows that up to 35 MW will be exported as steam to the pulp plant.

- **What modes of operation will the CHP plant incorporate with respect to electricity and steam generation?**
- **Please describe how the CHP plant is designed to operate in the event of unplanned reduction in steam demand from the pulp plant or steam is not required.**

Reason for question: The information is not provided in the Application.

The normal mode of operation will be combined heat and power (CHP). In CHP mode, steam will be extracted from the steam turbine to provide heat to processes at the Pulp Plant and WWTP, and heat for plume abatement and space heating. The CHP Plant is designed to accommodate variations in steam and heat loads from the various consumers on the site.

If the Pulp Plant and WWTP are not operating, the CHP Plant can continue to operate in 'power only' mode. In this mode, the steam turbine will operate in fully condensing mode, i.e. all steam produced by the boilers will pass through the steam turbine. If necessary, excess steam can be bypassed around the turbine. The steam turbine and bypass system will be designed and tested to react instantaneously to sudden and unplanned reductions in steam demand.

If the steam turbine is out of service, the boilers can continue to operate in 'turbine bypass mode'. In this mode, all steam bypasses the turbine to the air-cooled condenser (ACC). Steam can still be provided to the Pulp Plant via equipment to reduce pressure and temperature installed at the CHP Plant.

If the plant is disconnected from the local electricity distribution network (e.g. because of a problem on the network), the CHP Plant can continue to operate in 'island mode'. In this mode, the steam turbine generator will generate sufficient power to supply the CHP Plant and the other processes on the site. Excess steam will go directly to the ACC, bypassing the steam turbine. Steam for processes, plume abatement and space heating will be extracted in the same way as in CHP mode.

14 MANAGEMENT

(29) It is stated in the Supporting Document that the Applicant (Gent Fairhead & Co. Ltd) are "not a current operating company". Therefore, it has no existing Environmental Management System for its current business.

Please explain what is meant by the term "not a current operating company".

Reason for question: It is not clear in the Application.

The term "not a current operating company" was used to explain why the applicant, Gent Fairhead & Co Limited (GFC), does not have a current accredited EMS. GFC is an "operating" company in the sense that it is a trading company registered at Companies House, but its current operations are investment, administrative and managerial in nature.

The IWMF will be developed through special purpose vehicles (SPVs), wholly owned or controlled by GFC. These SPVs will be responsible for raising funds and implementing contracts for the design, construction and operation of the IWMF. GFC will ensure that its requirements for operational EMS, quality and health & safety management systems have been independently certified as meeting the appropriate international standards, and are incorporated in the contracts placed by the SPVs, and that these systems are implemented during the operation of the IWMF. The proposed operational contractors and structure are explained in Sections 1.1 "The Applicant": and 2.10.1 "Management Systems" of the Supporting information, including explanations of GFC's draft EMS Manual and outline Organisation structure provided in Annex 11 of the EP application.

Appendix A - Plume Management Plan

Appendix B - Approved Drainage Plans

Appendix C - Updated Stack Height Assessment

Appendix D - Updated BAT Assessment

Appendix E - Updated Odour Management Plan

Appendix F - AD Installation Boundary Drawing

Appendix G - CHPQA certificates and application form F3

Appendix H - Energy Flow Diagram

FICHTNER

Consulting Engineers Limited

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