

# APPLICATION TO VARY PERMIT EPR/AP3331MM - ENVIRONMENTAL RISK ASSESSMENT

Riccall Poultry Unit, King Rudding Lane, Riccall  
H Barker & Son Limited

JER9190

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12 November 2021

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Appendix A .....	H1 Tool
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# 1 INTRODUCTION

- 1.1.1 This Environmental Risk Assessment (ERA) has been carried out in support of an application for the varying of an existing environmental permit (EPR/AP3331MM), to include the addition of a small waste co-incineration plant (SWCP). It includes an assessment of the risk to the environment and human health from burning Grades A, B and C waste wood chip, at a feed rate of ~400 kg/hr within the SWCP.
- 1.1.2 The SWCP will be used to supply heat in the form of hot water at circa 105°C for use in the four associated poultry houses. The SWCP will be located within a new building as shown on the site plan included in Appendix B.
- 1.1.3 The approximate location of the SWCP installation is highlighted on the map below.

**Figure 1-1 - Site Location**



- 1.1.4 The main land use surrounding the area in which the facility is sited is identified as rural. The current surrounding land uses are:
- North – Agricultural Land;
  - East – Agricultural Land / Woodland;
  - South – Woodland / Business Park with Selby approximately 5km away;
  - West – Riccall Village is approximately 1.5 km away

- 1.1.5 The nearest residential receptor is a staff bungalow located between the poultry facility and the wood treatment facility.
- 1.1.6 The nearest surface water features to the site are the Dam Dike (~800m north) and the River Ouse (~1,200m southwest).
- 1.1.7 National grid reference for the facility is SE 63472 37182.
- 1.1.8 The SWCP will sit within the existing installation boundary for the permit.
- 1.1.9 Ecological receptors are detailed in table 1.1 below:

**Table 1-1. Nature and Heritage Conservation Sites**

Site Name	Screening Distance (km)	Distance / Direction from the Proposed Site
<b>Special Areas of Conservation (SAC)</b>		
River Derwent	10	6.5 km / East
Lower Derwent Valley		6.5 km / East
Skipwith Common		0.6 km / East
<b>Special Protection Areas (SPA)</b>		
Lower Derwent Valley	10	6.5 km / East
<b>Ramsar</b>		
Lower Derwent Valley	10	6.5 km / East
<b>Sites of Special Scientific Interest (SSSI)</b>		
Skipwith Common	2	0.6 km / East
<b>National Nature Reserve (NNR)</b>		
Skipwith Common	2	0.6 km / East
<b>Local Wildlife Sites (LWS)</b>		
York and Selby Cycle Track	2	2.10 km / North West
<b>Ancient Woodland</b>		
Holly Cars / Hart Nooking	2	2.1 km / North

- 1.1.10 Consideration of the environmental risks associated with the current poultry facility was considered at the time of the original application. The SWCP will replace the biomass boilers currently included as DAA as these are to be removed upon installation of the SWCP. Current permitted activities which will not change have not been considered within this assessment. The scope of the ERA considers risks associated with the changes subject to the application to vary the environmental permit.
- 1.1.11 The Environment Agency's Risk Assessments for your environmental permit<sup>1</sup> covers a range of environmental risks. Those aspects relevant to the operation of the proposed facility are covered within the following sections:
- Amenity and accidents
  - Emissions to air
  - Global warming potential

<sup>1</sup> Environment Agency, Risk assessments for your environmental permit, <https://www.gov.uk/guidance/risk-assessments-for-your-environmental-permit>

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- 1.1.12 The assessment of amenity and accidents risks is presented in the risk assessment tables in section 2. The assessment of emissions to air (section 3) and global warming potential (section 4) is supported by the H1 assessment software tool, which can be found in Appendix A to the Environmental Risk Assessment.
  - 1.1.13 This document provides the relevant risk assessments covering the above aspects.

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## 2 AMENITY AND ACCIDENTS

**2.1.1** This section provides an assessment of risks to environmental amenity and from accidents that could arise from operation of the facility. The assessment has been completed in accordance with the EA's Risk Assessments for your environmental permit.

**2.1.2** The scope of the assessment has covered the following aspects:

- odour;
- noise and vibration;
- fugitive emissions;
- visible emissions; and
- accidents.

**2.1.3** For each of the above, the approach to the assessment has followed the following six stage process:

- identify and consider risks for the site, and the sources of the risks;
- identify the receptors at risk;
- identify the possible pathways from the sources of the risks to the receptors;
- assess risks relevant to the activity;
- choose appropriate further measures to control these risks (if required); and
- submit the assessment of overall risk.

**2.1.4** Results of the assessment are provided in the following tables:

- Table 2-2 Assessment of odour risks
- Table 2-3 Assessment of noise and vibration risks
- Table 2-4 Assessment of fugitive emission risks
- Table 2-5 Visible emissions
- Table 2-6 Accidents risk assessment and management plan

**2.1.5** The risk assessment methodology has used a scoring mechanism whereby scores are assigned to:

- the probability of exposure; and
- the consequence of the hazard to the environment or human health.

**2.1.6** The risk assessment has been completed by scoring the hazard areas outlined above using a risk matrix as shown in Table 2-1 below:

**Table 2-1: Risk Matrix**

Consequence of the hazard to the environment or human health	Probability of Exposure			
	High	Medium	Low	Very Low
High	High	Medium	Low	Low
Medium	Medium	Medium	Low	Very Low
Low	Low	Low	Low	Very Low
Very Low	Low	Very Low	Very Low	Very Low

2.1.7 In completing the assessment, the proposed prevention and control measures are assumed to be in place. Where relevant, details of these measures are identified within the assessment.



**Table 2-2 Odour risk assessment and management plan**

<b>Hazard</b> What has the potential to cause harm?	<b>Receptor</b> What is at risk? What do I wish to protect?	<b>Pathway</b> How can the hazard get to the receptor?	<b>Risk management</b> What measures will you take to reduce the risk? If it occurs – who is responsible for what?	<b>Probability of exposure</b> How likely is this contact?	<b>Consequence</b> What is the harm that can be caused?	<b>What is the overall risk?</b> What is the risk that still remains? The balance of probability and consequence.
Odour emissions from the burning of waste wood chip in the SWCP.	Local residents (nearest residential receptor is a staff bungalow immediately adjacent to the facility and then Riccall Village approximately 1.5 km to the west)	Air	High temperature combustion in the SWCP would likely destroy any potential odours The location makes complaints unlikely, however, in the event of a complaint, the operator will follow a complaints procedure to record the complaint and take appropriate action or provide further monitoring as necessary.	Low	Low	Low
Odour emissions from the storage of waste wood chip.	Local residents (nearest residential receptor is a staff bungalow immediately adjacent to the facility and then Riccall Village approximately 1.5 km to the west)	Air	Waste stored will comprise a mixture of grade A, B, and C waste wood chip. Such waste has low odour potential. Waste wood chip will be stored within a building, which will remain closed except for access. Wood will be used on a first in first out basis to avoid prolonged storage. Storage is generally 2 days as the feedstock is tipped and then used within 24-48 hrs, however maybe stored for up to 5 days during shutdown. The remote location makes complaints unlikely, however, in the event of a complaint, the operator will follow a complaints procedure to record the complaint and take appropriate action or provide further monitoring as necessary.	Low	Low	Low

**Table 2-3 Noise and vibration risk assessment and management plan**

<b>Hazard</b> What has the potential to cause harm?	<b>Receptor</b> What is at risk? What do I wish to protect?	<b>Pathway</b> How can the hazard get to the receptor?	<b>Risk management</b> What measures will you take to reduce the risk? If it occurs – who is responsible for what?	<b>Probability of exposure</b> How likely is this contact?	<b>Consequence</b> What is the harm that can be caused?	<b>What is the overall risk?</b> What is the risk that still remains? The balance of probability and consequence.
Noise from vehicle movements onsite	Local residents (nearest residential receptor is a staff bungalow immediately adjacent to the facility and then Riccall Village approximately 1.5 km to the west)	Air	Deliveries of waste wood chip will be in-frequent (every couple of days). A small number of additional vehicle movements will be associated with employee movements, planned servicing and deliveries which will take place during normal working hours. The remote location makes complaints unlikely, however, in the event of a complaint, the operator will follow a complaints procedure to record the complaint and take appropriate action or provide further monitoring as necessary.	Very Low	Very Low	Very Low
Noise from operation of the facility, e.g. SWCP.	Local residents (nearest residential receptor is a staff bungalow immediately adjacent to the facility and then Riccall Village approximately 1.5 km to the west)	Air	The SWCP is designed to incinerate waste wood chip , and to use that heat production to heat the five chicken sheds on site. Waste wood chip will be delivered pre-chipped and therefore significant noise impacts from delivery and transfer are not expected. The SWCP and associated equipment will be fully enclosed in the building; the SWCP is essentially quiet in operation, typically operating at a low hum and virtually undetectable with the doors closed. The SWCP will be subject to regular inspection and planned preventative maintenance schedules to maintain its operational performance. A service and maintenance agreement have been entered into with the technology provider. The remote location makes complaints unlikely, however, in the event of a complaint, the operator will follow the complaints procedure to record the complaint and take appropriate action or provide further monitoring as necessary.	Very Low	Very Low	Very Low
Vibration from the SWCP	Local residents (nearest residential receptor is a staff bungalow immediately adjacent to the facility and then Riccall Village approximately 1.5 km to the west)	Land	Significant vibration effects are not anticipated for the SWCP. The remote location makes complaints unlikely, however, in the event of a complaint, the operator will follow a complaints procedure to record the complaint and take appropriate action or provide further monitoring as necessary.	Very Low	Very Low	Very Low

**Table 2-4 Fugitive emissions risk assessment and management plan**

<b>Hazard</b> What has the potential to cause harm?	<b>Receptor</b> What is at risk? What do I wish to protect?	<b>Pathway</b> How can the hazard get to the receptor?	<b>Risk management</b> What measures will you take to reduce the risk? If it occurs – who is responsible for what?	<b>Probability of exposure</b> How likely is this contact?	<b>Consequence</b> What is the harm that can be caused?	<b>What is the overall risk?</b> What is the risk that still remains? The balance of probability and consequence.
<b>To Air</b>						
Dust from storage of waste wood chip	Local residents (nearest residential receptor is a staff bungalow immediately adjacent to the facility and then Riccall Village approximately 1.5 km to the west)	Air	<p>The waste wood chip accepted on site will not be in the form of dust and is unlikely to generate significant quantities of dust. No further chipping or size reduction of the waste wood chip will be carried out. Deliveries and transfers shall be overseen by trained staff to ensure no dust impacts occur.</p> <p>All waste wood chip will be stored within a building. Doors to the building will remain closed except for access.</p> <p>The remote location makes complaints unlikely, however, in the event of a complaint, the operator will follow a complaints procedure to record the complaint and take appropriate action or provide further monitoring as necessary.</p>	Very Low - significant dust generation is not anticipated from operation of the SWCP.	Very Low	Very Low
Fumes (VOCs) from delivery and storage of diesel on site.	Local residents (nearest residential receptor is a staff bungalow immediately adjacent to the facility and then Riccall Village approximately 1.5 km to the west)	Air	<p>The diesel storage tank has a vent to permit tank breathing, however, the low volatility of the fuel would support low VOC emissions.</p> <p>The integrity of the tank is subject to routine checks as part of daily site inspections.</p>	Low	Low	Low
Dust from solid urea deliveries, storage and handling	Local residents (nearest residential receptor is a staff bungalow immediately adjacent to the facility and then Riccall Village approximately 1.5 km to the west)	Air	<p>Deliveries use a sealed connection system between the road vehicle and relevant storage tank.</p> <p>Any spillage of material during a delivery, for example during disconnection of the hose would be cleared immediately.</p> <p>Storage vessels are fitted with filters to minimise fugitive emissions of dust.</p>	Low	Low	Low

<b>Hazard</b> What has the potential to cause harm?	<b>Receptor</b> What is at risk? What do I wish to protect?	<b>Pathway</b> How can the hazard get to the receptor?	<b>Risk management</b> What measures will you take to reduce the risk? If it occurs – who is responsible for what?	<b>Probability of exposure</b> How likely is this contact?	<b>Consequence</b> What is the harm that can be caused?	<b>What is the overall risk?</b> What is the risk that still remains? The balance of probability and consequence.
Dust from bottom ash and APC (air pollution control) residue; handling and storage.	Local residents (nearest residential receptor is a staff bungalow immediately adjacent to the facility and then Riccall Village approximately 1.5 km to the west)	Air	<p>Techniques for handling residues will be outlined and followed by personnel.</p> <p>Bottom ash passes down to a grate. At the end of the grate the bottom ash residue falls into an ash cooling zone, with an ash auger (screw conveyor), which extracts the ash from the SWCP and deposits it into an enclosed metal receiver for disposal. The receiver is covered and removed from site. All ash handling activities are undertaken within the building.</p> <p>APC residues generated by the pollution control systems of the SWCP will be collected by the ceramic filter and stored in an enclosed container while awaiting despatch from site.</p> <p>In the event of a spillage of either residue, operators are required to arrange for cleaning immediately.</p>	Low	Low	Low
Dust from waste wood chip storage and removal from site.	Local residents (nearest residential receptor is a staff bungalow immediately adjacent to the facility and then Riccall Village approximately 1.5 km to the west)	Windblown to air	There will be small amounts of waste generated with the potential for off-site windblown dust. All waste wood chip will be stored within a building or within containers to prevent risk of off-site impacts. All staff will be trained in waste management procedures by their supervisors.	Very Low	Very Low	Very Low
<b>To Water</b>						
Leakage of diesel from transfers and storage.	Watercourse – Dam Dike ~800m north / River Ouse ~ 1200m southwest	Surface water drainage systems	<p>The storage tank (5,000 litre) is fully bunded to 110% capacity and will be subject to routine inspection during routine site maintenance visits.</p> <p>An appropriate spill kit will be provided to clean up any spills during deliveries. On delivery, only personnel trained in spillage procedures by their supervisors will be permitted to carry out deliveries of lubricating oils to the site.</p>	Very Low	Medium	Very Low
<b>To Land</b>						
Spillage of diesel to land.	Land	Direct contact	<p>The storage tank (5,000 litre) is fully bunded to 110% capacity and will be subject to routine inspection during routine site maintenance visits.</p> <p>An appropriate spill kit will be provided to clean up any spills during deliveries. On delivery, only personnel trained in spillage</p>	Very Low	Medium	Very Low

<b>Hazard</b> What has the potential to cause harm?	<b>Receptor</b> What is at risk? What do I wish to protect?	<b>Pathway</b> How can the hazard get to the receptor?	<b>Risk management</b> What measures will you take to reduce the risk? If it occurs – who is responsible for what?	<b>Probability of exposure</b> How likely is this contact?	<b>Consequence</b> What is the harm that can be caused?	<b>What is the overall risk?</b> What is the risk that still remains? The balance of probability and consequence.
			procedures by their supervisors will be permitted to carry out deliveries of diesel to the site.			
Transfer, storage and removal of bottom ash and APC residue	Site drainage system; Watercourse – Dam Dike ~800m north / River Ouse ~ 1200m southwest	Ground/ surface drains	Bottom ash handling and transfer will be undertaken within a building with an impermeable surface. Bottom ash falls into a grate, and at the end of that grate drops into an ash cooling zone, with an ash auger, which extracts the ash from the SWCP and deposits it into an enclosed metal receiver for disposal. The ash is transferred and stored in an enclosed system to minimise potential for spillage and/or fugitive emissions. Any spillage of bottom ash would be cleaned up immediately using dry techniques. A spillage management plan will be put in place.	Very Low	Low	Very Low
<b>Pests</b>						
Flies, and other pests or vermin.	Local residents (nearest residential receptor is a staff bungalow immediately adjacent to the facility and then Riccall Village approximately 1.5 km to the west)	Land/air	The nature of the waste wood chip to be accepted at the SWCP are not expected to be highly attractive to pests. All hardstanding areas will be regularly swept and maintained in good working order. Site housekeeping procedures ensure that site areas are routinely checked; should litter be identified; arrangements would be made to clean the affected area. These procedures will cover the areas subject to changes in this variation of permit. Pest control measures will be applied in accordance with recommendations from a specialist pest control advisor. In the event of a complaint, the complaints procedure will be followed to record and act on the complaint and instigate appropriate action.	Very Low – Good site management procedures should prevent this occurring.	Very Low	Very Low

**Table 2-5 Visible emissions**

<b>Hazard</b> What has the potential to cause harm?	<b>Receptor</b> What is at risk? What do I wish to protect?	<b>Pathway</b> How can the hazard get to the receptor?	<b>Risk management</b> What measures will you take to reduce the risk? If it occurs – who is responsible for what?	<b>Probability of exposure</b> How likely is this contact?	<b>Consequence</b> What is the harm that can be caused?	<b>What is the overall risk?</b> What is the risk that still remains? The balance of probability and consequence.
Plume from emission stack	Local residents (nearest residential receptor is a staff bungalow immediately adjacent to the facility and then Riccall Village approximately 1.5 km to the west)	Visual	Visible plumes are not anticipated to occur for the majority of operational time due to emissions temperature of 180°C. Any visible plumes observed during testing will be reported and investigated.	Very Low	Low – Minor visual disturbance of short duration at worst.	Low

**Table 2-6 Accidents risk assessment and management plan**

<b>Hazard</b> What has the potential to cause harm?	<b>Receptor</b> What is at risk? What do I wish to protect?	<b>Pathway</b> How can the hazard get to the receptor?	<b>Risk management</b> What measures will you take to reduce the risk? If it occurs – who is responsible for what?	<b>Probability of exposure</b> How likely is this contact?	<b>Consequence</b> What is the harm that can be caused?	<b>What is the overall risk?</b> What is the risk that still remains? The balance of probability and consequence.
Operator error	Air/Water/Land – dependent on the nature of the error.	Variable - dependent on nature of the error	<p>The SWCP will be automatically controlled under normal operations, which will minimise potential for operator error on site. The automatic control system will include alarms and warning lights to alert of potential operational problems, and where relevant will be triggered with sufficient margin to permit operator intervention.</p> <p>All staff (including contractors) will be qualified for the role to be carried out and trained specifically to carry out their responsibilities in relation to the SWCP. Training will include raising awareness of key plant parameters and the potential implications of failure to control operations as designed and the associated potential impact on the environment.</p>	Low	Low	Low
Loss of power	None	N/A	In the event of a loss of power during normal operation, the unit has a failsafe design and will trip and shutdown.	N/A	N/A	N/A
Fire causing emissions to air	Air	Direct release of combustion gases to air	Fire protection systems will be in place in accordance with those set out in the fire prevention plan (FPP). These will include automatic fire detection and suppression. The aim of the FPP is to as far as practicable minimise the duration of a fire event to less than 4 hours.	Low	Medium	Low
Fire causing emissions to water/firewater	Watercourse – Dam Dike ~800m north / River Ouse ~ 1200m southwest	Ground / surface water drainage system	<p>Fire protection systems will be in place in accordance with those set out in the fire prevention plan (FPP). The aim of the FPP is to as far as practicable minimise the duration of a fire event to less than 4 hours.</p> <p>Measures will be put in place to protect against fire including measures to manage and contain fire water from the permitted SWCP. A fire response system will be installed to ensure a rapid response thereby addressing the fire at the earliest point to avoid fire spread, and therefore minimise the amount of water required to tackle the fire.</p> <p>Penstock valves and impermeable surfacing will be in place to contain firewater and divert to dirty water storage tank.</p>	Low	Medium	Low

Flue gas abatement plant failure	Air	Stack	<p>All abatement plant is continuously monitored to ensure that it is operating as designed and that the reagent feed systems are working.</p> <p>In addition, emissions to air via the main stack are continuously monitored for key pollutants which would identify any potential increases in pollutant concentrations. All of these systems will include appropriate alarms to alert the operator to a potential problem and the appropriate action to be taken.</p> <p>Where monitoring of NO<sub>x</sub> emissions indicates increased concentrations, the injection of urea will automatically be adjusted to address this. Where monitoring of acid gas emissions (SO<sub>2</sub>/HCl) indicates increased concentrations, the injection of sodium bicarbonate will automatically be adjusted to address this.</p> <p>Operational staff will be trained in the actions to take in the event of control system alarms being triggered.</p>	Low	Medium	Low
Vandalism	Air/water/land	Various	<p>There is a low probability of vandalism and trespass due to site staff living on site and 24 hr CCTV coverage which is remotely monitored by third party contractors.</p>	Low	Low to Medium - depending on nature of the event.	Low
Flooding	Buildings and structures on site; neighbouring land	Surface water drainage system; local surface watercourses	<p>The site is within Flood Zone 1, with a low probability of flooding.</p> <p>Emergency procedures will be developed within the Accident Management Plan and will describe actions to take should a flood event occur.</p> <p>As part of the site's emergency procedures, the appropriate procedures for responding to, reporting and investigating in the event of a flood will be assessed.</p>	Very Low	Low	Very Low



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## 3 EMISSIONS TO AIR

3.1.1 This section provides the relevant screening assessments of point source emissions to air that could arise from operation of the facility. The assessment has been completed in accordance with the EA's Risk Assessments for your environmental permit.

3.1.2 The scope of the assessment has covered the following aspects:

- Release point characteristics;
- Air emissions inventory and mass flows;
- Emissions screening for further assessment;
- Photochemical Ozone Creation Potential (POCP).

3.1.3 Air emissions screening using the H1 software (Appendix A) has identified a subset of emissions whose significance warrants further modelling. The results of that modelling for these are presented in the air quality assessment report in Appendix E of the main application. The H1 software output tables are detailed below.

### 3.2 Emissions release point

3.2.1 Point-source emissions to air from the proposed facility will be from a 8m stack, at an efflux velocity of 12 m/s, and a normalised volumetric flow rate of 3,996 Nm<sup>3</sup>/hr at 100% load.

3.2.2 Modelled concentrations are those provided in the technical specification for the SWCP. This specification is considered representative of the boiler that will be installed at the facility. The technical specification is provided at Appendix C of the main application document.

3.2.3 The H1 screening assessment has considered emissions of the substances listed in below:

- Particulates (PM<sub>10</sub>);
- Hydrogen chloride;
- Hydrogen fluoride;
- Sulphur dioxide;
- Nitrogen dioxide;
- Carbon monoxide;
- Group I metals – cadmium (Cd) and thallium (Tl).
- Group II metals – mercury (Hg)
- Group III metals - antimony (Sb), arsenic (As), lead (Pb), chromium (Cr), cobalt (Co), copper (Cu), manganese (Mn), nickel (Ni), and vanadium (V).
- Dioxins and furans;
- Polychlorinated biphenyls (PCBs);
- Polycyclic aromatic hydrocarbons (PAHs); and
- Ammonia

### 3.3 H1 Screening Assessment

3.3.1 Emissions have been screened for significance against appropriate environmental standards for long-term and short-term exposure. Environmental standards are based on statutory air quality

limits where available, and upon human health protection environmental assessment levels (EALs) as given in H1 guidance.

3.3.2 EA guidance states that emissions can be screened out as insignificant where:

- Long term PC < 1% of EAL
- Short term PC <10% of EAL

3.3.3 Figure 3.1 and 3.2 below show the initial assessment for combustion products following abatement

**Figure 3.1: Air Emissions Inventory**

Air Emissions Inventory											
Please list all Substances released to Air for each Release Point identified in the previous page.											
Number	Substance	Meas'ment Method	Operating Mode (% of Year)	Data relating to Long Term effects			Data relating to Short Term effects			Annual Rate tonne/yr	ELV Conc. mg/m3
				Conc. mg/m3	Release Rate g/s	Meas'ment Basis	Conc. mg/m3	Release Rate g/s	Meas'ment Basis		
e.g.	sulphur dioxide	Estimated*	70% load	1510	3000	annual avg	1510	3000	hourly avg	55,000	2000
1	Particulates (PM10) (24 hr Mean)	Estimate	100.0%	10.0	0.011100	annual avg	30.0	0.033300	24 Hr Mean	0.3500	
2	Hydrogen chloride	Estimate	100.0%	10.0	0.011100	annual avg	60.0	0.066600	24 Hr Mean	0.3500	
3	Hydrogen fluoride (as F) (Ecological)	Estimate	100.0%	1.0	0.001110	annual avg	4.0	0.004440	Daily Averag	0.0350	
4	Sulphur Dioxide (24 Hour Mean)	Estimate	100.0%	50.0	0.055500	annual avg	200.0	0.222000	24 Hr Mean	1.7502	
5	Nitrogen Dioxide	Estimate	100.0%	200.0	0.222000	annual avg	400.0	0.444000	Daily Averag	7.0010	
6	Carbon monoxide	Estimate	100.0%	100.0	0.111000	annual avg	100.0	0.111000	24 Hr Mean	3.5005	
7	Cadmium and its compounds (as Cd)	Estimate	100.0%	0.1	0.000056	annual avg	0.1	0.000056	24 Hr Mean	0.0018	
8	Mercury and compounds, except methyl	Estimate	100.0%	0.1	0.000056	annual avg	0.1	0.000056	24 Hr Mean	0.0018	
9	Antimony and compounds (as Sb)	Estimate	100.0%	0.5	0.000555	annual avg	0.5	0.000555	24 Hr Mean	0.0175	
10	Arsenic and compounds (as As)	Estimate	100.0%	0.5	0.000555	annual avg	0.5	0.000555	24 Hr Mean	0.0175	
11	Lead	Estimate	100.0%	0.5	0.000555	annual avg	0.5	0.000555	24 Hr Mean	0.0175	
12	Chromium (VI) compounds (as Cr)	Estimate	100.0%	0.5	0.000555	annual avg	0.5	0.000555	24 Hr Mean	0.0175	
13	Copper dusts and mists (as CU)	Estimate	100.0%	0.5	0.000555	annual avg	0.5	0.000555	24 Hr Mean	0.0175	
14	Manganese and compounds (as Mn)	Estimate	100.0%	0.5	0.000555	annual avg	0.5	0.000555	24 Hr Mean	0.0175	
15	Nickel (total Ni compounds in the F	Estimate	100.0%	0.5	0.000555	annual avg	0.5	0.000555	24 Hr Mean	0.0175	
16	Vanadium	Estimate	100.0%	0.5	0.000555	annual avg	0.5	0.000555	24 Hr Mean	0.0175	
17	Polychlorinated biphenyls	Estimate	100.0%	0.0	0.000000	annual avg	0.0	0.000000	24 Hr Mean	0.0000	
18	Polycyclic aromatic hydrocarbons (	Estimate	100.0%	0.0	0.000003	annual avg	0.0	0.000003	24 Hr Mean	0.0001	
19	Ammonia (human health receptor)	Estimate	100.0%	10.0	0.011100	annual avg	10.0	0.011100	24 Hr Mean	0.3500	
20	Dioxins and Furans	Estimate	100.0%	0.0	0.000000	annual avg	0.0	0.000000	24 Hr Mean	0.0000	
21	Nitrous oxide	Estimate	100.0%	25.0	0.027750	annual avg	35.0	0.038850	24 Hr Mean	0.8751	

**Figure 3.2: Stage One Assessment**

Air Impact Screening Stage One									
Screen out Insignificant Emissions to Air									
This page displays the Process Contribution as a proportion of the EAL or EQS. Emissions with PCs that are less than the criteria indicated may be screened from further assessment as they are likely to have an insignificant impact.									
Number	Substance	Long Term	Short Term	Long Term			Short Term		
		EAL	EAL	PC	% PC of EAL	> 1% of EAL?	PC	% PC of EAL	> 10% of EAL?
		µg/m3	µg/m3	µg/m3	%		µg/m3	%	
1	Particulates (PM10) [	-	50.0	0.661	-		3.30	6.61	<b>No</b>
2	Hydrogen chloride	-	750	0.959	-		29.7	3.95	<b>No</b>
3	Hydrogen fluoride (as	-	4.91	0.0959	-		2.00	40.9	<b>Yes</b>
4	Sulphur Dioxide (24 h	-	125	3.30	-		34.5	27.6	<b>Yes</b>
5	Nitrogen Dioxide	40.0	200	9.31	23.3	<b>Yes</b>	47.0	23.6	<b>Yes</b>
6	Carbon monoxide	-	10,000	9.59	-		13.5	0.135	<b>No</b>
7	Cadmium and its com	0.00500	-	0.00331	66.0	<b>Yes</b>	0.119	-	
8	Mercury and compo	0.251	7.51	0.00331	1.33	<b>Yes</b>	0.0247	0.329	<b>No</b>
9	Antimony and comp	5.00	150	0.0480	0.959	<b>No</b>	1.19	0.791	<b>No</b>
10	Arsenic and compo	0.00301	-	0.0332	1,103	<b>Yes</b>	1.19	-	
11	Lead	0.501	-	0.0332	6.62	<b>Yes</b>	1.19	-	
12	Chromium (VI) comp	0.000201	-	0.0480	23,971	<b>Yes</b>	0.247	-	
13	Copper dusts and mi	10.00	200	0.0332	0.331	<b>No</b>	0.247	0.124	<b>No</b>
14	Manganese and con	0.151	1,500	0.0332	22.1	<b>Yes</b>	0.247	0.0165	<b>No</b>
15	Nickel (total Ni comp	0.0201	-	0.0332	165	<b>Yes</b>	1.19	-	
16	Vanadium	5.00	1,000	0.247	4.93	<b>Yes</b>	0.0332	3.31	<b>No</b>
17	Polychlorinated biphe	0.201	6.00	0.00000001	0.00000384	<b>No</b>	0.00000019	0.00000316	<b>No</b>
18	Polycyclic aromatic h	1.000	-	0.000288	0.0288	<b>No</b>	0.00712	-	
19	Ammonia (human he	180	2,500	0.959	0.533	<b>No</b>	23.8	0.949	<b>No</b>

3.3.4 The second stage of screening assesses the predicted environmental concentration (PEC) against EALs. The background concentration for pollutants is taken from the air quality modelling, details of which are given in Appendix E of the main application. Those not screened out as insignificant are recommended for further detailed assessment. The results suggest there is a need for further assessment of several species. Detailed modelling has been carried out for these species, and the results are given in Appendix E of the main permit application.

**Figure 3.3: Stage Two Assessment**

Air Impact Modelling Stage Two Screening										
Identify need for Detailed Modelling of Emissions to Air										
This page displays the Process Contributions in relation to the background pollutant levels and the EAL or EQS. You should use this information to decide whether to conduct detailed modelling. Note that releases that are insignificant are not shown as they are screened from further assessment. Also complete this page if you have already done detailed modelling.										
Number	Substance	Air Bkgrnd Conc. µg/m3	Long Term				Short Term			
			PC µg/m3	% PC of headroom (EAL - Bkgrnd)	PEC mg/m3	% PEC of EAL	% PEC of EAL >=70?	PC µg/m3	% PC of headroom (EAL - Bkgrnd)	% PC of headroom >=20?
		e.g. 12								
3	Hydrogen fluoride (as F) (Ecological - Daily Mean)	2.46	0.0959	-	0	-		2.00	-10.000	No
4	Sulphur Dioxide (24 Hour Mean)	2.84	3.30	-	0	-	34.5	28.9		Yes
5	Nitrogen Dioxide	7.3	9.31	28.5	16.7	41.6	47.0	25.4		Yes
7	Cadmium and its compounds (as Cd)	0.0006	0.00331	75.0	0.00390	78.0	0.119	-		
8	Mercury and compounds, except mercury alkyls,	0.0153	0.00331	1.41	0.0186	7.44	0.0247	0.330		No
10	Arsenic and compounds (as As)	0.0008	0.0332	1,505	0.0340	1,130	1.19	-		
11	Lead	0.0174	0.0332	6.86	0.0506	10.2	1.19	-		
12	Chromium (VI) compounds (as Cr)	0.0038	0.0480	-1,332	0.0518	25,871	0.247	-		
14	Manganese and compounds (as Mn)	0.0899	0.0332	55.1	0.124	82.0	0.247	0.0165		No
15	Nickel (total Ni compounds in the PM10 fraction)	0.0012	0.0332	176	0.0344	171	1.19	-		
16	Vanadium	0.0094	0.247	4.94	0.256	5.12	0.0332	3.38		No

### 3.4 Photochemical ozone creation potential

- 3.4.1 The photochemical ozone creation potential (POCP) has been calculated in accordance with the H1 guidance<sup>2</sup>. Nitrogen dioxide, sulphur dioxide and carbon monoxide emissions from the installation contribute to photochemical ozone creation.
- 3.4.2 The POCP for the SWCP is 37.46. The facility will be controlled to ensure that IED limits for the POCP pollutants are met.

<sup>2</sup> Environment Agency, H1 Annex F: air emissions [withdrawn] <https://www.gov.uk/government/publications/h1-annex-f-air-emissions>

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## 4 GLOBAL WARMING POTENTIAL

- 4.1.1 The global warming potential (GWP) has been calculated in accordance with the H1 guidance. The GWP score of 271.42 comprised the following main sources: carbon dioxide and nitrous oxide emissions from the process, including diesel used in auxiliary firing during start-up and using urea for NOx control.
- 4.1.2 Of these sources, carbon dioxide emissions from the process are by far the most significant, accounting for over 95% of the total GWP score calculated.
- 4.1.3 The direct releases from the burning of the waste wood chip are not included in the calculation of GWP as this is 100% biogenic material.

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## 5 FURTHER ASSESSMENT

- 5.1.1 An air quality modelling assessment has been carried out of the emissions from the facility. A copy of this assessment can be found in Appendix E of the main application. This has concluded that overall, the effects of the incinerator are not significant.
- 5.1.2 A human health risk assessment of emissions from the facility has been carried out. A copy of this assessment can be found in Appendix F of the main application. This has demonstrated that for the maximally exposed individual, exposure to dioxins, furans and dioxin-like PCBs is not significant.

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## 6 CONCLUSIONS

- 6.1.1 The following hazards from the operation of the proposed facility have been assessed:
- odour;
  - noise and vibration;
  - fugitive emissions;
  - visible plumes; and
  - accidents.
- 6.1.2 The assessment has concluded that the overall risks associated with the identified hazards, including the proposed management measures are low to very low.
- 6.1.3 The H1 risk assessment software tool has been used to support this Environmental Risk Assessment. The completed H1 software can be found within the Appendix A to this Environmental Risk Assessment.
- 6.1.4 Stack emissions to air for relevant air pollutants have been subject to detailed modelling and it has been concluded that the proposed development will not result in significant adverse impact to human or ecological receptors.

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## APPENDICES



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# Appendix A

## H1 Tool

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## Appendix B

### Sensitive Receptors and Flood Map