


FICHTNER

Consulting Engineers Limited



**INTERTISSUE
INTERTISSUE BIOMASS BOILER
ENVIRONMENTAL RISK
ASSESSMENT**

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

**INTERTISSUE
INTERTISSUE BIOMASS BOILER
ENVIRONMENTAL RISK ASSESSMENT**

Document Production & Approval Record				
ISSUE NO. 1	NAME	SIGNATURE	POSITION	DATE
<i>Prepared by:</i>	James Sturman		Consultant	16/11/2015
<i>Checked by:</i>	Stephen Othen		Technical Director	20/11/2015

Document Revision Record				
ISSUE NO.	DATE	DETAILS OF REVISIONS	PREPARED BY	CHECKED BY
1	20/11/2015	Issued for Client comments	JRS	SMO
2				
3				
4				
5				
6				
7				

© 2015 Fichtner Consulting Engineers. All rights reserved.

This report and its accompanying documents contain information which is confidential and is intended only for the use of Intertissue. If you are not one of the intended recipients any disclosure, copying, distribution or action taken in reliance on the contents of the information is strictly prohibited.

Unless expressly agreed, any reproduction of material from this report must be requested and authorised in writing from Fichtner Consulting Engineers. Authorised reproduction of material must include all copyright and proprietary notices in the same form and manner as the original, and must not be modified in any way. Acknowledgement of the source of the material must also be included in all references.

TABLE OF CONTENTS

TABLE OF CONTENTSIII

1 Introduction 1

 1.1 Risk Assessment Process 1

 1.2 Step 1 – Identify risks..... 1

 1.3 Step 2 – Assess the Risk 1

 1.4 Step 3 – Justify appropriate measures 1

 1.5 Step 4 – Present the Assessment 2

2 Table A1 Odour Risk Assessment and Management Plan..... 3

3 Table A2 Noise Risk Assessment and Management Plan..... 4

4 Table A3 Fugitive Emissions Risk Assessment and Management Plan 5

5 Table A4 Accidents Risk Assessment and Management Plan 7

6 Detailed Assessment10

 6.1 Emissions to Air.....10

 6.2 Habitats Assessment.....10

 6.2.1 Emissions to Water11

 6.2.2 Noise.....11

 6.3 Visual Impact.....11

 6.4 Odour11

 6.5 Photochemical Ozone Creation11

 6.6 Global Warming.....12

 6.7 Disposal of Waste12

7 Conclusions.....13

APPENDIX A – H1 ASSESSMENT TOOL..... 14

1 INTRODUCTION

Intertissue Ltd. (herein referred to as Intertissue) is developing a biomass-fuelled boiler (the Facility) to combust wood biomass fuels (herein referred to as fuel) at the Intertissue Briton Ferry paper manufacturing and processing plant on Brunel Way, Baglan Energy Park, Briton Ferry, Neath, South Wales (the Installation).

The aim of this report is to assess the environmental risks from the Facility.

Within the application for the Variation, Intertissue is required to demonstrate that the necessary measures are in place to protect the environment and ensure that the proposed changes to the Installation will not pose an unacceptable risk to the environment.

The aim of this document is to:

- a) identify potential risks that the activity may present to the environment;
- b) screen out those that are insignificant and don't require detailed assessment;
- c) identify potentially significant risks, where appropriate;
- d) choose the right control measures, where appropriate; and
- e) report the findings of the assessment.

This document has been developed to consider the requirements of Environment Agency Guidance Notes H1 Annexes A, C, H and F.

1.1 Risk Assessment Process

This assessment has been developed in accordance with the Environment Agency Guidance Note H1. This guidance promotes four key steps:

- a) identify risks from the activity;
- b) assess the risks and check that they are acceptable;
- c) justify appropriate measures to control the risks; and
- d) present the assessment.

1.2 Step 1 – Identify risks

The following report will identify the activities that present different types of risk to the environment associated with the operation of the Facility, including:

- a) odour;
- b) noise;
- c) fugitive Emissions; and
- d) accidents.

1.3 Step 2 – Assess the Risk

The report will include an assessment of risks associated with the operation of the Facility, and will identify the:

- a) hazard;
- b) receptor; and
- c) pathway.

1.4 Step 3 – Justify appropriate measures

This report will demonstrate that the risks associated with the operation of the Facility have been considered, and identify the control measures which will be in place to demonstrate that the risks are being appropriately managed.

1.5 Step 4 – Present the Assessment

The assessment will conclude by presenting the following:

- a) possibility of exposure;
- b) consequence; and
- c) the overall risk.

The report will present the Overall Risk applying the Environment Agency's H1 criteria, defined as:

- a) insignificant;
- b) not significant; and
- c) significant.

2 TABLE A1 ODOUR RISK ASSESSMENT AND MANAGEMENT PLAN

What Do You Do That Can Harm and What Could Be Harmed?			Managing The Risk	Assessing The Risk		
Hazard	Receptor	Pathway	Risk Management	Possibility of Exposure	Consequence	What is the Overall Risk?
What has the potential to cause harm?	What is at risk? What do I wish to protect?	How can the hazard get to the receptor?	What measures will you take to reduce the risk? If it occurs who is responsible for what?	How likely is this contact?	What is the harm that can be caused?	What is the risk that still remains? The balance and probability and consequence
It is not considered that waste wood biomass will give rise to emissions of offensive odour.						

3 TABLE A2 NOISE RISK ASSESSMENT AND MANAGEMENT PLAN

What Do You Do That Can Harm and What Could Be Harmed?			Managing The Risk	Assessing The Risk		
Hazard	Receptor	Pathway	Risk Management	Possibility of Exposure	Consequence	What is the Overall Risk?
What has the potential to cause harm?	What is at risk? What do I wish to protect?	How can the hazard get to the receptor?	What measures will you take to reduce the risk? If it occurs who is responsible for what?	How likely it this contact?	What is the harm that can be caused?	What is the risk that still remains? The balance and probability and consequence
Noise from plant items such as the combustion process, exhaust air fans, the stack exhaust, ID fan, and noise radiation from the building envelope itself etc. Noise from vehicle movements.	Immediate area. The closest residential property (the Caravan Park - Brunel Way) to the Facility is located approximately 1km to the north west of the Facility.	Sound propagation through air and the ground.	Sound attenuator to be fitted to the stack. Noisy plant items, when possible, will be installed inside buildings rather than outside and where appropriate they will be fitted with noise insulation. Regular maintenance of plant items. The Facility will be designed to reduce noise and tonal components.	Minimal.	Annoyance.	Insignificant. See Noise Assessment, Annex 2, for further information on the impact of noise emissions.

4 TABLE A3 FUGITIVE EMISSIONS RISK ASSESSMENT AND MANAGEMENT PLAN

What Do You Do That Can Harm and What Could Be Harmed?			Managing The Risk	Assessing The Risk		
Hazard	Receptor	Pathway	Risk Management	Possibility of Exposure	Consequence	What is the Overall Risk?
What has the potential to cause harm?	What is at risk? What do I wish to protect?	How can the hazard get to the receptor?	What measures will you take to reduce the risk? If it occurs who is responsible for what?	How likely is this contact?	What is the harm that can be caused?	What is the risk that still remains? The balance and probability and consequence
Emission releases from main building when opening/closing doors.	Immediate area - air	Air, surface runoff, direct contact.	All process activities will occur inside enclosed buildings.	Low	Nuisance, dust on clothing and cars	Insignificant
Spillage of fuel during delivery and offloading.	Immediate area – air, land, water	Air, surface runoff.	Fuel will be delivered to the Facility in covered road vehicles.	Low	Nuisance, dust and litter	Insignificant
Dust from fuel deliveries being blown off-site.	Immediate area – air, land	Air, surface runoff.	Fuel will be unloaded in a dedicated fuel unloading area. Where fuel is unloaded in external areas, it will be transferred into the fuel reception area. Fuel will not be stored in enclosed areas.	Low	Nuisance, dust and litter	Insignificant
Bottom ash discharge when handling.	Immediate area - air	Air, surface runoff, direct contact.	Once removed from the combustion chamber by the bottom ash extractors, the bottom ash is then discharged to containers in a dedicated bottom ash storage area.	Low	Nuisance	Insignificant
Discharge of Air Pollution Control residues (APCr) when emptying silo.	Immediate area – air, land	Air, surface runoff, direct contact.	When unloading APCr, negative pressure will be maintained to prevent releases into the atmosphere.	Low	Nuisance, release of hazardous dust	Insignificant
Lime / activated carbon leak during injection into APC system.	Immediate area – air	Air, surface runoff, direct contact.	Systems are enclosed and regular inspections/maintenance will be carried out. Reagents are injected via an enclosed dosing and conveying system.	Low	Nuisance	Insignificant

What Do You Do That Can Harm and What Could Be Harmed?			Managing The Risk	Assessing The Risk		
Hazard	Receptor	Pathway	Risk Management	Possibility of Exposure	Consequence	What is the Overall Risk?
What has the potential to cause harm?	What is at risk? What do I wish to protect?	How can the hazard get to the receptor?	What measures will you take to reduce the risk? If it occurs who is responsible for what?	How likely is this contact?	What is the harm that can be caused?	What is the risk that still remains? The balance and probability and consequence
Spillage of air pollution control reagents when capping or changing filter bags.	Immediate area – air, land	Air, surface runoff, direct contact.	Enclosed system. Kept under suction by the ID fan.	Low	Nuisance, release of hazardous dust	Insignificant
Spillage/leak when unloading from delivery vehicles chemical containers (IBC's, drums, etc.)	Immediate area – air, land	Air, direct contact.	Deliveries will be from road vehicles and off-loaded via mobile plant. Potential leaks/spills will be prevented by experienced mobile equipment operators undertaking unloading activities. Unloading activities will only be undertaken in areas of hard standing. Chemical containers will be stored within suitably designed secondary containment.	Low	Hazardous liquid or vapour release	Insignificant
Release of dusts from the transfer off-site of dry residues.	Immediate area – air, land	Air, direct contact.	Loading of bottom ash into vehicles will be undertaken in areas of hardstanding. Bottom ash will be transferred off-site in covered vehicles.	Low	Nuisance, dust on cars and road	Insignificant
Re-suspension of dust from road surface, when site vehicles arrive/leave.	Immediate area – air, land, water	Air, surface runoff.	Due care and attention.	Low	Nuisance, dust on cars and road	Insignificant

5 TABLE A4 ACCIDENTS RISK ASSESSMENT AND MANAGEMENT PLAN

What Do You Do That Can Harm and What Could Be Harmed?			Managing The Risk	Assessing The Risk		
Hazard	Receptor	Pathway	Risk Management	Possibility of Exposure	Consequence	What is the Overall Risk?
What has the potential to cause harm?	What is at risk? What do I wish to protect?	How can the hazard get to the receptor?	What measures will you take to reduce the risk? If it occurs who is responsible for what?	How likely it this contact?	What is the harm that can be caused?	What is the risk that still remains? The balance and probability and consequence
Spill during transfer of substances	Immediate area - air, land, water	Direct contact	Training in unloading practices. Under manual control, continual observation. Impervious surfaces outdoors.	Unlikely	Low	Not significant
Overfilling of vessels	Local environment air, land, water	Surface runoff, wind.	Training in unloading practices. Under manual control, continual observation. Impervious surfaces outdoors. High level alarms. Secondary containment for storage vessels.	Unlikely	Low	Not significant
Leak of demin water treatment and boiler water treatment chemicals	Immediate area - water	Surface runoff	Secondary containment for storage vessels. Routine inspection and maintenance. Impervious surface indoor, separate drains for process effluents.	Unlikely	Pollution of surface water	Not significant
Flue gas leak	Local environment - air	Air	Design standards. Inspection and maintenance programme. Controls and alarms for pressure. Most of the systems are retained at negative pressure.	Very unlikely	Pollution of atmosphere, health impacts	Not significant
Fuel storage failure	Immediate area - litter	Direct contact	Storage of fuel in a fuel dedicated storage area.	Unlikely	Litter	Insignificant
Control failure leading to combustion control upset	Local environment - air	Air - Winds generally blow from a south westerly direction.	Fuel inspection. Design of control system. Monitoring of combustion conditions. Maintenance of combustion air systems.	Unlikely	Pollution of atmosphere (short term), human health	Not significant

What Do You Do That Can Harm and What Could Be Harmed?			Managing The Risk	Assessing The Risk		
Hazard	Receptor	Pathway	Risk Management	Possibility of Exposure	Consequence	What is the Overall Risk?
What has the potential to cause harm?	What is at risk? What do I wish to protect?	How can the hazard get to the receptor?	What measures will you take to reduce the risk? If it occurs who is responsible for what?	How likely is this contact?	What is the harm that can be caused?	What is the risk that still remains? The balance and probability and consequence
Failure of emission abatement equipment	Local environment - air	Air - Winds generally blow from a south westerly direction.	Regular maintenance, inspections. Redundancy of critical equipment or spares on stock.	Unlikely	Pollution of atmosphere, human health.	Not significant
Failure of emission monitoring systems	Immediate area - air	Air - Winds generally blow from a south westerly direction.	Regular maintenance, inspections. Some spares for the CEMS system will be held on site.	Unlikely	Lack of data, public concern.	Not significant
Failure of containment (e.g. bund)	Immediate area - water, land	Surface runoff, wind, leaching.	Regular inspections of bunds.	Unlikely	Pollution of surface water.	Not significant
Making the wrong connections to drains	Local environment - water	Direct contact, leaching.	Detailed site drainage plan, which will be available to all staff.	Low	Pollution of surface water.	Not significant
Preventing incompatible substances coming into contact	Immediate area	Surface runoff, wind, direct contact.	Due care and attention.	Low	Low	Not significant
Unwanted reactions	Immediate area	Surface runoff, wind, direct contact.	Due care and attention.	Unlikely	Low	Not significant
Loss of power	None	N/A	Uninterruptible power supply for combustion control systems.	Low	None	Not significant
Loss of compressed air	None	N/A	Multiple compressors	Low	None	Not significant
Loss of boiler water	None	N/A	Failsafe shutdown.	Low	None	Not significant
Steam leak to plant building/atmosphere	Noise, Visual	Air	Statutory design, fabrication and inspection standards for steam systems. Controls and alarms for pressure. Routine operator checks.	Low	Nuisance from noise and visual impact	Not significant

What Do You Do That Can Harm and What Could Be Harmed?			Managing The Risk	Assessing The Risk		
Hazard	Receptor	Pathway	Risk Management	Possibility of Exposure	Consequence	What is the Overall Risk?
What has the potential to cause harm?	What is at risk? What do I wish to protect?	How can the hazard get to the receptor?	What measures will you take to reduce the risk? If it occurs who is responsible for what?	How likely is this contact?	What is the harm that can be caused?	What is the risk that still remains? The balance and probability and consequence
Residues handling failure	Immediate area - air, land, water	Direct contact	Training in transfer practices. Contained transfer systems. Impervious surfaces outdoors. Controlled drainage in areas where residues are stored.	Unlikely	Pollution of surface waters	Not significant
Fires in FGT bag filter	Local environment	Air - Winds generally blow from a south westerly direction.	Temperature measurement in filter, fire fighting systems.	Low	Dust, pollution of air	Not significant
Fire in furnace / fuel feed system	Immediate area - air	Air	Furnace charging procedures / training. Level indicator in chute. Fire detection and fighting systems.	Low	Pollution of air	Not significant
Fires in fuel reception and storage areas	Immediate area - air	Direct contact	Fire detection systems, water sprinklers and fire hoses. Fire marshals.	Low	Visual impact, pollution of air	Not significant
Fire from ignition of lube oil leak	Immediate area - air	Wind, direct contact	Use of fire-proof lube oil. Fire detection and protection systems.	Low	Visual	Not significant
Contaminated fire water	Immediate area - water, land	Surface runoff, leaching.	Firewater will be contained in accordance with the existing drainage arrangements for the Installation.	Low	Pollution of surface water	Not significant
Vandalism	Immediate area	Land, air, water	The existing security arrangements for the Installation will control access to the Facility.	Low	Release of substances to any environment	Not significant

6 DETAILED ASSESSMENT

The environmental impact of the Facility has been evaluated using the H1 software tool as described in Part 2 of Technical Guidance Note EPR-H1, presented in Appendix A. This assessment has been expanded by a more comprehensive Air Quality Assessment (see Annex 4) and a full Noise Assessment (see Annex 2).

6.1 Emissions to Air

An assessment of emissions to air has been undertaken using the Environment Agency’s assessment tool H1. The H1 assessment is presented in Annex 1 of this report.

A more detailed assessment and discussion of the emissions to air has been presented within the Air Quality Assessment which is contained within Annex 5.

6.2 Habitats Assessment

There are a number of habitat sites within the Environment Agency screening distances. These habitat sites are presented in Table 6.1.

Table 6.1: Sensitive Ecological Receptors				
Site	Location (m)		Distance from the Facility Stack at Closest Point (m)	Lichens identified as present within APIS database
	x	y		
European designated sites (within 10km)				
Crymlyn Bog Ramsar, SAC and SSSI	271820	194171	1922	No
UK designated sites (SSSIs) (within 2km)				
Crymlyn Burrows SSSI	272626	193011	509	No
Earlswood Road Cutting and Ferryboat Inn Quarries SSSI	273039	193935	1190	No
Pant-y-Sais SSSI	271821	194171	1922	No
Locally designated sites (within 2km)				
Crymlyn Bog and Pant Y Sais NNR	271832	194195	1933	No
Pant-y-Sais LNR	271820	194168	1921	No
Red Jacket Fen WTR	272033	194305	1903	No
Ancient Woodlands 1	274672	192654	1620	No
Ancient Woodlands 2	274511	192944	1457	No
Ancient Woodlands 3	274234	193502	1381	No
Ancient Woodlands 4	274190	193796	1534	No
Ancient Woodlands 5	273540	194317	1656	No
Ancient Woodlands 6	273138	194309	1582	No

Earlswood Road Cutting and Ferryboat Inn Quarries SSSI has been designated due to geological interest and as such is not sensitive to air quality impacts.

An assessment of the impact of the Installation upon these habitat sites is presented in Annex 5. As concluded within the air quality assessment:

- At all European designated sites within 10 km of the Facility, the impact of emissions is predicted to be less than 1% of the long term Critical Level and Loads and less than 10% of the short term Critical Levels. Therefore it can be concluded that emissions from the proposed scheme are not significant and there is no likely significant effect (alone and in-combination);
- At all UK designated sites within 2 km of the Facility, the impact of emissions is predicted to be less than 1% of the long term Critical Level and Loads and less than 10% of the short term Critical Levels when operational availability is taken into account. Therefore it can be concluded that emissions from the proposed scheme are not significant and there is no likely significant effect (alone and in-combination); and
- At all locally designated sites, emissions are not likely to have a significant impact. This conclusion has been drawn because the process contribution is less than 100% of the Critical Level or Load.

6.2.1 Emissions to Water

Surface water run-off from all external areas of hardstanding (roads and storage areas) will be discharged into the existing surface water drainage system.

All excess process effluents, which cannot be re-used, will be discharged into the existing wastewater drainage systems.

All chemicals will be stored in an appropriate manner incorporating the use of bunding and other measures (such as acid and alkali resistant coatings) to ensure appropriate containment. The potential for accidents, and associated environmental impacts, is therefore limited.

Adequate quantities of spillage absorbent materials will be made available in accordance with the existing arrangements for the Installation.

Unloading of chemicals and raw materials for the operation of the Facility will take place within areas of concrete hardstanding.

6.2.2 Noise

The impact of noise from the Facility is considered in the noise assessment contained in Annex 2. As can be seen from the assessment, the impact of noise from the Facility is 'low'.

6.3 Visual Impact

The visual impact of the Installation has not been considered in the EP application, since this is primarily a matter for the planning authorities.

6.4 Odour

It is not considered that waste wood biomass will give rise to emissions of offensive odour, therefore this is not considered to be a concern for the Installation.

6.5 Photochemical Ozone Creation

Releases of CO, NO₂, SO₂ and benzene contribute to the generation of excess tropospheric ozone, while releases of NO remove ozone from the atmosphere. The annual releases of these substances can be ascribed a photochemical ozone creation potential (POCP). Values for the POCP are stated in Annex (f) of Technical Guidance Note EPR-H1, for the pollutants included within the air quality assessment, as:

- | | | |
|----|-----------------|------|
| a) | CO | 2.7 |
| b) | NO ₂ | 2.8 |
| c) | SO ₂ | 4.8 |
| d) | Benzene | 21.8 |

The total POCP for the Facility is calculated in the H1 Software Tool as 340 tonnes. This assessment is based on the assumption that all NO_x is released as NO₂.

6.6 Global Warming

The assessment of the contribution of the Facility to Global Warming is complex. On the one hand, the Facility releases carbon dioxide to the atmosphere by the combustion of natural gas and fuel (wood chips), which is considered to be carbon-neutral. On the other hand, the Installation generates heat, which displaces heat generated from the combustion of natural gas, which releases carbon dioxide from the combustion of fossil fuels.

In accordance with the Environment Agency requirements, a Greenhouse Gas Assessment which considers the direct and indirect emissions from the co-incineration of biomass fuels within the Facility and compares this with the emissions produced if the heat was produced by combustion of natural gas in a conventional gas boiler has been presented in Annex 6.

6.7 Disposal of Waste

Methods for reducing the impact from waste disposal are considered in section 2.7 of the Supporting Information.

7 CONCLUSIONS

As presented in this report, the Facility is considered to contain appropriate control measures and management systems to ensure that the Facility does not have any significant impacts upon the local environment.

Appendix A – H1 Assessment Tool



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