Environmental Risk Assessment

Issue 1.0

Produced for **Sullivan Projects Ltd (c/o Besblock Ltd.)**

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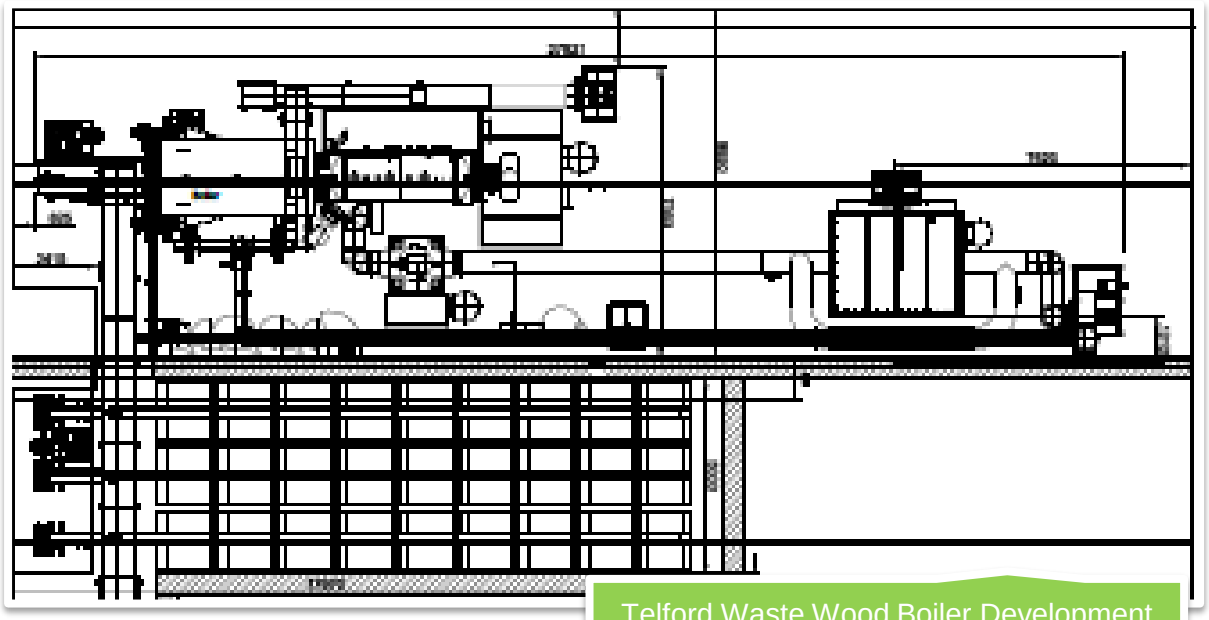

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1.0 INTRODUCTION

This Environmental Risk Assessment has been produced in support of a local authority Part B permit application for a small waste incineration plant biomass boiler to be operated by Besblock Ltd (hereon referred to as Besblock), Teflord, Shropshire. This document provides a full environmental risk assessment for the proposed installation of a biomass boiler plant, combusting Grade C waste wood. This document been produced in conjunction with the following documents:

- Besblock-0 Non-Technical Summary
- Besblock-1 Management System
- Besblock-2 Process Flow Diagram
- Besblock-4 Air Quality Impact Assessment
- Besblock-5 Emissions Management & Monitoring Plan

1.1 Reason for Application

The installation of a biomass boiler by Besblock supports the generation of heat required for the oven used in the curing process of concrete blocks. Besblock receive Grade C waste wood for use as fuel in the biomass boiler.

1.2 Assessment Process

The Guidance "*Risk assessments for your environmental permit"* produced by the Environment Agency and DEFRA outlines a five-step process for assessing the site activity and the risk to local amenity to successfully produce an Environmental Risk Assessment:

1. Identify and consider risks for your site, and the sources of the risks.
2. Identify the receptors (people, animals, property and anything else that could be affected by the hazard) at risk from your site.
3. Identify the possible pathways from the sources of the risks to the receptors.
4. Assess risks relevant to your specific activity and check they're acceptable and can be screened out.
5. State what you'll do to control risks if they're too high.

This risk assessment will identify the potential human and environmental impacts that could result from the activity of this boiler. Risk assessments will be carried out for the following hazards:

- Odour;
- Fugitive emissions (including dust and pests);
- Visible plumes;
- Noise;
- Fire.

Sector Guidance Note 2.8[1] page 76, point 8, states that there should be an accident plan in place which identifies the likelihood of consequences of accidents and also identifies the actions required to prevent accidents and mitigate any consequences. Assessment of potential accidents at the facility and the consequential effects on sensitive receptors have been accounted for in this document.

[1] Environment Agency. Guidance for the Recovery and Disposal of Hazardous and Non Hazardous Waste. Sector Guidance Note S5.06

2.0 ENVIRONMENTAL MANAGEMENT

P = Possibility C = Consequence M = Magnitude

Pollutant Model			Judgement				Action	
Source	**Pathway**	**Receptor**	**P**	**C**	**M**	**Justification of Magnitude**	**Risk Management**	**Residual Risk**
Odour & visible plumes - inadequate combustion or poor plume dispersion.	Aerial dispersion.	Local Residents	Med	Med	Med	Med – Incomplete combustion or poor plume dispersion may result in odorous, black smoke released from chimney.	• Optimum temperature and oxygen conditions to ensure complete combustion, remotely automated by boiler through CVP control package. • The moisture content of the fuel must be within the range the boiler can accept. In particular, fuel with a moisture content greater than that which the boiler can accept will produce black, odorous smoke. • Regular servicing and cleaning of the boiler by a trained operative as per the manufacturer's instructions.	Low

Pollutant Model			Judgement				Action	
Source	**Pathway**	**Receptor**	**P**	**C**	**M**	**Justification of Magnitude**	**Risk Management**	**Residual Risk**
Emissions – Air pollutants	Aerial dispersion	Local sensitive receptors	Med	Med	Med	Med – Results from combustion of wood fuels. Boiler has measures in place to limit release of PM10 and NOx. Incomplete combustion causes risk of elevated emissions e.g. during start-up and shut down.	• Detailed air quality modelling has been undertaken as part of this permit application. The results indicate the baseline air quality around the proposed installation is within European Limit Values and UK objectives. • The biomass boiler and stack shall be associated with written maintenance schedule and in accordance with the manufacturer's instructions. The biomass boiler shall be serviced at the frequencies agreed in the maintenance contract by a trained service engineer. • Staff operating and maintaining the boiler shall receive appropriate training and instructions from the boiler manufacturer. • Staff shall be aware of how to identify and mitigate elevated or abnormal pollution emissions. • The fuel shall be stored in a building to prevent contamination. • Good quality feedwater to ensure impurities do not lead to sediment or corrosion, thereby reducing boiler efficiency. • The biomass boiler stack height shall be sufficient to prevent emissions influencing ground-level air pollution concentrations. • The biomass boiler shall be serviced at regular intervals, as per manufacturer/supplier instruction. • Continuous infeed of fuel to limit elevated emissions during start-up and shut down.	Low
Emissions from boiler particulate matter – (PM10)	Aerial dispersion	Staff and local residents	Med	Med	Low	Low - The biomass boiler on site has a maximum emission rate for PM10 of 0.01918g/s	• Boiler fitted with multi-cyclone dust collector. • Optimum ratio of temperature, air and turbulence in boiler operations controlled by CVP control package. • Appropriate stack height to allow for dispersion. • Continual ash removal and routine maintenance can ensure optimum performance and reduce ash entrainment as this increases PM emissions.	Low

Pollutant Model			Judgement				Action	
Source	**Pathway**	**Receptor**	**P**	**C**	**M**	**Justification of Magnitude**	**Risk Management**	**Residual Risk**
Emissions from boilers – NO_x	Aerial dispersion	Staff and local residents	Med	Med	Med	Med – There is potential for workers to be regularly exposed to NOx. The biomass boiler on site has a maximum emission rate for NO_x of 0.23014g/s.	• Boiler fitted with a selective non-catalytic reduction de-NOx system with urea dosing. • An advanced combustion control 'step combustion' to minimise NOx production. • Optimum ratio of temperature, air and turbulence in boiler operations, controlled by trained operatives and CVP control package. • Appropriate stack height to allow for dispersion. • Optimum moisture content managed by boiler operatives via moisture monitoring. • Biomass fuel has a low nitrogen content. • Regular servicing of the boilers by a trained operative as per the manufacturer's instructions.	Low
Emissions from boilers – CO	Aerial dispersion	Staff and local residents	Low	Low	Low	Low - The biomass boilers on site operates efficiently and has a maximum emission rate for CO of 0.09589g/s.	• Optimum ratio of temperature, air and turbulence in boiler operations, controlled by trained operatives and CVP control package. • Appropriate stack height to allow for dispersion. • Optimum moisture content managed by boiler operatives via moisture monitoring. • Regular servicing of the boiler by a trained operative as per the manufacturer's instructions.	Low
Emissions from boilers – TOCs	Aerial dispersion	Staff and local residents	Low	Med	Med	Med - Combustion of wood fuel could release TOCs into the atmosphere.	• Optimum ratio of temperature, air and turbulence in boiler operations, controlled by trained operatives and CVP control package. • Optimum moisture content managed by boiler operatives via moisture monitoring. • Regular servicing of the boiler by a trained operative as per the manufacturer's instructions.	Low

Pollutant Model			Judgement				Action	
Source	**Pathway**	**Receptor**	**P**	**C**	**M**	**Justification of Magnitude**	**Risk Management**	**Residual Risk**
Emissions from boilers – Sulphur Dioxide	Aerial dispersion	Staff and local residents.	Med	Med	Med	Med - Harmful effects of sulphur compounds are primarily reflected in the low temp corrosion of the boiler.	• Optimum temperature and oxygen conditions to ensure complete combustion, remotely automated by boilers through CVP control package. • Using fuels with low sulphur content. • Regular servicing of the boiler by a trained operative as per the manufacturer's instructions.	Low
Emissions from boilers – HCl and HF	Aerial dispersion	Staff and local residents	Low	Med	Med	Med - Combustion of treated wood may result in release of heavy metals, dioxins, or furans, should waste acceptance procedures be inadequate.	• Suppliers are informed that the site will not accept any wood that is lower quality than Grade C. • Pre-acceptance procedures to mitigate non-conforming materials entering the waste stream. • Loads inspected for contamination upon arrival on site and such material rejected.	Low
Emissions from boilers – heavy metals, dioxins, furans.	Aerial dispersion	Staff and local residents	Low	Med	Med	Med - Combustion of treated wood may result in release of heavy metals, dioxins, or furans, should waste acceptance procedures be inadequate.	• Suppliers are informed that the site will not accept any wood that is lower quality than Grade C. • Pre-acceptance procedures to mitigate non-conforming materials entering the waste stream. • Loads inspected for contamination upon arrival on site and such material rejected.	Low
Airborne dust particulates from the transport of wood fuels	Aerial dispersion.	Local Residents	Med	Low	Low	Low - Limited potential for frequent and long-term exposure for people working close to the site due to location of facility.	• Dust generation attributable to vehicle movements will be controlled by the maintenance and sweeping of the site access roads. • During dry weather action will be taken to remove dust from the road. • The Site Manager will carry out a daily visual assessment of dust emission within the site and at the downwind site boundaries.	Low
Noise from boilers.	Aerial dispersion.	Local Residents, Employees	Low	Med	Low	Low - Equipment generates very low levels of noise.	• Regular maintenance of plant & machinery. • Before the boiler is connected to the heating system, the heating system must be thoroughly rinsed to remove dirt and sediment.	Low

Pollutant Model			Judgement				Action	
Source	**Pathway**	**Receptor**	**P**	**C**	**M**	**Justification of Magnitude**	**Risk Management**	**Residual Risk**
						Impurities and sediment accumulating in the heating boiler can lead to noise and corrosion, if the plant is not properly maintained.		
Ash – build up in boilers restricts flow of flue gas and reduced boiler efficiency.	Aerial Dispersion/ Build up inside plant.	Biomass boilers.	Med	Med	Med	Med - Wood ash is generated from burning fuel. Wood ash composition can be harmful to the environment if feedstock quality is poor.	• Continual bottom ash removal and routine maintenance can ensure optimum performance and reduce ash entrainment. • High quality, sustainable feedstock.	Low
Ash – release of heavy metals.	Spillage.	Plants and soils	Low	Low	Low	Low - Ash is removed from the boilers and disposed of suitably.	• Ash collected and disposed of suitably as hazardous waste. • Fly ash is also contained following capture by mulit-cyclone. • Boiler ash shall be stored in lidded bins and then bagged before being removed from site, to prevent fugitive emissions on dust.	Low
Water leak	Spillage	Staff and local residents	Low	Low	Low	Low – few opportunities for release of water.	• Pipework is inspected regularly and maintained by a trained operative when required. • If a leak is detected, boilers will be shut down until resolved.	
Fire on site	Aerial dispersion	Staff and local residents	Med	Med	Low	Med - Fires can be deliberate or accidental.	• Suitable containment of wood fuels. • Follow manufacturer guidance and instructions on plant maintenance. • Follow manufacturers guidance and instructions on boiler operation. • Routine boiler servicing. • Manually controlled mains water dousing system • Hydraulic trough infeed with a physical anti-burn-back barrier, incorporating a cutting edge to cut any oversized fuel particles • Automatic water dousing system into the hydraulic infeed, thermostatically controlled	Low
P = Possibility C = Consequence M = Magnitude								

3.0 ACCIDENT MANAGEMENT

3.1 Emergency Contacts

Emergency Services	999
Local Police	101
Environment Agency Hotline	0800 807 060
Health and Safety Executive	0345 300 9923
Electricity Supplier	N/A
Local Authority	Telford and Wrekin Council
Waste Disposal Contractor	Unknown
Gas Supplier	N/A
Sewerage Undertaker	Severn Trent Water
Fuel Supplier	Various

3.2 Company Contacts (Out of hours)

Operations Manager

3.3 Environmental Accident Management Plan

Pollutant Model			Judgement				Action	
Source	**Pathway**	**Receptor**	**P**	**C**	**M**	**Justification of Magnitude**	**Consequences**	**Actions to be taken**
Plant Failure (Hydraulic Leaks, Damaged equipment)	Potentially polluting liquids leak into the building where the boiler is housed or onto the hard surfaced ground outside.	Environment	Low	Med	Low	Low - Very little likelihood of occurrence. All equipment subject maintenance regime.	Potentially polluting liquids flow onto hard surfaced area of facility.	Stem leak if possible. Inform site manager. Isolate spill using spill control kits or adsorbent material. Monitor leak and prevent any liquid from entering drains. Drain any contaminated tanks, clean any spillage and dispose of waste as appropriate. Monitor external areas to ensure no further contamination. Record the incident. Inform Local Authority or Environment Agency if necessary. Review Operations and Management System.

Pollutant Model			Judgement				Action	
Source	**Pathway**	**Receptor**	**P**	**C**	**M**	**Justification of Magnitude**	**Consequences**	**Actions to be taken**
Severe Weather	Flooding Wind damage Ice/frost	Plant & Equipment Site Conditions	Low	Med	Low	Low - Flooding unlikely due to slope of site leading to drainage containment system and location of site. All plant securely fixed inside a building.	Damage to plant and equipment	Cease operations if required. Assess damage. Mitigate any pollution caused. Inform site manager. Inform Local Authority or Environment Agency if necessary. Repair damage. Record incident.
Arson/ Vandalism	N/A	Plant & Equipment Site Conditions	Low	Med	Low	Low - Site to be as secure as possible. All plant to be locked when not manned. All doors and gates locked outside working hours. The site has no public access.	Damage to equipment Fire Litter	Assess damage. Mitigate any damage/pollution caused (following fire plan). Inform site management. Inform Police. Inform Local Authority if required. Record incident. Review site security.
Fire	Spread from source of ignition	Site buildings, Local Residents	Low	Med	Med	Med - No ignition sources permitted near flammable material. Fuel must be stored to prevent fire.	Fire could spread to site buildings and potentially to neighbouring sites, subject to wind direction and strength. Potential for severe damage to property and potential loss of life from fire/smoke inhalation.	Raise alarm on site. Call 999. Ensure personnel are alerted evacuated and accounted for from danger area, following the fire evacuation plan. If safe, switch off electricity/fuel supplies. Inform site management. Liaise and follow instructions of emergency team making them aware of any hazards on site. Any fire water treated/disposed of appropriately.
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