



**JM ENVIROFUELS (Barry) WOOD PROCESSING FACILITY**

## **FIRE PREVENTION and MITIGATION PLAN**

**BY**

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## Definitions:

- **Lagoon:-** A structure or tank holding leachate water runoff, usual term compost leachate tank, usually heavy BOD water
- **Pond:-** A structure or natural body of water connected to local drainage and water system usually holding fish and wild life
- **Surface water Tank:-** A structure or tank for the collection and storage of surface water runoff from the hard surfaced paved areas
- **Processing Area:-** An area designated as the area to process waste, usually associated with waste reception, where all machines are operating to manage materials
- **Quarantine Area:-** An area designated for the storage of materials, primarily for the segregation of materials in an incident situation, but can also be used for waste processing, temporary parking, material segregation etc. is 50% minimum size of the largest stockpile on site and in this case that would be 35mx25m
- **Maltese Cross:-** A concrete structure configured into a cross, made of 4 bays, in this case the bays dimensions are 17.5m x 17.5m or 20m x 20m designed to segregate materials into definitive piles
- **Storage Bay:-** A concrete Structure for the storage of product or waste, usually has at least 2 sides maybe 3 sides, for the segregation of material.
- **Impermeable surface:-** A concrete/Tarmac pavement structure for the collection and direction of water runoff to a suitable collection point. Must be impervious to water so water travels over the top.
- **Processed material:-** Material which has been mechanically treated, usually through a shredder or screener, usually size reduced and segregated into specific sizes for onward delivery to end use
- **All Metal Separator:-** A piece of machinery which extracts ferrous and non-ferrous materials from the process
- **Screener:-** A piece of machinery used to size sort the materials into different grades, generally 0/10mm, 10/75mm, <75mm
- **Shredder High Speed:-** Size reduction using a variable hammer rotor with revolutions per minute greater than 100 RPM and screens to size materials
- **Primary Slow Speed Shredder:-** Size reduction using a fixed shafts with revolutions per minute less than 100 RPM and breaker bar and combs to size the materials (more coarse material)
- **Secondary Slow Speed Shredder:-** Size reduction using fixed shafts with revolutions per minute less than 100 RPM and breaker bar and combs to size the materials, usually a finer cut for more uniform materials output
- **iTom system:-** Thermal temperature measuring equipment for the monitoring and reporting of stockpile temperatures at an in pile depth of 1m-3.5m (inside the stockpile) usually 2 probes per bay, or 4 probes per batch
- **IR Gun:-** Infrared temperature monitoring device, can take photos or static point monitoring using an infrared thermal detection. Usually used on machinery or engines etc to establish temperature and wear and heat generation



## **1 Fire Prevention Objectives**

The purpose of this document is to identify potential fire hazards, detail the controls implemented to prevent fires and the actions taken to reduce the impacts should there be a fire on site.

This plan has been prepared in conjunction with the format prescribed by Natural Resources Wales and Fire Prevention & Mitigation plan Guidance No.16 V2 August 2017.

This plan details the measures that will be taken to;

- Minimise the likelihood of a fire happening
- Aim for a fire to be extinguished within 4 hours
- Minimise the spread of fire within the site and to neighbouring sites

A copy of the site plan and the FPMP is to be located on the outside of the weighbridge in a "Fire Information" Box for the emergency services to locate key information in the event of an incident on site.

## **2 Management Responsibilities**

### **2.1 The Company Director and Site manager will;**

- Ensure the effective implementation of the FPMP
- Allocate sufficient resources to ensure the FPMP can be implemented
- Ensure site staff are trained and competent to manage the arrangements in place for the FPMP, annual Fire drill in accordance with FPMP.
- Monitor the effectiveness of the FPMP through weekly inspections
- Manage emergency situations and initiate the Emergency plan
- Regularly review and update the plan as required.

### **2.2 The Site Operatives will;**

- Follow operating instructions
- Maintain the site in accordance with the FPMP and take part in an annual drill.
- Report any activity or events which could affect the FPMP strategy.

### 3 Activities at the Site

#### 3.1 The Site Location

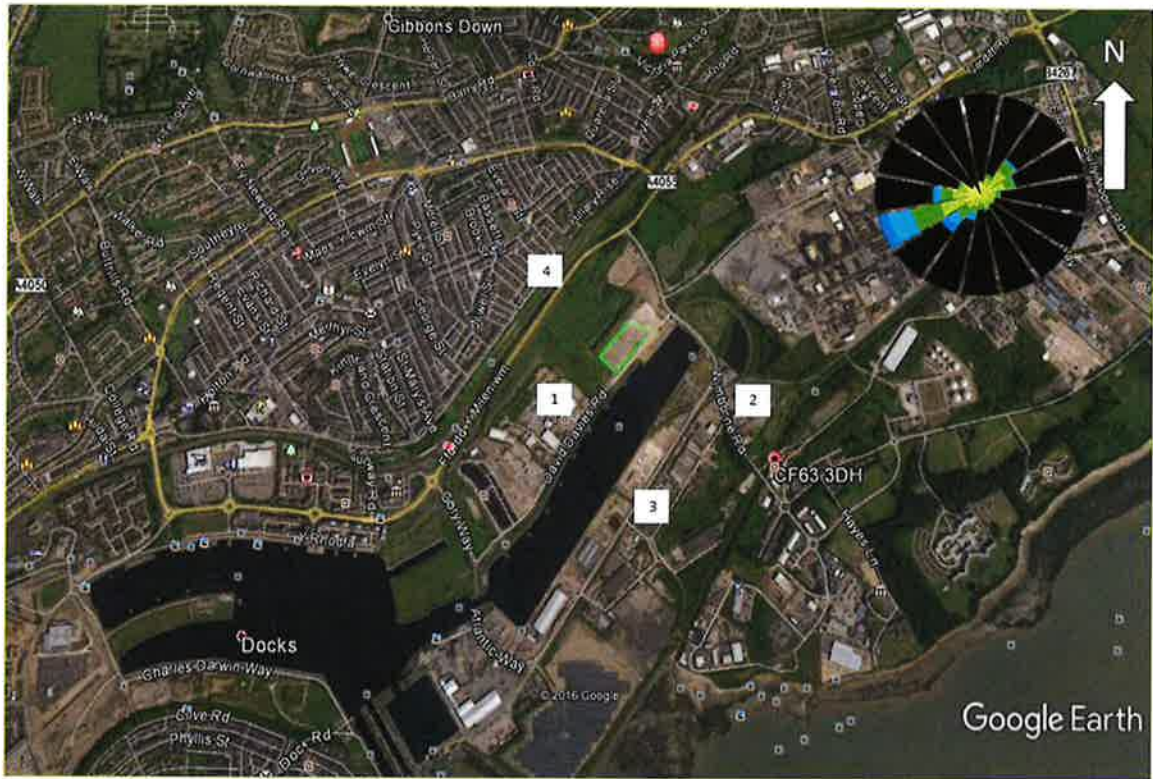


Figure 1: Site Location and Receptors

The site is situated to the east of Barry town centre, north west of No.2 Dock, Berth 31 off Wimborne Road. The location of the facility is shown in the site location plan. Wood waste processing will be carried out on an area of the existing site and all operations will be carried out on impermeable hard standing, all surface waters will drain to centralised storage facility on the existing site. There will not be any discharges off site.

The wood process has a steady demand throughout the year, this though is ramped up in the Autumn owing to the storage requirements for this material at the power station for the Christmas shut down period.

The process requirements for this material will be approximately 20,000 tonnes maximum to provide sufficient buffer during the winter periods when the demand for supply is expected to increase.

Should situations arise such as plant breakdown / temporary closure of outlets, contingency plans are in place to divert materials within Jack Moody Recycling sites.

The worst-case event will be prior to the Christmas break period and post planned





and unplanned shut down periods of the power stations, if all bays are fully utilised 1,500 tonnes of material will be processed per week for a maximum 12-week period. This is to cater for the peak in demand during this period.

The Wood will be managed accordingly due to the seasonal market and the requirements of the power stations, meaning that the storage piles, size of material, time on site will fluctuate accordingly.

In addition, the site will be utilised to store / bulk up and transfer glass, metal, bottom ash and plaster board

### **3.2 Local Receptors – See Figure 1**

Within 1km of the site the following receptors are located;  
Permit Area = Green Line

Location	Receptor	Distance
1	Harris Pye International	166m SW
2	Container Storage	320m SEE
3	Industrial	371m SE
4	Residential	330m NW
5	Dow Corning	250-500m E

The site is adjacent to a Barry Docks which leads to Severn Estuary but is 800m away from nearest SSSI – Barry Island (SSSI Code 33WVA) and Hayes Point to Bendrick Rock (SSSI Code 510). There is also a rail link to the neighbouring Scrap metal yard. The site boundary is approximately 330m from the nearest residential household. These local receptors would be impacted by a large fire on site, however the prevailing wind direction is South Westerly, thus reducing the likelihood of impact of air emissions from those receptors located South of the site. The site boundary is between 250 and 500m of the Dow Corning COMAH Site, which could be affected by air emissions depending upon how a fire is dealt with.

### **3.3 Waste reception, processing and storage**

#### **Wood:**

It is anticipated that 413 tonnes of wood are to be received on site each day, this material is received, rejected, processed and stored in accordance with written operating procedures.

Pre-acceptance procedures will ensure compliance with the waste types the facility is permitted to accept. Third parties will be required to provide the operator, in advance, with all necessary information/documentation to satisfy the requirements of the Environmental Protection (Duty of Care) Regulations 1991 and, the





conditions of the Environmental Permit. Further information is provided in the Management techniques section.

A waste stream will only be accepted where pre-acceptance documentation shows that it is suitable for storage and processing at the site and, that it is authorised by the Environmental Permit. Checks will be made to establish whether the haulier is a registered waste carrier or has a valid exemption from registration. Only registered waste carriers, or those who are lawfully exempt from registration, will be permitted to use the site.

Wastes will be checked on arrival against the details given on the waste transfer note/season ticket. If necessary, the weighbridge operator, or other suitably qualified person, will make a visual inspection of loads received in sheeted or netted containers. If HOT loads are identified and have not been highlighted from the above checks and audits the loads will be rejected or quarantined in bays or safe area for collection as per the previous section.

All waste loads, including those received in enclosed containers, will be inspected visually, upon deposit.

Any non-permitted wastes, deposited inadvertently, will be rejected and reloaded onto the delivery vehicle for off-site removal to an authorised facility. Where this is not practical the waste will be removed to the designated quarantine area or container for secure storage, prior to off-site removal to an authorised site.

Following the acceptance procedures detailed above, waste loads will be deposited into the appropriate stock pile and processed in accordance with the operational procedures.

- The site plan (Appendix A) shows the areas for wood storage and processing, as well as the storage bays for the transfer materials. The storage bays will have concrete block walls that facilitate being able to move the walls according to process demand, any changes to the site layout would be discussed with NRW and agreed before being undertaken.
- There is a 6m separation between the stockpiles, depending upon the stack length.
- The feedstock material will be evaluated and stockpiled prior to processing. The material will be handled on FIFO principles, e.g. first in, first out.
- The Bays will be numbered, as well as the stockpiles to aid with batch control and to ensure FIFO is achieved. The site will operate an information management system that will record the types, quantities, sources of waste received at the site.
- The nature of the incoming feedstock material (unprocessed), is considered to be low risk from a fire assessment of self-combustion due to it being composed of large pieces of wood rather than Chips. The stock will be managed to the compliance limits within the designated storage piles and bays. It is intended due to the demand for the contracted outlets, that the material will not be on



site for a prolonged period unless unforeseen outages occur. When the material has been processed into Chips, it becomes a higher risk from self-combustion compared with large pieces of unprocessed wood with minimal fine material.

- This material will be removed from site within 9 months of production. This will ensure that there is effective stock rotation eliminating the situation for old stock to remain in the back of bays.

The controls in place to reduce the risk from fire are;

- All deliveries are checked upon arrival (paper work & contents of the load)
- No loads are tipped without an operative in supervision
- Loads are checked before pushing into the bay
- A visual fire watch is carried out through the day
- A quarantine area is available for any hot / unsuitable loads
- Wood is stored within designated bays and segregated stock piles (left unprocessed for as long as possible)
- Plant & equipment is regularly blown out / washed down / has routine maintenance and parked up away from stockpiles at the end of the day. There is no specific parking area owing to the volume of plant of site (this is not practicable). All plant will be 6m away from wood stockpiles at the end of the day.
- The shredders contain a heat detection and self-activating fire extinguisher system
- Heat checks are undertaken with an IR heat gun on plant and equipment
- Processed material is monitored for temperature using the iTOM probes from the time of production.
- Fire watch is undertaken at the end of every day
- Contingencies are in place for when the power station is closed for maintenance and for operational breakdowns in the wood yard (Diverting wood to other sites and short-term hire options for site plant / machinery).

### **3.4 Wood transfer from site**

Contracts are in place for the sole supply of biomass fuel by JM Envirofuels Ltd to supply several power stations in the UK, of which Barry is one of the supply sites. Schedules are in place through the liaison between the Transport Manager and the Wood Hall Manager to achieve the required inputs into the power station.

Occasionally collections can be amended through site plant break down and power station shut down / break down. In these instances, Management reassess and modify the schedules accordingly;

- The modified schedules are sufficient to meet the demand for wood removal and therefore no action is taken,
- Arrangements are made to hire in plant so demand can be met

- Material is moved to another power station as a part of our contingency action plan (Appendix E – Contingency Plan) should a fire take place.

### 3.5 Single Source Waste

Single source wastes (glass, metal, Bottom Ash, Plasterboard) are to be delivered to site in segregated loads, these will be deposited into the appropriate storage bay until such a time that an economical load is ready for transfer off site to a licenced facility for recovery.

## 4 Managing Common Causes of Fire

### 4.1 Controlling ignition sources

Sources of ignition have been assessed and reduced as far as reasonably practicable. Remaining sources of ignition have been identified and controlled as described below;

Ignition Source	Monitor	When	Records	Control Measure
Plant/ Equipment	IR Heat Gun	Daily / Weekly	✓	Parked 6m away from wood at the end of the day
Wheeled Loading Shovel	IR Heat Gun	Daily / Weekly	✓	Parked 6m away from wood at the end of the day
Slow speed shredder	IR Heat Gun	Daily / Weekly	✓	Situated 6m away from stockpile. Detection & Suppression system fitted.
Mobile Screener	IR Heat Gun	Daily / Weekly	✓	Situated 6m away from stockpile
360 Excavator	IR Heat Gun	Daily / Weekly	✓	Parked 6m away from wood at the end of the day
Vehicles	IR Heat Gun	Daily / Weekly	✓	Parked 6m away from wood at the end of the day
Material (Self Combustion)	iTOM probe	Every 15minutes	✓	Email alert notification to Manager if 2° increase and investigation.

Unprocessed mixed wood	Visual	Daily / Weekly	✓	IR thermal imaging gun can be used, if suspect materials are noticed
Biomass Product	iTOM probe	Every 15minutes	✓	Email alert notification to Manager if 2° increase and investigation.
Fines	iTOM probe	Every 15minutes	✓	Email alert notification to Manager if 2° increase and investigation.
Single Source Wastes	Visual	Daily / Weekly	✓	
Arson	Perimeter 1.8m high Chain Link and Palisade Fence / Gates, CCTV	Daily	✓	Third party CCTV to call out Manager if alarms triggered. Managers have full access to cameras via mobile phones. CCTV is motion activated and covers the entire site.
Electrical	Visual during work			Permit to work
Hot works	Visual during work			Permit to work
Hot Exhausts	By operator	During processing		Regular blow out, situated 6m away from stock pile
Industrial Heaters <b>(Not Applicable)</b>				
Gas Bottles – in the CCTV unit	Visual during work	Daily / weekly		Situated near the weighbridge, over 6m away from wood
Smoking	Only in Designated area	Break times		Site Rules / Policy / Law

#### 4.2 Hot Works – permit to work (Grinding, cutting, welding)

These activities are not expected to be regular activities undertaken on site. Should such activities be required, they will be carried out in accordance with a management procedure that requires an authorisation to work and includes pre and post work checks (Permit to work).

- The area of works is to be kept clear of flammable and combustible materials for a distance of 6 metres.
- A fire watch takes place during the hot works operation and for 60 minutes after its completion and then a final inspection is completed at the end of the day.

- No hot works must be conducted in the proximity of combustible or flammable materials and provisions have been made for protection of such materials by non-combustible materials, where hot works is conducted must be properly ventilated.
- Appropriate signage will be used during these works.
- Sparks from buckets / grabs and equipment coming into contact with metallic surfaces are not expected to be a source of ignition.

There are no sources of ignition from the shredder / screener. This equipment is diesel powered and there is no metal on metal surfaces. The shredders are slow speed this is an added mitigation to fire risk, the equipment is fitted with a water mist system for dust cloud suppression and an automatic fire detection and extinguisher system. All equipment and plant is regularly blown out / cleaned to mitigate the potential risk of fire and checked with an IR Gun for heat.

Magnets are in use on conveyors to remove any metal (which potentially could be hot) from the shredding process and stored in metal containers.

Welfare and cooking take place in the canteen area, where appropriate fire extinguishers are held.

#### **4.3 Hot Spots / Hot Loads / Fires:**

Wood chip / fines begin to heat after production due to breathing (microbiological oxidation). Usually charring is an indication that temperatures are getting critical, this occurs sometime before smoke develops.

Daily checking of stock piles for temperature and signs of temperature increase will provide an early warning and minimise the potential for hot spots to develop. Should a hot load be identified, or a hot spot and requires digging out, this will be undertaken in a controlled manner;

- Identify a concrete block bay or an isolation/ quarantine area minimum 6m from other sources and materials with sufficient room to spread the materials to cool it down using the site plant (Shovel(s), 360 grabs)
- Monitoring of temperature with temperature probe or electronic hand-held infrared monitor
- Provision of a water spray or fogging from hoses
- Flooding of the stock pile by inserting perforated pipes and pumping water in
- Dug out material (Hot spot or Fire) will be stored away from stock piles in an isolated/Quarantined area and dampened down, temperatures will be monitored until the temperature is no longer a risk with a temperature probe or hand-held monitor.
- This material will then be removed from site to a suitable licensed facility.



- On-site security is provided: e.g. locked gates, Palisade fencing 1.8m high, and the site has Monitored 24-hour CCTV. Managers have access to CCTV cameras live from mobile phones. The CCTV covers the full site.

#### **4.4 Visitors and Contractors**

Visitors and Contractors are controlled on site, all have to sign in at the weighbridge where the site rules are explained. Contractors will be issued a permit to work and the work will be supervised, should the works potentially have an impact on the requirements of the FPMP this will be explained to the contractor and detailed in the permit to work and visitors will be accompanied around the site.

#### **4.5 General Housekeeping**

The site is kept as clean and tidy as possible at all times. Daily and weekly inspections are undertaken for drainage, tidiness, fire extinguishers, diesel storage, access / egress into the site as a part of the walk around. These checks are recorded in the daily diary (electronic or hard copy).

Daily site boundary checks (1.8m high palisade fence) are completed to ensure the site security is maintained and the risk of arson reduced. Any defects will be repaired as soon as practicable and in any event within 5 days of discovery.

Out of hours, plant and equipment is not stored next to the storage bays, their locations are detailed on the site plan (See Appendix A).

Fire equipment is checked regularly and serviced annually.

#### **4.6 Plant and Equipment Maintenance**

The plant and machinery used on site may include;

- Excavator with grab attachment fitted
- Loading shovel(s)
- Screener
- Slow Speed Shredder with Magnet for metal separation

Specific details are in the site EMS.

All equipment will be of suitable for the activity intended. Equipment will be operated, inspected and maintained in accordance with the manufacturers' recommendations, in order to minimise fugitive emissions, electrical faults / damaged or exposed cables (works to be carried out by a qualified electrician). It is recognised the importance of ensuring that critical plant and equipment are maintained using preventative maintenance. All plant and equipment will be maintained in accordance with manufacturers' recommendations, preventative work will be carried out as a part of routine checks. Suitable facilities for the maintenance and storage of plant and equipment will be provided.





All plant on site is diesel, all plant is regularly serviced / repaired to reduce / prevent spillages on site.

In addition, throughout the day operators remove dust and wood chip from vulnerable areas such as exhausts and engine bays and fans. All plant and equipment prior to the end of shift, is cleaned, blown out, checked with heat gun and visually inspected by the operator for the purpose of identifying fire risks. All items of plant are fitted with fire extinguishers.

#### **4.7 Hot works**

As detailed in section 4.2 above, Hot works (such as welding, cutting, grinding) activities are rarely carried out on site, when they are a permit to work will be issued. Should such activities be required (in an emergency only), they will be carried out in accordance with a management procedure that requires an authorisation to work and includes pre and post work checks. The area of works is to be kept clear of flammable and combustible materials for a distance of 6 metres. A fire watch takes place during the hot works operation and for 60 minutes after its completion and then a final inspection is completed at the end of the day. No hot works must be conducted in the proximity of combustible or flammable materials and provisions have been made for protection of such materials by non-combustible materials, where hot works is conducted must be properly ventilated. Appropriate signage will be used during these works.

## **5 Prevent self-combustion**

### **5.1 Self-Combustion Risk**

The risk from self-combustion from the materials on site is low owing to how they are received, processed and removed from site. This is justified through the BRE Global reports – Iso thermal self-heating reports Jan15R1 BRE Report No. 300036 and P112562 on small and large wood chips and Fire Spread report Oct14 BRE Report No. 136540. **In addition, the self-heating analysis on the wood chips was used in the BRE peer review report, published by the Environment Agency, to support the current Prevention Plan guidance, BRE Report No. P104794.**

**Conclusions form the BRE Global self-heating reports on the testing of wood chips and the piles sizes;**

**BRE Report No.300036**





1. Small (20mm) and large (10-75mm) wood chips were tested isothermally to determine their self-heating properties. From the critical ignition temperatures recorded the materials were found to be susceptible to self-ignition.
2. Thermal ignition theory has been used to correlate the results and a straight line for  $\ln(dcTR^2/r^2)$  versus  $1/TR$  has been found over the cube size range tested. Therefore, extrapolations for larger piles and different geometries may be made with confidence.
3. The lowest critical temperature determined for the small chips is 58°C when stored in a silo of 20m x 20m x 4m. Time to ignition is estimated at 97 days.
4. The lowest critical temperature determined for the large chips is 108°C when stored in a silo of 20m x 20m x 4m. Time to ignition is estimated at 84 days.
5. The moisture content of both wood chip samples tested was 23-24%. Significant changes to the moisture content would affect the self-heating behaviour.

#### **BRE Report No. P112562**

BRE report No. P112562

Based on the laboratory experimental results obtained for the two wood chip samples (10-75mm and >75mm), the high critical temperatures of the materials required for the piles to undergo self-heating indicates the piles in the dimensions analysed are unlikely to undergo self-combustion.

For processed chips 10-75mm being stored in piles 17.5m x 17.5m x 5m the critical temperature is 105°C with a time to ignition once this temperature is reached estimated to be 259 days.

For unprocessed wood a chip size of >75mm in size has been used as a worse case, and the critical temperature is calculated to be 130°C with an estimated time to ignition of 313 days when stored in dimensions 25m x 20m x 5m.

Even if the critical temperatures are reached the time to undergo ignition is in excess of 6 months. However, it should be noted that even small increases in temperature above the critical temperature will reduce the estimated ignition time dramatically.

Thus, the fire prevention strategy for these piles follows a three stage fire safety approach:

1. The piles sizes are kept within the limits stated, in particular a maximum of 5m in height.
2. The residence time for both piles is kept to < 6 months.
3. The processed wood, being of slightly higher risk, undergoes temperature monitoring where a > 2°C temperature risk or 45°C is recorded then investigation and if necessary, action is taken to cool the pile.

## 6 Manage Waste Piles

### 6.1 Managing Storage time

Item	NRW (guidance)	BRE Global Ltd (test Data)	JMEL (site limits)	Risk Level
Unprocessed Wood (UP) Stored in the open (>75mm chips used)	4m high 20m stack width	130°C (25m x 20m x 5m) 128°C (25m x 20m x 6m) 132°C (35m x 20m x 4m)	3000m <sup>3</sup> 25x20x 5 (example) (35x20x4) (example)	Low
Processed Wood (PW) (10- 75mm) Stored in Bays	4m high 20m stack width	105°C	1250m <sup>3</sup>	Low / Medium
Fines (0-20mm) Stored in open stock piles	Not detailed	65°C (10m x 10m x 3m)	300m <sup>3</sup>	Medium
Storage Time (UP)	6 months	313 days (130°C)	9 months	
Storage Time (PW and Fines)	3 months	259 days (105°C)	9 months	
Temperature (UP) – Critical limit	Not detailed	130°C	45-60°C	
Temperature (PW) – Critical Limit	Not detailed	105°C	45-60°C	

### 6.2 Waste Quantities and Locations

Wood waste grade B and C will be sourced mainly from contractors, transfer sites and local authority contracts in the local area. All wastes are assessed for their suitability to be received on site with the accepted waste types. Should Hazardous wood be found this will be removed into a suitable bay or container for removal from site, or the entire load will be rejected, in accordance with the duty of Care Regulations and notifying the appropriate Authority.

The site plan Appendix A shows the areas for wood stockpiles and storage bays. All storage will be in the open, the building in the permit area is the weighbridge. The bays will have concrete block walls that facilitate being able to be moved should changes be required. Any changes to the site layout would be discussed with NRW and agreed before being undertaken.

Staff will be informed and trained in the procedures for processing and storage.

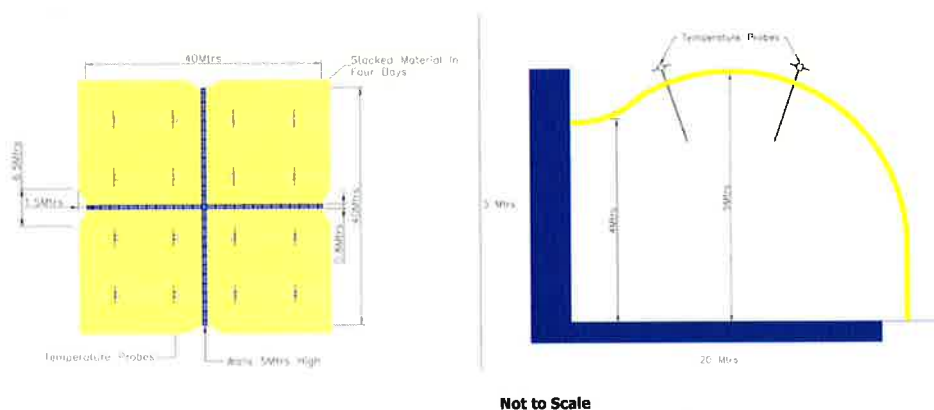
The processed materials will be stored within the Maltese Cross configurations, 17.5m x 17.5m x 5m or 20m x 20m x 4m, each quadrant storing no more than 1250m<sup>3</sup> (367.5 tonnes per quadrant, 1470 tonnes per Maltese Cross), 1m freeboard adjacent to the walls – domed in the centre of the bay and a minimum of 6m between the cross configurations.

### **6.3 Storage Bay Management**

The storage bay walls are designed to act as fire breaks to minimise the spread of fire across the site. The blocks are Class A1 rated and have a 120-minute fire resistance period in accordance with BS EN 13501-1:2002.

The free board space for every bay will be maintained at 1 metre adjacent to the walls, using the information provided in the BRE Global research report (BRE Report 136540), this free board is sufficient to prevent fire spread across the top of the bays but does not prevent the materials being domed in the middle in normal conditions and to maintain the radiated insulation properties of the concrete block system.

There is no requirement to have joints filled between the blocks, as there is no gap. The blocks are manufactured to give a fire resistance time of 120 minutes.



Overspill will be slightly outside the quadrants at times during the working day as this is inherent with the nature of the operations. At the end of the day, or completion of a quadrant, any overspill will be pushed into the quadrant or removed to another bay to ensure that there is the correct freeboard to prevent fire spread. This will be managed and monitored by site management ensuring the toe of the wall end is visible at all the end of the operational day. This will be reduced owing to extending the bay walls to 20m.

Unprocessed wood will be stored in stockpiles, as this is low risk material. Each stockpile will have a minimum 6m separation from the adjacent stockpile.



#### **6.4 Waste storage bay inspections**

##### **Formal Inspections**

On a daily basis each storage bay is visually inspected by the site manager for any anomalies, such as visual signs of heat, steam or vapour. Any anomaly will be actioned by investigation and remedial action will be taken such as rotation of the material, removal of the material, dampening down etc.

Unprocessed wood owing to its form has been proven to be low risk and will not generate sufficient heat to combust (BRE Global reports,), when stored in the dimensions and time periods detailed above. Owing to the structure of these stock piles being large pieces of wood there is nothing on the market that can measure / detect heat in the core of these stock piles. We will carry out visual checks of these stock piles daily, and the IR heat gun can also be used as another means of monitoring.

##### **Informal Inspections**

Owing to the nature of our business, site operatives are located within the yard area throughout the day, whereby they are continually and vigilantly observing / monitoring the condition of the site process and materials for the potential fire risk situations.

#### **6.5 Monitor and control temperature**

##### **ITOM – active temperature monitoring**

Active Temperature monitoring probes will be used to monitor the processed material in the bays for temperature fluctuations (Minimum 2 probes per Bay, placed from the top of the pile into the core). We have several probe lengths dependent upon the size of the stock pile that is to be monitored. The ITOM system is set with parameters by management, any sharp increase of more than 2 degrees will provoke a response via email to management to investigate, if no action a second hierarchy of emails are sent out to the upper tier of management, emails then continue to record the process until issues are closed. Management also have access to live CCTV cameras on site, through mobile phones to get an instant view of the entire site and history of the temperature rise from the emails.

Processed material and fines are monitored daily with the ITOM probes (See Appendix D). Each probe has a unique number/ code, recording temperature every 2.5 minutes and sends data every 15 minutes, trigger temperatures are set and when reached email notification is sent out to mobile phones. All the data is stored on PC's. Management also have mobile access to the site cameras, allowing for visual checks outside of operating hours.

Flame ionisation detectors and thermal cameras will not work in an outdoor environment we only use this equipment for specific machinery, also with the design of the site with the Maltese crosses it is not possible to get a clear field of view



(therefore black spots would be a problem). The iTOM system has been working at our other permitted facilities without any cause for concern (Hollybush EPR/DB3601HB, Lodgewood EPR/BB3907UX). Photographic evidence can be taken to demonstrate stock rotation is taking place. Actions from inspections are recorded in the daily diary (electronic and/or hard copy).

## **6.6 Non- waste**

In addition to the wood waste, the following sources of fuel have been identified as;

- Diesel (Red, for machines and plant) (500-2000Litres in a double skinned tank)
- Oils & Grease (25 Litre drums stored in ISO)

These are stored outside of the wood process area as shown on the Site Plan (Appendix A).

## **7 Fires**

### **7.1 Receptors**

- Human
- Employees     }
- Site users     } Health (smoke inhalation) & Safety (burns)
- Public         }
- Environment   - SSSI's
- Air             - Smoke / windblown ash
- Land           - Impact of fire on ground & fire residue
- Water          - Firewater run-off

Risks to people & prevention of harm is covered by operational Risk Assessments, Safe Working Procedures, and Emergency Procedures (including those detailed in the Fire Log Book). In an incident, key receptors would be contacted as detailed in Appendix B – Emergency Action Plan.

In the event of a fire, as a minimum the key points of action would be;

- Reduce the pile size of the affected material – good access to the piles due to separation distances facilitates this. Use Quarantine area which is close by
- Set up a controlled burn with the FRS – if approved by the FRS and NRW
- Put pumps into action if necessary / break up affected material to extinguish
- Clear up residues and dispose of off site

In the event of a fire, Risks to the environment are addressed by the site infrastructure and the prevention measures in this document.

- Air – Perimeter Bund around perimeter of pad & internal stock bay walls create windbreaks.
- Land- Impermeable pad constructed to protect ground beneath & provide containment.



- Water - Pad constructed with falls to contain run-off, all run-off collected in above ground tank.

The mostly likely impact would be from smoke due to suppressing the fire with water. It is expected (with FRS approval) that a controlled burn would take place, whereby the impact of smoke would be substantially reduced. Smoke may cause a temporary issue for the train using the railway line for the loading / unloading of scrap metal. The SSSI's are approximately >800m from the facility, it is not anticipated that these will be affected by a fire on site.

## **7.2 Fire Prevention Measures:**

- Wind breaks
- Fire breaks – 6m separation distance
- Concrete stock bay walls and Maltese Cross arrangement. The blocks are Class A1 rated and have a 120-minute fire resistance period in accordance with BS EN 13501-1:2002.
- Metals removed and stored separately.
- Daily Temperature (Readings taken every 2.5 minutes and reported at 15-minute intervals) and moisture monitoring of processed stocks at risk of self-combustion (Processed Wood, fines,), either using a temperature probe or a thermal heat gun. Monitoring will be with online probes to a live monitoring system – iTOM (this is in use at all our facilities – See Appendix D). This is in addition to the contracted monitoring by CCTV. Managers have access to site cameras through mobile phones at all times.
- Keep wood in unprocessed form as long as possible (LOW RISK STATE). As proven in the BRE Global reports.
- Stock rotation, ensures that stock is not left on site longer than necessary (within 9 months), helping to reduce the possibility of self-combustion. The stock bays will be filled and emptied in rotation. With the demand required for contracted outlets that are in place, the bays will be emptied frequently. Contingency plans are in place to divert wood to other Jack Moody Recycling facilities should the need arise (See Appendix E).
- Site inspection for any signs of combustion at the start & end of each day
- Fire watch (following cessation of production) at the end of each processing shift
- Mobile plant parked at a suitable distance away from stockpiles outside operating hours
- Site security to reduce potential for arson (3<sup>rd</sup> party Monitored 24hr CCTV) and perimeter Palisade fencing
- Housekeeping – processing plant regularly cleaned/ serviced.
- Plant maintenance – daily checks (bearings), planned & routine, annual servicing.





- Stockpiles arranged to allow access from at least 2 sides in case of need to fight fire

There is a strict no smoking policy on site, a designated smoking area is by the weighbridge for staff and visitors to use. The smoking area does not contain any combustible materials and there is a sand / or water filled bucket for cigarette ends.

### **7.3 Quarantine Area**

Quarantine area (minimum 25m x 15m) will be dependent upon site operations / wind & weather conditions and is situated close to the stockpiles (6m away from stock piles) and will be 50% volume capacity of the largest pile (1500 m<sup>3</sup>) either an area on the pad or in one of the storage bays identified on the site plan.

The area is on an impermeable surface and waters from this area drain to the site surface water tank.

### **7.4 Fire-Fighting Provisions**

Fire extinguishers are located around the premises.

Mobile extinguishers will be a variety of: 6kg Foam, 6ltr water, 4ltr Carbon dioxide.

Plant is fitted with industry standard extinguishers.

Access to water will be from the 1 million litre site tank, a 4inch water main on site and a Fire Hydrant on David Davis Road (100m from entrance).

There is also the availability to abstract water from the Port (subject to consent from the Port Authority and agreement from FRS).

Site extinguishers are inspected annually by an external fire protection company and visual checks are carried out monthly by the site manager. All extinguishers are placed in prominent locations in clear view with easy access.

There is no fixed fire suppression system on site. Fire suppression will be achieved by the use of mobile equipment as described above to actively fight any fire on site. Staff have been trained to use extinguishers in the event of an emergency. The estimated volume of water needed to fight a wood fire has been calculated at 4hrs firefighting water requirements for site, with wood stockpiles of 3000m<sup>3</sup> as detailed in 5.3. Wood piles in case of emergency require a rate of 5m<sup>3</sup> or 5000 litres of water per minute of burn.

A Fire and rescue Tender has a capacity of 2700 litre per minute through its high-pressure pump or 162,000 litres per hour for one tender running all hoses. 3 No. fire tenders would use 486,000 litres of water at maximum pump output per hour. As the site harvests all water and if an assumption of 60% water goes back to





tank from the fire-fighting activities 4 hrs or 240 minutes at 5m<sup>3</sup> per minute equates to 1200m<sup>3</sup> per hr requirement. Total storage capacity on site for fire prevention is 1million Litres in the surface water tank.

\*Please note that the water extracted from the tank to put out a fire would lead to a reduction in water level in the tank which would then give capacity for run-off from fire-fighting – an endless loop apart from evaporation and absorption. The breaking up of piles using site plant will also reduce the impact and requirements for water. Due to the 6m separation distances around the piles, mobile plant will be used, when safe to do so, to remove unburnt materials to the quarantine area and thus reducing the fire size for active fire-fighting.

There is sufficient water on site and with the locality to meet this demand.

## **7.5 Fire Alarm and Detection**

The fire alarm on site is an airhorn with manual operation from the weighbridge. The iTOM probes give early warning of a potential fire, by means of continuous monitoring and notification by email to mobiles (see Appendix D).

## **7.6 Staff Training**

All staff are trained in the site operating procedures, FPMP requirements, maintenance procedures and emergency plans.

All staff are trained in the use of firefighting equipment, the requirements of the FPMP in an emergency and the emergency plan, this will be put into practice annually.

Refresher training and updates are given to staff as required. The effectiveness of this is tested through regular fire drills and fire scenarios.

Records are kept for all training completed and for fire drills performed.



## **7.7 Emergency Action Plan**

Actions to detail with an emergency from a fire are detailed in the Emergency Action Plan (see Appendix B). This Plan contains details for key personnel.

The most senior member of staff on site at the time of an incident will act as incident controller until Senior management get to site.

The plan also contains contact details of neighbours to contact in the event of an incident.

To prevent an incident escalating and to reduce the spread of fire, onsite plant (Loading shovel(s), 360 Grab,) would be used to move unburnt wood adjacent to the fire to an alternative area on site. Also, these machines could be used to break into the stock pile on fire, to remove unburnt wood and drench the burning wood. To give an example for the capability of the plant should an incident occur, we would expect 3 loading shovels to be able to move 1000m<sup>3</sup> of wood within an hour and with the assistance of the grab we will be able to remove adjacent stockpiles / reduce the stockpile on fire to minimise the spread of fire and extinguish a fire within 4 hours in accordance with the objectives in the FPMP.

The initiation of this action would be taken by the most senior member of staff on site and will always consider the safety of employees.

The assessment of whether to move unburnt wood / break into the burning stack will consider the following;

- The safety of the operative inside the machine
- The direction of smoke
- The heat of the fire – intensity & duration
- Means of escape

### **Access for Emergency Services**

The main access for emergency services is through the main gate on the south of the site, off Wimborne Road, please refer to site plan (Appendix A).

If required water can be from the Hydrant on David Davis Road as well as from the Dock adjacent to the site.

### **Liaison with Emergency Services**

It is expected to have a visit from FRS periodically, for a familiarisation visit along with welcoming any advice that the FRS may have.

### **Post Incident Actions**

After an incident the following steps would be taken;

- Access any damage
- Liaise with the insurance provider
- Remove any excess fire water
- Remove any burnt or semi burnt material to a licensed waste management facility
- Repair / replace any damaged infrastructure
- Suspend operations if repairs cannot be made – implement Contingency plan.

### **Fire Prevention Risk Assessments**

A fire risk assessment, desk-top fire priority gathering audit and an Environmental hazard, pathways & receptors assessment have been conducted in order to produce this Fire Prevention Plan. Please refer to Appendix C for details.

### **7.8 Continual Improvement Action Plan**

JM Envirofuels is dedicated to continually improving site operations through investments and modifications, taking into account Industry Best Practice. It is intended as a part of the Annual review of the site EMS that the FPMP is also reviewed, taking into account the results of the annual drills.

## **8 Managing Fire Water**

### **8.1 Site Drainage and Containment**

The waste processing areas will incorporate an impermeable pavement with drainage via the above ground tank. The tank has no outlets to prevent contaminated water entering surface water (eg following a fire). All waste storage areas will drain to the tanks.

The construction of the floor for the waste process area is with re-enforced concrete, it is considered that this construction is in line with the requirements of the CIRIA (C736) guidance.

### **8.2 Operational Area**

#### **Drainage design**

The new area for operating is approximately 15310m<sup>2</sup>.



Taking a M5-48hr event of 50mm a runoff volume of 7655m<sup>3</sup> would be generated at the site. To handle this runoff, a new storage tank will be construction with a capacity of 1million Litres (allowing for 33.5% extra/free space storage capacity).

This will be managed via a pumping chamber and surface mounted 1million litre tank shown on the site layout drawing.

The tank will be filled from surface run-off, along with a 4" mains fed supply to ensure that the tank has sufficient guaranteed water in storage.

Couplings on the storage tank will be compatible with Fire service equipment.

Firefighting water usage on site will be part of the fire prevention and mitigation plan, we have provided the calculation as part of the drainage design also.

### Fire-fighting considerations

Firefighting water usage on site will be part of the fire prevention plan, we have provided the calculation as part of the drainage design. Other notes to be considered when evaluating the water requirements are:

- A Fire and rescue Tender has a capacity of 2700 litre per minute through its high-pressure pump or 162,000 litres per hour for one tender running all hoses.
- 3 No. fire tenders would use 486,000 litres of water at maximum pump output per hour.
- As the site harvests all water and if an assumption of 60% water goes back to tank from the fire-fighting activities this means over a 4 hr period 1166m<sup>3</sup> of water will be recycled, of the total 1944m<sup>3</sup> used in 4 hrs by 3 No. fire tenders at a rate of 486m<sup>3</sup> per hour.

### Fire action Procedures

ACTION	Equipment	WHO.?	WHEN.?
Reduce pile size first and localise fire	Using on site machinery	Site management and staff	Immediately
Remove from the area excess materials	Using on site machinery	Site management and staff	Immediately
Inform the relevant authorities		Site management and staff	Immediately
Start firefighting procedures	Fire brigade and on-site equipment	FRS and site Management	After agreement with FRS



### **8.3 Fire Fighting Water (stockpile size 3000m<sup>3</sup> for 4Hrs)**

A 4hrs firefighting water requirement for sites, with wood stockpiles of 3000m<sup>3</sup>. Wood piles in case of emergency require a volume of 1200m<sup>3</sup> water for 4 hrs or 240 minutes at 5m<sup>3</sup> (this figure supplied by the FRS as part of the WISH assessment of fire risk assumes two fire tenders in attendance) per minute equates to 1200m<sup>3</sup> per 4hr event.

Total storage capacity on site for fire prevention is 1 million litres in surface water tank and associated drainage. The tank will always have the minimum required volume of water in them of 1million litres.

Site design is such that if a fire event would occur, all water stays bunded on site by the site infrastructure. The site infrastructure includes a perimeter drainage channel directing water to the sump for pumping.

\*Please note that the water extracted from the tank to put out a fire would lead to a reduced level in the tank which would then give capacity for run-off from fire-fighting – an endless loop apart from evaporation and absorption. The breaking up of piles using site plant will also reduce the impact. Mobile plant will be used, if safe to do so, to take away unburnt material from a pile to the site quarantine area which is close by. This will reduce the fuel loading and thus reduces the quantity of fire water required.

Waste treatment and storage activities will be carried out on an impermeable surface, with drainage directed to a sealed tank, giving an added level of protection to soils, surface water and groundwater. Regular checks of site surfacing, drainage, bunding and storage vessels and these will be repaired as necessary, to ensure that they retain their integrity. The tank has no outlet to prevent contaminated water entering surface water or sewers (e.g. following a fire). All waste storage areas will drain to the tank.

All tanks and drums used for the storage of diesel, plant oil and lubricants, will be suitable for the material being contained. The diesel tank is 500 litres and is double skinned. Oils will be in 25 Litre drums stored within the ISO unit away from the processing pad. All liquids are stored in compliance with HSG 51 (HSE guidance for storage of Flammable Liquids) and The Control of Pollution (Oil Storage) (Wales) Regulations 2017.

Plant on site is diesel, all plant is regularly serviced / repaired to reduced / prevent spillages on site.

The management in emergency situations and the initiation of the emergency plan – including the management of fire water, is the responsibility of the Company Director / Site Manager. This would also include the organisation of tankers to remove excess waters from the site should the situation arise.

## 9 Summary Table

NRW FPMP requirement	Site FPMP meets the requirements for alternative measure
<i>Your fire prevention plan must be a standalone document within the site management system</i>	The site FPMP document is a specific document forming part of the site Management system.
<i>You must make sure that staff know where you keep your fire prevention plan.</i>	Detailed in Sections 1, 2.1
<i>All staff and contractors working on the site must understand the contents of the fire prevention plan.</i>	Detailed in Sections 4.4, 7.6
<i>You must have regular exercises to test how well your plan works...</i>	Detailed in Sections 2.1, 2.2 and P42
Activities at your site	Section 3 has this information
Site plans and maps	<p>Provided in Appendix A</p> <p>Buildings are identified</p> <p>Access points around the site are identified.</p> <p>Water tank labelled.</p> <p>Fixed and mobile plant parking area labelled</p> <p>Quarantine area is identified</p> <p>Location of plant and fuels shown.</p> <p>Sensitive receptors identified in section 7.1 on aerial map with compass rose and in 3.2 with distances and direction.</p> <p>Hydrant locations shown.</p> <p>Areas of hardstanding identified.</p> <p>Site drainage shown to surface water tank.</p> <p>Storage stack and bay sizes detailed on plans</p>
Arson	<p>On-site security comprises: locked gates, 24-hour monitored CCTV from cameras which managers can access from mobile phones.</p> <p>There are daily site boundary checks and fencing damage repaired.</p>
Maintenance and inspection of plant	<p>Maintenance and servicing are detailed in section 4.6 p.15 with mobile plant storage location identified on the site plan in Appendix A and is away from wood chip storage areas.</p> <p>Plant have fire extinguishers and shredder/screener has fire detection and suppression system. It also has a water misting system to keep wood dust to a minimum.</p> <p>Cleaning of wood and dust deposits is given.</p> <p>The Table in section 4.1 confirms the mobile equipment is parked away from the wood chip storage area with the screener and shredder located 6m away from stockpiles.</p>

Electrical faults including damaged or exposed electrical cables	Detailed in section 4.1 & 4.6.
Discarded smoking materials	Covered in section 7.2. Smoking only allowed in designated area by weighbridge away from wood storage area. Shown on site plan.
Hot works	Detail on p 13-16, 43. Extinguishers provided during hot works. Areas cleared of combustibles and fire watches used.
Industrial heaters	Not used
Hot exhausts	Covered in section 4.1.
Ignition sources	Detail provided in section 4.1.
Batteries	Not present as waste
Leaks and spillages of oils and fuels	Bulk diesel storage is well away from wood storage area in double skin tank. Oil is in 25 litre drums away from wood storage/processing area. No ELVs on site.
Build-up of loose combustible waste, dust and fluff	Wood dust layers and chips cleaned from machinery and water misting used to reduce dust created from shredding.
Reactions between wastes	Not applicable as only wood is processed and stored.
Deposited hot loads	No hot loads are expected, rejected and re-loaded back onto lorry or quarantine area used. Procedures detailed in section 4.3 for identifying and rejecting hot loads arriving on site.
Self-heating Storage time	<p><u>Unprocessed wood</u></p> <p>Self-heating fire prevention measures detailed in section 5.2:            No acceptance of hot loads            First in first out            Daily visual inspection.            9-month maximum storage            Wood pieces are large &gt;75mm but will have some finer material.            Isothermal basket test was undertaken on two sizes of wood chips as detailed in the BRE Global reports for the site pile geometries.            The calculations show high material critical temperatures at 130°C for ignition and a time scale of approx. 10 months once the material reaches this temperature.</p> <p><u>Processed wood</u></p> <p>Temperature monitoring is taken from the time of production, not after 9 months (<b>Exceeds NRW requirement</b>).            Temperature monitoring of piles using 1-3m probes and/or thermal heat gun.  <i>As depth of piles are 5m then using 2.5m length probes will reach the centre of the pile which is the most likely area for self-heating.</i></p>



	<p>Action taken once 2°C rise is recorded or a temperature of 45°C is reached which is well below the critical temperature.</p> <p>Metals removed via screening.</p> <p>9-month maximum storage period is within the calculated time to ignition.</p> <p>Control of pile sizes</p> <p>Isothermal basket tests undertaken on 10-75mm size wood chips.</p> <p>Concrete bays used to store waste Blocks are class A1 fire classification</p> <p>Visual inspection daily.</p> <p>Critical temperatures are high at 105°C and time to ignition is approx. 8 months once this temperature is reached for the bulk of the material. These are within the proposed time and temperature parameters detailed in the site plan. <b>(Exceeds the NRW requirements).</b></p>
Monitor and control temperature	<p>Metals are removed using the magnets (x2) and the eddy current separator (for non-ferrous metals) on the screener/shredder and stored in a metal skip.</p> <p>Fines 0-10mm are removed and stored separately in 300m<sup>3</sup> volumes as per FPMP guidance in separate storage piles.</p> <p>Temperature monitored of fines from time of storage, not after 3 months. <b>(Exceeds the NRW requirements).</b> These size wood chips were tested by BRE and included in the report for large pile sizes in excess of 300m<sup>3</sup>.</p> <p><b>(Exceeds the NRW requirements).</b></p> <p>Material is not hot when it comes out of the shredder as slow speed shredder used.</p> <p>Details of the iTOM temperature probes are given with trigger temperatures. In Appendix D section 4.1 trigger temperature of 45°C is stated. Section 4.1.5 details of what staff do when a trigger level has been identified by iTOM.</p> <p>Section 4.2.1 also defines actions taken if temperature trigger levels reached, i.e removal to quarantine area.</p> <p><i>As depth of piles are 5m then using 2.5m length probes will reach the centre of the pile which is the most likely area for self-heating.</i></p>
Waste bale storage	Not applicable
Management of pile sizes Maximum pile sizes 750m <sup>3</sup> unprocessed, 450m <sup>3</sup> processed, 300m <sup>3</sup> fines	<p>Unprocessed wood to be stored in 3000m<sup>3</sup> stacks. Each stack will have a separation distance of 6m from the adjacent stack.</p> <p>There is a batch control to manage the storage of each stack.</p> <p>Processed wood to be stored in the maltese cross bays 1250m<sup>3</sup>.</p> <p>Each bay is numbered to control storage time (FIFO principal).</p> <p>These bays will be monitored as soon as the bay is full <b>(Exceeds the NRW requirements to monitor after 3 months storage time).</b></p> <p>The fines, not added to the processed stock will be stored up to 300m<sup>3</sup> in separate piles. The fines will be monitored for</p>

	<p>temperature when the volume has been achieved (<b>Exceeds the NRW requirements to monitor after 3 months storage time</b>).</p>
Prevent Fire Spreading Separation distances	<p>6m separation distances are used on the site between unprocessed stack piles and as detailed on the site plan. Distances to the site boundary are well in excess of 6m.</p> <p>The higher risk processed wood is stored within the maltese crosses. There will be 1m free board adjacent to the bay walls to minimise fire spread.</p> <p>Detailed fire radiation calculations were undertaken by BRE for processed wood stored in these bays.</p> <p>We have detailed in the FPMP that should a fire start, the risk of spread will be reduced by actively reducing the stack size as well as moving adjacent stacks away from the fire. This will be achieved by using the range of plant on site (3 shovels, 360 Grab). See Section 4, P 12 &amp; 15 &amp; P43.</p> <p><b>(Meets the objective in the Guidance)</b></p> <p>Quarantine area is used for locating burning materials or unburnt material as required. Located on plan P23.</p> <p><b>(Exceeds the NRW requirements).</b></p> <p>Removal of waste to the quarantine area during a fire is by use of mobile equipment present on the site is an additional measure if safe to do so.</p>
Fire walls and bays	<p>Site FPMP confirms use of 120-minute fire resisting concrete bay walls for storing processed wood in the Maltese Cross and allows access to extinguish any fires within a bay and also to remove material from adjacent bays.</p> <p>First In First Out policy is detailed on P10, P22.</p> <p>The plan describes how the iTOM temperature probes are used to monitor pile temperatures throughout from construction of the pile, 24hrs a day and reported to Managers when alarms are triggered.</p> <p><b>(Exceeds the NRW requirements).</b></p> <p>Details on concrete blocks are provided in the Appendix.</p> <p>Flame heights and radiation analysis has been undertaken by BRE.</p>
Quarantine area – 50% of the largest stock pile size	<p>This area is identified on the site plan as a capacity of 2500m<sup>3</sup>. It has capacity to hold at least 50% of largest pile and 100% of higher risk processed and fine wood materials. It is located more than 6m away from other stored wood piles (P23).</p> <p><b>(Exceeds the NRW requirements).</b></p> <p>The use of the quarantine area is mentioned in relation to cooling of burning material and temporary storage of unsuitable wastes arriving at the site.</p>
Detecting fires	<p>A number of methods of detecting fires are given in the site FPMP which include:</p>

	<p>Air horn for general site fire alarm</p> <p>IR Gun – used mainly for machinery</p> <p>iTOM – for early detection within piles. (2-4 probes per bay, different length probes (1.5 – 3m). Email notification to Managers. See Appendix D.</p> <p>CCTV 24-hour monitoring, Managers have access to cameras via mobiles.</p> <p>Shredder has specific fire detection / Suppression system.</p> <p>Visual daily checks and fire watch at the end of the day.</p>
Suppression system	<p>Storage of wood chips is external only and so no fixed building fire suppression system is available.</p> <p>Shredder has a fixed fire detection and suppression system.</p>
Firefighting techniques	<p>The resources available at the site to fight a fire are detailed in the site plan in section 7 and Appendix B, and include:</p> <ul style="list-style-type: none"> <li>• Access around the perimeter of the wood chip storage area and also around each pile, as identified on the site plan, to allow for approach from different directions.</li> <li>• Mobile plant is available to remove burning wastes and to localise a fire by moving unburnt material to quarantine area or moving adjacent stock piles away.</li> <li>• Fire hydrants at the site entrance – identified on the site plan.</li> <li>• Water reservoir up to 1 million litres available on-site at wood chip storage area. Site is designed to collect fire water run-off for re-circulation.</li> <li>• Staff are available on site to assist FRS. 2 staff during working day.</li> <li>• Portable fire extinguishers around site and on equipment.</li> </ul>
Water supplies	<p>Section 7 and 8 detail the quantity of water available and required to fight a fire in a large pile of 3000m<sup>3</sup> for 4 hours.</p> <p><b>(Meets the objective in the Guidance)</b></p> <p>In reality, the pile would be smaller owing to the measures detailed to minimise the fire size.</p> <p><b>(Exceeds the NRW requirements).</b></p>
Managing fire water	<p>The site plan details the water containment system used on the site and in the wood chip storage area as detailed in Section 8.</p>
During and after an incident	<p>There is an Emergency plan in section 7.7 and Appendix B that details the actions and equipment available during an incident including FRS access and post fire requirements.</p>

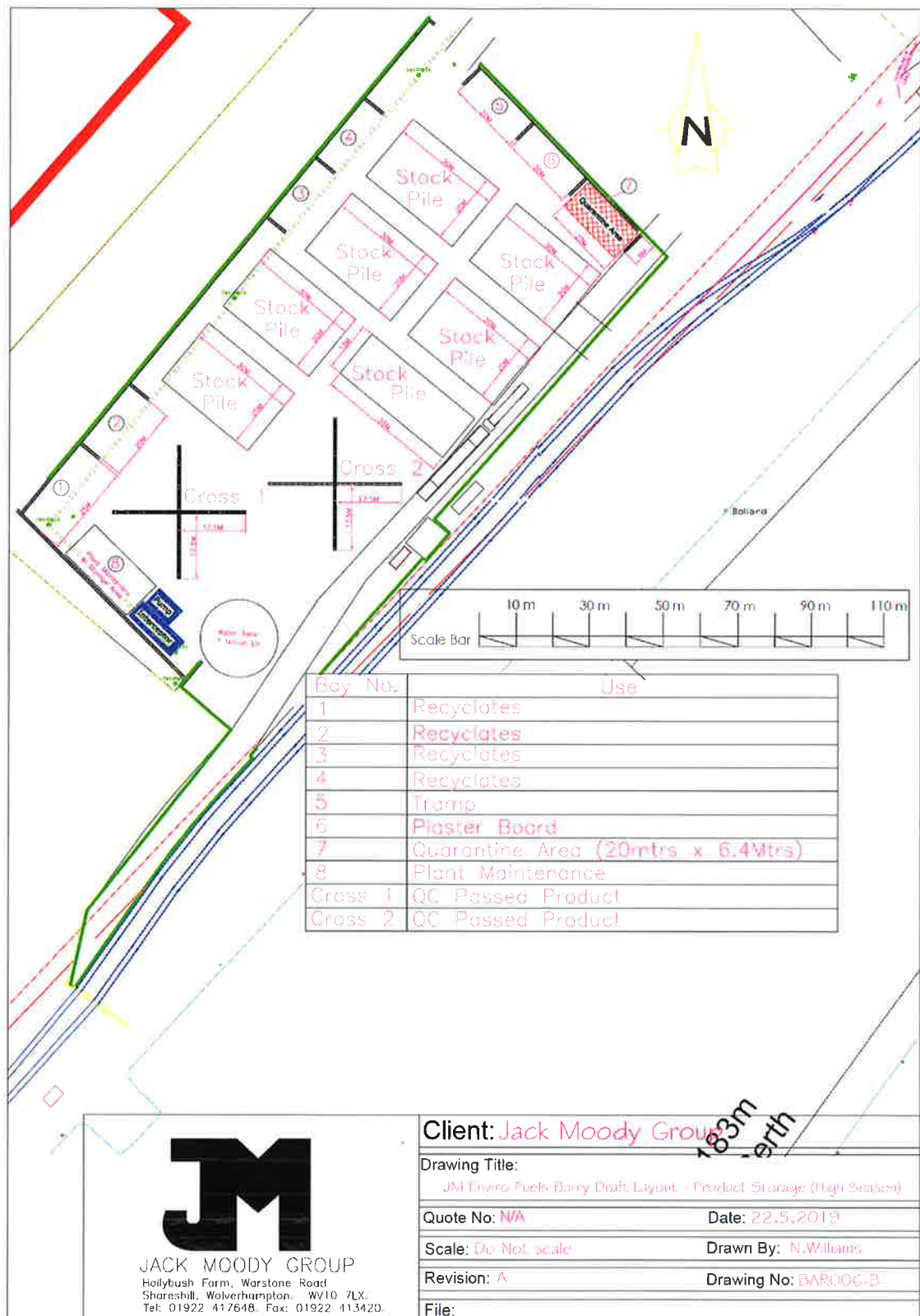


## **10 APPENDICES**

- Appendix A Site Plan
- Appendix B Emergency Action Plan
- Appendix C Fire Prevention Risk Assessment
- Appendix D ITOM System
- Appendix E Contingency Plan

### **Appendix A**







## **Appendix B**

### **Emergency Action Plan**





## **Emergency Fire Action Plan**

- **Introduction**

The fire safety plan has been established for the safe working of the Barry site to ensure that:

- This plan covers the action to be taken in the event of a fire on the Barry Site
- How fire hazards will be controlled.
- Emergency responders will be notified of a fire emergency.
- Emergency responders will not be delayed in carrying out their duties.
- Firefighting operations will be managed effectively without unnecessary delays.
- Designated supervisory staff will be appointed and organized to respond to fire emergencies.
- Instructions including schematic diagrams describing the type, location and operation of building fire emergency systems will be established.
- Building facilities, systems, equipment and devices will be properly inspected and maintained.

The fire safety plan reflects the characteristics of the wood facility considering the available firefighting infrastructure. The fire safety plan includes the following information:

- **Emergency procedures for an emergency**

In the event of a Fire all operatives must inform Site Manager or Supervisor by radio or by mobile phone. He will then inform the Fire Brigade 999 and the NRW Incident Hotline 0300 065 3000. In the event of the fire effecting residents the police may need to be involved because the residents may need evacuation.

Other contact numbers are: Mr John Keenan (Site Manager) Mobile: 07921 254839  
Mr Andy Bakes (Operations Director) Mobile: 07736 598781  
Mr Alan Webb (M.D) Mobile: 07764 289530

- **Training of site personnel on Fire and evacuation procedures**

Site operatives have the evacuation procedures explained at their induction provided by the Health and Safety Manager. Regular site fire safety meetings a part of regular safety meetings



and fire drills are conducted annually, this will include scenarios such as a stack fire / machine fire and what to do in accordance with the FPMP requirements.

- The Assigned site personnel are responsible to maintain fire safety duties

These are the Site Manager and Site Supervisor. They are responsible for controlling combustibles on the site and around the buildings. Also, general site housekeeping this done by asking staff to removing excess pallets, rubbish /waste material and other combustibles on a regular basis.

Other things to take into consideration are maintaining separation of combustibles from open flame devices. They maintain and clear unobstructed from access route(s) for fire brigade. Maintaining there is a clear exit from the office.

The parking of vehicles or delivery trucks should not obstruct fire department access if needed to attend site.

- Firefighting Services – Access Route

Site drawings are in weighbridge / site office for the fire brigade and show the location of firefighting equipment. The site address signs are visible and legible to emergency crews from the street. The site road is 12 metres wide, allowing good access for appliances (See Appendix A).

- Fire Extinguishers

There is a sufficient quantity and type on-site and servicing is undertaken annually by Diamond Fire or another certified company.

They are provided at or near fuel operated equipment and are they adjacent to any hot works operations (e.g. cutting torch, welding, torching, etc.). The extinguishers are intended for small fires and plant fires. Water is intended for extinguishing wood fires.

All plant has industry standard fire extinguishers onboard, the shredder has an automatic suppression system.

- Hot Spots

Wood chip / fines begin to heat after production due to breathing (microbiological oxidation), usually charring is an indication that temperatures are getting critical, this occurs sometime before smoke develops.

Daily checking of stock piles for temperature and signs of temperature increase as well as not keeping material onsite for two weeks will minimise the potential for hot spots.

Should a hot spot be identified and requires digging out, this will be undertaken in a controlled manner;



- Identify a concrete block bay or an isolation / quarantine area minimum 6m from other sources and materials with sufficient room to spread the materials to cool it down
- Monitoring of temperature with temperature probe or electronic hand-held infrared monitor
- Provision of a water spray or fogging through hoses
- Flooding of the stock pile by inserting perforated pipes and pumping water in
- Use on site plant (Loading shovel(s), 360 Grab) to remove hot material
- The removed material will be put away from stock piles in an isolated area using site plant (Shovel(s), 360 Grab) and dampened down, temperatures will be monitored until the temperature is no longer a risk with a temperature probe or hand-held monitor. This material will be removed from site for disposal if not longer suitable or for re-processing at one of our primary processing sites.

- **Hot Works Operations**

The area is to be kept clear of flammable and combustible materials for a distance of 6 metres. A fire watch takes place during the hot works operation and for 60 minutes after its completion and then a final inspection is completed at the end of the day. No hot works must be conducted in the proximity of combustible or flammable materials and provisions have been made for protection of such materials by non-combustible materials, where hot works is conducted must be properly ventilated. Appropriate signage will be used during these works.

- **Flammable and Combustible Storage**

There are no flammable or combustible liquids stored within the wood yard. The Diesel tank and oil storage is away from the processing area.

- **Electrical Installations and Petroleum Gases**

The electrical installations, storage and use of petroleum gases comply with the requirements of the Safety Standards Act. Electrical installations will be installed and checked by a qualified electrician (every 3 years). Diesel is stored in a double skinned, secure tank. Lubricants and diesel are stored outside of the processing areas in the ISO.

- **Security**

On-site security is provided: e.g. locked gate, 1.8m high chain link and palisade fencing, and the site has Monitored 24-hour CCTV – Full site coverage / movement detecting (with contact call out list held by the CCTV company). Managers also have live access to the site cameras from mobile phones.

- **Contact Personnel**

There a list of names and telephone numbers of persons to be contacted during and after normal operating hours or in the event of an emergency are below;

- [REDACTED]
- [REDACTED]
- Mr Alan Webb (M.D) [REDACTED]

In addition, key neighbours to be contacted also;

Location	Receptor	Contact Number
1	Harris Pye Marine International	01446 720066
2	Atlantic Container Storage	01446 677648
3	Dow Corning	01446 732350
4	Assoicated British Port Authority	029 2083 5042
	Vale of Glamorgan Civil Protection Unit	01446 700111
	Highways Agency	0300 123 5000
	Barry Hospital	01446 704000
	Holton Primary School	01446 734 844
	Cadoxton Primary School	01446 741 518
	Hafod Housing Association	01446 732 494
	Pen Yr Enfys	01446 729 911
	Bellavista Nursing Homes	01446 743 983

All the contact personnel are able to respond in a timely fashion with a response time of about 30 minutes.

- **Building Diagrams:**

The diagrams for the site are:

- Plans of the site;
- Muster point(s);
- Location of water sources
- Location of fire protection equipment

The fire safety plan will be reviewed and updated as the site developers and then periodically afterwards. The plan will evolve and will be used to maintain and protect the buildings and site operatives.



- Fire Precautions and Evacuation procedures

The Managing Director will ensure that: -

All employees receive comprehensive induction before commencing work, to ensure that they are fully aware of all the arrangements in place during the evacuation procedure.

A register of employees is kept up-to-date at all times. This register must be available for inspection at all times and will be taken to the fire assembly point in the event of an evacuation for the purpose of calling the roll.

The requirements for employee training in fire safety are adhered to.

A fire logbook is kept up-to-date with all relevant records relating to fire safety and ensure that it is made available for inspection by the local authority fire brigade.

All fire-fighting equipment is tested on a regular basis as per the manufacturer's guidelines and records kept.

A fire evacuation drill is carried out at least annually which will be recorded in the fire logbook.

A fire risk assessment is undertaken within the workplace, outlining who may be affected by a fire along with any special requirements that may be identified.

A regular check is made to ensure escape routes and doors are not obstructed. Fire exit doors should be unlocked and available for use at all times when persons are in the building. Fire doors should be closed at all times and not wedged open.

In the event of a fire, the safety of a life shall override all other considerations, such as saving property and extinguishing the fire.

**The company does not expect employees to fight fires, however, extinguishing action can be undertaken if it is safe to do so. On no account, should a closed room be opened to fight a fire.**

Employees should report any concerns regarding fire safety to management, so that the company can investigate and take any remedial actions that may be necessary. The hazard detection form can be used for this function.

#### Weighbridge / Office

In the event of a fire breaking out in the site office all staff must follow the company's fire instructions and evacuate the office by following the green man to the fire exits.

Re-entering the building is strictly prohibited until the incident control officer from the emergency services declares that it is safe to do so.

#### Process Yard

In the event of a fire in the stockpiles, operatives must inform the Site Manager by radio or mobile, who will then inform the fire brigade and NRW. After this he will instruct the appropriate members of staff assist in the fire action plan.

At present temperature monitoring will be undertaken daily during operational hours using a temperature probe in addition to monitoring with online probes to a live monitoring system-iTOM when daily monitoring indicates that a thermal event could develop Refer to Wood SOP (standard operating procedures) for trigger levels. Following ABPR guidance (currently the only standard detailing continued monitoring) there will be a minimum of two probes per storage bay during evenings and weekends. This will be in addition to the contracted monitoring by CCTV.

#### • Extinguishing Fires.

Only attempt to put out fires if safe to do so. If in doubt, evacuate the buildings or site area. Fire extinguishers are located at various positions around the site and in the site offices. Familiarise with their positions.

The following table summarises the various fires on which the different types of extinguishers should be used. These will only be used for small fires, it is not practicable to fight large fires with extinguishers. For fires the Fire Rescue Service will be notified. Staff will work alongside FRS to extinguish the fire if practically possible by removing to the Quarantine area or concrete bay to contain the fire.

Type	Solid fires (wood, paper, cloth, etc.)	Liquid fires (petrol, oil, paints, fats)	Safe in vicinity of live electrical apparatus
Water (gas cartridge)	YES	NO	NO
AFFF spray	YES	YES	YES
Halon 1211 (BFC)	NO	YES	YES
Dry powder	NO	YES	YES
CO2	NO	YES	YES

#### • Points of Importance

- i) All operatives must familiarise themselves with the 'Fire Evacuation' drawing displayed in the weighbridge and in recycling site office any contractor Prior to commencing work, must have an induction and pointed out all how this relates to the actual site layout.





- ii) No hot works are to be carried out without prior agreement of JM Barry Site Management and must be carried out under a 'permit to work'. Appropriate firefighting equipment must be at hand during hot works operations.
- iii) In the case of a fire, all operatives and staff must report to the fire assembly point adjacent to the weighbridge. Then a role call will be done to ensure all personnel have evacuated.
- v) Operatives must not leave the Fire Assembly Point area until they are told to do so by JM Barry Site Management.

**Important**

Many activities are the cause of fire. It is your responsibility to prevent fires by safe working practices.

**The Site Manager will inform the Fire Brigade and the Natural Resources Wales Incident Hotline 0300 065 3000**



## **Appendix C**

### **Fire Prevention Risk Assessment**

<i>Table 1 – Potential environmental hazards, pathways &amp; receptors</i>		
Hazard	Pathway	Receptor
Inadequate waste acceptance procedures resulting in the receipt of non-permitted wastes	Airborne / Land based	Site personnel, visitors, local residents, neighbouring facilities
Inadequate waste storage leading to odour, litter & dust	Airborne / Land based	Site personnel, visitors, local residents, neighbouring facilities, A1033, rail line
Transfer of materials leading to spillage	Airborne / Land based	Site personnel, visitors, local residents & neighbouring facilities, rail line
Overfilling vehicles/ vessels leading to spillage	Airborne / Land based	Site personnel, visitors, local residents & neighbouring facilities, rail line
Emissions from plant & equipment	Airborne / Land based	Site personnel, visitors, local residents, school & neighbouring facilities, rail line
Failure of containment	Absorption to ground, un-off & site drains	Site personnel, visitors, local residents & neighbouring workforces. Groundwater, surface water, air quality & soils, Estuary, SSSI's
Fires	Airborne	Site personnel, visitors, local residents, school & neighbouring workforces, air quality. A1033, Estuary, SSSI's
Failure to contain firewater	Absorption to ground, run-off, site drains	Groundwater, surface water & soils, Estuary (SSSI's), A1033, Salt End Sewage works
Wrong connections made in drains/ other systems	Absorption to ground, run-off & site drains	Groundwater, surface water & soils, Estuary, SSSI's, Salt End Sewage Works
Failure of main services	Airborne	Site personnel, visitors, local residents & neighbouring facilities, air quality
Operator error	Airborne, land & water	Site personnel, visitors, local residents & neighbouring facilities, Groundwater, surface water, Estuary(SSSI), air quality & soils
Dust from processes & site roads	Airborne	Site personnel, visitors, local residents, neighbouring facilities, A1033
Mud / debris on roads due to site activities	Site roads, public highway	Users of site roads and public highway
Breach of security	Fences / gates	Site personnel, plant / equipment, intruders
Release of effluent before adequate checks are made	Absorption to ground, run-off & site drains	Groundwater, surface water & soil, Estuary, SSSI's

Tables 2,3 and 4 identify the scoring system;

<i>Table 2 - Probability of hazard occurring without the use of protective measures</i>	
Frequency	Score
Never	0
Annually or less frequently	1
Monthly or less frequently	2
Weekly or less frequently	3
Daily or less frequently	4
More frequently than daily	5

*Table 3 - Consequence of hazard to the environment or human health*

<b>Consequence</b>	<b>Score</b>
Harmless	0
Almost harmless	5
Some harm	10
Harmful	15
Very harmful	20
Extremely harmful	25

*Table 4 - Mitigation factor*

<b>Mitigation</b>	<b>Score</b>
Ineffective or non-existent	1
Partly effective	2
Effective	3
Very effective	4
Entirely effective	5

The risk assessment matrix, for JM Barry is shown in Table 5;

Table 5 - Risk Assessment Matrix						
Hazard	Probability of Hazard Occurring	Consequence of Hazard	Risk Factor (Probability x Consequence)	Summary of Preventative Measures/Controls	Mitigation Factor	Mitigated Risk Factor (Risk Factor / Mitigation Factor)
Inadequate waste acceptance procedures	5	10	50	Pre-acceptance procedures are in place to confirm compliance with list of permitted waste types. On arrival at the facility, waste loads will be checked against the details given on waste transfer notes/season tickets. All waste loads will be inspected visually on deposit in the waste reception area. Any non-permitted wastes (including hot loads) deposited inadvertently at the site, will be reloaded onto the delivery vehicle for off-site removal or placed in a quarantine area. Hazardous wastes will not be accepted.	4	12.5
Inappropriate waste storage	5	10	50	After inspection, wastes will be stored in the waste reception area to wait processing. Materials unsuitable for processing are stored in containers or bays as appropriate.	5	10
Transfer of substances (e.g. filling or emptying of vessels)	2	15	30	Diesel Oil, Plant oil and lubricant tanks will either, be self-bunded or, surrounded by bunds with a minimum capacity of 110% of the tank's contents. Bund bases and sides will be impermeable. All vents, sight glasses and pipework connections etc will be located within the bunded area. Absorbent material will be used to treat any spillage that may arise.	5	6
Overfilling of vessels	3	15	45	Diesel Oil, Plant oil and lubricant tanks will be bunded (see above). The volume of liquid in these tanks will be recorded. The level will be checked before deliveries are made, to ensure sufficient capacity within the tank. Absorbent material will be used to treat liquid spillages.	5	9
Emissions from plant or equipment,	5	15	75	Alarms and interlocks will be used on major items of plant and equipment in the facility as part of the control system. There will be strict compliance with startup, shut down and operating procedures. Maintenance and servicing of plant and equipment will be in accordance with the manufacturers' recommendations. Spill kit available should a spillage occur.	5	15

Table 5 - Risk Assessment Matrix

Hazard	Probability of Hazard Occurring Without Protective Measures	Consequence of	Risk Factor (Probability x	Summary of Preventative Measures/Controls	Mitigation Factor	Mitigated Risk Factor (Risk Control/Mitigation)
Failure of containment	1	15	15	Diesel Oil, Plant oil and lubricant tanks will be fully bunded (see above). The effective capacity of the bunds will be maintained at all times. The site will have an impermeable surface, with waste handling areas drained to an underground storage tank. Tanks, bunds, raw materials storage containers and the surface water drainage system and sumps etc. will be inspected on a weekly basis. Any repairs will be undertaken as soon as practicable and no later than 5 working days from discovery (subject to the availability of replacement materials). Mitigation measures will be undertaken immediately, if there is a possibility of pollution or harm.	5	3
Fires	1	25	25	No wastes will be burned within the boundaries of the site. Fire extinguishers will be located at the site. All fire extinguishers will be clearly marked and, tested at appropriate intervals, to confirm their integrity. Site personnel will be made aware of their location and trained in their correct use. There will be strict compliance with pre-acceptance and acceptance procedures to ensure only permitted wastes are accepted. Explosive, flammable and oxidizing wastes will not be received. Implementation of Fire Prevention Plan. Thermal radiation damage will be minimal owing to the impermeable surface and bay walls being concrete, these structures will absorb heat up to 1200°C. There is no infrastructure adjacent that could be affected by thermal effects. Following a fire the integrity of the floor and blocks will be inspected by a suitably qualified engineer and a report provided, any actions resulting from this will be acted upon. There is a no smoking policy within the operational area.	4	6.25
Failure to contain firewater	1	15	15	There are no outlets to allow drainage off site, containment of potentially contaminated firewater will be in the storage tank.	4	3.75
Wrong connections made in drains or other systems	1	15	15	Suitably qualified engineers will ensure that materials and plant are in accordance with approved specifications and, their installation is in accordance with the approved designs.	4	3.75
Failure of main services	1	10	10	The facility will incorporate process controls, to ensure plant can be operated safely at all times, including during emergency shut down in the event of a power cut.	5	2
Operator error	2	15	30	Strict compliance with the operator's Environmental Management System (EMS). Use of Technically Competent Persons, as part of the Fit and Proper Person requirement, to manage activities at the site. Health and safety and environment, accident, management training, will be provided for all employees.	4	7.5



Table 5 - Risk Assessment Matrix					
Hazard	Probability of Hazard Occurring Without Protective	Consequence of Hazard	Risk Factor (Probability x Consequence)	Summary of Preventative Measures/Controls	Mitigated Risk Factor (Risk Factor / Mitigation Factor)
Dust from waste handling operations, processing and loading etc.	3	10	30	<p>The waste accepted at the site is not intrinsically dusty. There will be strict compliance with waste pre-acceptance and acceptance procedures. Waste will be deposited, stored and processed in a controlled manner, in accordance with site operational procedures.</p> <p>The site will be hard-surfaced with concrete on the operational area. The site will utilize dust suppression, as well as manual or mechanical sweeping as necessary. Dust protection netting will be used in areas where dusty operations are undertaken. Visual monitoring for dust will be undertaken daily.</p>	5
Mud on adjacent highways due to activities on site	2	15	30	All internal roads and waste storage and processing areas will comprise a paved, impermeable surface that is fit for purpose. Internal roads, site entrance and public highway will be cleaned by mechanical sweeper, as appropriate. Waste will only be stored on paved areas. Waste handling activities are unlikely to generate mud. Site staff will inspect the roadways regularly and instigate remedial action if required.	5
Breach in site	3	15	45	Perimeter fencing (1.8m high), and lockable gates are installed. Monitored CCTV will be used.	4
Explosions	0	15	0	There is no risk of explosions owing to the waste streams accepted and the waste acceptance procedures that are in place.	5
Sources of ignition from plant /equipment	4	15	60	The plant is routinely maintained, thereby reducing the potential for electrical faults. The loading buckets do scrap up debris from the impermeable surface; the potential for sparks from this activity is minimal as there is not any aggregate on the wearing surface. The impermeable surface is routinely checked as is replaced when defects are identified.	4



## **Appendix D**

### **iTOM System**

## Standard Operating Procedures (SOPs) for Monitoring Wood Waste Temperature

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Jack Moody Recycling Template SOP	Issue 1 Revision 1	Issued: 10/02/2015
Jack Moody Recycling Limited	Issue 1 Revision 2	Issued: 22/04/2015

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### COMPANY DETAILS AND RESPONSIBLE PERSON

**Company name, address and telephone number**

**JM Envirofuels Limited,  
Head Office:  
Hollybush Farm, Warstone Road,  
Shareshill, Wolverhampton, WV10 7LX.  
Tel: 01922 417648**



FIG. 1 Jack Moody Recycling Ltd

**Recovery facility name, address and telephone number**

**JM Envirofuels Barry Limited  
Berth 31 Wimborne Road  
Barry  
Glamorgan  
CF63 3DH**

## General items

### 1.1 General description of monitoring process

The process is to produce a Fuel for power stations and this document is produced for the temperature and moisture monitoring and quality management of the processed fuel prior to delivery.

## 2 Input materials

### 2.1 Types of input materials

Wood waste types accepted are Grade A B C (see table 1, for definition).



FIG. 2 Acceptable Wood Waste



FIG. 3 Wood Waste Delivery

G	Typical Markets	Typical Sources of Raw Material for Recycling.	Typical Materials	Typical Non – Wood Content Prior to Processing	Notes
<u>Grade A.</u>	A feedstock for the manufacture of professional and consumer products such as animal bedding and horticultural mulches.	Distribution, Retailing, Packaging, Secondary manufacture e.g. joinery.	Solid softwood and hardwood.	Nails and metal fixings.	Some visible particles of coatings and light plastics will remain.
"Clean"			Packaging waste, scrap pallets, packing cases, and cable drums.	Minor amounts of paint, and surface coatings.	Excludes grades below.
<u>Recycled Wood</u>	May also be used as fuel for renewable energy generation in non WID* installations, and for the manufacture of pellets and briquettes.	Pallet Reclamation.	Process off-cuts from manufacture of untreated products.		
<u>Grade B.</u>	A feedstock for Industrial wood processing operations such as the manufacture of panel products, including chipboard and medium density fibreboard (mdf)	As Grade A, plus construction and demolition operations and Transfer Stations.	May contain up to 60% Grade A material as above, plus building and demolition materials and domestic furniture made from solid wood.	Nails and metal fixings. Some paints, plastics, glass, grit, coatings, binders and glues. Limits on treated or coated materials as defined by WID.	The Grade content is not only costly and difficult to separate, it is essential to maintain the quality of feedstock for chipboard manufacture, and for PRN revenues. Some feedstock specifications contain a 5 – 10% limit on former panel products such as chipboard, MDF, and plywood.
<u>Industrial Feedstock</u>					Excludes Grade D
<u>Grade</u>					

<b><u>Grade C.</u></b>	Biomass fuel for use in the generation of electricity and/or heat in WID** compliant installations	All above plus Municipal Collections, Recycling Centres	All of the above plus fencing products, flat pack furniture made from board products and DIY materials	Nails and metal fixings,	Suitable only For WID installations**
<b><u>Fuel Grade.</u></b>		Transfer Stations And Civic Amenity Recycling sites	High content of panel products such as chipboard, MDF, plywood, OSB and fibreboard.	Paints coatings and glues, paper, plastics and rubber, glass, grit. Coated and treated timber (non CCA or creosote).	Material coated and treated with preservatives as defined by WID may be included. Excludes Grade D

Table 1.

## 2.2 Sources of input materials

See Table 1.

The company has contract(s) with waste producers for the delivery of wood.

## 2.3 Rejection or acceptance and storage of input materials

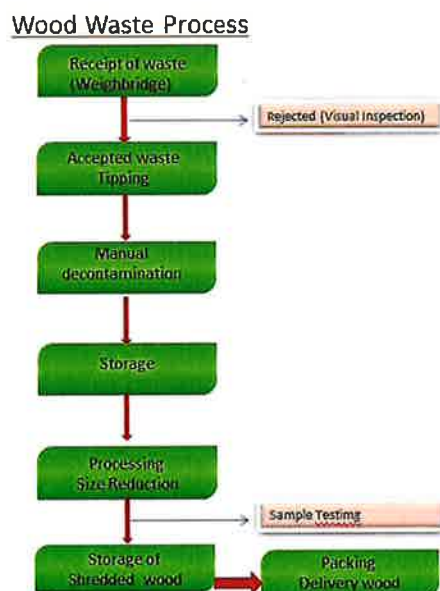


FIG. 4 Wood Waste Process





Input materials delivered for recycling shall enter the site via the weighbridge.

The description, nature and source of wastes that arrive at the site are verified prior to weighing. Details of the waste carrier, waste type, client/source and quantity (tonnes) of waste shall be recorded on a central computer and on a Waste Transfer Note.

The weighbridge operator shall then notify the driver to proceed to the appropriate stock pile where a site operative shall ensure the wood waste carrier takes it to the input materials storage area which will be a numbered bay/stockpile system. Here, the waste carrier will deposit the waste wood so as not to merge it with any input materials already being stored until it has been inspected.

A site operative shall visually inspect each load deposited at the discharge point, to ensure that it is acceptable prior to pushing into the bay.

Any load shall be rejected if subjective assessment of the surface of the waste deposited indicates that it contains more than 10% contamination by volume and moved to the quarantine / isolation area.

Each load for rejection shall be separated from loads awaiting inspection or those accepted for shredding and then removed from the site prior to the waste carrier leaving the site.

If a load is less contaminated with litter/contrary items than the above limit, these shall be removed as far as practically possible and placed into a 'rejects' container stored on the impermeable pavement. The container's contents shall regularly be removed for disposal and recycling.

Each accepted load shall be assessed to identify the processing requirements and any potential problems.

## **2.4 Traceability of input materials]**

A record system shall be maintained connecting sources of wastes with delivery dates and weights. This is achieved via the use of a weighbridge and bay system and the duty of care information collected for every load that arrives.

Wood waste arriving on site shall be directed to the weighbridge situated at the site entrance. Details of the waste carrier, waste type, source and quantity (tonnes) of waste shall be recorded at the site office (Waste Transfer Note). The weighbridge clerk shall notify the driver to proceed to the appropriate Stockpile or bay area where the load shall be tipped and inspected by available site operatives. After tipping in the allocated area, the driver shall be directed back to the weighbridge, weighed off and issued with a weighbridge ticket.





FIG. 5 Weighbridge Entry

Wood processing batches are created one at a time, each being given a unique reference number and is clearly identifiable with a marked board with the unique bay number together with the probe set (Minimum 2 probes) used in the Maltese cross bay, this then stays with the bay during the monitoring process. Once formation of a bay is completed, the next bay will be started. The bay 'start' date is recorded (on the 'Bay Formation and Monitoring Record Sheet'). Once the formation of this bay is complete probes are installed to start the monitoring process, the 'finish' date is recorded (on the "Bay Formation and Monitoring Record Sheet").

Unprocessed wood loads are directed to the appropriate stockpile area, again the stockpile will be given a reference number.

In accordance with RPS 207 each rejected load shall be recorded as well as action taken (e.g. load returned to sender or site audit required, etc).



FIG. 6 Rejected Material

### **3 Preparation of input materials**

#### **3.1 Shredding**

Input materials accepted and stored for this wood waste process shall be stockpiled. Shredding shall be carried out on each working day, as required.

Any large objects, for example tree trunks and root stocks, over 40 cm in diameter shall be removed and placed away from the shredding process.

The shredded material shall be stored into a bay if not delivered to the power station that day.



FIG. 4 Wood shredded to form a batch

### 3.2 Mixing

Mixing of material between old and newly defined bays will be done after shredding explained in section 4.1.

### Moisture assessment prior to bay formation

Moisture evaluation of the shredded material shall be carried out when using a handheld probe and if indicates that moisture is different from existing materials then a new bay will be started for that batch/bay of materials and the information recorded on the bay record sheet.

### 3.3 Records connecting delivery notes with shredding dates, mixing and wetting

Each wood waste bay that undergoes the shredding process at this site shall be given a unique batch/bay number.

As data for all waste wood arriving at the site shall be recorded on weighbridge software, and automatic bay data sheets provide details of the batches formed, a connection to the weighbridge ticket for each bay is achieved via date of bay formation - start and finish date (dates in between can be compared to the weighbridge data).

Jack Moody Holdings PLC Landscaping   Recycling   Civil Engineering				JM Tickets for Batch :	JMCgWR1593
				Printed Date:	05/01/2015
Ticket No	Date	Company	Product	Nett Wtg	
C300047	05/01/2015	DAVE THE PAVE		2580	
C300096	05/01/2015	PAUL MCGOWAN		13460	
C300098	05/01/2015	DAVE THE PAVE		2420	
C300101	05/01/2015	BIFFA WASTE SERVICES LIMITED		11080	
C300141	06/01/2015	PRIVATE CUSTOMER		16400	
C300148	06/01/2015	Jones Skips Wolverhampton		16700	
C300172	06/01/2015	SERCO		15280	
C300184	06/01/2015	PRIVATE CUSTOMER		2180	
C300186	06/01/2015	RANGLES BUILDING SOLUTIONS		2900	
C300191	06/01/2015	TREEWAY FENCING LIMITED		8680	
C300235	07/01/2015	BIFFA WASTE SERVICES LIMITED		10740	
C300250	07/01/2015	FCC 2		16500	
				118920	

FIG. 5 Tickets that form a Batch

The 'Bay Formation and Monitoring Record Sheet' shall also hold the results of the feedstock quality assessment (in particular any feedstock rejections), wetting/misting for dust. It shall also include the unique number of any other bays mixed with this bay (including oversize) material when added to the bay will also be recorded on the bay formation and monitoring recorded sheet. The weighbridge ticket will always identify the feedstock process for the incoming wood material.



#### 4 Wood activities – managing, monitoring.

##### 4.1 Bay formation and monitoring

After receipt at the weighbridge, each accepted load will have been visually checked for litter and picked accordingly, and pre-treated (shredded/mixed/watered) where required, ready for delivery to power station.

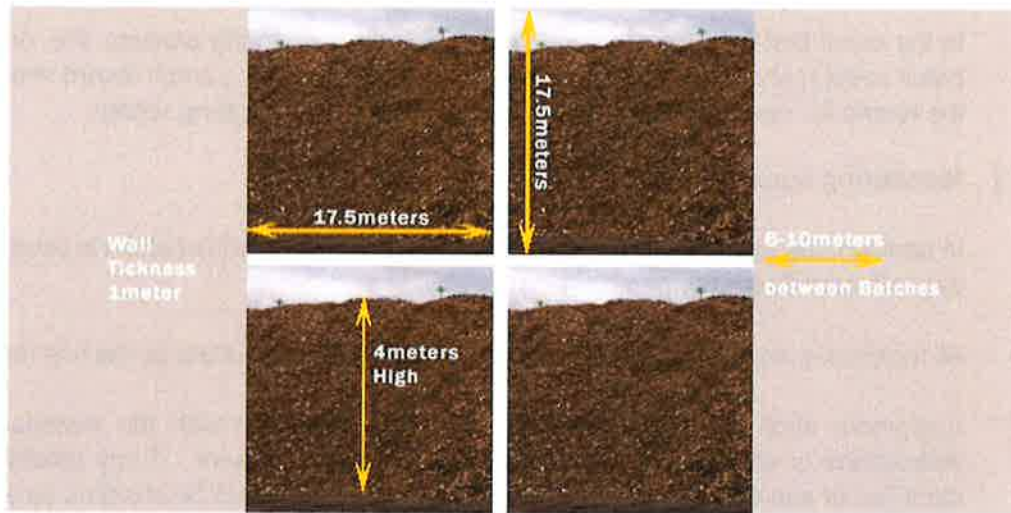


FIG. 6 Shredded Wood Storage and Probes (not to scale)

The dimensions of each batch shall be approximately 4 metres high, 20 metres square, organised in a maltase cross, with a gap of typically 6-10 metre between each maltase cross. This allows easy access for operational personal/Fire services (FRS).



FIG. 7 Shredded Wood Dimensions

The New Probes sample the bay temperature every 2.5 minutes and reports every 15 minutes 24/7 remotely. It will automatically alert the site manager (by email), if the



temperatures rise above a predefined value (45°C) or the temperature rises by 2°C in a 24hour period.

Probes of varying lengths (1.5 – 3m) will be put into the processed material from the day of processing, the number of probes will be a minimum of two and will be determined by the size of the material in the bay. The probes will be moved periodically around the bay to ensure that representative readings are obtained.

Each formed batch's unique number shall be easily visible to any operative inspecting materials on site.

In the event that batches are combined during the monitoring process, the 'on-going' batch code(s) shall be recorded on each of the corresponding batch record sheets and the record for one of these batches shall be used as the ongoing record.

#### **4.1.1 Monitoring equipment**

In addition, the wireless probes the site uses a hand-held probe (which is used once a day to record Batch temperatures).

All monitoring equipment shall be maintained in a functional state by the site manager.

Equipment shall be calibrated at a frequency consistent with the manufacturer's instructions or at least every 12 months, whichever is sooner. If any problems are identified or suspected, the relevant item(s) of equipment shall be checked as a matter of urgency.

Calibration dates and outcomes shall be recorded in the 'Equipment Calibration Record Sheet' and any calibration certificates shall also be filed with this record.

#### **4.1.2 Temperature monitoring and records**

Temperature detected by the sensor when inserted in the batch shall be allowed to stabilise before a final reading is recorded.

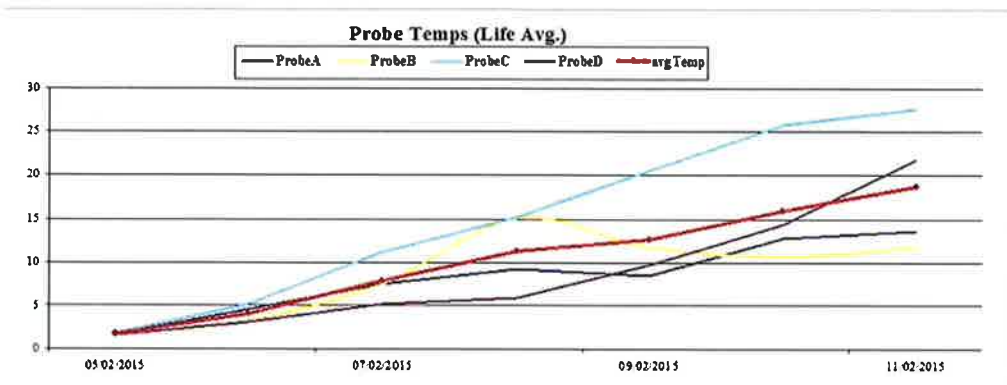


FIG. 11 Shredded Wood Temperature Monitoring

All Batch temperature monitoring results shall be recorded in the 'Batch Formation and monitoring Record Sheet'

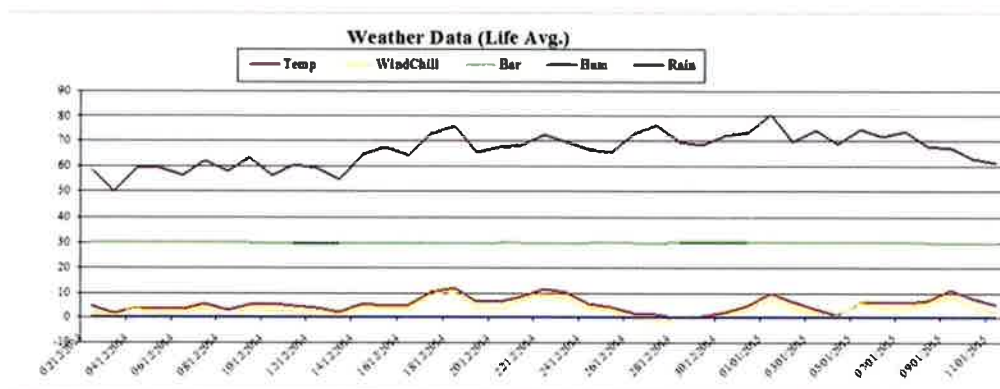


FIG. 11 Weather data during Windrow monitoring

#### 4.1.4 Weather monitoring and records

The following weather conditions shall be monitored and recorded daily;

- Temperature,
- Wind Chill
- Pressure,
- Humidity and
- Rain Fall



#### 4.1.5 Monitoring records and corrective actions

Monitoring records for each Batch shall be checked every working day.

Corrective actions shall be carried out if stockpile/batch core zone temperature trends move out of the target range.

Corrective action to lower the batch/stockpile temperature may include:

- Additional or more frequent turning/mixing;
- Decrease batch size;
- Water addition if temperature conditions have become too dry; and/or
- Source dry input materials if weather conditions have become too moist.

Any corrective action taken to bring Batch core temperatures within the target ranges shall be recorded on the 'Batch Formation and Monitoring Record Sheet'.

#### 4.2.1 Process validation phase

##### Monitoring Table using the hand-held probe

Parameter	Limits
Temperature Core decomposition zone	Once per working day. At 2 points per bay/stockpile at a minimum of 1-3 m below surface.
Moisture content Core decomposition zone	At 2 points per bay/stockpile at minimum of 0.5 m below surface.

The responsible person shall ensure the critical control points and critical limits of the monitoring process are recorded on the batch record sheet

The site manager shall ensure that the critical control points and critical limits of the wood process continue to be effective in guiding process management. If for any reason they are suspected or known to have become ineffective, a phase of Hazard Analysis and Critical Control Points evaluation and process validation shall be returned to (refer to the quality policy

Parameter	Limits
Core Temperature	Once per working day with a handheld probe or continuous with iTOM monitoring system.
Range parameters For iTOM monitoring System	Temperature range for normal operating condition is between 0-45 degrees C  Temperature range for Critical monitoring and piles requiring attention and moving or splitting to



	<p>cool is 45-60 degrees C also time limit of 1 week before removal from site</p> <p>Temperature range for emergency action to be taken immediately and piles moved to the quarantine area and eventually off site and split up in quarantine area immediately are 60-75 degrees C over a 24 hour period</p>
<p>Moisture content Core zone</p>  <p>Moisture Content Core Zone</p>	<p>At 2 points per bay at minimum of 0.5 m below surface.</p> <p>Ideal moisture range is 15%-35%</p> <p>If moisture is outside of the range 15%-35% less than 15% - NO Action deliver to Power station</p> <p>If moisture is outside of the range 15 %-35% More than 35% - Out of specification for fuel and requires drying or blending or moving to the quarantine area for windrowing, drying and aeration moving</p>

**REF, BRE Global Ltd Isotherme testing report February 2015 (note limits and data from report)**

#### 4.2.2 Product storage and batch identification

Wood products batches shall be stored outdoors as described in section 4.1.

The graded wood batches shall be stored explained in section 4.1.

## CONCLUSIONS

1. Small and large wood chips were tested isothermally to determine their self-heating properties. From the critical ignition temperatures recorded the materials were found to be susceptible to self ignition.
2. Thermal ignition theory has been used to correlate the results and a straight line for  $\ln(Q_0 TR^2/R^2)$  versus  $1/T_{ig}$  has been found over the cube size range tested. Therefore, extrapolations for larger piles and different geometries may be made with confidence.
3. The lowest critical temperature determined for the small chips is 58°C when stored in the silo. Time to ignition is estimated at 97 days.
4. The lowest critical temperature determined for the large chips is 108°C when stored in the silo. Time to ignition is estimated at 84 days.
5. The moisture content of both wood chip samples tested was 23-24%. Significant changes to the moisture content would affect the self-heating behaviour.

For comparison purposes other combustible materials such as dried sewage sludge (Waste Derived Fuel) has typical critical ignition temperatures of between 47 – 74°C for a volume of 27m<sup>3</sup>. However, these materials have a much smaller particle size being granules or pellets (0.5mm – 2mm length) with moisture contents of less than 10%.

The small chips tested here have a critical ignition temperature of 70°C and the large chips 122°C for a 27m<sup>3</sup> volume and hence these chips would not be classed as materials of self-heating for transport purposes as per the HSE requirements in reference 2.

If the material is stored in concrete silos this will have a beneficial effect in the event of a fire of reducing the potential for fire spread to other stacks or piles by reducing the radiative heat effects – see BRE report 135540 Fire spread Analysis. In terms of self-heating the shielding effect of having the wood chips contained on a concrete bunker, as opposed to an open pile, could result in the pile temperatures increasing at a faster rate if self-heating were to occur after the critical temperature has been reached. This would be due to reduced cooling air flows across the pile surface taking heat away from the pile.

After the wood has been loaded onto vehicles by site staff it will then be weighed at the weighbridge and a weigh bridge ticket is produced by the weigh bridge with the customer's name and weight of the wood being dispatched to the customer.



### Executive Summary:

This procedure describes the activity, procedures and monitoring at the Barry Recycling facility.

Reference has been made to the NRW guidance document Fire Prevention and Mitigation Plans 2017, along with Commissioned research for Fire Spread Analysis and Self-Heat Report (BRE Global Ltd).

Based on the information provided, the SOP concludes the following;

Item	NRW (guidance)	BRE Global Ltd (test Data)	JMRL (site limits)
Volume Unprocessed Wood (UP)	No volume limit	130°C	3000m <sup>3</sup>
Volume Processed Wood (PW)	No volume limit	105°C	1250m <sup>3</sup>
Fines (0-10) Stored in Bays	No volume limit	65°C	300m <sup>3</sup>
Storage Time (UP)	6 months	313 days	9months
Storage Time (PW)	3 months	259 days	9 months
Temperature (UP) – Critical limit	Not detailed	130°C	45-60 degrees
Temperature (PW) – Critical Limit	Not detailed	105°C	45-60 degrees



## **APPENDIX F**

### **Business Continuity Plan**

# Disaster Recovery Business Continuity and Risk Management Plan

Revision 2

Date: May 2019

## Introduction

### Distribution List

Copy Number	Name	Location
001	A Webb	Head office,
002	[REDACTED]	Site Manager
003		
004		
005		
006		

**If you have any suggested changes to this plan, please notify Peter Reynolds – Health, Safety and Environment Manager**

### Aim of this Plan

To prepare this business to cope with Disaster Recovery, Business Continuity and Risk management in the event of an emergency.

### Objectives

- To define and prioritise the Critical Functions of the business
- To analyse the emergency risks to the business
- To detail the agreed response to an emergency
- To identify Key Contacts during an emergency



## **Disaster Recovery**

Disaster is defined as a prolonged impact on the ability to maintain service level. Types of disaster may include:

- Total loss of access to premises, machines, personnel and customers files
- Partial loss of premises, machines, personnel and customer file due to,
  - External or internal strike
  - Ecological events such as flood
  - Accidents, such as fire or
  - Deliberate disruption (e.g. Bombs)

This plan will provide direction and tools to assess the damage, establish emergency communications, plan and implement solutions so that the loss is minimised, and the stricken facilities are repaired or replaced as soon as possible.

The responsibilities include:

- Full assessment of loss and actions necessary to recover
- Assign staff
- Specify physical and technical requirements
- Source temporary site for medium to long term if required
- Implement agreed tasks and solutions in the short, medium and long term

Outside Services include:

- Power & Utilities
- Royal Mail
- Courier Services
- Suppliers
- Other departments within JM Envirofuels Limited



In the event of a disaster occurring at JM Envirofuels Barry which makes the site unusable, the following plan will be put into operation immediately.

1. A member of senior staff from JM Envirofuels Barry head office will contact the insurance company CGI and inform them of the incident.
2. The JM Envirofuels operations contact (Site Manager) will be alerted, who will then implement the Recovery Plan. Moving forward, all members of staff will be contacted and subsequently assigned tasks to begin the recovery process. This could include either meeting on site or at a specific location or being contacted remotely via email or telephone depending on the arisen circumstances. Members of JM Envirofuels Barry staff now assigned to the recovery team will be responsible for:
  - Business recovery
  - Assessing salvage viability
  - New equipment purchases where required
  - New arrangements for suppliers etc.

The staff from JM Envirofuels Barry will move to the Head Office with the main objective to provide a full set-up as far as reasonably practicable and continued supply services to our customers with minimum disruption. The recovery team authority will supersede any existing procurement procedures. (If the Head office is affected by the incident, other offices are available within other Jack Moody Group Sites)

JM Envirofuels Barry will transfer priority work and personnel to the recovery site. The Site Manager will co-ordinate the relocation of any required equipment and stationery, deploy replacement kit and hire equipment where necessary.

If the site becomes unusable for a long period of time, the Site Manager will plan for a relocation site that is suitable for their needs to operate as a business whilst the old site is dealt with.

The Site Manager will undertake a site survey and kit out the new location with suitable equipment necessary to restore the offices or production to full strength, if any equipment can be salvaged from the disaster site, JM Envirofuels' staff will check and re-deploy any such equipment that can be used.

## **Business Continuity Plan**

JM Envirofuels Business Continuity Plan will ensure that processes are in place that will be followed in the event of unforeseen events, likely to cause disruption to normal business activities.





JM Envirofuels will work with customers and suppliers to minimise the effect of any such occurrences.

JM Envirofuels Business Continuity Plan is based on the following objectives:

- Identify at an early stage, abnormal occurrences that may impact the service.
- Assess the probability of these events occurring and evaluate the impact.
- Design and implement procedures, both reactive and pro-active, to minimise the possibility of the plan being implemented.
- Provide necessary resources to ensure customers receive the necessary service levels.
- Refer to Risk Management

These primary objectives will be achieved by:

- Identifying key personnel, equipment, facilities and systems required to recover and or maintain service.
- Use the recovery plan to restore full operational capability in the minimum amount of time.

Events are classified into 3 escalating levels, and these reflect the severity of the event, and directly correlate with the required action.

**Level One** – Minor event that must be recorded for review purposes. These are events that in isolation have minor capacity to disrupt operations.

**Level Two** – Events that have the potential to disrupt operations. These must be notified to the director and contract managers and recorded with the insurance company if required.

**Level Three** – Events capable of major disruption whether actual or potential. The full Continuity Plan must be initiated, and relevant parties and authorities informed.

It is important that the escalation plan be implemented and escalated in a controlled manner. Responsibility for implementation rests initially with Mr Robert Moody, M.D. who will co-ordinate all aspects of the initial implementation

**Response One** – Responsibility rests with the contract manager for co-ordinating and documenting all events.



**Response Two** - Responsibility rests with the site manager for the processes which have to be implemented immediately. The contracts manager is responsible for all further actions and escalations.

## **Risk Management**

Risk Management is the identification, assessment and prioritisation of risks (defined in ISO31000) and the effect of uncertainty on objectives, whether positive or negative. This is followed by co-ordinated actions and resources to monitor, control, and minimize the probability and impact of negative events.

JM Envirofuels Risk Management outlines steps and procedures that are either currently implemented or have the availability to be implemented, in the bid to reduce negative effects on the business and its ability to uphold business continuity as detailed above. JM Envirofuels have taken steps to ensure that risks relating to loss or damage are reduced and monitored as far as reasonably practicable.

### **Premises**

- Are covered by comprehensive 24-hour CCTV which is recorded.
- Are kept locked when not in use and are further guarded by high level fencing throughout.
- Yard areas, offices and ancillary buildings are regularly maintained to include the worthiness of roofing, security to windows and doors and general overall condition.
- Comprehensive insurance is maintained for every aspect of the business activity

### **Information and Communications**

- All documentation is regularly backed up and kept in an off-site location.
- Information is also collated and stored by an external online service provider.
- All primary staff members have access to mobile computer and telephone facilities in the event that affixed office equipment is not accessible.
- JM Envirofuels IT systems are monitored and maintained via an external communications company.



### General Works

- All operations hold relevant health and safety and industry specific training certificates. To include regular refresher training and conformity audits.
- All staff members are aware of the policy and procedure for documenting incidents, injuries and near misses.
- All individual works carry site specific method statements and risk assessments.
- All staff are aware of the fire and emergency procedure, and this information is displayed accordingly.
- All vehicles and associated plant is regularly maintained.

### Log Sheet

Date	Time	Information / Decisions / Actions	Initials