



**PELLET PRODUCTION FACILITY**

**DRAFT Version 2**

**STARTUP, SHUTDOWN, MALFUNCTION,  
OPERATION AND MAINTENANCE PLAN**

**AND**

**BEST MANAGEMENT PRACTICES MANUAL**

**QUALITY ASSURANCE AND QUALITY  
CONTROL PLAN**

**PREPARED BY**

**VULCAN RENEWABLES, LLC  
2020 COUNTY ROAD 214,  
ST. AUGUSTINE, FL 32084**

**DECEMBER 2014**

**VERSION 1.0**

## **PURPOSE AND POLICY**

This manual has been prepared to serve as the official policy of Vulcan Renewables, LLC. Employees engaged in the operation of the pellet manufacturing facility will be trained in the contents of this manual and will follow the procedures outline within. Once trained, all employees will follow these written procedures and should refer to this manual when performing their specific job. Employees not following these procedures or who perform their job in an unsafe manner or in a manner that causes excessive environmental impact will be subject to disciplinary action or employment termination.

The purpose of this manual is to instruct every employee in the safe operation of the facility and to maintain strict compliance with all environmental permits and OSHA rules. Employees are encouraged to make suggestions that improve this manual to make the workplace safer and to reduce environmental impacts.

This manual will be updated periodically. When substantial changes are made to this document, employees will be informed in periodic safety and environmental compliance meetings.

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Christopher Kim, President

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Date

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Joe Williams, Operations Manager

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Date

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James Denes, Plant Manager

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Date

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## **CLEAN WOOD FURNACE**

### **EMERGENCY SHUTDOWN PROCEDURES FOR CLEAN WOOD FURNACE**

- 1) Operator will make sure all interlocking equipment shuts down when clean wood furnace shuts down, forced air blower, clean wood metering bin, dryer infeed auger, if they do not shut down.
- 2) Operators will keep all other equipment running unless the clean wood furnace is going to be shut down for more than one hour.

### **EMERGENCY MAINTENANCE PROCEDURES FOR CLEAN WOOD FURNACE**

- 1) Maintenance will lock out clean wood furnace using the company policy for lock out tag out.
- 2) Maintenance will test clean wood furnace to make sure it will not start after lockout.
- 3) Maintenance will perform maintenance needed to repair clean wood furnace.
- 4) After all repairs are completed maintenance will pick up all tools, make sure clean wood furnace is safe to turn on and then take their locks off.
- 5) Maintenance will let operator know they may restart the clean wood furnace, forced air blower, clean wood metering bin, dryer infeed auger.
- 6) Maintenance will visually inspect clean wood furnace as it is running to make sure all repairs are completed and there will be no further problems.

### **ASH REMOVAL**

1. Ash in the clean wood furnace is to be cleaned out as needed using steel rakes and come-along. Precautions must be taken to minimize dust caused by removing ash from the furnace by the use of water spray in the ash bin.
2. Ash will be removed before clean wood furnace is started.

3. The cooled and wet ash will be augured up into a holding bin. Holding bin will be removed and emptied when full.
4. Cold and wet ash will be used as a soil amendment by mixing it into the compost/soil pile.

## **ASH AUGER**

### **EMERGENCY SHUTDOWN PROCEDURES FOR ASH AUGER**

- 1) Operator will make sure all interlocking equipment shuts down when Ash Auger needs maintenance, clean wood furnace, forced air blower, clean wood metering bin, dryer infeed auger, if they do not shut down.
- 2) Operators will keep all other equipment running unless the ash auger is going to be shut down for more than one hour.

### **EMERGENCY MAINTENANCE PROCEDURES FOR ASH AUGER**

- 1) Maintenance will lock out ash auger using the company policy for lock out tag out.
- 2) Maintenance will test ash auger to make sure it will not start after lockout.
- 3) Maintenance will perform maintenance needed to repair ash auger
- 4) After all repairs are completed maintenance will pick up all tools, make sure ash auger is safe to turn on and then take their locks off.
- 5) Maintenance will let operator know they may restart the ash auger for cleaning of the furnace.

Maintenance will visually inspect ash auger as it is running to make sure all repairs are completed and there will be no further problems

## **FURNACE FORCED AIR BLOWER**

### **EMERGENCY SHUTDOWN PROCEDURES FOR FURNACE FORCED AIR BLOWER**

- 1) Operator will make sure all interlocking equipment shuts down when furnace forced air blower shuts down, clean wood metering bin and furnace if they do not shut down operator must shut them down.
- 2) Operators will keep all other equipment running unless the furnace forced air blower is going to be shut down for more than one hour.

### **EMERGENCY MAINTENANCE PROCEDURES FOR FURNACE FORCED AIR BLOWER**

- 1) Maintenance will lock out furnace forced air blower using the company policy for lock out tag out.
- 2) Maintenance will test furnace forced air blower to make sure it will not start after lockout.
- 3) Maintenance will perform maintenance needed to repair furnace forced air blower.
- 4) After all repairs are completed maintenance will pick up all tools, make sure furnace forced air blower is safe to turn on and then take their locks off.
- 5) Maintenance will let operator know they may restart the furnace forced air blower.
- 6) Maintenance will visually inspect furnace forced air blower as it is running to make sure all repairs are completed and there will be no further problems.



## **CLEAN WOOD METERING BIN**

### **EMERGENCY SHUTDOWN PROCEDURES FOR CLEAN WOOD METERING BIN**

- 1) Operator will make sure all interlocking equipment shuts down when clean wood metering bin shuts down, dryer infeed auger if it does not shut down operator must shut it down.
- 2) Operators will keep all other equipment running unless the clean wood metering bin is going to be shut down for more than one hour.

### **EMERGENCY MAINTENANCE PROCEDURES FOR CLEAN WOOD METERING BIN**

- 1) Maintenance will lock out clean wood metering bin using the company policy for lock out tag out.
- 2) Maintenance will test clean wood metering bin to make sure it will not start after lockout.
- 3) Maintenance will perform maintenance needed to repair clean wood metering bin
- 4) After all repairs are completed maintenance will pick up all tools, make sure clean wood metering bin is safe to turn on and then take their locks off.
- 5) Maintenance will let operator know they may restart the clean wood metering bin, furnace auger, the furnace system, dryer infeed auger, and dryer infeed bin.
- 6) Maintenance will visually inspect clean wood metering bin as it is running to make sure all repairs completed and there will be no further problems.

## **500hp WET MATERIAL HAMMER MILL**

### **EMERGENCY SHUTDOWN PROCEDURES FOR HAMMER MILL**

- 1) Operator will make sure all interlocking equipment shuts down when hammer mill shuts down, dryer infeed bin, dryer infeed auger, hammer mill auger, and furnace if they do not shut down operator must shut them down.
- 2) Operators will keep all other equipment running unless the hammer mill is going to be shut down for more than one hour.

### **EMERGENCY MAINTENANCE PROCEDURES FOR HAMMER MILL**

- 1) Maintenance will lock out hammer mill using the company policy for lock out tag out.
- 2) Maintenance will test hammer mill to make sure it will not start after lockout.
- 3) Maintenance will perform maintenance needed to repair hammer mill.
- 4) After all repairs are completed maintenance will pick up all tools, make sure hammer mill is safe to turn on and then take their locks off.
- 5) Maintenance will let operator know they may restart the hammer mill, hammer mill auger, the furnace system, dryer infeed auger, and dryer infeed screener.
- 6) Maintenance will visually inspect hammer mill as it is running to make sure all repairs are completed and there will be no further problems.

## **CHIP CONVEYOR**

### **EMERGENCY SHUTDOWN PROCEDURES FOR CHIP CONVEYOR**

- 1) Operator will make sure all interlocking equipment shuts down when chip conveyor shuts down 500hp wet material hammer mill, dryer infeed bin, infeed Auger, and furnace system. They will make sure all interlocked equipment shuts down dryer screener, dryer infeed auger, forced air blower, and furnace if they do not shut down operator must shut them down.
- 2) Operator will keep all other equipment running unless the chip conveyor is going to be down for more than one hour.

### **EMERGENCY MAINTENANCE PROCEDURES FOR CHIP CONVEYOR**

- 1) Maintenance will lock out the chip conveyor using the company policy for lock out tag out.
- 2) Maintenance will test the chip conveyor to make sure it will not start after lock out.
- 3) Maintenance will perform maintenance needed to repair the chip conveyor.
- 4) After all repairs are completed maintenance will pick up all tools, make sure the chip conveyor is safe to turn on and then take their locks off.
- 5) Maintenance will let operator know they may restart the chip conveyor, chip screener, dryer infeed auger, wet material hammer mill, and furnace.
- 6) Maintenance will visually inspect the chip conveyor as it is running to make sure all repairs are completed and there will be no further problems.

## **WOOD CHIP SCREENER**

### **EMERGENCY SHUTDOWN PROCEDURES FOR WOOD CHIP SCREENER**

- 1) Operator will make sure all interlocking equipment shuts down when wood chip screener shuts down, chip conveyor, 500hp wet material hammer mill, furnace infeed auger, forced air blower, and furnace if they do not shut down operator must shut them down.
- 2) Operator will keep all other equipment running unless the wood chip screener is going to be down for more than one hour.

### **EMERGENCY MAINTENANCE PROCEDURES FOR CHIP CONVEYOR**

- 1) Maintenance will lock out the wood chip screener using the company policy for lock out tag out.
- 2) Maintenance will test the wood chip screener to make sure it will not start after lock out.
- 3) Maintenance will perform maintenance needed to repair the wood chip screener.
- 4) After all repairs are completed maintenance will pick up all tools, make sure the wood chip screener is safe to turn on and then take their locks off.
- 5) Maintenance will let operator know they may restart the, wood chip screener, chip conveyor, chip screener, dryer infeed auger, wet material hammer mill, and furnace.
- 6) Maintenance will visually inspect the wood chip screener as it is running to make sure all repairs are completed and there will be no further problems.

## **DRYER INFEED AUGER**

### **EMERGENCY SHUTDOWN PROCEDURES FOR CHIP AUGER**

- 1) Operator will make sure all interlocking equipment shuts down when dryer infeed auger shuts down, chip screener, chip conveyor, 500hp wet material hammer mill, furnace infeed Auger, forced air blower, and furnace if they do not shut down operator must shut them down.
- 2) Operator will keep all other equipment running unless the dryer infeed auger is going to be down for more than one hour.

### **EMERGENCY MAINTENANCE PROCEDURES FOR CHIP CONVEYOR**

- 1) Maintenance will lock out the dryer infeed auger using the company policy for lock out tag out.
- 2) Maintenance will test the dryer infeed auger to make sure it will not start after lock out.
- 3) Maintenance will perform maintenance needed to repair the dryer infeed auger.
- 4) After all repairs are completed maintenance will pick up all tools, make sure the dryer infeed auger is safe to turn on and then take their locks off.
- 5) Maintenance will let operator know they may restart the, dryer infeed auger, wood chip screener, chip conveyor, chip screener, dryer infeed auger, wet material hammer mill, and furnace.
- 6) Maintenance will visually inspect the dryer infeed auger as it is running to make sure all repairs are completed and there will be no further problems.

## **DRYER**

### **EMERGENCY SHUTDOWN PROCEDURE FOR DRYER**

- 1) Operator will shut down furnace system.
- 2) Operator will make sure all interlocking equipment shuts down when dryer shuts down, dryer infeed auger, chip screener, chip conveyor, 500hp wet material hammer mill, furnace infeed Auger, forced air blower, and furnace if they do not shut down operator must shut them down.
- 3) Operators will keep all other equipment running unless the dryer is going to be down for more than one hour.
- 4) Operators will turn on manual deluge system to help prevent dryer from catching on fire, also will string fire hose out just in case of fire.

### **EMERGENCY MAINTENANCE PROCEDURES DRYER**

- 1) Maintenance will lock out dryer using the company policy for lock out tag out.
- 2) Maintenance will test dryer to make sure it will not start after lock out.
- 3) Maintenance will perform maintenance needed to repair dryer.
- 4) After all repairs are completed maintenance will pick up all tools, make sure dryer is safe to turn on and then take their locks off.
- 5) Maintenance will let operator know they may restart the, dryer, dryer infeed auger, wood chip screener, chip conveyor, chip screener, dryer infeed auger, wet material hammer mill, and furnace.
- 6) Maintenance will visually inspect dryer as it is running make sure all repairs are completed and there will be no further problems.

## **NEW YORK BLOWER**

### **EMERGENCY SHUTDOWN PROCEDURES FOR NEW YORK BLOWER**

- 1) Operator will make sure all interlocked equipment shuts down when New York blower shuts down, dryer infeed auger, chip screener, chip conveyor, 500hp wet material hammer mill, furnace infeed Auger, forced air blower, and furnace if they do not shut down operator must shut them down.
- 2) Operators will turn on manual deluge system to help prevent dryer from catching on fire, also will string fire hose out just in case of fire.
- 3) Operator will keep all other equipment running unless the New York blower is going to be down for more than one hour.

### **EMERGENCY MAINTENANCE PROCEDURES FOR NEW YORK BLOWER**

- 1) Maintenance will lock out New York blower using the company policy for lock out tag out.
- 2) Maintenance will test New York blower to make sure it will not start after lock out.
- 3) Maintenance will perform maintenance needed to repair New York blower
- 4) After all repairs is completed maintenance will pick up all tools, make sure New York blower is safe to turn on and then take their locks off. Maintenance will let operator know they may restart the New York blower, dryer, dryer infeed auger, wood chip screener, chip conveyor, chip screener, dryer infeed auger, wet material hammer mill, and furnace.
- 5) Maintenance will visually inspect the New York blower as it is running to make sure all repairs are completed and there will be no further problems.

## **DRYER CYCLONE AIR LOCK**

### **EMERGENCY SHUTDOWN PROCEDURES FOR DRYER CYCLONE**

- 1) Operator will make sure all interlocking equipment shuts down when dryer cyclone air lock, shuts down, new York blower, dryer, dryer infeed auger, chip screener, chip conveyor, 500hp wet material hammer mill, furnace infeed Auger, forced air blower, and furnace if they do not shut down operator must shut them down.
- 2) Operator will make sure to turn on the manual deluge system to prevent a fire in the dryer.
- 3) Operator will keep all other equipment running unless the dryer cyclone air lock and feeder are going to be down for more than one hour.
- 4) Operator will also get fire hoses hooked up and ready in case of fire.

### **EMERGENCY MAINTENANCE PROCEDURES FOR DRYER CYCLONE**

- 1) Maintenance will lock out dryer cyclone air lock using the company policy for lock out tag out.
- 2) Maintenance will test dryer cyclone air lock to make sure it will not start after lock out.
- 3) Maintenance will perform maintenance needed to repair dryer cyclone air lock.
- 4) After all repairs are completed Maintenance will pick up all tools, make sure dryer cyclone air lock is safe to turn on and then take their locks off.
- 5) Maintenance will let operator know they may restart the, dryer cyclone air lock, New York blower, dryer, dryer infeed auger, wood chip screener, chip conveyor, chip screener, dryer infeed auger, wet material hammer mill, and furnace.
- 6) Maintenance will visually inspect dryer cyclone as it is running to make sure all repairs are completed and there will be no further problems.



## **HAMMER MILL**

### **EMERGENCY SHUTDOWN PROCEDURES FOR HAMMER MILL**

- 1) Operator will make sure all interlocking equipment shuts down when hammer mill shuts down, dryer cyclone air lock, New York blower, dryer, dryer infeed auger, chip screener, chip conveyor, 500hp wet material hammer mill, furnace infeed Auger, forced air blower, and furnace if they do not shut down operator must shut them down.
- 2) Operator will make sure to turn on the manual deluge system to prevent a fire in the dryer.
- 3) Operators will keep all other equipment running unless the hammer mill is going to be shut down for more than one hour.
- 4) Operator will also get fire hoses hooked up and ready in case of fire

### **EMERGENCY MAINTENANCE PROCEDURES FOR HAMMER MILL**

- 1) Maintenance will lock out hammer mill using the company policy for lock out tag out.
- 2) Maintenance will test hammer mill to make sure it will not start after lockout.
- 3) Maintenance will perform maintenance needed to repair hammer mill.
- 4) After all repairs are completed maintenance will pick up all tools, make sure hammer mill is safe to turn on and then take their locks off.
- 5) Maintenance will let operator know they may restart the hammer mill dryer cyclone air lock, New York blower, dryer, dryer infeed auger, wood chip screener, chip conveyor, chip screener, dryer infeed auger, wet material hammer mill, and furnace.
- 6) Maintenance will visually inspect hammer mill as it is running to make sure all repairs are completed and there will be no further problems.

## **MATERIAL HANDLING FAN**

### **EMERGENCY SHUTDOWN PROCEDURES FOR MATERIAL HANDLING FAN**

- 1) Operator will make sure all interlocked equipment shuts down when material handling fan shuts down, hammer mill, dryer cyclone air lock, New York blower, dryer, dryer infeed auger, chip screener, chip conveyor, 500hp wet material hammer mill, furnace infeed Auger, forced air blower, and furnace if they do not shut down operator must shut them down.
- 2) Operator will make sure to turn on the manual deluge system to prevent a fire in the dryer.
- 3) Operator will keep all other equipment running unless the material handling fan is going to be down for more than one hour.
- 4) Operator will also get fire hoses hooked up and ready in case of fire.
- 5) Operator will also make sure dryer cyclone air lock is turned off.

### **EMERGENCY MAINTENANCE PROCEDURES FOR MATERIAL HANDLING FAN**

- 1) Maintenance will lock out material handling fan using the company policy for lock out tag out.
- 2) Maintenance will test material handling fan to make sure it will not start after lock out.
- 3) Maintenance will perform maintenance needed to repair the material handling fan
- 4) After all repairs are completed Maintenance will pick up all tools, make sure the material handling fan is safe to turn on and then take their locks off.
- 5) Maintenance will let operator know they may restart the material handling fan the hammer mill dryer cyclone air lock, new York blower, dryer, dryer infeed auger, wood chip screener, chip conveyor, chip screener, dryer infeed auger, wet material hammer mill, and furnace.
- 6) Maintenance will visually inspect the material handling fan as it is running to make sure all repairs are completed and there will be no further problems.

## **STORAGE BIN**

### **EMERGENCY SHUTDOWN PROCEDURES FOR STORAGE BIN**

- 1) Operator will make sure all interlocked equipment shuts down when storage bin shuts down, material handling fan, hammer mill, dryer cyclone air lock, New York blower, dryer, dryer infeed auger, chip screener, chip conveyor, 500hp wet material hammer mill, furnace infeed Auger, forced air blower, and furnace if they do not shut down operator must shut them down.
- 2) Operator will keep all other equipment running unless the storage bin is going to be down for more than one hour.
- 3) Operator will make sure to turn on the manual deluge system to prevent a fire in the dryer.
- 4) Operator will also get fire hoses hooked up and ready in case of fire.
- 5) Operator will also make sure dryer cyclone air lock is turned off.

### **EMERGENCY MAINTENANCE PROCEDURES FOR STORAGE BIN**

- 1) Maintenance will lock out storage bin using the company policy for lock out tag out.
- 2) Maintenance will test storage bin to make sure it will not start after lock out.
- 3) Maintenance will perform maintenance needed to repair the storage bin.
- 4) After all repairs are completed Maintenance will pick up all tools, make sure the storage bin is safe to turn on and then take their locks off.
- 5) Maintenance will let operator know they may restart the storage bin, material handling fan the hammer mill dryer cyclone air lock, new York blower, dryer, dryer infeed auger, wood chip screener, chip conveyor, chip screener, dryer infeed auger, wet material hammer mill, and furnace.
- 6) Maintenance will visually inspect the storage bin as it is running to make sure all repairs are completed and there will be no further problems.

## **PELLET MILL DRAG CONVEYOR**

### **EMERGENCY SHUTDOWN PROCEDURES FOR PELLET MILL DRAG CONVEYOR**

- 1) Operator will make sure all interlocked equipment shuts down when pellet mill drag conveyor shuts down, They will make sure all interlocked equipment shuts down.
- 2) Operator will keep all other equipment running unless the Pellet Mill drag conveyor is going to be down for more than one hour.
- 3) Drying line can continue to run until storage bin is full.
- 4) Operator will also shut down their pellet mills after they run out of material.

### **EMERGENCY MAINTENANCE PROCEDURES FOR PELLET MILL DRAG CONVEYOR**

- 1) Maintenance will lock out pellet mill drag conveyor using the company policy for lock out tag out.
- 2) Maintenance will test pellet mill drag conveyor to make sure it will not start after lock out.
- 3) Maintenance will perform maintenance needed to repair the pellet mill drag conveyor.
- 4) After all repairs are completed maintenance will pick up all tools, make sure the pellet mill drag conveyor is safe to turn on and then take their locks off.
- 5) Maintenance will let operator know they may restart the pellet mill drag conveyor, pellet mills, dryer infeed bin, infeed auger and furnace system.
- 6) Maintenance will visually inspect the pellet mill drag conveyor as they are running to make sure all repairs are completed and there will be no further problems.

## **CROSS OVER CONVEYOR**

### **EMERGENCY SHUTDOWN PROCEDURES FOR CROSS OVER CONVEYOR**

- 1) Operator will make sure all interlocked equipment shuts down when cross over conveyor. shuts down, pellet mill drag conveyor
- 2) Operator will keep all other equipment running unless the pellet mill drag conveyor is going to be down for more than one hour.
- 3) Drying line can continue to run until storage bin is full.
- 4) Operator will also shut down their pellet mills after they run out of material.

### **EMERGENCY MAINTENANCE PROCEDURES FOR CROSS OVER CONVEYOR**

- 1) Maintenance will lock out cross over conveyor using the company policy for lock out tag out.
- 2) Maintenance will test cross over conveyor to make sure it will not start after lock out.
- 3) Maintenance will perform maintenance needed to repair the cross over conveyor.
- 4) After all repairs are completed maintenance will pick up all tools, make sure the cross over conveyor is safe to turn on and then take their locks off.
- 5) Maintenance will let operator know they may restart the cross over conveyor, pellet mill drag conveyor, pellet mills,
- 6) Maintenance will visually inspect the pellet mill drag conveyor as they are running to make sure all repairs are completed and there will be no further problems.

## **PELLET MILL INFEED CONVEYOR**

### **EMERGENCY SHUTDOWN PROCEDURES FOR PELLET MILL INFEED CONVEYOR**

- 1) Operator will make sure all interlocked equipment shuts down when pellet mill infeed conveyor. shuts down, cross over conveyor, pellet mill drag conveyor
- 2) Operator will keep all other equipment running unless the pellet mill infeed conveyor is going to be down for more than one hour.
- 3) Operator will also shut down their pellet mills after they run out of material.
- 4) Drying line can continue to run until storage bin is full.

### **EMERGENCY MAINTENANCE PROCEDURES FOR PELLET MILL INFEED AUGERS**

- 1) Maintenance will lock out pellet mill infeed conveyor using the company policy for lock out tag out.
- 2) Maintenance will test pellet mill infeed conveyor to make sure it will not start after lock out.
- 3) Maintenance will perform maintenance needed to repair the pellet mill infeed conveyor.
- 4) After all repairs are completed maintenance will pick up all tools, make sure the pellet mill infeed conveyor is safe to turn on and then take their locks off.
- 5) Maintenance will let operator know they may restart the pellet mill infeed conveyor, the cross over conveyor, pellet mill drag conveyor, Pellet Mills,
- 6) Maintenance will visually inspect the pellet mill infeed conveyor as it is running to make sure all repairs are completed and there will be no further problems.

## **PELLET MACHINE SURGE BIN**

### **EMERGENCY SHUTDOWN PROCEDURES FOR PELLET MACHINE SURGE BIN**

- 1) Operator will make sure all interlocked equipment shuts down when pellet machine surge bin. shuts down ,pellet mill infeed conveyor cross over conveyor, pellet mill drag conveyor
- 2) Operator will keep all other equipment running unless the pellet machine surge bin is going to be down for more than one hour.
- 3) Operator will also shut down their pellet mills after they run out of material.
- 4) Drying line can continue to run until storage bin is full.

### **EMERGENCY MAINTENANCE PROCEDURES FOR PELLET MACHINE SURGE BIN**

- 1) Maintenance will lock out pellet machine surge bin using the company policy for lock out tag out.
- 2) Maintenance will test pellet machine surge bin to make sure it will not start after lock out.
- 3) Maintenance will perform maintenance needed to repair the pellet machine surge bin.
- 4) After all repairs are completed Maintenance will pick up all tools, make sure the pellet machine surge bin is safe to turn on and then take their locks off.
- 5) Maintenance will let operator know they may restart the pellet machine surge bin the pellet mill infeed conveyor, the cross over conveyor, pellet mill drag conveyor, pellet mills.
- 6) Maintenance will visually inspect the pellet machine surge bin as they are running to make sure all repairs are completed and there will be no further problems.

## **PELLET MILLS**

### **EMERGENCY SHUTDOWN PROCEDURES FOR PELLET MILLS**

- 1) Operator will make sure all interlocked equipment shuts down when pellet mills. shuts down, pellet machine surge bin, pellet mill infeed conveyor cross over conveyor, pellet mill drag conveyor
- 2) Operator will keep all other equipment running unless the pellet mill is going to be down for more than one hour.
- 3) Operator will also shut down their pellet mills after they run out of material.
- 4) Drying line can continue to run until storage bin is full.

### **EMERGENCY MAINTENANCE PROCEDURES FOR PELLET MILLS**

- 1) Maintenance will lock out pellet mills using the company policy for lock out tag out.
- 2) Maintenance will test pellet mills to make sure it will not start after lock out.
- 3) Maintenance will perform maintenance needed to repair the pellet mills.
- 4) After all repairs are completed maintenance will pick up all tools, make sure the pellet mills is safe to turn on and then take their locks off.
- 5) Maintenance will let operator know they may restart the pellet mills, pellet machine surge bin the pellet mill infeed conveyor, the cross over conveyor, pellet mill drag conveyor, pellet mills.
- 6) Maintenance will visually inspect the pellet mill as they are running to make sure all repairs are completed and there will be no further problems.



## **HOT PELLET CONVEYOR**

### **EMERGENCY SHUTDOWN PROCEDURES FOR HOT PELLET CONVEYOR**

- 1) Operator will make sure all interlocked equipment shuts down when hot pellet conveyor. shuts down, pellet mills, pellet machine surge bin, pellet mill infeed conveyor cross over conveyor, pellet mill drag conveyor
- 2) Operator will keep all other equipment running unless the hot pellet conveyor is going to be down for more than one hour.
- 3) Drying line can continue to run until storage bin is full

### **EMERGENCY MAINTENANCE PROCEDURES FOR HOT PELLET CONVEYOR**

- 1) Maintenance will lock out hot pellet conveyor using the company policy for lock out tag out.
- 2) Maintenance will test hot pellet conveyor to make sure it will not start after lock out.
- 3) Maintenance will perform maintenance needed to repair the hot pellet conveyor.
- 4) After all repairs are completed maintenance will pick up all tools, make sure the hot pellet conveyor is safe to turn on and then take their locks off.
- 5) Maintenance will let operator know they may restart the hot pellet conveyor, pellet mills, pellet machine surge bin the pellet mill infeed conveyor, the cross over conveyor, pellet mill drag conveyor, pellet mills.
- 6) Maintenance will visually inspect the hot pellet Conveyor as it is running to make sure all repairs are completed and there will be no further problems.

## **PELLET COOLER BUCKET ELEVATOR**

### **EMERGENCY SHUTDOWN PROCEDURES FOR PELLET COOLER BUCKET ELEVATOR**

- 1) Operator will make sure all interlocked equipment shuts down when pellet cooler bucket elevator. shuts down, hot pellet conveyor, pellet mills, pellet machine surge bin, pellet mill infeed conveyor cross over conveyor, pellet mill drag conveyor
- 2) Operator will keep all other equipment running unless the pellet cooler bucket elevator is going to be down for more than one hour.
- 3) Drying line can continue to run until storage bin is full

### **EMERGENCY MAINTENANCE PROCEDURES FOR PELLET COOLER BUCKET ELEVATOR**

- 1) Maintenance will lock out the pellet bin bucket elevators using the company policy for lock out tag out.
- 2) Maintenance will test the pellet cooler bucket elevators to make sure it will not start after lock out.
- 3) Maintenance will perform maintenance needed to repair the pellet cooler bucket elevators.
- 4) After all repairs are completed maintenance will pick up all tools, make sure the pellet cooler bucket elevators is safe to turn on and then take their locks off.
- 5) Maintenance will let operator know they may restart the pellet cooler bucket elevators the hot pellet conveyor, pellet mills, pellet machine surge bin the pellet mill infeed conveyor, the cross over conveyor, pellet mill drag conveyor, pellet mills.
- 6) Maintenance will visually inspect the pellet cooler bucket elevators as it is running to make sure all repairs are completed and there will be no further problems.

## **COOLER CONVEYOR**

### **EMERGENCY SHUTDOWN PROCEDURES FOR COOLER CONVEYOR**

- 1) Operator will make sure all interlocked equipment shuts down when cooler conveyor. shuts down, pellet cooler bucket elevator hot pellet conveyor, pellet mills, pellet machine surge bin, pellet mill infeed conveyor cross over conveyor, pellet mill drag conveyor.
- 2) Operator will keep all other equipment running unless the cooler conveyor is going to be down for more than one hour.
- 3) Drying line can continue to run until storage bin is full.

### **EMERGENCY MAINTENANCE PROCEDURES FOR COOLER CONVEYOR**

- 1) Maintenance will lock out the cooler conveyor using the company policy for lock out tag out.
- 2) Maintenance will test the cooler conveyor to make sure it will not start after lock out.
- 3) Maintenance will perform maintenance needed to repair the cooler conveyor.
- 4) After all repairs are completed maintenance will pick up all tools, make sure the cooler conveyor is safe to turn on and then take their locks off.
- 5) Maintenance will let operator know they may restart the cooler conveyor the pellet cooler bucket elevators the hot pellet conveyor, pellet mills, pellet machine surge bin the pellet mill infeed conveyor, the cross over conveyor, pellet mill drag conveyor, pellet mills.
- 6) Maintenance will visually inspect the cooler conveyor as it is running to make sure all repairs are completed and there will be no further problems.

## **PELLET SCREENER**

### **EMERGENCY SHUTDOWN PROCEDURES FOR PELLET SCREENER**

- 1) Operator will make sure all interlocked equipment shuts down when pellet screener. shuts down, cooler conveyor, pellet cooler bucket elevator hot pellet conveyor, pellet mills, pellet machine surge bin, pellet mill infeed conveyor cross over conveyor, pellet mill drag conveyor.
- 2) Operator will keep all other equipment running unless the pellet screener is going to be down for more than one hour.
- 3) Drying line can continue to run until storage bin is full.

### **EMERGENCY MAINTENANCE PROCEDURES FOR PELLET SCREENER**

- 1) Maintenance will lock out the pellet screener using the company policy for lock out tag out.
- 2) Maintenance will test the pellet screener to make sure it will not start after lock out.
- 3) Maintenance will perform maintenance needed to repair the pellet screener.
- 4) After all repairs are completed maintenance will pick up all tools, make sure the pellet screener is safe to turn on and then take their locks off.
- 5) Maintenance will let operator know they may restart the pellet screener, the cooler conveyor the pellet cooler bucket elevators the hot pellet conveyor, pellet mills, pellet machine surge bin the pellet mill infeed conveyor, the cross over conveyor, pellet mill drag conveyor, pellet mills.
- 6) Maintenance will visually inspect the pellet screener as it is running to make sure all repairs are completed and there will be no further problems.

## **SCREENER CONVEYOR**

### **EMERGENCY SHUTDOWN PROCEDURES FOR SCREENER CONVEYOR**

- 1) Operator will make sure all interlocked equipment shuts down when screener conveyor. shuts down, pellet screener, cooler conveyor, pellet cooler bucket elevator hot pellet conveyor, pellet mills, pellet machine surge bin, pellet mill infeed conveyor cross over conveyor, pellet mill drag conveyor.
- 2) Operator will keep all other equipment running unless the screener conveyor is going to be down for more than one hour.
- 3) Drying line can continue to run until storage bin is full.

### **EMERGENCY MAINTENANCE PROCEDURES FOR SCREENER CONVEYOR**

- 1) Maintenance will lock out the screener conveyor using the company policy for lock out tag out.
- 2) Maintenance will test the screener conveyor to make sure it will not start after lock out.
- 3) Maintenance will perform maintenance needed to repair the screener conveyor.
- 4) After all repairs are completed maintenance will pick up all tools, make sure the screener conveyor is safe to turn on and then take their locks off.
- 5) Maintenance will let operator know they may restart the screener conveyor, the pellet screener, the cooler conveyor the pellet cooler bucket elevators the hot pellet conveyor, pellet mills, pellet machine surge bin the pellet mill infeed conveyor, the cross over conveyor, pellet mill drag conveyor, pellet mills.
- 6) Maintenance will visually inspect the screener conveyor as it is running to make sure all repairs are completed and there will be no further problems.

## **BUCKET ELEVATOR**

### **EMERGENCY SHUTDOWN PROCEDURES FOR BUCKET ELEVATOR**

- 1) Operator will make sure all interlocked equipment shuts down when bucket elevator. shuts down, screener conveyor, pellet screener, cooler conveyor, pellet cooler bucket elevator hot pellet conveyor, pellet mills, pellet machine surge bin, pellet mill infeed conveyor cross over conveyor, pellet mill drag conveyor.
- 2) Operator will keep all other equipment running unless the bucket elevator is going to be down for more than one hour.
- 3) Drying line can continue to run until storage bin is full.

### **Emergency maintenance procedures for Bucket Elevator**

- 1) Maintenance will lock out bucket elevator using the company policy for lock out tag out.
- 2) Maintenance will test bucket elevator to make sure it will not start after lock out.
- 3) Maintenance will perform maintenance needed to repair the bucket elevator.
- 4) After all repairs are completed maintenance will pick up all tools, make sure the bucket elevator is safe to turn on and then take their locks off.
- 5) Maintenance will let operator know they may restart the bucket elevator, the screener conveyor, the pellet screener, the cooler conveyor the pellet cooler bucket elevators the hot pellet conveyor, pellet mills, pellet machine surge bin the pellet mill infeed conveyor, the cross over conveyor, pellet mill drag conveyor, pellet mills.
- 6) Maintenance will visually inspect the bucket elevator as it is running to make sure all repairs are completed and there will be no further problems.

## **PELLET CONVEYANCE BLOWER**

### **EMERGENCY SHUTDOWN PROCEDURES FOR PELLET CONVEYANCE BLOWER**

- 1) Operator will make sure all interlocked equipment shuts down when pellet conveyance blower. shuts down, bucket elevator ,screener conveyor, pellet screener, cooler conveyor, pellet cooler bucket elevator hot pellet conveyor, pellet mills, pellet machine surge bin, pellet mill infeed conveyor cross over conveyor, pellet mill drag conveyor.
- 2) Operator will keep all other equipment running unless the pellet conveyance blower is going to be down for more than one hour.
- 3) Drying line can continue to run until storage bin is full.

### **EMERGENCY MAINTENANCE PROCEDURES FOR PELLET CONVEYANCE BLOWER**

- 1) Maintenance will lock out pellet conveyance blower using the company policy for lock out tag out.
- 2) Maintenance will test pellet conveyance blower to make sure it will not start after lock out.
- 3) Maintenance will perform maintenance needed to repair the pellet conveyance blower.
- 4) After all repairs are completed maintenance will pick up all tools, make sure the storage bin fan is safe to turn on and then take their locks off.
- 5) Maintenance will let operator know they may restart the pellet conveyance blower, the bucket elevator, the screener conveyor, the pellet screener, the cooler conveyor the pellet cooler bucket elevators the hot pellet conveyor, pellet mills, pellet machine surge bin the pellet mill infeed conveyor, the cross over conveyor, pellet mill drag conveyor, pellet mills.
- 6) Maintenance will visually inspect the pellet conveyance blower as it is running to make sure all repairs are completed and there will be no further problems.

## **STARTUP PROCEDURES**

**All employees will be informed that start up is going to take place and equipment is going to be started. Operators and Maintenance will do a walk around inspection making sure all equipment is safe to turn on.**

1. Operators and Maintenance will inspect all magnets and turn on air compressor.
2. Maintenance will make sure that all pellet mill roller heads are set, and the pellet mills are ready to be put into production.
3. The Operator will start the fire in the furnace.
4. Once the furnace reaches 1000°, the Operators will start turning on the furnace Fuel system, fuel blower, and fuel Auger.
5. After the furnace forced air blower is started the Operator will set his outlet set point to the temp that is needed.
6. Operators will start turning on bag house, dryer, dryer cyclone, airlock, hammer mill, New York Blower, material handling fan, storage bin, 500hp hammer mill, chip conveyor, chip screener, dryer feed auger, After starting the above equipment operators will visually inspect that all equipment turned on is running.
7. Loader operators will check with pellet operator to make sure it is all right to start filling the dryer infeed bin. If yes the loader operator will start filling the bin.
8. Pellet mill operators will start turning on , pellet conveyance blower, bucket elevator, screener conveyor, pellet screener, cooler conveyor ,pellet cooler bucket elevator, hot pellet conveyor, pellet mills, pellet machine surge bin, pellet mill infeed conveyor, cross over conveyor, pellet mill drag conveyor, After start the above equipment operators will visually inspect that all equipment turned on is running.
9. Operator will turn on the pellet mill infeed conveyor, the pellet machine surge bin, and pellet mill cross over augers at a very low



rate, and will gradually come up with the cross over auger until we get the desired tons per hour.

10. Maintenance will do a walk around inspection of all emission points and equipment to make sure they are running and working properly. If Maintenance observes any emissions they will log down what they observed and at what time they observed.

Once everything is running and is producing the way it should startup is complete.

## **SHUT DOWN PROCEDURES**

1. Operator will inform the loader operator to stop filling the dryer infeed bin.
2. Operator will wait for all of the material to empty out of the dryer infeed bin and infeed auger before shutting them down.
3. Operators will wait for all material to pass through the dryer before shutting the furnace and furnace fuel system down, once the material is out of the dryer they may shut the furnace and furnace fuel system down.
4. Operators will wait for the mill surge bin to run empty before shutting the pellet mill drag conveyor, cross over conveyor pellet mill infeed augers and the pellet mill surge bin down.
5. Operators will shut down one pellet mill at a time, making sure that there is no material left in the mill, after shutting the pellet mills down operator will open the access door on mills.
6. All other equipment will run for at least 15 min. after shutting the pellet mills down.
7. **After the Operator is sure all Materials have been run through the system they can continue his or her shut down.**
8. Operators will shut down the wet material hammer mill, chip conveyor, chip screener, dryer infeed auger, dryer, dryer cyclone, hammer mill, new york blower, cyclone airlock, material handling fan.
9. Operators will shut down hot pellet conveyor.
10. After the bucket elevator is empty operators can shut down bucket elevator.
11. After the cooler conveyor is empty the operators can shut down the cooler conveyor.
12. After screener is empty operators can shut down screener

13. After screener conveyor is empty operators can shut down screener conveyor
14. Operators can shut down the pellet bin bucket elevator
15. Operators can shut down pellet conveyance blower

Operators will do a walk around inspection of the plant to make sure there is no equipment running and all fans are turned off, and all rolling stock equipment are put inside and locked up.

## **MAINTENANCE SCHEDULE**

### **DAILY**

FURNACE FORCED AIR BLOWER  
CLEAN WOOD METERING BIN  
DRYER CYCLONE  
COOLER  
DRYER INFEED SCREENER AND AUGER  
WET HAMMER MILL AND CONVEYOR  
CHIP SCREENER  
DRYER INFEED AUGER  
DRYER  
NEW YORK BLOWER  
DRYER CYCLONE AIR LOCK  
DRY HAMMER MILL  
MATERIAL HANDLING FAN  
PELLET MILL DRAG CONVEYOR  
PELLET MILLS  
AUTO GREASER FOR PELLET MILLS  
W 14 LOADER

### **WEEKLY**

WET HAMMER MILL / CHECK HAMMERS  
NEW YORK BLOWER / CHECK FAN BLADES  
DRY HAMMER MILL / CHECK HAMMERS  
MATERIAL HANDLING FAN / CHECK FAN BLADES  
BAG HOUSE  
DRYER  
CROSS OVER CONVEYOR  
PELLET MILL INFEED CONVEYOR  
PELLET MACHINE SURGE BIN  
HOT PELLET CONVEYOR  
PELLET COOLER BUCKET ELEVATOR  
COOLER CONVEYOR  
PELLET SCREENER  
SCREENER CONVEYOR

BUCKET ELEVATOR  
PELLET CONVEYANCE BLOWER

## **MONTHLY**

FORK LIFTS #1 & #2  
ELECTRICAL PANELS  
CHIP SCREENER  
CHIP CONVEYOR GEAR BOX  
DRYER INFEED AUGER GEAR BOX  
CLEAN WOOD FURNACE  
ASH AUGER  
DRYER GEAR BOX  
NEW YORK FAN / MOTOR  
DRYER CYCLONE AIR LOCK GEARBOX  
MATERIAL HANDLING FAN / MOTOR  
PELLET MILL DRAG CONVEYOR / GEARBOX  
PELLET MILL CROSS OVER AUGERS #1 & #2  
PELLET MILL INFEED CONVEYORS #1 & #2  
PELLET MACHINE SURGE BIN / GEAR BOXES  
PELLET MACHINE GEAR BOXES  
HOT PELLET CONVEYOR GEARBOX  
PELLET COOLER ELEVATOR BELTS / MOTOR  
COOLER CONVEYOR GEARBOX  
PELLET SCREENER GEARBOX / BELTS  
SCREENER CONVEYOR GEARBOX  
BUCKET ELEVATOR GEARBOX / BELTS  
PELLET CONVEYANCE BLOWER / FAN BLADES

## **SEMI-ANNUAL**

CLEAN WOOD FURNACE AUGER /GEAR BOX  
WET HAMMER MILL  
CHIP CONVEYOR / CHAIN  
DRYER INFEED AUGER / FLITES  
DRYER CYCLONE AIR LOCK / PADDLES  
DRY HAMMER MILL / SCREENS  
MATERIAL HANDLING FAN / CHECK BLADES FOR BUILD UP

NEW YORK BLOWER / CLEAN FAN BLADES  
PELLET MILL DRAG CONVEYOR / INSPECT DRAG PADDLES  
PELLET MILL INFEED CONVEYORS / INSPECT DRAG PADDLES

## **YEARLY**

W 14 LOADER  
WET HAMMER MILL  
CHIP CONVEYOR  
CHIP SCREENER  
DRYER INFEED AUGER  
FURNACE  
FURNACE FORCED AIR BLOWER  
CLEAN WOOD METERING BIN  
DRYER SEALS  
NEW YORK BLOWER  
CYCLONE  
DRYER CYCLONE AIR LOCK  
PELLET MILL INFEED AUGERS #1 & #2  
PELLET MILL CENTER FEEDERS #1 & #2  
PELLET MILL CROSS OVER AUGERS  
BAG-HOUSE

Maintenance will refer to maintenance sheets for the required maintenance needed to be performed on the daily, weekly, monthly, semiannually and yearly.

## **OPERATION PARAMETERS FOR EMISSION LIMITS**

- 1) **Dryer In-Let Temp:** Operators will keep their dryer inlet temp below 800°, the dryer inlet alarm is set at 790°, once this temperature is reached the furnace fuel auger will shut off until the temperature is lower than 790°. Then the auger will come back on. If this process does not happen the operator will inform the plant supervisor immediately. If the alarm is activated the operator will slow down his or her infeed to the dryer. Example feed at 50% slow down to 45% the operator will log down on his daily mill log when this has occurred.
- 2) **Bag House pressure Drop:** Operators will log down once per/shift the pressure on the bag house, They will make sure we maintain 2.5 to 7.0 inches of water. If the Operator observes reading starting to climb they will notify the plant manager as soon as possible. If we are less than 2.5 or more than 7.0 the bag house alarm will come on, if this happens the operator will slow down their dry In-feed. If slowing down the In-feed did not fix the problem and the alarm is still on, operators will start the shutdown process and will inform the plant supervisor and maintenance. At this time the required maintenance will be performed to the bag house, to make sure we are in compliance. Operators will also observe the bag house for any particles or dust coming from the bag house. If they do observe any dust coming from the bag house they will contact the plant supervisor immediately, and start the shutdown process.
- 3) **Cyclone Pressure Drop:** Operators will log down once per / shift the pressure on the dryer cyclone, they will make sure we maintain 2.5 to 7.0 inches of water. If we are over 7.0 inches of water or under 2.5 inches of water the operator will inform the plant supervisor and will also start the shutdown process. The mill will not start running until maintenance has been performed to put us back into compliance. operators will also observe the stack and cyclones for any dust or particles coming from them. If they do observe dust coming from the cyclones the operator will contact the plant supervisor immediately, and start the shutdown process.
- 4) **Dryer Through-Put:** Operators will make sure that we are not trying to dry over 18 wet tons of wood per/hour, they will do this by following the parameters set by the plant manager. Those parameters areas

followed no more than 75% of the Infeed, no more than 55% of the pellet mills. If we are over the 18 tons of wet wood per/hour operators will slow down their infeed to the dryer.

## **MAINTENANCE TO POLLUTION GENERATING AND CONTROL EQUIPMENT.**

Employees will inspect all equipment that deals with the control of emissions every shift and report any wear that they may see; if any of the equipment is not in good working condition they will immediately report it to their plant supervisor.

- 5) **Smoke:** If any employee, sees any smoke coming out of the stack they will inform their plant manager, maintenance or operator that they are smoking, We will observe the smoke using the method 9 for smoke reading and if we our out of compliance the operator will immediately slow down his or her infeed to the dryer by 5% if this does not put us back into compliance the operator will slow his or her infeed down another 5%. Once we are back in compliance the operator will inform the plant manger that the blend is wet so that the plant manager can make the changes to the blend to put us at full production, if the plant manager cannot change the blend he will inform the operator and the operator will have to run at a slower speed.
- 6) **Incoming and outgoing material:** All employees will observe incoming and outgoing trucks to make sure they have taken the proper precautions to clean the bumpers, wheel wells, tops of the tuck and sawdust or shavings, before leaving. All employees will remind truck drivers of this and will report any that o not follow this procedure to their plant supervisor.

If any of these emission limits are hit the plant manager will inform FDEP with the time it happened the reason it happened and how we have corrected the problem.



# **BEST MANAGEMENT PRACTICES FOR LAND CLEARING DEBRIS AND YARD WASTE MANAGEMENT**

## **INTRODUCTION**

Vulcan Renewable operates under SIC Code 2493 (reconstituted wood products) on the same site as several other businesses with similar management but under different ownership. Specifically, Indianhead Biomass Services operates a yard waste and wood recycling operation under SIC Code 5093 (recyclable scrap and waste material) that will supply some of the wood for the wood furnace. This furnace cannot burn “residential yard waste” as it is defined by the US EPA as municipal solid waste. Indianhead Biomass Services accepts both residential yard waste and land clearing debris from a variety of sources. A detailed description of clean woody biomass is presented in the next section.

The yard trash, land clearing debris (LCD) and other clean wood will be managed, including the storage, processing, and removal of it, in accordance with Chapter 62-709, F.A.C., including within the rule required time frames (e.g., Rule 62-709.320(2)(e) and 62-709.330(2), F.A.C.), and with the facility’s registration (e.g., yard trash transfer station or a solid waste organics recycling facility). The facility will maintain its aforementioned registration as long as it is storing and/or processing yard trash, LCD, and clean wood.

## **CLEAN WOODY BIOMASS**

To assure that only clean woody biomass is burned in the furnace, Vulcan Renewable has accepted the following definition. This definition was taken from another FDEP air permit that burns wood in a boiler.

Only clean wood will be fired in the wood furnace. “Clean wood” means wood, including lumber, tree and shrub trunks, branches, and limbs, that is free of paint, glue, filler, pentachlorophenol, creosote, tar, asphalt, chromated copper arsenate, other wood preservatives or treatments.”

<b>Fuel Type</b>	<b>Description</b>
In-forest residue and slash	Tops, limbs, whole tree material and other residues from soft and hardwoods that result from traditional silvicultural harvests.
Mill residue	Saw dust, bark, shavings and kerf waste from cutting/milling whole green trees; fines from planing kiln-dried lumber; wood waste material generated by primary wood products industries such as round-offs, end cuts, sticks, pole ends; and reject lumber as well as residue material from the construction of wood trusses and pallets.
Pre-commercial tree trimmings and understory clearings	Tops, limbs, whole tree material and other residues that result from the cutting or removal of certain, smaller trees from a stand to regulate the number, quality and distribution of the remaining commercial trees; and forest understory which includes smaller trees, bushes and saplings.
Storm, fire and disease debris	Tops, limbs, whole tree material and other residues that are damaged due to storms, fires or infectious diseases.
Urban wood waste	Trees and other clean, woody matter generated by landscaping contractors or power line/roadway clearance contractors that have been cut down for land development, right-of-way clearing or general landscape management purposes.
Recycled industrial wood	Clean wood derived from used pallets packing crates; and clean wood dunnage (not chemically treated) disposed by commercial or industrial users.
Supplementary fuel material	Clean agricultural residues (i.e., rice hulls, straw, etc.; no animal wastes or manure); and whole tree chips and pulpwood chips.

## **RESIDENTIAL YARD WASTE**

Residential yard waste is delivered by municipal customers and their contractors in rear-loader type trucks. It is any “yard” waste segregated by a homeowner and picked up as part of the routine residential trash pickup.

This waste is then recycled at the Indianhead Biomass site located on

County Road 214. All “yard” waste is staged in one location on the site (see figure 1). This is controlled by several methods and is part of the written procedure of Indianhead Biomass. They are;

1. At the tipping scale when the waste is first received. If not known by the customer name, the scale operator asks the driver what type of waste is being delivered; yard trash or land clearing debris. The load is inspected and either accepted or rejected. If the load is accepted, they are then instructed where to drop the load.
2. Upon entering the recycling site, a trained spotter will identify the load and a second inspection is made. Acceptable loads will be placed at the designated locations. Signs are clearly posted that separate yard trash from land clearing debris.
3. Any waste placed in the “yard trash” designated area will not be used as fuel in the wood furnace.
4. Any loads containing construction or demolition (C&D) debris is rejected. Clean concrete is accepted and disposed of in an identified area away from the wood site.

## **LAND CLEARING, EASEMENT TRIMMINGS AND STORM DEBRIS**

Land clearing debris is brought to the site by many different customers and in two major forms, chipped and bulk. Chipped wood is typically brought in by easement contractors who chip wood as it is cut at the job site. Bulk wood typically comes in from sites being cleared for construction or agricultural purposes. Storm debris may come in chipped or in bulk. In all cases, they are processed in a similar fashion as yard waste with the exception of where this material is staged.

Non-residential yard trash (e.g., land clearing debris) is stored in a designated location clearly marked with signs. The procedure is as follows;

1. At the tipping scale when the waste is first received. If not known by the customer name, the scale operator asks the driver what type of waste is being delivered; yard trash or land clearing debris. The load is inspected and either accepted or rejected. If the load is accepted, they are then instructed when to place the load.

2. Upon entering the recycling site, a trained spotter will identify the load and a second inspection is made. Acceptable loads will be placed at the designated locations. Signs are clearly posted that separate yard trash from land clearing debris.
3. Any waste placed in the “land clearing” designated area may be used as fuel in the wood furnace.
4. Any wood coming in from land clearing, easement trimmings or storm debris that is already chipped is directed to a storage pile at the pellet facility. Indianhead Biomass believes it receives enough chipped wood from these activities to fire the wood furnace at the Vulcan pellet plant. When supplement wood chips are needed, Indianhead Biomass will operate a small 3-ton/hr electric wood chipper to process clean wood for use in the furnace.
5. Some of the oak logs from land clearing will also be used in the furnace to supplement the wood chips. This wood may be cut into 2-foot long logs and split using a log splitter.

## **QUALITY CONTROL AND QUALITY ASSURANCE**

Indianhead Biomass uses the following quality control procedures for acceptance or rejection of waste wood.

**Training** – The scale master, spotter and heavy equipment operators are trained to identify acceptable waste loads. They are trained to identify the difference between land clearing or clean loads and municipal yard trash. For the largest customers, this is done by the contract type. A copy of the training certificate is included in the employee file.

**Signage** – Signs have been posted identifying the yard trash storage area, the land clearing or clean wood storage area and the chipped clean wood pile at the pellet plant.

**Inspection** – Each load is visually inspected by a trained employee prior to accepting the load. If regulated solid waste such as household goods, C&D waste, metal, treated or painted wood, food waste, batteries, industrial trash, plastic or anything not meeting the definition of yard trash or clean wood is found in a load, the entire load is rejected. If any unacceptable waste is found in the load after placement, the waste will be loaded into the truck and removed from the site.

**Printed Maps** – A printed map is given to drivers unfamiliar with the site showing them where to place their load.

## **PRECAUTIONS TO PREVENT UNCONFINED PARTICULATE EMISSIONS**

Vulcan Renewables, LLC will take the following reasonable precautions to control the emissions of unconfined particulate matter, in accordance with §62-296.320(4)(c):

- Maintain a buffer between on-site activities and the property line.
- Application of water to minimize particulate emissions from vehicle traffic, wood debris storage and handling and miscellaneous activities onsite.
- Use of landscaping and regular maintenance of vegetation,
- 15 mph posted speed limits on unpaved roads.
- Conveyor systems and associated drop points for material shall be covered or partially enclosed.
- All areas for chip material handling will be on concrete or in partially enclosed buildings.
- All drying line equipment is mounted on concrete and will be washed off and/or swept up daily and if there is any dust or spillage during the work day.
- All pellet machines are in an enclosed building and will be monitored throughout the work day for dust and spillage. If there is any spillage or emitting dust during operation the machine will be shut down. The spill will be cleaned up and machine repaired.
- Periodic equipment maintenance shall be performed to maintain conveyor systems and drop point integrity.
- Daily observations of conveyor systems and associated drop point integrity will be conducted to identify equipment abnormalities.
- Plant personnel shall be trained on identification of warning signs of equipment malfunction.

- Ash from the furnace will be removed manually by rake or come-along into the ash bin.
- The ash bin is equipped with an ash auger to transfer the cold ash. Water spray will be used to wet the ash to prevent fugitive dust.
- Wet ash will be used as a soil amendment by being mixed into soil.
- Operators will clean up dust and other materials on and around all equipment at the end of the day and/or during their shift.



## OBJECTIONABLE ODOR PLAN

Due to the employment of several engineering and management practices offsite odor impacts from this process is unlikely. The following is an overview of the primary ways odors from this facility are managed. Objectionable odors are possible from the use of wood to fire the furnace. This would be noticeable as a “forest fire” or “smoky” type of odor.

### Engineering Controls

The same combustion process engineering design employed to control particulate matter (smoke) is effective for controlling wood smoke odors.

- Temperature - The minimum furnace temperature after startup is approximately 750 deg F, the combustion zone is 1400-1800 deg F while the wood coals are 2500 to 3500 deg F. Heat recovery is used for drying the product and the fuel. The combustion air (with VOC) is introduced at the rotary drier at a temperature of 700 deg F and the furnace outlet temperature is approximately 800 deg F.
- Turbulence - Combustion air (with VOC) is introduced into the furnace tangentially and at multiple locations along the sides of the furnace resulting in cyclonic flow. This effectively extends the travel path of the gasses to the outlet, thereby increasing chamber residence time.
- Time – the longer the gasses are at high temperature the more thorough the destruction of odorous compounds and VOC. Using a simple residence time calculation without accounting for cyclonic flow we calculate the following;

*The firebox volume is 546 cubic feet.*

*Residence time = Volume of combustion chamber in CF / (ACFM/60 sec/min)*

*Residence time = (546 cf)/(6000ACFM/60 sec/min)*

*Residence time = 5.46 seconds*

Typical VOC control of 98% is achieved using 1500 deg F at 0.75

seconds. We believe that the average VOC oxidation temperature will be less than 1500 deg F but the long residence time will increase combustion efficiency. Efficient combustion reduces smoke and odor from the furnace.

## **Best Management Practices**

Odors from wood smoke are most likely to occur during start-up and shut-down when the furnace is at its lowest temperature. During normal operation, opacity is expected to be 5%. The procedures for start-up and shut-down described in this Plan assure that minimal time is spent under sub-optimal temperatures.

Many of the precautions to prevent unconfined particulate emissions described in this Plan have a positive influence for keeping odors confined to the facility.

This furnace cannot burn “residential yard waste” as it is defined by the US EPA as municipal solid waste. Segregation of waste by trained operators assures that only acceptable waste is input.

Distance from potential sensitive receptors is a useful tool for odor mitigation and management. The furnace is located approximately 3,700 feet east from I-95, 6,200 feet south of a residential area and 3,800 feet north of SR 214.

## **Administrative Controls**

In the unlikely event a neighborhood odor issue arises Management will initiate a review of operations to determine if the odors are related to equipment failure or mis-operation. Should all systems be found operating within the design parameters the Management may choose to alter operating times or other variable procedures to mitigate off-site odor impacts.