

LCOA wood chip burn-off process description

- 1) **Purpose of facility:** burning off wood content and resizing of the “wood chip” feedstock in order to facilitate further off-site processing for metal recovery.
- 2) **Feedstock:** “Wood chip” is sourced from metal mines. It is fine ore that has filtered through ore passes and ended up in haulage drains. As a consequence of blasting taking place in the mine workings, the material is contaminated with wood from the mine wood pack roof support. This wood presents as fine splinters.
- 3) **Output:** intermediate product from which wood has been removed (burnt off) and which has been resized. The intermediate product is returned to mines for treatment in the mine’s processing plant to recover any metal that may be present.
- 4) **Fuel burning appliance:** portable diesel burners heat a rotary kiln.
- 5) **Fuel:** diesel
- 6) **Infrastructure:**
 - a) Hopper
 - b) Screw conveyor
 - c) Portable diesel burners
 - d) Rotary kiln with drop-out box (larger particles) and exit gas cyclone filter in series with exit gas bag filter (airborne particles)
 - e) Screen
 - f) Mill
 - g) Bagging station
- 7) **Site surfacing:**
 - a) Compacted, un-stabilised soils.
 - b) An approximately 20m x 20m concrete slab has been cast for the burn-off and resizing process, including burn-off, cooling, filtering, screening, milling, bagging.
 - c) Loose concrete blocks have been laid down at the feedstock and product storage areas.
- 8) **Buildings:**
 - a) The site has been walled with vibracrete.
 - b) There are no permanent structures constructed on site.
 - c) Portacabins and shipping containers house a storage unit, a laboratory for feedstock and product analysis, and an administrative office.

9) Bulk engineering services:

- a) There is no connection to municipal water or electricity supply, or to sewerage reticulation or stormwater system as yet.
- b) Electricity is provided by diesel generator.
- c) Water is imported in containers to site.
- d) Stormwater is not managed in any way.
- e) A chemical toilet is present on site.

10) Process steps:

- a) Wood chip feedstock is delivered to site in 1 tonne bags.
- b) Bagged feedstock is stored on concrete blocks and covered with a canvas tarpaulin.
- c) Bags are conveyed and tipped by bottom discharge into the hopper by telehandler.
- d) Open screw conveyor conveys wood chip to kiln.
- e) Rotary kiln operates at 800 – 900°C and burns off the wood.
- f) Larger, heavier particles of "oversized" treated product fall into the kiln's drop-out box and from the drop-out box into a pan.
- g) The pan is conveyed to a bund by telehandler and the oversize is tipped into the bund for cooling overnight. The oversize is covered by a heat resistant tarpaulin whilst cooling.
- h) 1 tonne bags are manually filled with oversize using spades. The bags of oversize are weighed.
- i) The bags of oversize are conveyed by telehandler to a vibratory screen.
- j) The screen separates the oversize into +1mm and -1mm sized product.
- k) The oversize and -1mm product discharge directly into bags.
- l) The -1mm bagged product is conveyed by telehandler to the product storage area ready for transportation to customer.
- m) The oversize is bagged, conveyed and loaded into the mill by telehandler.
- n) The milled (resized) product discharges directly into bags and conveyed to the storage area ready for transportation to customer.
- o) The product storage area is surfaced with concrete blocks and the bags are covered with a tarpaulin.
- p) Finer, airborne particles (treated product) are extracted by fan from the kiln to a cyclone. The larger, heavier particles separated out in the cyclone fall directly into a drum and are then tipped into bags for storage ready for transportation to customer.
- q) Remaining, very fine airborne particles are extracted by fan from the cyclone to a bag filter. The very fine particles are knocked out of the bag filter into a drum and are then tipped into bags for storage ready for transportation to customer.

11) Raw materials, outputs, by-products, air emissions, waste:

a) Raw materials:

- i. Wood chip: fine ore comprising rock, silica, wood chip and metal.
- ii. Fuel: diesel

b) **Outputs:** intermediate product, wood removed and resized.

c) **By-products:** none

d) **Waste:** none

e) **Air emissions:** combustion emission and particulate from diesel burners and wood burn-off; dust from material handling.

12) Design capacity of burner and kiln:

a) 420kgph wood chip, or 5tpd @ 12 hours operating per day, or 100tpm @ 5 operating days/week.

b) 30lph diesel, or 360lpd @ 12 hours operating per day

13) Actual throughput:

a) Average throughput February – July 2021: 25.6 tpm

b) Highest throughput: 45.6 tonnes in January

c) Lowest throughput: 9.6 tonnes in May

14) Relevant dates:

a) February 2021: cleared site of vegetation and levelled and walled.

b) March 2021: established burn-off plant on site.

c) 7 July 2021: ceased operations.