


Equipment

- Mobile Plant - Wheeled loading shovels, 360° excavators, skid-steers, telehandlers
- Process Plant - Feeders, crushers, conveyors, screens, picking belts, eddy current separators, magnetic separators, filtration equipment, pumps

Personnel

- Managers and their Deputies
- Trained and competent mobile plant operatives or under authorised training
- Trained and competent process plant operatives or under authorised training

Procedure

- The raw IBA stockpile will be managed/pulled up by WLS and excavator, material shall at all times be kept at 1m below the top of the bay retaining walls and within the permitted stockpile heights.
- It is the responsibility of the excavator and WLS operatives to manage the material prior to it being fed into the process plant. IBA during the maturation process can solidify, the excavator will break up the IBA to make it as granular as possible, this process can release dust which is suppressed by means of water addition at the excavating bucket or by the storage area dust suppression equipment. In addition to dust the process of breaking the IBA up can release vapour, excavator and WLS operatives are to ensure plant windows are kept shut to minimise exposure.
- The moisture content of IBA prior to processing is an important factor, operatives must inform the Depot Manager/Deputy if there are concerns regarding the level of moisture content.
- Operatives will notify the Depot Manager/Deputy if when preparing the IBA for processing excessive amounts of unburnt waste is in evidence.
- Access to the plant buildings and equipment will be via the designated pedestrian walkways for the respective location.
- Only trained operators will use the plant/equipment, unless under the supervision of a trained and authorised operator.
- On completion of pre-start checks  [IBA Plant Inspection Checklist.docx](#) (00001669) the process plant will be started by the operator (flow charts are added as appendices to this process document for each processing location). Particular attention will be paid to ensure stockpiling areas are clear of personnel and vehicles before starting the plant. It is the operative's responsibility to ensure that all conveyor belts have been purged prior to instigating the automatic shutdown process. Best practice is to ensure the plant is allowed to fully run clear at the end of a production run.
- Incinerator Bottom Ash (IBA) with a nominal 0/100mm size designation is loaded by wheeled loading shovel (WLS) into the receiving hopper above a variable speed feeder. The feeder is equipped with grizzly bars to screen off any oversized material that has become compacted through storage which reduces the potential for material blockage. Oversized ash will be crushed by the WLS and reprocessed, released oversized metals from this process will be removed to the appropriate ferrous or non-ferrous (i.e. large motors) material bays.
- The feeder feeds IBA onto a rising conveyor C/W belt weighing equipment and presents it to an overband electromagnet which removes a portion of the ferrous material, the ferrous element being stored in a designated bay for recycling.
- Following the initial ferrous metal removal, the material is fed into a rotating trommel screen providing a 2-way split of 0/32mm and +32mm material.

- Both the -32mm and +32mm fractions leave the trommel screen via conveyor belts and pass under further overband electromagnets for ferrous metal removal, the ferrous elements being stored in a designated bay for recycling.
- Individual depot processes vary but the principal objective of the IBA process plants is to size the material by screening in order to maximise non-ferrous metal recovery by means of eddy current separators (ECS).
- The separated fractions are conveyed toward an eddy current separator (ECS) which is specifically designed to process a particular fraction. Any residual ferrous elements (Pellet)* are removed by a magnetic pulley at the head of the conveyor feeding the ECS and the remaining ash is discharged by means of a vibrating tray feeder. The ECS separates non-ferrous elements from the material stream and discharges them into a designated bay, the remaining ash is ultimately stockpiled although some specific fraction will be subject to further cleaning by manual picking of unburnt materials or stainless steel. Manually picked items are placed in appropriate skips. (flow charts are added as appendices to this process document for each processing location).
- Efficient operation of the IBA processing plant requires that the ECS feeders, belts and transfer points remain free from built up material. It is the responsibility of all IBA processing operatives to monitor equipment for build ups. When identified operatives shall inform the IBA process deputy so that the plant can be shutdown, isolated and cleaned as required.
- The total processed material values and separated fraction values are recorded daily on the IBA Production Record spread sheet. Depending on the individual depot processes recovered non-ferrous material values are recorded either by emptying the process bays into buffer bays and noting the transferred weight as totalled on the wheeled loading shovel weighing system, or by recording the number of bags produced in a day and their individual values taken from the weigh scales.
- Ferrous pellet removed by the magnetic pulleys is resized using a vertical shaft impact (VSI) crusher, methods of presenting material to the VSI vary across the process locations. There is the option at all locations for ferrous pellet to be stored in bays prior to crushing (to be read in conjunction with the "IBA PRODUCTION PROCESS FLOW CHART" for the site).
- The resulting incinerator bottom ash aggregate (IBAA) is discharged into stockpiling areas which will be managed by WLS operatives. Where material stockpiles need to be pushed up manually ramps with edge protection at 1.5m or half the diameter of the largest wheel will be constructed being sure to stay within the permitted stockpile heights. Stockpile sheer faces must be avoided at all times, where they form they will be pulled back and shaped by an excavator with extended boom. WLSs should not be used due to the potential for collapse and engulfment when working below a sheer face.

Person carrying out assessment:	Mark Norris
Personnel assisting with assessment:	Lucian Hester
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Severity x Likelihood = Risk							
Score Zero	Trivial No Action Required - Monitor and review the task at hand.	Score 1-3	Low Risk Where reasonably practicable Control Measures should be implemented to reduce the risk.	Score 4-9	Medium Risk Control Measures are required and must be implemented.	Score 10-16	High Risk Task must not begin until Control Measures are in place to reduce the risk to an acceptable level.

Risk Assessment

Number of people affected:	<15	Are employees affected?	✓	Are contractors affected?	✓	Are visitors affected?	X	Are members of the public affected?	X
								Delete / add symbols as necessary	

Ref	Hazard / Aspects	Safety (S) / Environmental (E)	Hazard Effect (Safety S) / Impacts (Environmental E)	Pre-Control Rating			Control Measures to reduce the risk/impact to its lowest level	Post-Control Rating		
				Severity	Likelihood	Risk		Severity	Likelihood	Risk
Mobile Plant	Collision	S	Injury Death Damaged property and/or equipment	4	3	12	Trained and competent plant operatives or under authorised training. Segregated traffic routes. Segregated pedestrian walkways. Hi-vis clothing worn by all pedestrians. Plant fitted with vision aids. Suitable lighting around site and fitted to machines. Site speed limit to be adhered to. All round vision assessments on mobile plant. Regular maintenance and cleaning of mobile plant. All contractors and visitors report to weighbridge on arrival and will receive an induction prior to carrying out any work.	4	1	4
	Collision	E	Ground contamination Release to water	2	2	4	Trained and competent plant operatives or under authorised training. Segregated traffic routes. Plant fitted with vision aids. Suitable lighting around site and fitted to machines.	2	1	2

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				Severity	Likelihood	Risk		Severity	Likelihood	Risk
							Site speed limit to be adhered to All round vision assessments on mobile plant.			
Mobile Plant (Cont'd)	Trapped by something i.e. Engulfment by stockpile	S	Injury Death Damaged property and/or equipment	4	3	12	Trained and competent plant operatives or under authorised training. Stockpile management training. Identified stockpile height limits.	4	1	4
Fixed Process Plant	Entrapment	S	Injury Death	4	2	8	Trained and competent plant operatives or under authorised training. Daily pre-work inspections to be carried out before plant start-up, with any defects being reported and addressed. All equipment to have close and effective guarding to the relevant industry standards. No loose clothing/hair to be worn adjacent to moving/rotating parts.	4	1	4
	Noise and vibration	S	Injury	2	3	6	Process Plants designed to reduce noise levels so far as reasonably practicable. Operational areas subjected to regular noise assessments with findings trained out to operatives. Daily pre-work inspections to be carried out before plant start-up, with any defects being reported and addressed. Signage to identify areas where the use of PPE is required.	2	2	4
	Air emissions and noise	E	Pollution Nuisance	2	2	4	Noisy process areas enclosed within cladded structures. Doors to process areas to remain closed during operational periods.	2	1	2

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				Severity	Likelihood	Risk		Severity	Likelihood	Risk
							Daily pre-work inspections to be carried out before plant start-up, with any defects being reported and addressed.			
Fixed Process Plant (Cont'd)	Dust	S	Injury Occupational Death	4	3	12	Process plants designed to entrap/contain dust so far as reasonably practicable. Process areas subject to automated dust suppression with manual override facility. Operational areas subjected to regular dust assessments with findings trained out to operatives. Signage to identify areas where the use of RPE is required. Health Screening. Daily pre-work inspections to be carried out before plant start-up, with any defects being reported and addressed.	4	1	4
	Air emissions, dust	E	Pollution Nuisance	2	2	4	Dusty process areas enclosed within cladded structures. Doors to process areas to remain closed during operational periods. Process areas subject to automated dust suppression with manual override facility. Regular use of road sweepers to clean both internal haul roads and external roads as required. Provision of vehicle wheel washing equipment.	2	1	2

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				Severity	Likelihood	Risk		Severity	Likelihood	Risk
							Daily pre-work inspections to be carried out before plant start-up, with any defects being reported and addressed.			
Fixed Process Plant (Cont'd)	Exposure to harmful substance - Inhalation of vapours	S	Injury	3	2	6	Operational areas subjected to regular air monitoring assessments to confirm that air borne substances are below Workplace Exposure Limits (WEL) with findings trained out to operatives. Ventilation systems to increase flow of fresh air and reduce potential for vapour build up.	3	1	3
	Electricity	S	Injury Electrocution Death	4	2	8	Equipment and component installation to the relevant industry standards. Equipment to be subjected to regular inspection by qualified personnel. Portable appliance testing (PAT) and fixed. Daily pre-work inspections to be carried out before plant start-up, with any defects being reported and addressed. Isolators, Emergency stops (E/Stops) and Pull Wires to be inspected and checked to confirm operation with results recorded on Plant Isolator E-Stop and Pull Wire Check List.docx (00001725). Adherence to Company Lock Out Procedure Procedure - Lockout (Electrical).docx (00001544).	4	1	4

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				Severity	Likelihood	Risk		Severity	Likelihood	Risk
	Trips, slips and falls	S	Injury Death	4	2	8	Designated/designed pedestrian routes. Inspection and cleaning regimes to keep walkways clear of obstructions.	4	1	4
Fixed Process Plant (Cont'd)	Manual Handling	S	Injury	3	4	12	Operatives to be trained in Manual Handling techniques, annual refresher Toolbox talks. Where possible use mechanical aids and always work within an operative's capabilities. Picking belts designed to minimise the need to overreach with bins located so as to reduce lifting requirements. Any gloves worn to be appropriate for the task (i.e. cut resistance).	3	1	3
	Magnetic Fields	S	Injury Death	4	2	8	Induction process and signage to highlight the potential dangers of magnetic fields to persons with pacemakers.	4	1	4
Stockpiles	Trapped by something i.e. Engulfment by stockpile	S	Injury Death Damaged property and/or equipment	4	2	8	Pre-start alarms and physical checks to ensure that stockpiling areas are free from personnel and plant when processing commences. Stockpile management training. Identified stockpile height limits.	4	1	4
	Exposure to harmful substance - IBA	S	Injury/III heath	2	2	4	All processed materials are subjected to documented acceptance criteria to confirm permit compliance, permit allows processing of only non-hazardous materials.	2	1	2
	Dust	S	Injury Occupational Death	4	3	12	Mobile plant windows to be kept shut. Process areas subject to automated dust suppression with manual override facility.	4	1	4

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				Severity	Likelihood	Risk		Severity	Likelihood	Risk
							Operational areas subjected to regular dust assessments with findings trained out to operatives. Signage to identify areas where the use of PPE is required.			
Stockpiles (continued)	Air emissions, dust	E	Pollution Nuisance	2	2	4	Process areas subject to automated dust suppression with manual override facility.	2	1	2
	Sheer faces	S	Injury Death Damaged property and/or equipment	4	2	8	Sheer faces to be shaped by excavator working at a safe distance with extended boom. Stockpile management training.	4	1	4
	Ramps	S	Injury Death Damaged property and/or equipment	4	2	8	Stockpile ramps with edge protection at 1.5m or half the diameter of the largest wheel will be constructed. Stockpile management training. Benching and no face greater than 7.5m.	4	1	4

Manager's Signature (for printed copies only): Name:

Review Date: Signature: Review Date: Signature: