



**A GUIDANCE NOTE ON THE  
BEST PRACTICABLE MEANS  
FOR  
SPECIFIED PROCESS –  
MINERAL WORKS  
(INCINERATOR BOTTOM ASH TREATMENT PLANT)  
BPM 11/3 (2024)**

**Environmental Protection Department**

Environmental Compliance Division /  
Air Quality Management Division

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# 1. INTRODUCTION

- 1.1 This Note is one of a series issued by the Environmental Protection Department (EPD) to guide the air pollution management of specified processes (SP), to which Part IV of the Air Pollution Control Ordinance (the Ordinance) applies, and the assessment of an application for SP licence. It covers the SP and associated processes in relation to the treatment of incinerator bottom ash (IBA)<sup>1</sup> in a stand-alone building (other than the one housing the incinerators) under the SP of "Mineral Works" as described in Schedule 1 to the Ordinance –

“Works in which the processing capacity exceeds 5,000 tonnes per annum and in which –

- (a) metallurgical slags; or
- (b) pulverized fuel ash; or
- (c) minerals, other than moulding sand in foundries or coal at electricity works,

are subjected to any size reduction, grading or heating by a process giving rise to dust, not being any works described in any other specified process.”

## Best Practicable Means (BPM)

- 1.2 Under section 12 of the Ordinance, the owner of any premises used for the conduct of an SP shall use the BPM for preventing the emission of noxious or offensive emissions from their plants, preventing the discharge of such emissions into the atmosphere and rendering such emissions where discharged harmless and inoffensive. **This Note sets out the general requirements for the provision and maintenance of the BPM to minimize air pollutant emissions from an individual facility. However, an applicant for an SP licence should recognize that fulfilment of the requirements in this Note does not necessarily lead to the granting of a licence because the decision will also have to take into account the specific circumstances of individual application. In addition, the Director of Environmental Protection, who is the Air Pollution Control Authority under the Ordinance (or the Authority for short) may impose specific requirements in the licence, if granted, in lieu of the requirements set out in this Note. The terms and conditions in the SP licence represent the statutory requirements for the environmental management of the SP.**

(Note: The term “best practicable means”, where used with respect to the emission of an air pollutant from a premises, has reference not only to the provision and efficient maintenance of appliances adequate for preventing such emission, but also to the manner in which such appliances are used, and the proper supervision by the owner of the premises of any operation that generates the air pollutant.)

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<sup>1</sup> IBA is the residues falling from the grates and siftings falling through the grates in the moving grate incineration system for municipal solid waste.

## **2. EMISSION LIMITS**

- 2.1 All emissions to air, other than steam and water vapour, shall be colourless, free from persisting mist or fume, and free from droplets.
- 2.2 Emission from non-fugitive fixed emission points in the SP and associated processes covered by this Note shall not:
  - (a) exceed the concentration limits set out in Annex I; and
  - (b) appear to be as dark as or darker than Shade 1 on the Ringelmann Chart when compared in an appropriate manner with the Ringelmann Chart or an approved device.

## **3. TYPES OF FUELS USED**

- 3.1 All fuels to be used shall comply with the Air Pollution Control (Fuel Restriction) Regulations in force or be approved by the Authority. Clean energy sources and fuels with proven benefits to air pollution reduction (such as electricity, gaseous fuels, recovered heat, etc.) shall be adopted whenever practicable in the process.

## **4. CONTROL OF EMISSIONS**

- 4.1 The treatment plant for IBA shall be designed, equipped, built and operated in such a way that emission of air pollutants is controlled to prevent:
  - (a) causing harm to the environment, adverse effects to human health, or creation of any nuisance situation (e.g. objectionable odours or excessive dust emissions noticeable outside the premises where the process is carried out);
  - (b) creating hindrance to the attainment or maintenance of the relevant air quality objectives; and
  - (c) imposing undue constraints on the existing and future development or land use.
- 4.2 The main equipment for the IBA treatment processes, such as slag feeder, rotary or drum screen, sieve, conveyor belt, hammer mill, hammer crusher, magnetic separator, trommel, shaking table, bucket wheel sand washer, eddy current separator, jigger and plate and frame filter press, shall be operated within an enclosed building (hereinafter referred to as “the IBA Treatment Plant”) with a well-designed ventilation system capable of maintaining a sufficient negative pressure for preventing escape of airborne dust. Measurements and records showing sufficient negative pressure is maintained shall be made available for examination as and when required by the Authority.
- 4.3 All dust-laden air generated by the IBA treatment processes shall be adequately

collected and vented to an effective fabric filtering system or other equivalent dust abatement systems acceptable to the Authority with dust removal efficiency of not less than 99% before being discharged into the atmosphere.

## **5. OPERATION AND MAINTENANCE**

- 5.1 BPM requirements include the proper operation and maintenance of equipment, its supervision when in use and the training and supervision of qualified staff. Specific operation and maintenance requirements may be specified by the Authority in SP licence for individual equipment.
- 5.2 All air pollution control and monitoring equipment shall be operational and functioning properly during the entire period of the IBA treatment processes.
- 5.3 Operating staff shall be properly trained in their duties relating to control of the process and emissions to air. Particular emphasis shall be given to training for start-up, shut-down and handling abnormal conditions.
- 5.4 Malfunctioning and breakdown of the process or air pollution control equipment, which would cause exceedance of the emission limits or breaches of other air pollution control requirements, shall be reported to the Authority without delay. Moreover, all practicable means (including refraining from using the defective equipment) shall be taken to minimize the abnormal emission.

## **6. FUGITIVE EMISSION CONTROL**

- 6.1 The Authority will prescribe the requirements in consideration of the specific circumstances of individual SP plant. As a general guidance, the loading, unloading, handling and storage of fuels, raw materials, wastes, by-products, products and IBA shall be carried out in a manner acceptable to the Authority so as to prevent the release of:
  - (a) visible dust emissions; and
  - (b) other noxious or offensive emissions.
- 6.2 The IBA Treatment Plant shall be constructed to be dust-tight. Doors should have seals and be kept closed at all times, except when necessary for the movement of plant, personnel and materials. Self-closing or motorized doors should be provided and fitted with alarms which operate if the doors fail to close within a reasonable period of time.
- 6.3 Where practicable, the free fall transfer points from conveyor-to-conveyor or conveyor-to-stockpile shall be designed to minimize the height of vertical drop to reduce excessive dust generation.
- 6.4 Dust control misting system or device with similar dust suppressing effectiveness shall

be installed at appropriate locations within or outside the IBA Treatment Plant to suppress airborne dust.

- 6.5 Any stockpile of dusty materials shall be either stored inside the IBA Treatment Plant, covered entirely by impervious sheeting, placed in an area sheltered on the top and the 3 sides or sprayed with water or a dust suppression chemical so as to maintain the entire surface sufficiently wet. Untreated IBA shall be stored inside the IBA Treatment Plant or in an enclosed environment as far as practicable.
- 6.6 All open stockpiles of IBA-derived aggregates of size in excess of 5 mm shall be kept sufficiently wet by water spraying where practicable. The stockpiles of IBA-derived aggregates having a size of 5 mm or less shall be enclosed on 3 sides and covered entirely by impervious sheeting, to minimize wind-whipping. Save for fluctuations in stock or production, the average stockpile shall stay within the enclosure walls and in no case the height of the stockpile shall exceed twice the height of the enclosure walls.
- 6.7 Any part of the conveyor belt that is located outside the IBA Treatment Plant shall be properly enclosed with suitable material on the top and the 2 sides with bottom plate to minimize dust emission due to the wind-whipping effect.
- 6.8 Scrapers shall be provided at the turning points of all conveyors to remove dust adhered to the belt surface.
- 6.9 All conveyor transfer points shall be totally enclosed. Openings on the enclosure for the passage of conveyors shall be fitted with effective flexible seals to prevent dust emission.
- 6.10 The conveyor belts and other relevant equipment for the transportation of materials shall be maintained in good condition. Any dust accumulated on, under or around conveyor belts shall be cleaned on a regular basis.
- 6.11 The access roads within the premises leading to the IBA Treatment Plant shall be paved to the satisfaction of the Authority. Any damage or worn out on the access roads shall be repaired within a reasonable time.
- 6.12 The surfaces of all access roads within the premises leading to the IBA Treatment Plant, which could be paved with concrete, bituminous materials, hardcores or metal plates, shall be kept clear of dusty materials or adequately wet whenever there is vehicle movement on the access roads to prevent fugitive dust emissions.
- 6.13 Vehicle cleaning facilities shall be provided at the site exit of the premises and used to clean leaving vehicles as follows:
  - (a) All vehicle cleaning activities shall be carried out within the site boundary. During cleaning, the whole vehicle body shall be located within the site boundary, and there shall be no splashing of wash water to public area outside the site boundary at all times.
  - (b) Effective vehicle cleaning facilities and/or arrangement, such as installation of

adequate number of pressurized water spray nozzles, shall be in place and operated to thoroughly wash down muddy materials from the vehicle body and wheels before vehicles leave the site exit. Where necessary, manual hosing by trained labourer shall also be supplemented to ensure thorough removal of dust and no muddy water on the vehicle body and wheels.

- (c) Effective vehicle stopping device, such as a barrier gate or other effective means agreed by the Authority, and interlocking system shall be installed at the exit of the cleaning area inside the site boundary to ensure sufficient time for cleaning and drying of the vehicles. Detailed inspection of the vehicles after cleaning shall be conducted to ensure thorough removal of dust and adequate drying. There shall be no dripping of water from the vehicle body and/or wheels of the vehicle leaving the site to areas outside the boundary; and
  - (d) A slurry water handling system shall be provided and operated effectively to intercept all wash water from the vehicle cleaning process. There should be a peripheral U-channel or suitable alternative to ensure no discharge or spillage of the wash water beyond the site boundary and to prevent dust deposit accumulation on the public roads.
- 6.14 There shall be no visible run-off of sediment-laden water from the vehicle cleaning facilities to areas outside the premises.
  - 6.15 As different arrangements of vehicle cleaning facilities may be used to meet specific site conditions, the applicant seeking a new licence, variation of a licence or renewal of a licence shall provide detailed information on vehicles cleaning facilities for agreement by the Authority.
  - 6.16 Dusty materials or IBA-derived aggregates shall be transported in a dust-tight container or skip covered entirely by impervious sheeting to prevent fugitive dust emissions.
  - 6.17 The handling of the dust collected by the fabric filtering system shall be carried out without fugitive dust emissions.
  - 6.18 A high standard of housekeeping shall be maintained in all plant areas. The deposit or spillage of any dusty materials such as IBA, IBA-derived aggregates, products or by-products in open area shall be cleaned up as soon as possible and practicable measures shall be taken to minimize fugitive emission during the cleanup and disposal of the deposit or spillage.

## **7. MONITORING REQUIREMENTS**

- 7.1 Necessary monitoring equipment and techniques, such as negative pressure monitor and alarm system, shall be provided and used to demonstrate that the process is properly operated and the emissions can be minimized to meet the emission limit in Annex I. The scope, manner and frequency (at least once every year and in accordance with EN standard EN 13284-1 or other equivalent standard agreed by the Authority) of the monitoring shall be sufficient for this purpose and will be determined by the Authority

based on the processing capacity, types of treatment by-products and monitoring results of the commissioning trial.

- 7.2 Monitoring results and essential operating parameter(s) that may significantly affect the emission of pollutants shall be recorded and submitted to the Authority in such manner specified by the Authority. The records should be retained at the premises for a minimum of two years, or other period specified by the Authority, after the date of last entry and made available for examination as and when required by the Authority.
- 7.3 Dust patrols shall be conducted by the plant environmental personnel or operator along the site boundary and any other pre-agreed locations outside the premises at least once per day. Investigation and corrective actions shall be taken promptly by the plant environmental personnel or operator when air pollution caused by excessive dust emissions from the IBA treatment processes is detected.
- 7.4 Total hourly raw material input, product output and material stock (by manual recording), and other essential operating parameter(s) which may significantly affect the emission of air pollutants shall be recorded and submitted to the Authority.

## **8. COMMISSIONING**

- 8.1 Commissioning trial of the plant, to be witnessed by the Authority whenever appropriate, shall be conducted in such manner and format agreed with the Authority to demonstrate the effectiveness of the air pollution control measures and the compliance with emission limit. A report shall be submitted to the Authority within 1 month after the completion of the commissioning trial.

## **ANNEX I CONCENTRATION LIMIT FOR EMISSIONS FROM INCINERATOR BOTTOM ASH TREATMENT PLANT**

- I.1 Air pollutant emissions from the IBA Treatment Plant shall not exceed the concentration limit tabulated in the following table. The air pollutant concentration is expressed at reference conditions of 0°C temperature, 101.325 kilopascals pressure and dry condition. Introduction of diluted air to achieve the emission concentration limit shall not be permitted.

<b>Air Pollutant</b>	<b>Concentration Limit (mg/m<sup>3</sup>)</b>
	<b>Average over the sampling period*</b>
Particulates	5

*Note:*

\* *Average value of three consecutive measurements of at least 30 minutes each.*