

# CHAPTER 8

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## Mitigation Measures



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# MITIGATION MEASURES

## 8.1 Introduction

In the prevention of potential environmental impacts from the implementation of the Project, mitigation and abatement measures will be recommended in this chapter for concurrent implementation with the Project. Mitigation and abatement measures proposed as part of this assessment can be categorised as the following:

- Prevention – Related to Project Options and prevention is commonly addressed during the pre-construction or planning stage of the Project and is associated with the preliminary aspects of the Project including site and technology selection;
- Control – Related to the controlling of pollutant or other associated potential impacts, control may include the implementation of various measures during the construction and operation stages of the proposed Project, including engineering measures, monitoring and audit activities, or on-going social engagement; and
- Compensatory – Related to the lessening or the balancing of any unavoidable environmental impact, compensatory measures maybe included where liable and applicable, including the establishment of nature reserves, or greater Project Proponent involvement or sponsorship in the surrounding community.

## 8.2 Water Quality

### 8.2.1 Construction Stage

#### Pollution Prevention and Mitigation Measures (P2M2)

- Provision of adequate numbers of sanitation facilities (portable toilets and/or toilets with septic tank) for the construction workers.
- Portable toilets shall be regularly de-sludged.
- All temporary fuel tanks and storage areas should be provided with drip collection devices and be sited on sealed areas with a bund enclosure capable of containing 110% of the inventory of the largest tank; the provision of a weather shelter over the storage tank is an appropriate measure to prevent the accumulation of rainwater within the bund.





- Temporary fuel storage facilities and refuelling activities should be located away from on-site drainage channels.
- Used lubrication oils shall be stored in designated drums, properly stored with updated inventory record showing the quantity and movement of material. The disposal of used oil is to be in accordance with the Environmental Quality (Scheduled Waste) Regulation 2005.
- All site workers are to be trained regarding the appropriate use, handling and disposal of site based chemicals and lubricants, as well as emergency spill response.

## 8.2.2 Testing and Commissioning Stage and Operation Stage

### **Pollution Prevention and Mitigation Measures (P2M2)**

- Oil and chemical storage facilities should be located away from on-site drainage channels.
- Spill cleaning kits are to be located at strategic locations in the plant area to be used in the unlikely event of a spillage of chemical or oil related material. The disposal of oil rags and used spill kit materials is to be in accordance with the Environmental Quality (Scheduled Waste) Regulation 2005.
- All workers are to be trained regarding the appropriate use; handling and disposal of site based chemicals and lubricants, as well as emergency spill response.
- Periodical water quality monitoring to be carried out.
- Waste water from washing activities is not allowed to be directly discharged off from the Project site and shall be treated as described in Section 5.6.2.2.
- Regular or periodical inspection of the temporary waste water storage tanks' piping system must be carried out to avoid any leakage or spillage.

## 8.3 Air Quality

### 8.3.1 Construction Stage

The following mitigation measures are recommended to minimise the potential short term increase of suspended particulates or gases emission within the Project site and its surrounding area.

### **Pollution Prevention and Mitigation Measures (P2M2)**

- Speed limit to be imposed on vehicles entering the Project site to reduce dusts.
- Fuel burning equipment to be regularly maintained and serviced to prevent the emergence of dark smoke.
- Open burning is prohibited on-site at all times.





- Barrier shall be provided if necessary to control dust dispersion.
- The appointed contractor to appoint Environmental Officer (EO) to monitor and manage environmental issue at site and ensure compliance to environmental requirements

### **8.3.2 Testing and Commissioning Stage and Operation Stage**

#### **Pollution Prevention and Mitigation Measures (P2M2)**

- Proper periodical monitoring and maintenance of the thermal treatment facility.
- To ensure proper operation and continued optimal performance of the air pollution control system (APCS), the APCS must be operated and managed by Competent Person such as Certified Environmental Professional in Bag Filters Operation (CePBFO) for bag filter.
- Emission limit to comply with the Third Schedule [Regulation 15], Activity K: Incinerators in All Sizes of the Environmental Quality (Clean Air) Regulations 2014.
- Periodical monitoring of the ambient air quality to be carried out to address the cumulative future impacts of some of the hazardous air pollutants on the public health and surrounding environment.
- To install Continuous Emission Monitoring Systems (CEMS) recognised by DOE and linked to DOE Negeri Melaka.
- Update the Emergency Response Plan (ERP) to include measures in the event of control system failure to minimise uncontrolled emissions to the atmosphere.

## **8.4 Noise**

### **8.4.1 Construction Stage**

#### **Pollution Prevention and Mitigation Measures (P2M2)**

- Establish periodical maintenance schedule for all motorised machineries and equipment as preventive measure to minimise emission of loud noise. Attention shall be given to efficiency of mufflers to reduce noise problems.
- Enclosure or other type of acoustic measures shall be applied on equipment which contribute to noise levels higher than 85 dB(A).
- Safety signage shall be installed to inform workers of areas with high noise level.
- To ensure a safe and healthy workforce, proponent and its contractors shall provide workers who work in high noise level areas with adequate protective devices such as earmuffs or earplugs. Exposure to high noise levels shall be managed and limited as prescribed in the First Schedule of the Factories and Machinery (Noise Exposure) Regulation 1989.



- Periodical monitoring at the centre of healthcare waste thermal treatment plant's boundaries.

## 8.4.2 Testing and Commissioning Stage and Operation Stage

### **Pollution Prevention and Mitigation Measures (P2M2)**

- Establish periodical maintenance schedule for all motorised machineries and equipment as preventive measure to minimise emission of loud noise. Attention shall be given to efficiency of mufflers to reduce noise problems.
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- Periodical monitoring at the centre of healthcare waste thermal treatment plant's boundaries.

## 8.5 Waste Generation and Management

### 8.5.1 Construction Stage

#### **Pollution Prevention and Mitigation Measures (P2M2)**

- Good house-keeping to be practised at the Project site
- Establish a waste management plan which includes allocation of a dedicated construction waste storage area on site, frequency of waste collection and disposal and periodical inspection on site.
- Minimise generation of solid waste by sound planning of material usage, using reusable items and encourage 5S and 3R concepts during Project operation.
- Scheduled wastes shall be managed and handled in accordance with the Environmental Quality (Scheduled Waste) Regulation 2005.
- Provide adequate number of waste bins at strategic locations around the site office and work areas.
- No open burning is allowed at the Project site.



## 8.5.2 Testing and Commissioning Stage and Operation Stage

### **Pollution Prevention and Mitigation Measures (P2M2)**

- Good housekeeping to be practised at Project site.
- Minimise generation of solid waste by sound planning of material usage, using reusable items and encourage 5S and 3R concepts during Project operation.
- To establish scheduled waste management plan to ensure that scheduled wastes are managed and handled in accordance with the Environmental Quality (Scheduled Wastes) Regulation, 2005.
- Scheduled wastes shall be stored in leak-proof containers, labelled, inventoried and temporarily stored within the dedicated scheduled waste storage area prior to disposal off site. These wastes may be stored on site for 180 days or less, provided that the accumulation quantity does not exceed 20 MT at one particular time.
- Spill kits are to be made available for the containment or clean-up of spills. Material used to contain / clean-up spillage shall be handled as scheduled waste.
- Collection, recovery or disposal of scheduled wastes shall be by DOE licensed transporters to approved and licensed premises.

## 8.6 Quantitative Risk Assessment

### **Pollution Prevention and Mitigation Measures (P2M2)**

- Update the current Emergency Response Plan (ERP) as appended in **Appendix 9.6.1** to include the potential new scenarios associated with the Project.
- Ensure the implementation of an effective health and safety management system.
- Fire protection equipment should be regularly inspected, tested and maintained.

## 8.7 Health Impact

### **Pollution Prevention and Mitigation Measures (P2M2)**

- If employment of foreign labours is unavoidable, it must be through proper agent with proper documentation in compliance with the Immigration and Labour rules and regulations of Malaysia. Movement of these workers must be monitored. A repatriation programme shall be instituted at the end of the contract to ensure smooth and legal departure of the foreign labours. A clause of this requirement must be stated in the contract document between the Project Proponent and their contractors and sub-contractors.
- All workers shall go through medical check-up prior to employment and thereafter periodically, with special emphasis on communicable diseases especially malaria, hepatitis and tuberculosis.





This is particularly important for foreign workers. Suspected persons should be directed to the relevant health authorities for further action.

- Mosquitoes, especially *Aedes mosquito* which transmits dengue, may breed easily in water collecting containers and depressions around the construction site. Pests like rodents, flies and cockroaches may also breed in an unsanitary environment. Therefore, it is important to ensure that good housekeeping to be practised and other appropriate measures will be taken to prevent the creation of these mosquito and pest breeding areas and to ensure proper housekeeping and cleanliness of the entire construction site.
- To ensure proper operation and continued optimal performance of the air pollution control system (APCS), the APCS must be operated and managed by Competent Person such as Certified Environmental Professional in Bag Filters Operation (CePBFO) for bag filter.
- A health and safety reporting system should be implemented to record data and generate management information to support technical and economic decision making. As part of this system, all accidents, near misses, unsafe acts, unsafe conditions and bodily potential hazardous situations should be recorded and reported to the appointed health and safety representative, with the main aim of preventing recurrence.
- A continuous training and education to all workforces. New workers in particular should be thoroughly informed about potential health risks and how to prevent them in their own working environment during the induction process.

## 8.8 Project Abandonment

### Pollution Prevention and Mitigation Measures (P2M2)

- A detailed abandonment plan shall be prepared and submitted to DOE.
- All wastes shall be properly disposed at approved and / or licensed facilities.
- A scheduled programme shall be prepared to provide information on planning for the demolishing and removal of equipment, machinery and building structure.