GUIDELINES FOR PACKAGING, LABELLING AND STORAGE OF SCHEDULED WASTES IN MALAYSIA

FOREWORD

Environmental Quality (Scheduled Wastes) Regulations, 2005 requires hazardous wastes to be properly packaged, labelled and stored. Waste generators are responsible to ensure that the scheduled wastes generated and stored temporarily in their premises pending further treatment or disposal, are managed according to the above stated Regulations. Amongst the vital elements towards proper management of scheduled wastes to be considered is the selection of suitable location for storage area, design of storage area, selection of suitable storage containers and the use of appropriate hazard communication based on hazardous characteristics, as well as good practices in managing or handling the scheduled wastes containers. These elements are crucial as to prevent leakages or spillages of scheduled wastes which could pose immediate danger to the workers and lead to contamination to its surrounding environment.

These guidelines specify the requirements for site selection and design criteria for storage of scheduled wastes, packaging, labelling and management of containers containing scheduled wastes. It is hoped that these guidelines will facilitate proper packaging, labelling and storage of scheduled wastes, thus ensuring the proper management of scheduled wastes.

These guidelines shall be in addition to and not in derogation of any written law.

Protecting the Environment is Our Shared Responsibility.

Dato' Halimah Hassan
Director General of Environment, Malaysia
January 2014

GUIDELINES FOR PACKAGING, LABELLING AND STORAGE OF SCHEDULED WASTES IN MALAYSIA

1.0 INTRODUCTION

1.1 Packaging, labelling and storage of scheduled wastes are the important aspects in scheduled wastes management. These are due to their characteristics that can pose risks to human health and the environment if not managed properly.

1.2 To facilitate the proper handling of scheduled wastes, information about the hazards associated with the wastes must be communicated through proper labels and should be used by wastes handlers.

1.3 To ensure that the wastes are safely handled, suitable containers are also needed to be used by the waste generators. It is the responsibility of the waste generators to ensure that scheduled wastes are packed based on the composition in a manner suitable for handling, storage and transportation.

1.4 These guidelines are prepared to facilitate proper packaging, labelling and storage of scheduled wastes in accordance to the requirements of Regulation 8, Regulation 9 and Regulation 10 of the Environmental Quality (Scheduled Wastes) Regulations 2005 which came into force since 15th August 2005.

2.0 SCOPE

These guidelines provide guidance for proper packaging, labelling storage of scheduled wastes from the time the waste is generated to its final disposal. The scope of these guidelines will cover the following areas:

- Legal requirements regarding the storage of scheduled wastes
- Site selection criteria of storage area;
- Design criteria and construction of storage area;
- Selection of proper containers;
- Labelling of containers; and
- Management of scheduled wastes stored.

3.0 DEFINITION

3.1 Waste generator refers to any person who generates scheduled wastes (including non-prescribed and prescribed premise of scheduled wastes).

3.2 Storage means the holding of scheduled waste for a temporary period prior to the waste being transported, treated and disposed. There are two(2) types of storage:

(i) On-site storage - Buildings or areas occupied to be used for the storage of any scheduled waste which is produced on those premises.

(ii) Off-site storage - Premises occupied or used for the storage, collection or transfer of any scheduled waste which is not produced on those premises.

3.3 Container means any device which is used to store scheduled wastes.

3.4 Labelling means the requirement to label the container containing scheduled wastes as stipulated under Regulation 10 of the Environmental Quality Regulations (Scheduled Wastes) 2005.

4.0 LEGAL REQUIREMENTS

4.1 Regulation 8 of the Environmental Quality Regulations (Scheduled Wastes) 2005 stipulates the following requirements:

(i) Every waste generator shall ensure that scheduled wastes generated by him are properly stored, treated on-site, recovered on-site for material or product from such scheduled wastes or delivered to and received at prescribed premises for treatment, disposal or recovery of material or product from scheduled wastes.

(ii) Every waste generator shall ensure that scheduled wastes that are subjected to movement or transfer are packaged, labelled and transported in accordance with the guidelines prescribed by the Director General.

4.2 Regulation 9 of the Environmental Quality Regulations (Scheduled Wastes) 2005 stipulates the following requirements:

(i) Scheduled wastes shall be stored in containers which are compatible with the scheduled wastes to be stored, durable and which are able to prevent spillage or leakage of the scheduled waste into the environment.

(ii) Incompatible scheduled wastes shall be stored in separate containers, and such containers shall be placed in separate secondary containment areas.

(iii) Containers containing scheduled wastes shall always be closed during storage except when it is necessary to add or removed the scheduled wastes.

(iv) Area for the storage of the containers shall be designed, constructed and maintained adequately in accordance with the guidelines prescribed by the Director General to prevent spillage or leakage of scheduled wastes into the environment.

(v) Any person may store scheduled waste generated by him for 180 days or less after its generation provided that:-

(a) The quantity of scheduled waste accumulated on the site shall not exceed 20 metric tonnes; and

(b) The Director General may at any time, direct the waste generator to send any scheduled wastes for treatment, disposal or recovery of material or product from the scheduled wastes up to such quantity as he deems necessary.

(vi) A waste generator may apply to the Director General in writing to store more than 20 metric tonnes of scheduled wastes.

(vii) If the Director General is satisfied with the application made under paragraph 4.2(vi), the Director General may grant a written approval either with or without conditions.

4.3 Application for storing of scheduled wastes for more than 20 metric ton made under paragraph 4.2(vi) as stipulated under Regulation 9(6) of Environmental Quality (Scheduled Wastes) Regulations 2005 should be submitted directly to the respective Department of Environment's state office, by using prescribed form.

4.4 Regulation 10 of the Environmental Quality Regulations (Scheduled Wastes) 2005 stipulates the following requirements:

(i) The date when the scheduled wastes are first generated, name, address and telephone number of the wastes generator shall be clearly labelled on the containers that are used to store the scheduled wastes.

(ii) Containers of scheduled wastes shall be clearly labelled in accordance with the types applicable to them as specified in the

Third Schedule and marked with the scheduled waste code as specified in the First Schedule for identification and warning purposes.

(iii) No person is allowed to alter the markings and labels mentioned in paragraph 4.4(i) and 4.4(ii).

4.5 The construction of an *off-site storage facility* is a prescribed activity under Activity 18(a)(v) of the Environmental Quality (Prescribed Activities) (Environmental Impact Assessment) Order 1987. Section 34A, Environmental Quality Act 1974 requires an Environmental Impact Assessment (EIA) report to be submitted for approval by the Director General before carrying out such activity.

4.6 The operation of the off-site storage facility will require a written permission under Section 19 of the Environmental Quality Act 1974 and licence under Section 18 of the same Act.

5.0 SITE SELECTION AND DESIGN CRITERIA FOR STORAGE OF SCHEDULED WASTE

5.1 Selection Criteria for Storage Area

Selection of storage area should take into consideration the following criteria:

5.1.1 On-site storage:

(i) A proper designated area in the waste generator premises, away from the manufacturing/processing area and area of employees activities.

(ii) Storage area should be located away from sources of heat or fire.

(iii) The designated area should not be located at areas that has the potential to be flooded or close to the edge of hill or slopes.

Figure 1: Example of improper storage of schedule wastes at the edge of slope

5.1.2 Off-site storage facility:

(i) Siting of the off-site storage facility should comply with requirement specified in the Guidelines for the Siting and Zoning of Industrial and Residential Areas, published by the Department of Environment.

(ii) The facility should be within an industrial area.

(iii) The designated facility should not be located in a flood prone area.

5.2 Storage Design Criteria

5.2.1 The storage area of scheduled wastes should be designed, constructed and maintained adequately in accordance to the following criteria to prevent spillage or leakage of scheduled wastes into the environment.

5.2.2 The storage area should be designed to provide adequate space to store all scheduled wastes generated or managed by the premise. The design capacity should consider the following:

i. Providing 25% extra storage capacity of the actual maximum amount of waste generated; and

ii. Storage duration for not more than 180 days or as prescribed by the Department of Environment.

5.2.3 The entire storage area must be fenced-in and regarded as restricted area. Adequate signage should be put up clearly and visible with the word “DANGER” and “SCHEDULED WASTES STORAGE”.

5.2.4 The floor of the storage area and loading and unloading area must be covered with concrete or any suitable lining material, free of cracks and gaps.

5.2.5 The storage place should be sheltered or roofed or covered with suitable covering material.

5.2.6 The entire storage area should be surrounded by a concrete dike or other equivalent structure designed to contain any spillage of the waste under the worst case scenario. The capacity of the containment should be 110% of the largest container stored in the storage area.

5.2.7 There should not be any opening in the dike to prevent any leakage of waste from the storage area.

5.2.8 The dike area should be graded to a sump.

5.2.9 The storage area should be properly managed to prevent rain water or surface water from entering the storage area.

5.2.10 Any surface water run-off should be channelled to a proper drainage system to avoid the water from entering the storage area.

5.2.11 The loading and unloading area should be designed to contain any spillage.

5.2.12 The storage area should be equipped with ventilation system for volatile wastes.

5.2.13 Separate compartments should be provided for different groups of incompatible wastes. The compatibility of scheduled wastes can be referred to Fourth Schedule, Regulation 2 of the Environmental Quality (Scheduled Wastes) Regulations 2005 as in **Appendix 1**.

5.2.14 Storage area should be designed to provide adequate emergency escape route.

5.2.15 The storage area should be equipped with fire fighting and other emergency response equipment as well as spill kit and comply fully with the requirements of the Fire and Rescue Department of Malaysia.

6.0 PACKAGING AND LABELLING OF SCHEDULED WASTES CONTAINERS

6.1 Identification of Waste Characteristics

6.1.1 The scheduled wastes characteristics should be identified by the following methods:

(i) Sampling and analysing the scheduled wastes

(a) The scheduled waste should be sampled and analysed to identify the hazards and contaminant in the waste.

(b) During the sampling and analysis of the waste, the Material Safety Data Sheet (MSDS) / Chemical Safety Data Sheet (CSDS) / Safety Data Sheet (SDS) and/or waste card should be referred to, if it is available in order to get their hazards properties such as physical hazards, human health hazards and environmental hazards including any special protection requirement needed.

(ii) Identification based on process knowledge or history

Generally, the waste generated from a process may exhibit some similar hazardous characteristics of the raw materials or chemicals or substances used. Any changes in the process line or during the production process may lead to changes and alteration of the composition of the waste generated. The changes in the process should be notified to, and be made aware of, by the relevant authorities.

6.1.2 The scheduled wastes may have the following hazardous characteristics:

- corrosive substances;
- explosive substances;
- infectious substances;
- inflammable liquids;
- inflammable solids;
- organic peroxides;
- oxidising substances;
- solid: spontaneously combustible;
- solid: dangerous when wet;
- toxic substances; and
- mixture of miscellaneous dangerous substances.

Sufficient precaution should be given when dealing with scheduled wastes having the above characteristics.

6.2 Selection Of Containers

6.2.1 An appropriate container should be selected according to the characteristics of the scheduled wastes. The characteristic of scheduled wastes shall be compatible with the type of material used for the container to prevent any reaction which will deteriorate the container.

6.2.2 In normal practice, scheduled wastes are stored in the following containers:

- Bunghole drum (steel/plastic)
- Open top drum (steel/plastic) with cover and clamp
- Intermediate bulk container;
- Corrugated box / carton box;
- Flexible Intermediate Bulk Containers (FIBCs) /Jumbo Bags / Bulk Bags / Polypropylene Big Bags

6.2.3 The quantity of the wastes should be taken into consideration to estimate the appropriate size and strength of container to avoid over spilling or container breakage.

6.2.4 The container used should be in good condition (free from any damage such as tear or hole).

6.2.5 Assigning specific containers for specific wastes will allow the containers to be reused without further washing/cleaning.

6.2.6 Containers containing residues of chemicals or scheduled wastes which are not compatible to the waste to be stored should be properly rinsed prior to usage. The solution generated from the rinsing activity should be contained and characterized prior to treatment or disposal at sites approved by the Department of Environment.

6.2.7 Suggested packaging according to waste types and characteristics are as follows:

Type of containers	Type of scheduled wastes	Packaging Requirement
Bunghole drum (steel/plastic)  	• Inorganic or organic liquid waste • Steel drums should not be used for corrosive wastes such as acids or alkalis • Plastic drums compatible with most solvents. Solvents that are not compatible with plastic such as Diethyl Ether and Chloroform should be stored in steel drums	• No hole, no bulge, and free of dent and corrosion
Open top drum with cover and clamp (steel/plastic)  	• Solid waste • Steel drums should not be used for acidic or alkaline waste • Example: sludge, e-waste, pharmaceutical waste, laboratory waste, contaminated gloves etc.	• No hole, no bulge, and free of dent and corrosion

	Intermediate bulk container 	• Used for a broad range of waste streams such as oils, solvents and acids	• No hole or crack
	Jerrican / carboy 	• Inorganic or organic liquid waste such as chemical wastes, solvents, etc	• No hole or crack
	Containers for clinical waste  	• Clinical wastes / pathogenic wastes	• No hole or crack

Corrugated box / carton box 	• Dry solid waste with no free-flow liquid generated in small quantity • Example: e-waste, contaminated rags, expired drugs, cosmetics, etc.	• No tear or hole
Flexible Intermediate Bulk Containers (FIBCs)/ Jumbo Bags 	• Dry solid waste with no free-flow liquid • Example: dust, slag, ash, clinker, e-waste, dry sludge, contaminated rags / garnet, etc.	• Preferably FIBCs made of high density poly ethylene (HDPE) • Must be doubled lining • Bags not to be filled more than 90% for secure packaging

6.3 Labelling Of Containers

6.3.1 For identification and warning purposes, containers of scheduled wastes shall be clearly labelled in accordance with the Third Schedule of the Environmental Quality (Scheduled Wastes) Regulations 2005 and marked with the scheduled wastes code as specified in the First Schedule of the Environmental Quality (Scheduled Wastes) Regulations 2005. The characteristics labels as in the Third Schedule of the Environmental Quality (Scheduled Wastes) Regulations 2005 are as illustrated in **Appendix 2**.

6.3.2 The characteristic label shall be a square set at an angle of 45 degrees and the dimension shall not be less that 10 cm by 10 cm except where the size of the container or package warrants for a label of smaller size. Examples of waste characteristic labels are as shown in **Figure 2**.

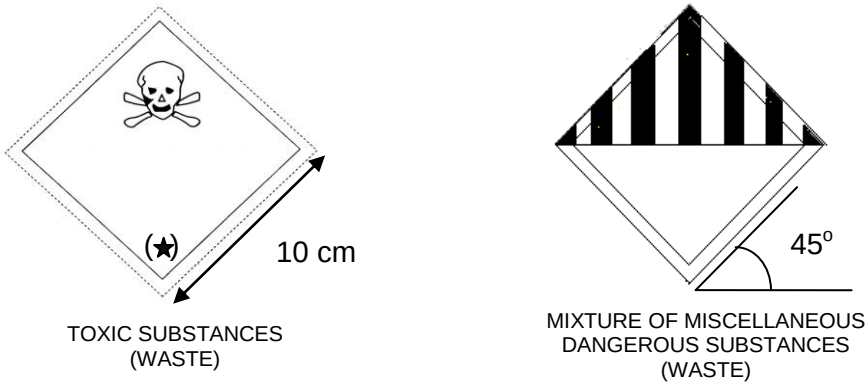


Figure 2: Examples of waste characteristic labels.

6.3.3 The colours used on the labels 1 to 11 shall be in accordance with British Standard BS 381 C, “colours for specific purposes”.

Colour	Reference No.
French blue	166
Canary yellow	309
Signal red	537
Light orange	557

6.3.4 The labels shall be divided into halves, the upper half of the label shall be reserved for the pictorial symbol (characteristic label) and the lower half for text printed in block capitals containing information as listed in paragraph 6.3.7.

6.3.5 The text shall be printed in black on all labels except when the background of the label is black, red or blue, the text shall be in white.

6.3.6 The labels may be of the following types:

- stick on;
- metal plates;
- stencilled on the container; or
- printed on the container.

6.3.7 Information to be included in the label for scheduled wastes containers:

- The date when the scheduled wastes are first generated; and
- The name, address and telephone number of the scheduled waste generator.

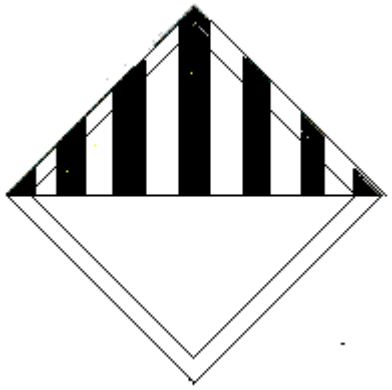
No person is allowed to alter the identification number and the labels and markings.

6.3.8 All labels should be able to withstand open weather exposure without a substantial reduction in effectiveness.

6.3.9 Label should be placed on a background of contrasting colour.

6.3.10 In the case of waste capable of causing two or more hazards, all the hazards must be clearly identified and the waste shall be labelled accordingly.

6.3.11 **Figure 3** is an example of label for the scheduled wastes containers.



MIXTURE OF MISCELLANEOUS DANGEROUS SUBSTANCES
(WASTE)

Waste code	:
Waste name	:
Date generated	:
Name of waste generator	:
Address and telephone number	:

Figure 3: Example of label for scheduled wastes container

6.4 Placing/Filling/Packing of Incompatible Scheduled Wastes In Containers

6.4.1 Incompatible scheduled wastes shall be placed/filled/packed in separate containers. Incompatible scheduled wastes when mixed will produce hazardous situations. The indication of some of the hazards that can be expected if mixing of incompatible wastes took place is as shown in Fourth Schedule, Regulation 2 of the Environmental Quality (Scheduled Wastes) Regulations 2005 as in **Appendix 1**.

6.4.2 Since the waste generated from a process may exhibit some similar hazardous characteristics of the raw materials or chemicals or substances used, the Compatibility Chart for Chemical Mixtures as in **Appendix 3** can be used to indicate the hazards that can arise from mixing of incompatible chemical wastes.

7.0 MANAGEMENT OF CONTAINERS CONTAINING SCHEDULED WASTES

7.1 Incompatible scheduled wastes shall be stored in separate containers, and such containers shall be placed in separate secondary containment area. Secondary containment area is a liquid-tight barrier that will contain hazardous materials that are released from a container.

7.2 Containers containing scheduled wastes should always be closed at all time except when it is necessary to add or remove the scheduled wastes.

7.3 Filling of wastes into containers should be as nearest as possible to the point of waste generation.

7.4 If a container is in poor condition or leaking, the spillage should be contained immediately and prevented from spreading. The scheduled wastes should be immediately transferred to a new or a good condition container.

7.5 If solvents and other liquid wastes received in bulk are to be stored at the storage site, an adequate number of storage tanks with an appropriate piping and pumping system should be installed. Fire prevention procedures and regulations must be observed.

Figure 4: Storage tanks for waste oil. The capacity of the containment should be 110% of the largest container stored.

7.6 Special tanks for spent oil and lubricants should be provided, and designed to allow for settling and discharge of water and sludge.

7.7 Containers containing scheduled wastes should be placed on pallet and should be stored as follows:

- A maximum of 4 drums or 1 bag per standard pallet
- Stacking of pallet without crate storage should not more than 2 tiers. The stacking with crate storage should not be more that 3 tiers. Example of crate storage as in **Figure 5**.

Figure 5: Crate storage of scheduled wastes

- In rows two pallets wide.
- Drums should be stored vertically and not horizontally for stability.

Example of storage area layout showing placement of containers is as illustrated in **Figure 6**.

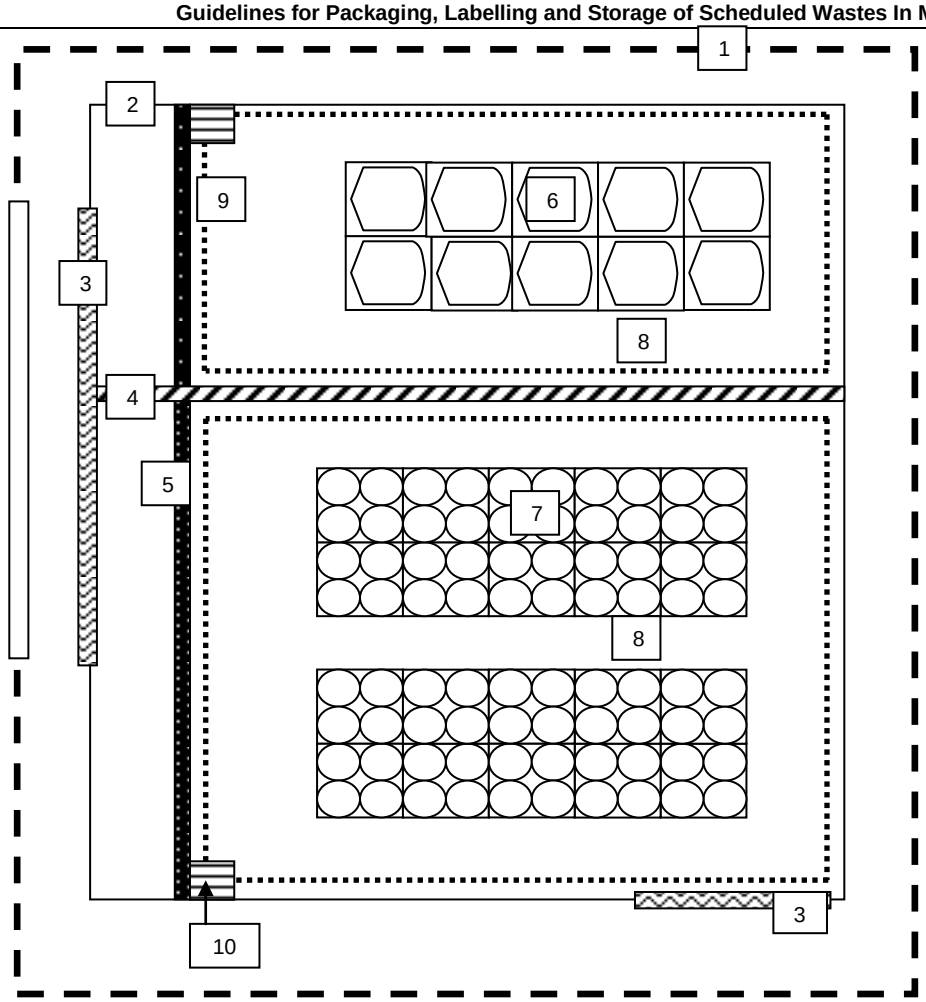


Figure 6: Example of storage area layout

Note:

1 : • The entire storage area must be fenced-in.

2 : • The storage place is sheltered or roofed or covered with suitable covering material and equipped with ventilation system for volatile wastes

• The floor of the storage is covered with concrete or any suitable lining material, free of cracks and gaps.

3 : • Entrance / emergency exit

4 : • Separate compartments for different groups of incompatible wastes

5 : • The storage area is surrounded by a concrete dyke or other equivalent structure to contain any spillage.

6 : • A jumbo bag containing scheduled wastes is placed on a pallet. The pallet is placed in rows by two pallets wide.

7 : • 4 drums containing scheduled wastes is placed on a pallet. The pallet is placed in rows by two pallets wide.

8 : • Containers should be stored with an ample aisle space between groups of containers

9 : • Perimeter drain

10 : • The storage area should be graded to a sump.

7.8 Suitable equipment such as forklift should be used to move the containers. Containers should not be pushed, rolled or dragged.

7.9 Containers should be stored with an ample aisle space between groups of containers to allow for:

- The free movement of the forklift and other equipment and machinery
- Emergency fire fighting purpose
- Emergency escape route
- Ease of inspection of containers for leaks or spillages

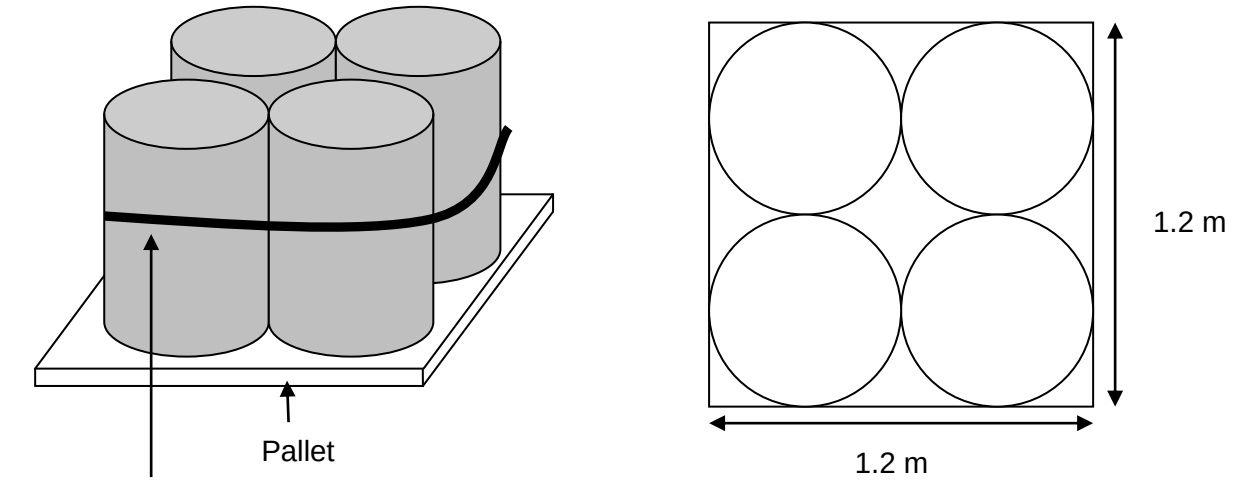
7.10 Reactive wastes should be kept away from any moisture.

7.11 Smoking should be prohibited in scheduled wastes storage area and non-smoking signage should be put up at the storage area.

7.12 Containers to be transported to other prescribed premises for recovery or disposal shall be:

- Robust and capable to withstand transportation by lorry.
- All drums or bags must be fastened securely on a good conditioned pallet.
- The drums shall secured by appropriate plastic wrapping and/or plastic/steel tape or band as shown in **Figure 7**.

7.13 Inventory record for each scheduled wastes should be maintained to indicate the date, type and quantity of wastes brought into or removed from the storage site. A copy of the inventory record should also be made available at the storage area.



Side view of 4 drums on pallet **Top view of 4 drums on pallet**

Figure 7: Packaging of drums for transportation

Figure 8: Example of drums secured by plastic wrapping

7.14 The waste generator should provide information (waste card) as in **Appendix 4** for each type of scheduled wastes and should be made aware to all relevant employees and parties.

7.15 All employees involved in the identification, handling, labelling, transportation, storage and emergency response team on the spillage or leakage of scheduled waste should also be trained on the proper management of scheduled wastes as stipulated under Regulation 15 of the Environmental Quality (Scheduled Wastes) Regulations 2005.

7.16 All wastes handlers should be provided with suitable personal protection equipment (PPE) in carrying out their duties.

7.17 Emergency procedures should be established and documented in a manual made available to relevant employees. A copy of the emergency procedures should also be made available at the storage area.

8.0 STORAGE AREA INSPECTION

8.1 Inspection of the stored containers shall be carried out on weekly basis to avoid any mishap, and be kept in a log book for reference.

8.2 Waste generators and handlers shall prepare a standard inspection checklist for the purpose of regular inspection, an example of which is as shown in **Appendix 5**.

8.3 Inspection checklist shall be kept and updated from time to time.

8.4 Upon inspection, immediate action shall be taken if any problem is detected.

8.5 The waste generators shall prepare an accurate and up-to-date inventory of scheduled wastes as stipulated under Regulation 11 of the Environmental Quality (Scheduled Wastes) Regulations 2005.

Appendix 1

SCHEDULED WASTES OF POTENTIAL INCOMPATIBILITY

The mixing of a waste in Group A with a waste in Group B may have the following potential consequences:

Group 1-A	*Group 1-B*
Alkaline caustic liquids	Acid sludge
Alkaline cleaner	Chemical cleaners
Alkaline corrosive liquid	Electrolyte, acid
Caustic wastewater	Etching acid, liquid or solvent
Lime sludge and other corrosive alkalies	Pickling liquor and other corrosive acid
	Spent acid
	Spent mixed acid

Potential consequences: Heat generation, violent reaction

Group 2-A	*Group 2-B*
Asbestos	Solvents
Berryllium	Explosives
Unrinsed pesticide containers	Petroleum
Pesticides	Oil and other flammable wastes

Potential consequences: Release of toxic substances in case of fire or explosion

Group 3-A	*Group 3-B*
Aluminium	Any waste in Group 1-A or 1-B
Berryllium	
Calcium	
Lithium	
Magnesium	
Potassium	
Sodium	
Zinc powder and other reactive metals and metal hydrides	

Potential consequences: Fire or explosion; generation of flammable hydrogen gas

Group 4-A	*Group 4-B*
Alcohols	Any concentrated waste in Group 1-A or 1-B
	Calcium
	Lithium
	Metal hydrides
	Potassium
	Sodium
	Water reactive wastes

Potential consequences: Fire, explosion or heat generation; generation of flammable toxic gases

Group 5-A	*Group 5-B*
Alcohols Aldehydes Halogenated hydrocarbons Nitrated hydrocarbons and other reactive organic compounds and solvents Unsaturated hydrocarbons	Concentrated Group 1-A or 1-B wastes Group 3-A wastes

Potential consequences: Fire, explosion or violent reaction

Group 6-A	*Group 6-B*
Spent cyanide and sulphide solution	Group 1-B wastes

Potential consequences: Generation of toxic hydrogen cyanide or hydrogen sulphide gas

Group 7-A	*Group 7-B*
Chlorates and other strong oxidizers Chlorites Chromic acid Hypochlorites Nitrates Nitric acid Perchlorates Permanganates Peroxides	Organic acids Group 2-B wastes Group 3-B wastes Group 5-A wastes and other flammable and combustible wastes

Potential consequences: Fire, explosion or violent reaction

APPENDIX 2

THIRD SCHEDULE

LABELLING REQUIREMENT FOR SCHEDULED WASTES

EXPLOSIVE SUBSTANCES
(WASTE)
Symbol (exploding bomb): black; Background: light orange
Label 1

INFLAMMABLE LIQUIDS
(WASTE)
Symbol (flame): black or white; Background: red
Label 2

INFLAMMABLE SOLIDS
(WASTE)
Symbol (flame): black; Background: white with vertical red stripes
Label 3

SOLID: SPONTANEOUSLY COMBUSTIBLE
(WASTE)
Substance liable to spontaneous combustion
Symbol (flame): black;
Background: upper half white, lower half red
Label 4

SOLID: DANGEROUS WHEN WET
(WASTE)
Substances which, if in contact with water, emit inflammable gases
Symbol (flame): black or white; Background: blue
Label 5

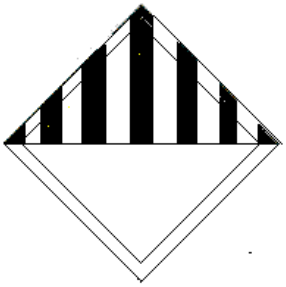
OXIDIZING SUBSTANCES
(WASTE)
Symbol (flame over circle): black; Background: yellow
Label 6

ORGANIC PEROXIDES
(WASTE)
Symbol (flame over circle): black; Background: yellow
Label 7

TOXIC SUBSTANCES
(WASTE)
Poisonous (toxic) substances
Symbol (skull over crossbones): black; Background: white
Label 8

INFECTIOUS SUBSTANCES
(WASTE)
Symbol (three crescents superimposed on a circle): black;
Background: white
Label 9

CORROSIVE SUBSTANCES
(WASTE)
Symbol (liquids spilling from two glass vessels and attacking a hand and a metal): black;
Background: upper half white, lower half black
Label 10



MIXTURE OF MISCELLANEOUS DANGEROUS SUBSTANCES
(WASTE)
Symbol (nil); Background: white with upper half vertical black stripes
Label 11

Appendix 3

Compatibility chart for chemical mixtures

Reactivity Group No.	Reactivity Group Name	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	101	102	103	104	105	106	107
1	Acids, Mineral, Non-oxidizing	1																																								
2	Acids, Mineral, Oxidizing		2																																							
3	Acids, Organic		G, H	3																																						
4	Achohol and Glycols	H	H, F	H,P	4																																					
5	Aldehydes	H, P	H, F	H, P		5																																			
6	Amides	H	H, GT				6																																		
7	Amines, Aliphatic and Aromatic	H	H, GT	H		H		7																																	
8	Azo compounds, Diazo compounds and Hydrazines	H, G	H, GT	H, G	H, G	H			8																																
9	Carbamates	H, G	H, GT						G, H	9																															
10	Caustics	H	H	H		H				H, G	10																														
11	Cyanides	GT, GF	GT, GF	GT, GF					G			11																														
12	Dithiocarbamates	H, GF, F	H, GF, F	H, GF, GT		GF, GT		U	H, G				12																												
13	Esters	H	H, F						H, G		H			13																											
14	Ethers	H	H, F												14																										
15	Fluorides, Inorganic	GT	GT	GT												15																									
16	Hydrocarbons, Aromatic		H, F														16																								
17	Halogenated Organics	H, GT	H, GT, P					H, GT	H, G		H, GF	H						17																							
18	Isocyanates	H, G	H, GT, P	H, G	H, P			H, P	H, G		H, P, G	H, G	U						18																						
19	Ketones	H	H, F						H, G		H	H								19																					
20	Mercaptans and other Organic Sulfides	GF, GT	H, GT, F						H, G									H	H	H	20																			
21	Metals, Alkali and Alkaline Earth Elemental	GF, H, F	GF, H, F	GF, H, F	GF, H, F	GF, H, F	GF, H	GF, H	GF, H	GF, H	GF, H	GF, H	GF, GT, H	GF, H								21																		
22	Metals, other Elemental Alloys as powders, vapors or sponges	GF, H, F	GF, H, F	GF					GT, H, F	U	GF, H								H, E	GF, H		GF, H, F		22																
23	Metals, other Elemental Alloys as sheets, rods, moldings, etc.	GF, H, F	GF, H, F						H, F, G										H, F						23															
24	Metals and Metal compounds, Toxic	S	S	S			S	S			S															24														
25	Nitrides	GF, H, F	H, F, E	GF, H	GF, H, E	GF, H			U	H, G	U	GF, H	GF, H	GF, H					GF, H	U	GF, H	GF,H	E				25													
26	Nitriles	H, GT, GF	GT, H, F	H							U												H, P			S	GF, H	26												
27	Nitro compounds, Organic		GT, H, F			H					H, E												GF, H, E				GF, H, E		27										
28	Hydrocarbons, Aliphatic, Unsaturated	H	H, F			H																	H, E						28										
29	Hydrocarbons, Aliphatic, Saturated		H, F																											29										
30	Peroxides and Hydroperoxides, Organic	H, G	H, E		H, F	H, G		GT, H	H, F, E	GT, H, F		GT, H, E	GT, H, E						H, E	H	GT, H, F	H, E	H, G	H, G		H, G	GF, H, E	GT, H, P		H, P		30										
31	Phenols and Cresols	H	H, F						H, G											H, P			GF, H				GH, H					H	31									
32	Organophosphates, Phosphothioates, Phosphodithioates	GT, H	GT, H						U		H, E												H									U		32								
33	Sulfides, Inorganic	GT, GF	GT, H, F	GT		H			E										H													GT, H			33							
34	Epoxides	H, P	H, P	H, P	H, P	U		H, P	H, P		H, P	H, P	U									H, P	H, P	H, P		H, P	H, P					H, P	H, P	U	H, P	34						
101	Combustible and Flammable materials, Miscellaneous	H, G	GT, H, F																				H, G, F			GF, H, F						GT, H, F				101						
102	Explosives	H, E	H, E	H, E					H, E		H, E			H, E								H, E	H, E	H, E	E	E					H, E	H, E		H, E	H, E	H., E	102				
103	Polymerizable compounds	P, H	P, H	P, H					P, H		P, H	P, H	U									P, H	P, H	P, H	P, H	P, H					P, H	P, H		P, H				103			
104	Oxidizing Agents, strong	GT, H		GT, H	H, F	H, F	GT, H, F	GT, H, F	H, E	GT, H, F		GT, H, F	GT, H, F	H, F	H, F		H, F	GT, H	GT, H, F	H, F	GT, H, F	H, F, E	H, F		H, F, E	GT, H, F		H, E	H, F	H, F	H, G	H, F	GT, H, F	GT, H, F	H, G, F	H, G, F	H, E	GT, H, F	104		
105	Reducing Agents, strong	GF, H	GT, H, F	GF, H	GF, H, F	GF, H, F	GF, H	GF, H	GF, H				GT, H	H, F				H, E	GF, H	GF, H	GF, H						GF, H	H, E			H, E	GF, H	GF, GT		H	GF, H	H, E	GF, H, P	H, F, E	105		
106	Water and mixtures containing water	H	H						G										H, G			GF, H	GF, H		S	GF, H							GF, GT						GF, GT	106	
107	Water reactive substances	E	X	T	R	E	M	E	L	Y		R	E	A	C	T	I	V	E		D	O		N	O	T		M	I	X	!	!	!								107
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	101	102	103	104	105	106	107

Reactivity code	Consequence
H	Heat generation
F	Fire
G	Innocous non-flammable gas generation
GT	Toxic gas generation
GF	Flammable gas generation
E	Explosion
P	Violent polymerization
S	Solubilazation toxic substance
U	Maybe hazardous but unknown

Example: H, F, GT — Heat generation, fire and toxic gas generation

NOTES:

1. Source from EPA-600/2-80-076, April 1980. 'A method determining the compatibility of chemical mixtures.'
2. This chart can be used to identify hazards that can be expected when chemical wastes are mixed.
3. This list is not an exhaustive list as there are different activities of the thousands of compounds that may be encountered.
4. Any blanks that appear in the chart does not mean that the mixture cannot result in a hazard occurring.
5. Detailed information on hazards involved in handling and disposing of any given waste should be obtained from the waste generator.

Appendix 4

A. Properties

1. Category of waste
   - according to the First Schedule

2. Origin
   - State from which process, activity, occurrence, etc. the waste is generated

3. Physical properties of waste
   - Flashpoint ^{o}C
   - Boiling point ^{o}C
   - Consistency at room temperature (gas, liquid, sludge, solid)
   - Vapours lighter/heavier than air
   - Solubility in water
   - Waste lighter/heavier than water

4. Risks
   - by inhalation
   - by oral intake
   - by dermal contact

B. Handling of Waste

1. Personal protection equipment
   - Gloves, goggles, face shield etc.
2. Procedures/Precautions in handling, packaging transporting and storage
3. Appropriate label
   - Labels for the containers
4. Recommended Method of Disposal

C. Precautions in case of spill or accidental discharge causing personal injury

1. In case of inhalation of fumes or oral intake
   - Symptoms of intoxication
   - Appropriate first aid
   - Guidelines for the physician

2. In case of dermal contact or contact with eyes
   - Symptoms of intoxication
   - Appropriate first aid
   - Guideline for the physician

D. Steps to be taken in case of spill or accidental discharge causing material damage arising from –

1. Spill on floor, soil, road etc.
2. Spill into water
3. Fire
4. Explosion

Appendix 5

Scheduled wastes storage inspection checklist

Date of inspection:._____

Instructions:
(a) Tick "Yes" next to all inspection items that meet facility procedures.
(b) Tick "No" next to all inspection items that do not meet the procedures.
(c) Provide specific comments on all "No" items.
(d) Inspector **shall** sign at the bottom of the table and submit the report to the supervisor once the inspection is completed.

Inspection Item	YES	NO	Comments and remarks	Action to be taken (if any)
Number of containers in stock according to the Fifth Schedule of the Environmental Quality (Scheduled Wastes) Regulations				
Containers dated properly				
Containers labelled properly				
Containers stored within 180 days				
Total quantity of scheduled wastes stored did not exceed 20 metric tonnes				
Containers observed FREE of leakage, hole, dent, bulge or corrosion				
Ample aisle space maintained				
Containment system FREE of water or other liquids				

Signature: _____

Name of inspector: _____

Overall comments:_____

_____

_____

Name of supervisor: _____ Date: _____

Comments:_____

_____

_____

REFERENCES

1. Environmental Quality (Scheduled Wastes) Regulations 2005

2. Malaysia Standard MS 2304:2010: Practices for Managing Scheduled Waste Containers

3. Environmental Institute of Malaysia (EiMAS)'s training material for Certification Course for Scheduled Wastes Managers

4. Hazardous Waste Storage Guidelines, Environmental Protection Services, Alberta Environment, June 1988

5. Guidelines for Storage of Scheduled Wastes, First Edition, 1993

6. Guideline for Non-Rigid Scheduled Wastes Containers, Department of Environment, 2011

7. Panduan Permohonan Kelulusan Lesen Bagi Menduduki dan Menggunakan Premis yang Ditetapan (Kemudahan Pengolahan dan Pelupusan Buangan Terjadual), Edisi Ketiga, 2007

8. Best Management Practices: Handbook for Hazardous Waste Containers, USEPA, 1997

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