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1.PURPOSE

To ensure the correct management of waste generated at Sohar Aluminium facilities.

2.SCOPE

This standard outlines Sohar Aluminium's approach to identify, characterize, handle, safe storage, transport, collection and dispose all waste generated in Sohar Aluminium.

This standard applies to all SA controlled operations and activities.

This standard applies to hazardous and non-hazardous waste generated from process and non-process activities in work areas and facilities.

3.ACCOUNTABILITIES AND AUTHORITIES (in relation to this Standard)

Role	Accountability	Authority
Chief Operating Officer	Standard owners.	Authorise standard design, implementation and change.
Manager, CM	Standard custodian	Authorise standard improvement
Manager, EHS	Standard design, ongoing monitoring and improvement.	Recommend design, change or improvement and periodic auditing
Department Managers	Correct standard implementation in own Department. Standard Control.	Leadership Assign Tasks Monitor / Review

4.DEFINITIONS AND ABBREVIATIONS

TERM	DESCRIPTION
Basel Convention	An international convention made to protect human health and the environment against the adverse effects of hazardous wastes which may result from the generation, transboundary movement and management of hazardous waste.
Construction and Excavation waste/materials	Waste that is generated by building activities rather than industrial production processes can be categorized as non-hazardous.
Domestic waste	Waste generated within SA premises from domestic activities (e.g. kitchen, canteen, and camp)

TERM	DESCRIPTION
Environmental Authorities	The governmental or non-government organizations that review, evaluate and approve any development from environmental point of view (in Oman, it is the Environmental Authority). They are accountable for setting up the environmental legislation and enforcement of the environmental law.
Hazardous waste	Any waste arising from activities at any Sohar Aluminium facility which, due to its natural composition, characteristic or quantity or any other reason is hazardous or potentially hazardous to humans, plants or animals, or environment
Medical Waste	Waste from human or animal tissue, blood, excretion, body fluids, medicines and expired medicines and containers/wrappers, dressings, syringes, needles, sharps, or any other waste that may cause the infections of persons coming into contact with it. Note: In Sohar Aluminium, these wastes shall be disposed via incineration through an approved Medical Waste Incineration Plant.
No Objection Letter (NOL)	Document issued by EA that permits transport to and disposal at the Sohar site for a specific consignment.
Non-hazardous waste	Any discarded solid or a semi-solid material which does not endanger the environment or human health, if it is dealt with in a safe and scientific manner
Recyclable waste	Those waste materials that can be separated from non-recyclable waste and could be economically reused at less cost as compared to disposal.
EA	Environmental Authority
Stakeholders	Groups and organizations having an interest or stake in an organization's Environmental Management System (e.g., regulators, shareholders, customers, suppliers, special interest groups, residents, etc.).
Transboundary movement	Any movement of hazardous wastes or other wastes from an area under the national jurisdiction of one State to or through an area under the national jurisdiction of another State or to or through an area not under the national jurisdiction of any State, provided at least two States are involved in the movement
Waste	Any solid, liquid, or contained gaseous material that is being discarded for disposal, incineration, recycling or other treatment methods.
Waste Management Database	A database containing all information related to waste management practices at Sohar Aluminium. It forms part of the Environmental database.
Work Area	Part of a hierarchical structure that represents physical location. The hierarchy breaks down a site into logical physical sections. For the purpose of this Standard, the work area will be any site controlled by Sohar Aluminium.
Working Environment	The locations where one or more employees and/or contractors are working or are present as a condition of their employment. The working environment includes not only physical locations, but also the equipment or materials used by the employee and/or contractors during the course of his or her work. A working Environment can be on or off site.

5. RESPONSIBILITIES

5.1. COO

- Overall accountability for this Standard for ensuring that waste is managed in accordance with legislative requirements.

5.2. General Manager/Director

- Ensure that this Standard is implemented and complied with by Departments under their responsibility.

- Review, analyse and plan control measures with their departmental managers with regards to this Standard.
- Ensure the correct decisions are made in terms of CAPEX investment to prevent incidents affecting the environment.

5.3. Departmental Manager

- Establish SOPs for handling different wastes on a case by case basis. This can be achieved by adding waste aspects into existing SOP's. This may include
 - Periodic sampling, analyzing and reporting.
 - Storage requirements,
 - Handling and transport requirements,
 - Reuse and/or recycling
 - Requirement of treatment and disposal, and
 - Final products and residues
- Seek assistance from EHS to identify and assess the characteristics of various wastes and classify them into different types as per this Standard.
- Ensure efficient operational activities and aim for waste minimization to the maximum effort possible.
- Aim for waste re-use within the plant premises for all possible reuse opportunities.
- Explore recycling possibilities in coordination with Supply Chain Management, Central Maintenance and EHS Departments.
- Locate and identify the most effective location for waste collection.
- Notify the Central Maintenance Manager (controller of the waste removal contract) in advance prior to generating a new non-routine waste stream.
- Arrangement of be'ah Fees by owner of the waste.
- Ensure EHS Central are consulted in environmental issues.

5.4. Area Superintendent

- Ensures that all persons involved in waste management are trained in appropriate segregation, handling, transportation, re-use, recycling, and disposal of waste.
- Assist the Environment Department in developing a Characterization and Classification of the Waste.
- Notifying the Waste Management Department by telephone, or in writing of the existence, location and serial numbers (if appropriate) of redundant equipment or scrap materials, which require disposal, and for labeling the equipment accordingly.
- Determine the number of the waste skips /container/bins/receptacle to be distributed throughout the Work Area(s).
- Maintaining the waste collection areas as neat and clean.
- Segregation of the waste streams in accordance to this Standard.
- When planning to undertake, activities likely to generate an additional waste burden to pre-notify the Plant Services Department & EHS.

5.5. Central Maintenance Manager

- Responsible for arranging the disposal of waste and redundant equipment in accordance with the provisions of this Standard.

- Owner of the hazardous waste storage area.
- Ensure that the waste removal practices comply with this Standard.
- Define skip specification and arrange for skips in all work areas
- Determine a competent waste handling contractor with EHS team.
- Ensures that the movement of any wastes from the site to an external location or to the hazardous waste storage facilities is accompanied with a Waste Consignment Note (WCN).
- Arrange for the disposal of redundant equipment in accordance with the provisions of this Standard.

5.6. Plant Services Superintendent

- Compile monthly waste statistics and produce reports as per this Standard.
- Review waste trending for each department.
- Manage the waste removal contractor.
- Conduct regular inspections of the waste with EHS team.
- Authorize skips removal from SA premises (via waste consignment note).
- Ensure that all waste removed from site complies with this Standard.
- Identification of recyclable materials and arranging their collection from the sites and storage at designated storage yards.
- Creating and maintaining an inventory of waste streams and wastes generated at SA.
- Ensuring safety and security at the hazardous and recyclable waste yard(s).
- Attending to urgent calls from operation departments for waste related issues and arranging non-routine transport/shipment of wastes including recyclable wastes.
- Guiding the departments on SA waste management Standards.
- Ensure timely removal of waste skips from operational areas.
- Supporting operations in the effective implementation of SA waste management Standard.

5.7. Plant Services Controller

- Preparation of Skip removal and skip movement schedule.
- Routine inspection of the waste skips to ensure waste segregation.
- Weighing of skips before they leave SA site and inspection of weighing.
- Checking and instructing the waste removal contractor and the concerned SA Department on:
 - Emptying of filled up waste skips.
 - Housekeeping around waste skips.
 - Any pile up of wastes plant wide.
- Inputting of waste statistics into a waste statistics in electronic media and maintaining records of wastes, WCNs/ gate passes.
- Ensuring that wastes are taken to the approved destination via WCN reviews and audits.
- Preparation of monthly waste generation reports.
- Maintaining the Hazardous Waste Yard.
- Maintaining the Scrap Yard.

- Contactor management and pre-qualification periodically as due diligence.

5.8. Supply Chain Manager

- Prior to awarding any contract that may generate waste, ensure that a plan is prepared by vendor and approved by EHS and Central Maintenance Managers.
- Facilities redundant sale for waste such as metal.

5.9. Engineering Manager

- Ensures that all contractors working under CAPEX comply with this Standard.
- Ensure that each project has a signed and completed waste management plan.
- Ensure the waste report is completed monthly.
- Ensure that all WCN are maintained in the project files.
- Audit regularly the waste generated from project as site visit with EHS Team.
- Tracking and development on regularly waste management and with map on the monthly basis.

5.10. EHS Manager

- Ensure regular audits on the waste management at the company premises.
- Assist Operational Departments in finding possible recycling opportunities of different waste generated at the SA premises in coordination with Supply Chain Management and Central Maintenance Departments.
- Ensure that the waste statistics are reported to the stakeholders on regular basis.
- Ensure that the waste management practices in the Sohar Aluminium premises are conducted in line with the regulatory requirements.
- Recommend any changes to this Standard as a result of legal requirement.
- Assist the operational areas in finding ways to recycle waste.
- Update on the change of regulation from EA on the monthly basis on environmental lean.

5.11. Senior Analyst-Waste Management

- Characterization and classification of waste.
- Maintain a database of all waste and waste streams originating from operational activities.
- Conduct regular audits of the waste handling practices.
- Act as advisory body with regards to waste management.
- Assist departments to resolve issues relating to waste management.
- Ensure that the waste is characterized classified according to this Standard.
- Categories waste as hazardous or non-hazardous.
- Find options and solutions for waste streams on site, including hazardous and non-hazardous wastes.
- Update on new waste management practice option on Oman with ligament with EA.
- Obtain, where required NOL or other necessary permit from EA for the movement of wastes.
- Obtain Basel permit for the international movement of hazardous wastes.
- Obtain permits for the hazardous waste storage area, including SPL. Communicate permit

requirements to CM manager and advise if any permit requirements are not being met.

- Update NOL, CN and Letters register.
- Report waste data to EA.

5.12. Plant Service Controller

- Originates Waste Consignments for different waste streams.
- Fills in the WCN form and ensures clear fields are clear on the form.
- Retains relevant copy of issued WCN.
- Notifies plant services and EHS department prior to issuing WCN forms.
- Ensures waste received or recipient of consignment is suitable for handling the material.
- Seek advice from Environment department for non-routine waste streams.

5.13. Area EHS Coordinator

- Conduct regular inspections on the waste skips/bins.
- Follow-up waste segregation in work areas.
- Liaise with waste contractor in skips placement and removal.
- Reviews the Waste Consignment Notes of respective areas.

5.14. Plant Security

- Ensure that no waste leaves the site without a Waste Consignment Note.
- Compare the waste load with the Waste Consignment Note and signs section C.
- If the skip is not approved, return the skip to its original site and notify the EHS coordinator.

5.15. Waste Transporter

- Ensure having required valid license for hazardous waste transportation.
- Provide skips based on the Plant Services Department Instructions
- Coordinate with the Area EHS Coordinators in skips placement and removal.
- Ensure the skip is fit for road transport.
- Deliver the skip at the right destination and pay the necessary fees.
- Ensure that a signed Waste Consignment Note accompanying the waste load before removing the skips from the designated skips areas.
- Ensure that the Waste Consignment Note is signed by the waste receiver.
- Return the original copy of the Waste Consignment Note, with all signatures' to Plant Services Department.
- Prepare regular reports on the waste removal statistics.
- Report any deviation from this Standard to the Plant Services Superintendent.

5.16. Waste Receiver

- Segregate and store waste in the appropriate facilities as per license and permits conditions.
- Sign off and seals WCN for received waste consignments.

5.17. Employees

- Segregate and store waste in the appropriate containers at designated areas in accordance to this Standard.

5.18. Contractors

- Ensure that all waste generated during their activities on the company premises is managed safely and in accordance with this Standard and legislative requirements.

6. STANDARD

6.1. Waste Management Strategy

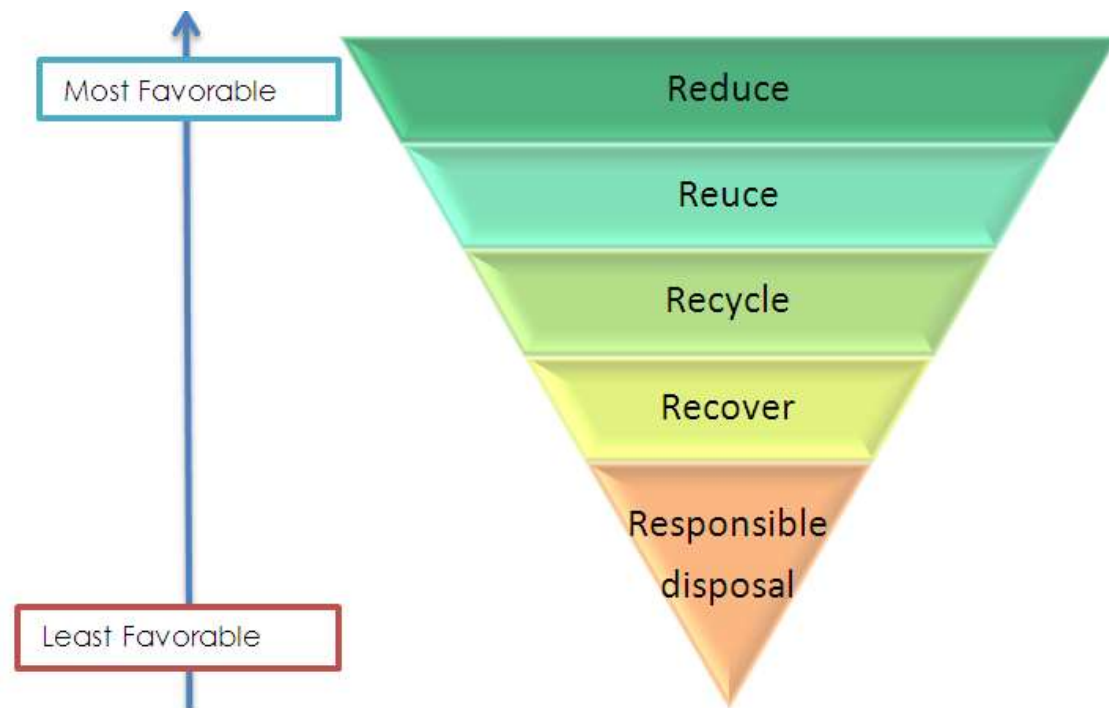
Appropriate characterization and classification of waste is fundamental to determining the appropriate handling and disposal methods to ensure effective and environmentally sound waste management.

The aim of the waste hierarchy is to extract the maximum practical benefits from materials and to generate the minimum amount of waste. This strategy provides the framework for waste management at Sohar Aluminium and is based on "Five (5) R" principles: viz.

- Reduction or avoidance of waste at the outset
- Reuse
- Recycling
- Resource Recovery, and
- Responsible Disposal.

Figure 1 illustrates the elements of the 5Rs Hierarchy.

Figure-1: The elements of the 5Rs Hierarchy



Below is a summary of each principle given in the Hierarchy:

6.1.1. Reduce

Reduce implies that waste generator should be looking at their processes, selecting raw materials or optimize processes and reducing material used. This in return will reduce or eliminate the amount of waste generated. Material mass balance can help in this process. Reduce is the most environmentally preferred option in the waste management hierarchy.

6.1.2. Reuse

Reuse is the next preferred option after reduce. In order to ensure reuse of the material, appropriate segregation shall be practiced of all process outputs. Reuse can apply to using a material again in the same process, or using it for a new process without modifying its properties.

Waste Reuse is the re-use of wastes generated in their original form in the same process or other processes either on-site or off-site. By implementing waste reuse options, Sohar Aluminium also saves on waste collection and disposal costs.

6.1.3. Recycle

Once the previous 2 steps cannot be used for the remaining by-product, recycling comes in the picture as the 3rd preferred option. In order to be able to do this a proper segregation of waste into coloured skips/bins in accordance to this Standard shall be practiced. The viability of recycling operations is dependent on the market for recycled materials and the cost involved in transporting the products to be recycled to the processing centres. The characteristics of recyclable waste shall not be altered or changed throughout the waste handling process which will make it non-recyclable

The recycling process reclaims the original material and uses it in new products and includes the collection, processing, and reuse of materials that would otherwise be thrown away. Recycling can decrease the consumption of new raw materials, but will often save on the energy required to process raw materials into a product. Waste shall be segregated at source and stored in labelled, coloured skips/bins/containers/receptacles dependent on their characteristics and classification.

6.1.4. Recovery

Recover applies to the recovery of either materials or energy from a mixed waste stream. Material recovery involves a variety of mechanical or biological processes that remove a variety of materials from the waste stream. Sometimes this material is used to make a fuel that is then burned for energy. Energy recovery can skip the mechanical or biological processes and thermally treat the material to recover energy.

6.1.5. Responsible Disposal

Responsible disposal is the final disposal of waste remaining after other options (reuse, recycle and recovery) have been ruled out. If no disposal of Hazardous waste is available, it shall be stored on-site in a purpose built facility until further treatment or dispatch to an approved hazardous waste facility is obtained. The general non-hazardous waste, which remains after practicing the previous four Rs shall be disposed to an approved government landfill.

6.2. Waste Database

In order to effectively manage the waste, it is necessary to characterize and classify each waste type. The waste is classified into 2 main categories:

- Hazardous
- Non-hazardous

These categories are then sub-classified into:

- Domestic waste
- Food waste

- Construction and Excavation Waste
- Non-hazardous and non-recyclable
- Non-hazardous and recyclable
- Hazardous and non-recyclable
- Hazardous and recyclable
- Medical waste
- Reusable waste

The above classification was made based on the guidance note for "Waste Management at Sohar Industrial Port and Sohar Free Trade Zone" issued by Sohar Environmental Unit (Ref: REP-123-10-DJ, October 2010).

In order to comply with, it is necessary to create and maintain an inventory detailing characterization and classification into the waste management database. The database shall include but not be limited to:

- Waste description & Classification,
- Physical state,
- Weight/amount estimate
- Storage area
- Disposal method.
- Waste description
- Waste types
- Disposal method
- Inventory
- Transport companies
- Disposal sites

All details of waste generated from work areas shall be maintained in the database. New or potentially hazardous wastes shall be classified by the Generator of the waste in coordination with Environment Department. All classification analysis shall be maintained in the waste management database.

Waste electrical and electronic equipment with printed circuit boards shall be stored on site pending the identification of a disposal route.

6.3. Waste Handling and Storage

Items classified as waste shall be handled with a duty of care in accordance with legislative requirements. Sohar Aluminium is accountable for their waste stream as per the concept "cradle-to-grave".

Wherever practicable, waste should be compacted before placing in a storage container for off-site disposal/recycling.

All waste will be stored in a safe and secure manner pending collection by third party contractors for recovery, recycling or disposal.

All waste shall be stored in a manner that prevents its escape to the environment.

Liquid wastes shall be stored in containers appropriate for the properties of the waste. Such containers shall be stored in a suitably bunded area.

Waste generated by contractors shall be stored in designated areas and in dedicated containers. Contractors will demonstrate a duty of care over any waste generated by them on the company premises.

Redundant equipment shall be appropriately labelled and stored securely pending disposal and arrangements for its collection as per SCM requirement.

Inspections of short-term storage areas (e.g. skips areas) shall be done weekly by the department representative. This is to verify that storage areas are maintained in accordance with standard

practices regarding handling and storage, and to verify there are no leaks or mixing in containers.

Mixing hazardous waste with non-hazardous waste is NOT allowed.

6.4. Collection, Transportation and Disposal

Waste generated on the company premises shall only be transported off-site by a registered waste carrier. A copy of the waste carrier's valid registration certificate shall be obtained. Historical records of waste transfer should be retained for five (5) years.

Copies of valid waste management licenses for the final destination of all wastes shall be maintained on sites and records retained for a minimum of 5 years.

All waste transferred off-site shall be accompanied by a waste consignment note, completed and containing information in accordance with the relevant regulatory requirements and codes of practice.

Redundant equipment shall be sent for recycling to an approved contractor wherever practical.

6.5. Permitting Process

6.5.1. Hazardous Waste Permit Process

The hazardous waste is stored on-site in a contained yard called Hazardous Waste Storage Yard (HWSY). If the waste will leave SA premises, then it can follow any of the 3 routes below:

- Recycle in Oman
- Storage in Beah Engineered Landfill designed for hazardous waste.
- Export under Basel Convention

Any of the above routes require a Permit from EA. No hazardous waste site shall be created "even temporary" without granting a permit from the Environmental Authorities.

6.5.2. The Non-hazardous Waste Management

Any non-hazardous waste generated during operation phase from the industrial activities is considered non-hazardous industrial waste. Non-hazardous industrial waste has to be managed and disposed in a controlled way. This means tracking of type and quantity and using transparent disposal routes.

In order to implement this approach, it requires the following:

- Limited on-site storage of non-hazardous industrial waste.
- Documented generation, transportation and disposal with NOL and waste consignment note.
- Disposal in the designated area on Beah landfill site, if no recycle option is defined by the Senior Analyst-Waste Management advisor.
- Assessment of other proposed solutions by EA on case by case basis.

If the waste will leave SA premises, then it can follow any of the 2 routes below.

- a. Recycle in Oman (e.g. steel, wood, paper, cardboard, plastic, aluminium, glass, tires)
- b. Disposal to a special site at Beah Landfill Area. It requires a Beah manifest or an official confirmation by Beah team by email for each waste kind generated from SA.

6.5.3. Construction and Excavation Waste

Construction and Excavation Waste disposal requires a Beah manifest or an official email by Beah team; depends on waste if contaminated or not.

6.5.4. Domestic Waste

This is mainly generated from canteen and office waste. There is no permit requirement for this waste. The waste transporter needs to ensure that the internal consignment note is signed by the waste receiver. This is to prevent waste disposal beyond SA control. For Sohar Aluminium all this waste is disposed of at Beah at Sohar.

7. REVIEW OF THE STANDARD

The waste management Standard shall be periodically reviewed each 5-years. It may be also reviewed at any time in response to changes in legislation, standards, operations, or improved knowledge and understanding of EHS requirement.

The previous copies of the document are retained in the document management system.

8. REFERENCES

The following EHS systems are directly linked to this waste management Standard:

- RD 114/2001
- RD 115/2001
- MD 117/1993
- MD 118/1993
- Guidance note – Waste management @ SIP and SFZ, SEU (Ref: REP-123-10-DJ, October 2010)
- Guidance note – On-site storage of industrial waste, SEU, (Ref:REP-230-12-MJ, January 2011)
- Contractor EHS Management Standard - EHS-STD-372
- EHS Risk Management Standard - EHS-STD-205
- EHS Roles & Accountabilities - EHS-STD-307
- Compliance Obligation Standard - EHS-STD-204
- Documentation and Data Control Standard - STD-ENG-001
- Environmental Permit for SA Smelter and power plant with conditions.
- EHS Internal and External Audit Standard – EHS-STD-486
- ISO 14001

9. APPENDICES

- Appendix A – Waste Skips Colour Coding
- Appendix B – Waste Consignment Note Template
- Appendix C – Waste Reporting Template by Central Maintenance
- Appendix D – Hazardous Waste Storage Reporting by CM Template
- Appendix E – Waste Reporting to EA
- Appendix F – Example list of NOLs to be reported to EA
- Appendix G – Waste Streams generated at Sohar Aluminium
- Appendix H – Spent Pot Linings (SPL) Handling
- Appendix I – Basel Convention
- Appendix J – Hazardous Waste Storage Requirements

Appendix A – Waste Skips Colour Coding

Waste Type	Waste Included in the colour	Bin/Skip Colour	Type of Permit Required
Domestic Waste	Any non-hazardous waste generated from domestic use in the SA offices	Blue	None
Food waste	Any canteen/food waste.	MOLOK System	None
Non-hazardous and non-recyclable	Any industrial non-hazardous and non-recyclable waste	Yellow	No objection letter
Non-hazardous and recyclable	Any industrial non-hazardous and recyclable waste (e.g. steel, wood, paper, cardboard, plastic, aluminium, glass, tires).	Green	No objection letter
Construction and Excavation Waste	All waste generated from construction activities	Purple	No objection letter
Hazardous and non-recyclable	Any hazardous waste that cannot be recycled (for the time being)	Red	Permit
Hazardous and recyclable	Any hazardous waste that can be recycled	Orange	Permit
Medical waste	Any medical waste. This is completely managed by the health centre through a contract with an outside health institute.	Maroon	Permit

Appendix B – Waste Consignment Note Template

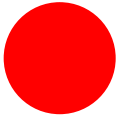
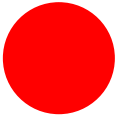
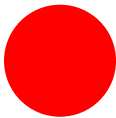
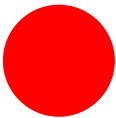
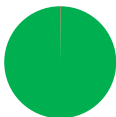
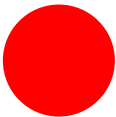
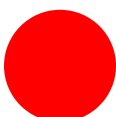
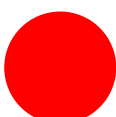
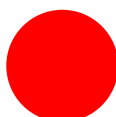
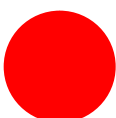
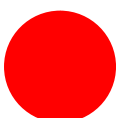
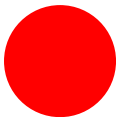
 SOHAR ALUMINIUM	WASTE CONSIGNMENT NOTE			WCN Number:	003352	
	Location:	1. Smelter	2. Power Plant	3. Port	Work Area:	
	Please circle one				Date:	
	This consignment note is for the transportation of all waste material to an authorized dumping or storage site.				Time:	
Name of Waste Transport Company:				Vehicle Type:		
Name of Driver:				Vehicle Registration No.:		
Destination:						
SECTION A: WASTE CATEGORY						
(Tick one box only. Use Separate WCN for Each Category)						
☐ Non-hazardous waste for Recycling	☐ Hazardous Waste for Recycling					
☐ Non-hazardous for Disposal	☐ Hazardous Waste for Disposal					
☐ Non-hazardous for Storage	☐ Hazardous Waste for Storage					
☐ Sewage for Treatment and Disposal	☐ Contaminated Wastewater for Treatment & Disposal					
SECTION B: WASTE TYPE						
Waste Type	Waste Type	Quantity (specify Units)				
☐ General non-hazardous	☐ Empty metal / plastic drums of hazardous materials	Please attach weigh bill (where relevant)				
☐ Metal scrap and non-hazardous metal containers	☐ Waste chemicals					
☐ Plastic waste and non-hazardous plastic containers	☐ Waste Tires					
☐ Wood scrap	☐ Waste oils, lubricants and sludge					
☐ Paper and Cardboard	☐ Waste batteries					
☐ Canteen Waste	☐ Contaminated soil					
☐ Excavated soils and rubble of non-hazardous nature	☐ Any other waste (specify)					
SECTION C: SIGNATURES						
Waste Consigner (Coordinator)	Waste Transporter (Driver)	Plant Protection	Waste Receiver			
Name:	Name:	Name:	Name:			
Designation:	Organization:	Designation:	Designation:			
Signature:	Signature:	Signature:	Signature:			
Date:	Date:	Date:	Date:			
Distribution:						
Pink Copy: Waste Consigner (Coordinator)	Yellow Copy: Plant Protection	Blue Copy: Consignee (Receiver)	Green Copy: Driver	White Copy: Return to Environment Department		

Doc. #EHS-WCN-Rev 001 – 25.02.08

Appendix C – Waste Reporting Template by Central Maintenance;

Total2014 in M³ (One skip = 6 M3)																				
Department	General (Landfill)	Domestic (Landfill)	Food (Landfill)	Metal (Recycled)	Wood (Recycled)	Paper (Recycled)	Shot Plaster (Haz.Stor ed SA)	Bath Magnetic (Haz.Stor ed SA)	Furnace Slag (Recycled)	Non - contaminated Refractory (Landfill)	Refractory (Landfill)	Carbon Dust (Haz.Stor ed SA)	Rock Wool (Landfill)	Kay wool (Landfill)	Filter Bags (Haz.Stor ed SA)	Carbon Savoie bags,Ram ming Paste bags (Haz.Stor ed SA)	Empty P Bags Drams (Recycled)	Soil & Cloth contaminated with oil (Landfill)	Total	
Administration	420	270	628	24	48	306	0	0	0	0	0	0	0	0	0	0	0	0	1696	
Carbon	948	48	636	222	2874	408	1758	462	156	0	102	0	12	0	0	0	354	0	7980	
Casthouse	162	36	174	150	240	78	0	0	0	0	54	0	0	18	0	0	42	0	954	
Central Maintenance	366	0	162	108	120	30	0	0	0	0	0	0	0	0	0	0	6	252	1044	
Reduction	1686	48	100.5	204	2172	522	0	0	0	192	0	48	144	0	0	78	300	0	5494.5	
SCM	300	102	33	0	294	162	0	0	0	0	0	0	0	0	0	0	0	0	891	
Port	345	24	30	6	12	36	0	0	0	0	0	0	0	0	0	0	0	12	465	
Power Plant	462	0	30	24	66	54	0	0	0	0	0	0	0	0	0	0	36	24	696	
Total	4689	528	1793.5	738	5826	1596	1758	462	156	192	156	48	156	18	0	78	738	288	19220.5	

Appendix D – Hazardous Waste Storage Reporting by CM Template;

	A	B	C	D	Comments
1					
	100%	0%	90%	100%	
2					
	99%	100%	71%	100%	
3					
	100%	100%	0%	100%	
4					
	100%	122%	109%	100%	
5					
	100%	100%			
	0.00%	0.00%			
6					
	61%	100%			
7					
	78%	100%			

Appendix E – Waste Reporting to EA
Waste-Smelter and Port

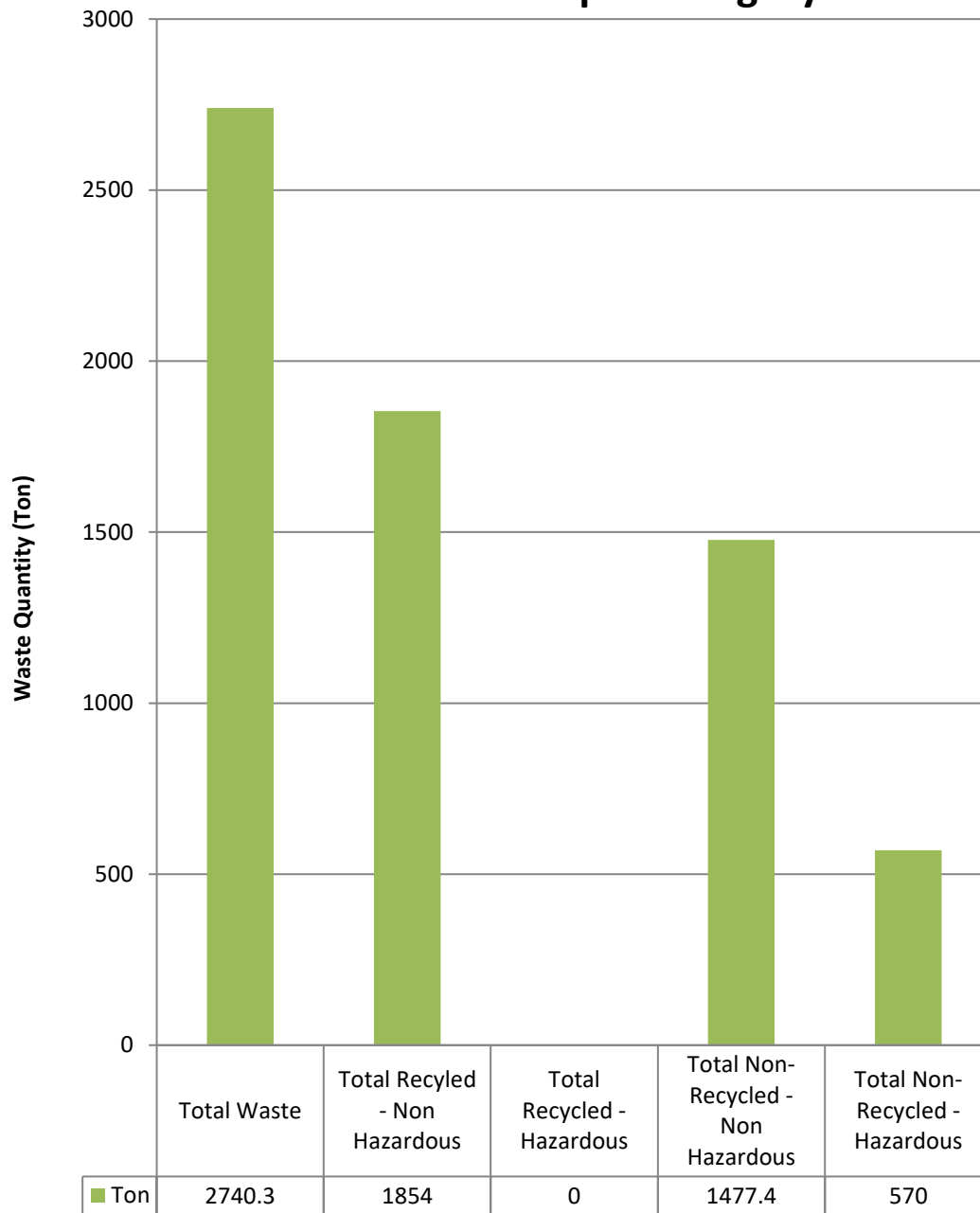
All types of waste are managed and sent for final disposal as per the category.

The total waste generation during the quarter was:

- Non-hazardous and non-recyclable = 2060t
- Non-hazardous and recyclable =2394t
- Hazardous and non-recyclable =522t
- Hazardous and recyclable =0t

Waste Category	Classification	Waste Type	Unit	Quantity				Final Disposal
				Oct-14	Nov-14	Dec-14	Total Q4	
Non-Hazardous	Non-recyclable	General (Landfill)	Ton	300	252	234	786	Sohar Landfill
Non-Hazardous	Non-recyclable	Domestic (Landfill)	Ton	48	66	60	174	Sohar Landfill
Non-Hazardous	Non-recyclable	Food (Landfill)	Ton	146	134.3	147.1	427.4	Sohar Landfill
Non-Hazardous	Recyclable	Metal (Recycled)	Ton	48	54	48	150	Local Metal Recycler
Non-Hazardous	Recyclable	Wood (Recycled)	Ton	360	456	264	1080	Wood recycler
Non-Hazardous	Recyclable	Paper (Recycled)	Ton	132	138	156	426	Local Recycler
Hazardous	Non-recyclable	Shot Blaster	Ton	156	156	156	468	Haz.Stored SA
Hazardous	Non-recyclable	Bath Magnetic	Ton	60	30	12	102	Haz.Stored SA
Non-Hazardous	Recyclable	Furnace Slag	Ton	18	12	12	42	Local Metal Recycler
Non-Hazardous	Recyclable	Refractory	Ton	12	24	12	48	Recycled (India)
Non-Hazardous	Non-recyclable	Refectory	Ton	18	6	18	42	Sohar Landfill
Non-Hazardous	Non-recyclable	Carbon Dust	Ton	0	0	18	18	Haz.Stored SA
Non-Hazardous	Non-recyclable	Rock Wool	Ton	0	18	6	24	Sohar Landfill
Non-Hazardous	Non-recyclable	Kay w ool	Ton	0	0	0	0	Sohar Landfill
Hazardous or Non Hazardous	Non-recyclable	Filter Bags	Ton	0	0	0	0	Type dependant
Hazardous	Non-recyclable	Ramming Paste bags	Ton	0	0	0	0	Haz.Stored SA
Non-Hazardous	Recyclable	Empty P Bags (Recycled)	Ton	36	36	36	108	Local Recycler
Non-Hazardous	Non-recyclable	Contaminated cloth oil	Ton	18	6	0	24	Sohar Landfill
Total Waste			Ton	1352	1388.3		2740.3	
Total Recyled - Non Hazardous			Ton	606	720	528	1854	
Total Recycled - Hazardous			Ton	0	0	0	0	
Total Non-Recycled - Non Hazardous			Ton	530	482.3	465.1	1477.4	
Total Non- Recycled - Hazardous			Ton	216	186	168	570	
SPL - 1st Cut (Carbon)			Ton	357	765		1122	Haz.Stored SA
SPL - 2nd Cut (Refractory)			Ton	245	525		770	Haz.Stored SA

Waste Generation per Category



Waste Category

Appendix F – Example list of NOLs to be reported to EA

No objections, waivers and other environmental regulatory documents							
1	NOL	NOL-import The calcined Petroleum Coke	MECA	24-Mar-08	none		current
2	NOL	Amperage increase to 384	MECA	12-Sep-11	none		current
3	NOL	NOL-Cast Iron Pins	MECA	10-Sep-13	10-Sep-14	10-Aug-14	in progress
4	NOL	NOL-Cast Iron Fine	MECA	10-Sep-13	10-Sep-14	10-Aug-14	in progress
5	NOL	NOL-Induction Furnace	MECA	10-Sep-13	10-Sep-14	10-Aug-14	in progress
6	NOL-14-051	used tyers	MECA	12-Jan-14	12-Jan-15		expire
7	NOL-14-054	filter bags	MECA	18-Mar-14	18-Mar-15		current
8	NOL-14-057	Used refractory bricks at OPCP	MECA	23-Feb-14	23-Feb-15		Current
9	NOL-14-063	Used refractory bricks	MECA	14-Apr-14	31-Mar-15	29-2-2015	current
10	NOL-14-070	contaminated soil w ith carbon	MECA	08-May-14	22-May-14		expire
11	NOL-14-074	Rock w ool	MECA	21-May-14	20-May-15	19-Apr-15	current
12	NOL-14-075	Recycle w aste;w ood,plastic,steel	MECA	22-May-14	21-May-15	19-Apr-15	Current
13	NOL-14-089	contaminated cloths (oil rags)	MECA	09-Jun-14	08-Jun-15	01-May-15	Current
14	NOL-14-111	used silicagel	MECA	22-Sep-14	22-Dec-14		expire
15	NOL-14-114	soil contaminated w ith Carbon	MECA	12-Nov-14	12-Nov-15		Current
16	NOL-14-115	Concrete w aste from Bechtel	MECA	24-Nov-14	31-Dec-15		current
17	NOL-14-116	Refractory brick w aste	MECA	24-Nov-14	31-Dec-15		current

Appendix G – Waste Streams generated at Sohar Aluminium

Waste Stream	Area Produced	Composition	Estimated Generation /comment	Destination
Non-Hazardous / Non-Recyclable				
Food waste	All areas		500 t/y Potentially recyclable	Sohar Landfill
Sweeping waste and dust	All areas			Sohar Landfill
Thermal Insulation Strips	Reduction – Lining/Delining Shop	Rockwool	60 m3/y	Sohar Landfill
Thermal insulation strips (K-wool)	Casthouse	K-wool	75 m3/y	Sohar Landfill
Electrical waste	All areas		Minor	Sohar Landfill
Refractory waste	Casthouse		20 t/y in average Potentially recyclable	Sohar Landfill
Oil Contaminated Materials	All areas	Oil spillages, gloves, oily rags, used filters, etc.		Sohar Landfill
STP sludge	STP		70 kg / month	Sohar Landfill
Non-Hazardous / Recyclable				
Wood	All areas		3,000 m3/year Potentially recyclable	Sohar Landfill/Recycling in Sohar
Glass	All areas			Sohar Landfill/Recycling in Sohar
Plastic	All areas			Sohar Landfill/Recycling in Sohar
Scrap steel & metal	All areas		600 t/year Potentially recyclable	Recycling in Sohar
Burn off butts	Carbon – Bath Plant	Carbon, Bath	150 t/y	To be recycled at Jindal
Refractory waste	Carbon – ABF	Bricks potentially contaminated with carbon, bath and iron	1,000 t/y Potentially recyclable	Recycled at OPCP
Paper & cardboard	All areas		1,000 m3/year Potentially recyclable	Sohar Landfill/Recycling in Sohar
Induction furnace slag	Carbon – Rodding Shop	Fe-15% C & Si -85%	300 t/y Potentially non-hazardous and recyclable	Recycled in Sohar Steel Factory
Cast iron cleaning discharge	Carbon – Rodding Shop	Fe>3mm - 44%	100 t/y Potentially recyclable	Recycled in Sohar Steel Factory
Iron oxide	Carbon – Rodding Shop	FeO ₂	Minor	Recycle in Rodding Shop
Coke spillage	Port Facilities			Recycle into silo
Anode Butts	Carbon		50,000 t/y	Recycle in Paste Plant
Alumina spillage	Port Facilities			Recycle into silo
Cast Iron	Carbon		7,000 t/y	Recycle in Rodding Shop
Hazardous / Non-Recyclable				
Butts shot blaster waste (fines and medium)	Carbon – Rodding Shop	Na-19% F-32% Fe-5% C-45%	1200 t/y Potentially recyclable	Hazardous Waste Storage Area
Carbon / silicon dust / carbon contaminated	Carbon – Rodding Shop			Hazardous Waste Storage Area
Magnetic waste	Carbon – Bath Plant	Bath, Iron	300 t/y Potentially recyclable	Hazardous Waste Storage Area
Pot skimmings / Carbon dust	Reduction – Potline	Carbon – bath mixture	40 t/y Potentially recyclable as anode cover material	Most of it is disposed as hazardous waste in the hazardous waste storage area
Used filters	Carbon – FTC	Fluoride contaminated	Potentially recyclable	Hazardous Waste Storage Area
Used batteries	All Areas		Potentially recyclable	Hazardous Waste Storage Area

Waste Stream	Area Produced	Composition	Estimated Generation /comment	Destination
Toxic AD-20 glue	Reduction – Lining/Delining Shop	Glue residues	Minor Potentially recyclable	Stored in Bechtel Yard
SPL: Cathode Carbon	Reduction – Lining/Delining Shop	SPL first cut	6,000 t/y in average 10,000 t/y at peak Potentially recyclable	Stored in SPL Building
SPL: Refractory Waste	Reduction – Lining/Delining Shop	SPL second cut		Stored in SPL Building
Ramming Paste / Lining paste	Reduction – Lining/Delining Shop	Coke, silica, pitch, coal tar	100 t/y Potentially recyclable	Stored in Bechtel Yard
Shot blasting waste	Reduction – Lining/Delining Shop	Spent shot, carbon	Potentially recyclable	Hazardous Waste Storage Area
Filter (GTC) Collector Bags	Reduction – Potline (GTC)	Fluoride & sodium contaminated	170 t/y	Currently being stored as hazardous waste. Potentially recyclable as plastic waste
Thermal insulation strips (K-wool)	Casthouse	K-wool	75 m3/y	Hazardous Waste Storage Area
Contaminated coke & alumina	Port Facilities			Hazardous Waste Storage Area
Slurry cake	Central maintenance		Potentially recyclable	Disposed in an approved STP in Sohar or Liwa
Organic wastes / solvents	Laboratory		Minor quantities	Store in the Lab as "hazardous waste"
Hazardous / Recyclable				
Dross	Casthouse	Aluminium Oxide	1,640 t/y Recycle at bath plant	Recycle in Bath Plant
Pitch spillage	Carbon – Paste Plant		Potentially recyclable	Recycle back in Paste Plant
Dust collectors fines	Carbon – Paste Plant	C, Fe	60 t/y Potentially recyclable	Recycle back in Paste Plant
Rotary breaker purge materials	Carbon – Bath Plant	Bath-2% Carbon-58% Al-40%	120 t/y Potentially recyclable	Recycle in Carbon and Casthouse
Magnesium oxide	Carbon – Rodding Shop		Minor	Recycle in Rodding Shop
Acids/ alkalis	Laboratory		Potentially recyclable	Recycle back in Lab
Pitch spillage	Port Facilities			Recycle into silo
Anode Butt Cleaning	Carbon		45,000 t/y	Recycle in Electrolysis
Bath Crust Bin	Carbon		92,000 t/y	Recycle in Electrolysis
Pure Tapped Bath Ingots	Carbon		10,000 t/y	Recycle in Electrolysis
Ladle Cleaning Bath	Casthouse		6,000 t/y	Recycle in Electrolysis
Delining Bath and Sweeping	Reduction		500 t/y	Recycle in Electrolysis
Scrap Green Anodes	Carbon		2,000 t/y	Recycle in Paste Plant
Scrap Paste	Carbon		4000 t/y	Recycle in Paste Plant
Scrap Baked Anodes	Carbon		1,000 t/y	Recycle in Paste Plant
Used oil	All areas			Recycle off-site

Appendix H – Spent Pot Linings (SPL) Handling

The spent lining which is removed from the pots is sorted into two categories. The first cut which comprises mainly of carbonaceous materials, and the second cut which comprises mainly of refractory materials. Depending on the sorting quality, the first cut and second cut proportions are approximately 30% and 70% of the total amount of SPL produced.

Particle size: After de-lining, the size of the SPL particles varies from metre-size blocks to dust.

SPL Composition: SPL is rich in refractory materials, carbon, sodium and fluoride. The mineralogical composition of SPL is -

- Carbon
- Silica, aluminosilicates
- Sodium fluoride, cryolite, caustic soda (after contact with ambient air moisture)
- Calcium fluoride
- Iron, iron oxide
- Cyanides

Due to its hazardous nature, SPL is a significant issue for Sohar Aluminium requiring appropriate management, storage, treatment and/or disposal.

SPL weight varies between 90 and 110 tonnes per pot. The average annual rate of SPL generated at Sohar Aluminium will totalize approximately 6,000 t/y (15 kg SPL/t Al) and could reach 10,000 t/y at peak.

These wastes are classified as hazardous because they are:

- Toxic: hazardous constituents include cyanide, metals and fluorides;
- Corrosive: it has a high pH due to the presence of sodium compounds;
- Reactive with water: any wetting of SPL will release inflammable, toxic and explosive gases (methane, hydrogen, ammonia).

A typical SPL analysis is provided in the Table below. The problem constituents (e.g. soluble fluoride and soluble cyanide) are mainly found in the SPL first cut constituted of carbon and in the insulation part (second cut) in direct contact with the first cut.

Table: SPL Composition

Compound	First cut (carbon lining)	Second cut (Insulation) Refractory
	Range in g/kg	
C	600 - 800	0 – 220
SiO ₂	0 – 60	100 - 500
Al ₂ O ₃	0 - 100	100 – 500
Metal Al	0 - 50	0
Fe ₂ O ₃	0	0 – 30
CaO	10 - 60	10 – 80
K ₂ O	< 5	< 5
MnO	0 – 0.2	0 – 0.2
TiO	0	0 – 1
Na	80 - 140	60 – 120
F	60 - 120	40 – 120
S	< 5	< 5
Cl	< 0.6	< 0.6
P ₂ O ₅	0 – 0.560	0 – 0.300
CN (Free)	0 - 1	0 – 0.1
CN (Total)	0 – 2.5	0 – 0.2
Be compounds	< 0.05	< 0.05

The following controls were put for the SPL handling:

- The plant will allow an indoor area for pot delining;
- Separating area will be equipped with dust control equipment;
- Absence of water inside the facility and storage on a confined impervious floor;
- SPL will be maintained in a dry state to prevent accumulation of explosive concentrations of hydrogen and methane;
- SPL storage area will be adequately and continuously ventilated;
- SPL storage will be secure and marked to prevent unauthorized, unrecognized and undetected entry.
- Three x 50 m deep monitoring boreholes will be placed around the storage facility and in a general "downstream" direction;
- Seeking potential recycling options for SPL with cement and steel plants.

Appendix I – Basel Convention

The Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and their Disposal was adopted on 22 March 1989 by the Conference of Plenipotentiaries in Basel, Switzerland, in response to a public outcry following the discovery, in the 1980s, in Africa and other parts of the developing world of deposits of toxic wastes imported from abroad. The Convention entered into force in 1992.

The overarching objective of the Basel Convention is to protect human health and the environment against the adverse effects of hazardous wastes which may result from the generation, transboundary movement and management of hazardous and other wastes.

The provisions of the Convention aim:

- The reduction of hazardous waste generation and the promotion of environmentally sound management of hazardous wastes, wherever the place of disposal;
- The restriction of transboundary movements of hazardous wastes except where it is perceived to be in accordance with the principles of environmentally sound management; and
- A regulatory system applying to cases where transboundary movements are permissible.

The regulatory system is the cornerstone of the Basel Convention as originally adopted. Based on the concept of prior informed consent, it requires that, before an export may take place, the authorities of the State of export notify the authorities of the prospective States of import and transit, providing them with detailed information on the intended movement.

The movement may only proceed if and when all States concerned have given their written consent. The Basel Convention also provides for cooperation between parties, ranging from exchange of information on issues relevant to the implementation of the Convention to technical assistance, particularly to developing countries.

Appendix J – Hazardous Waste Storage Requirements

The minimum requirements of on-site hazardous waste storage area are:

Floor requirements:

- Impermeable floor lined with impermeable concrete or any other impermeable material which is suitable for storing hazardous waste.
- The floor should handle the weight of the hazardous waste and the vehicles can move on it without any cracks.
- The floor should not be eroded over time and inspections must be included in maintenance plan.
- The floor should be smooth, easy to clean and do not absorb liquids (consider a chemical resistant coating)
- The floor material should not ignite sparks with friction or static.
- The maximum allowed load on the floor should be clearly presented.

Area:

- The area should have a collection system and slope if necessary to contain any spill or leakages.
- The area should not be too low that can lead to storm water collection.
- If the area is totally closed and adequately ventilated.
- If the stored hazardous waste gets affected with weather conditions, an appropriately designed fire resisting shelter should be provided.
- Correct signage should identify the hazardous waste.
- Access control should be implemented to allow only authorized persons.
- Adequate safety and fire fighting equipment should be provided.
- Communication system to the main office or the responsible persons in case of any emergencies should be established.
- The MSDS of all stored hazardous waste should be available.
- The storage area of hazardous waste should be always clean and well maintained.

Waste:

- The hazardous waste with flash point less than 32°C should be stored in a separated controlled area.
- Minimum amount of recyclable hazardous waste should be stored.
- Database of all stored hazardous waste should be available upon request from the authority.

No hazardous or non-hazardous waste should be disposed or transported off-site without SEU consignment note or registration consignment note.

[illegible]