HINDUSTAN ZINC
Zinc & Silver of India

Sustainability Framework

Guidance Note GN 08

Waste Management

Hindustan Zinc Limited

SAFE SMART SUSTAINABLE

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DATE	REVISION NUMBER	CHANGE SUMMARY
16/08/2025	v.1	Initial issue

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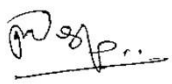
Signature	
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Confidentiality

1. INTRODUCTION

Waste Management programmes need to be effective to ensure that HZL uses resources efficiently and to ensure wastes we do produce minimise the impact on the environment and to human health. In addition, it is important that the generation of hazardous and non-hazardous waste will be avoided or minimised as far as practicable to reduce disposal to landfills and to encourage and promote reuse and recycling activities.

1.1. Who is this Guidance Note aimed at?

All HZL operations and managed sites, including new acquisitions, corporate offices and research facilities and all new and existing employees and contractor employees (working on HZL sites and transport contractors and their employees carrying HZL Wastes) and service suppliers. This document provides guidance that is likely to be applicable throughout all phases of the project lifecycle (including exploration and planning, evaluation, operation and closure).

1.2. What is the aim of this Guidance Note?

This Guidance Document supports the HZL Sustainability Framework and, in particular, HZL's HSE Policy and HZL's Technical Standards (in particular TS 09 on *Resource Use and Waste Management*) and aims to ensure that we properly manage the wastes we generate. TS09 outlines the measures which HZL implements in order to avoid (or if not possible, minimise) adverse impacts to the environment and human health from the generation, handling, storage, transport, treatment and disposal of the wastes. Waste management requirements established by HZL in the Sustainability Framework and TS 09 must be adhered to, as a minimum, and additional requirements established in regulatory requirements in local countries where appropriate, will also be applied. The guidance also helps HZL to conform to international best practice and sets out simple approaches to support the management of waste materials.

This Guidance Note should be read in conjunction with HZL's HSE Policy, Technical Standards and other Guidance Notes, specifically those on *Environmental Management (TS11)* and *Hazardous Materials (GN02)*.

1.3. How should this Guidance Note be used?

This Guidance Note is not mandatory but is intended to reflect good practice and provide the basis for continual improvement of waste management issues across the HZL business. Where the guidance is not followed, a suitable alternative way of managing wastes must be in place that achieves good practice and meets the requirements of HZL's Technical Standard TS09 *Resource Use and Waste Management*.

This Guidance Document provides advice on the general principles of waste management that should be followed by all HZL sites and provides recommendations and practical advice on the management of waste.

The Guidance Note is structured as follows:

- *Section 2*: Waste and Waste Definitions
- *Section 3:* General Principles of Waste Management
- *Section 4:* Waste Management Plans
- *Section 5:* Evaluating Waste Management Options
- *Section 6:* On-site Waste Handling and Storage
- *Section 7:* On-site Waste Treatment and Disposal
- *Section 8:* Waste Transfer and Off-site Treatment and Disposal
- *Section 9:* Record Keeping
- *Section 10:* Awareness and Training

At the end of the Guidance Note there is information on Definitions and Related Documentation, as well as the following annexes:

Annex A: Example Waste Transfer Note
Annex B: Example Waste Inventory
Annex C: Example Waste Register

2. WASTE AND WASTE DEFINITIONS

2.1. Waste

All HZL operations will generate wastes as a result of their activities. There are many different definitions for 'waste'. In Technical Standard TS09: *Resource Use and Waste Management*, waste is defined as:

> *Any substance (solid, liquid, or contained gaseous material) or object that is being discarded e.g. by disposal, recycling or incineration*

To clarify this definition, waste also includes those materials that are being stored with the intention that they will be disposed, recycled or incinerated.

Wastes can be anything that is generated from a process or activity that is no longer needed e.g. this could be solid or liquid products, wastewater, energy waste from inefficient equipment etc. Examples of typical solid and liquid waste streams covered by this Guidance Note that may arise include, but are not limited to, the following:

- General waste/'garbage' (e.g. mixed wastes from offices or processes that are not separated);
- Paper and cardboard;
- Plastic (e.g. shrinkwrap, plastic components);
- Wood (e.g. pallets);
- Scrap metals;
- Food waste;
- Printer ink cartridges;
- Batteries (e.g. fork lift trucks, vehicles);
- Contaminated equipment;
- Used maintenance and lubricating oils;
- Laboratory samples and chemicals;
- Used chemicals and solvents; Waste refractories; and Spent pot linings.

When defining what we mean by waste, we must also ensure that national definitions of waste, where they apply, are taken into consideration.

For the purposes of this Guidance Note, waste includes:

- Hazardous and non-hazardous wastes;
- Non-mineral wastes; and
- Aqueous and non-aqueous liquid wastes.

Specifically excluded from the definition of waste are materials that are produced by a process and then subsequently re-used. The following materials are also excluded from consideration by this Guidance Note:

- Mineral wastes (e.g. fly ash from captive and merchant power plants, red mud from aluminium refinery processes, Jarosite/jarofix from zinc operations, gypsum, lime grit process residues/sludges from smelters);
- Uncontained gaseous emissions and energy releases/inefficiencies;
- Wastewater discharges to sewer/ground and that are not stored in bulk tanks/containers for off-site disposal; and
- By-products which, although not the primary product from a process, are a recognised useful product.

Different types of wastes should be classified in line with HZL requirements and definitions e.g. 'hazardous'/'non-hazardous' and, where appropriate, in accordance with local legal/regulatory definitions.

2.2. Hazardous Waste

The HZL Technical Standard TS09 and this Guidance Note consider any waste as being 'Hazardous' as listed in Annex I of the Basel Convention and as outlined below in Table 2.1.

Table 2.1: Waste considered as being 'Hazardous' as listed in Annex I of the Basel Convention

WASTE STREAMS:	
Y1	*Clinical wastes from medical care in hospitals, medical centers and clinics*
Y2	*Wastes from the production and preparation of pharmaceutical products*
Y3	*Waste pharmaceuticals, drugs and medicines*
Y4	*Wastes from the production, formulation and use of biocides and phytopharmaceuticals*
Y5	*Wastes from the manufacture, formulation and use of wood preserving chemicals*
Y6	*Wastes from the production, formulation and use of organic solvents*
Y7	*Wastes from heat treatment and tempering operations containing cyanides*
Y8	*Waste mineral oils unfit for their originally intended use*
Y9	*Waste oils/water, hydrocarbons/water mixtures, emulsions*
Y10	*Waste substances and articles containing or contaminated with polychlorinated biphenyls (PCBs) and/or polychlorinated terphenyls (PCTs) and/or polybrominated biphenyls (PBBs)*
Y11	*Waste tarry residues arising from refining, distillation and any pyrolytic treatment*
Y12	*Wastes from production, formulation and use of inks, dyes, pigments, paints, lacquers, varnish*
Y13	*Wastes from production, formulation and use of resins, latex, plasticizers, glues/adhesives*
Y14	*Waste chemical substances arising from research and development or teaching activities which are not identified and/or are new and whose effects on man and/or the environment are not known*
Y15	*Wastes of an explosive nature not subject to other legislation*
Y16	*Wastes from production, formulation and use of photographic chemicals and processing materials*
Y17	*Wastes resulting from surface treatment of metals and plastics*
Y18	*Residues arising from industrial waste disposal operations*
WASTES HAVING AS CONSTITUENTS:	
Y19	*Metal carbonyls*
Y20	*Beryllium; beryllium compounds*
Y21	*Hexavalent chromium compounds*
Y22	*Copper compounds*
Y23	*Zinc compounds*

Y24	*Arsenic; arsenic compounds*
Y25	*Selenium; selenium compounds*
Y26	*Cadmium; cadmium compounds*
Y27	*Antimony; antimony compounds*
Y28	*Tellurium; tellurium compounds*
Y29	*Mercury; mercury compounds*
Y30	*Thallium; thallium compounds*
Y31	*Lead; lead compounds*
Y32	*Inorganic fluorine compounds excluding calcium fluoride*
Y33	*Inorganic cyanides*
Y34	*Acidic solutions or acids in solid form*
Y35	*Basic solutions or bases in solid form*
Y36	*Asbestos (dust and fibres)*
Y37	*Organic phosphorus compounds*
Y38	*Organic cyanides*
Y39	*Phenols; phenol compounds including chlorophenols*
Y40	*Ethers*
Y41	*Halogenated organic solvents*
Y42	*Organic solvents excluding halogenated solvents*
Y43	*Any congenor of polychlorinated dibenzo-furan*
Y44	*Any congenor of polychlorinated dibenzo-p-dioxin*
Y45	*Organohalogen compounds other than substances referred to in this Annex (e.g. Y39, Y41, Y42, Y43, Y44)*

In addition to the above, those wastes that exhibit one or more of the characteristics (as taken from Annex III of the Basle Convention) should be regarded as ‘Hazardous Waste’:

- explosive;
- flammable liquids;
- flammable solids;
- liable to spontaneous combustion;
- substances or wastes which, in contact with water emit flammable gases; oxidizing;
- organic peroxides;
- poisonous (acute);
- infectious;
- corrosives;
- wastes that liberate toxic gases in contact with air or water;
- toxic (delayed or chronic);
- ecotoxic; or
- capable of yielding another material after disposal, e.g. leachate, which possesses any of the characteristics listed above.

Where appropriate, hazardous wastes should also be classified in accordance with local legal/regulatory definitions.

2.3. Mineral Waste

‘Mineral Waste’, as set out in the HZL Technical Standard TS09, is defined as:

"Waste rock and overburden, tailings and spent heap leach ore from mineral processing, rejects from beneficiation or concentration of minerals, bauxite residue from alumina

production, dross, refinery discards and sludges, smelter and other furnace slags, dredging materials and soils contaminated by mineral waste".

It should be noted that the HZL requirements for the management of mineral wastes are not included in this Guidance Note and are considered separately in the HZL Guidance Note GN31 on *Mineral Waste and Tailings Management*.

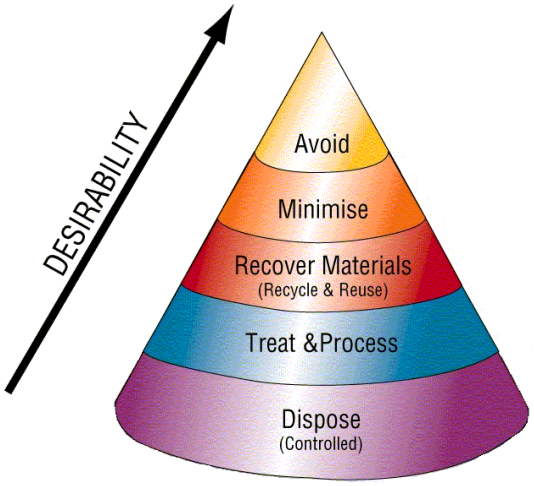
3. GENERAL PRINCIPLES OF WASTE MANAGEMENT

Technical Standard TS 09: *Resource Use and Waste Management* details the general principles that apply to the management of the wastes that are generated in the course of HZL activities. The key waste management principles are expanded upon in the following sub-sections.

These principles should be considered and applied in the context of the life cycle of the project, facility or site, from the design phase through operation to closure, and with consideration of environmental regulations and availability of resources locally to handle waste.

3.1 Waste Hierarchy

The waste management hierarchy, illustrated below, represents the internationally accepted preference of options for dealing with waste. Where practical and appropriate, waste management activities should be performed in accordance with this hierarchy.



In order of preference, the aim should be to:

Avoid or eliminate waste

If possible, the generation of waste should be avoided. Although rarely practical for many of HZL's production processes, with careful planning it may be possible to eliminate a variety of wastes.

Minimise waste

Complete elimination of waste is often not practical but the aim should be to minimise the amount of all waste types that are generated by the design and effectiveness of the process and application of good housekeeping practices. Reducing the amount of waste generated will reduce all of the potential impacts associated with the handling, storage, transport, treatment and disposal of the waste as well as reducing the amount of raw materials consumed.

Waste minimisation also includes reducing the amount of hazardous waste and/or the hazards associated with the wastes through substitution of raw materials with less hazardous materials (e.g. substituting oil-based drilling muds with water-based drilling muds) and by segregation of hazardous and non-hazardous wastes

Waste reduction should be achieved by careful planning and design, as well as by ensuring the implementation of good management and controls.

Re-use materials

Where possible, materials that arise as 'waste' from one process should be utilised in other processes – either on–site or on other sites (HZL or third-party sites). Operations should work with their partners, suppliers and other stakeholders to identify ways to use unavoidable wastes as inputs to other processes wherever possible.

Re-use of materials also includes refurbishing equipment rather than scrapping it prematurely.

Donation of unwanted items such as furniture or computers to local community s, schools etc can be a useful social contribution but it is essential that potential liabilities are avoided. The following precautions should therefore be taken for any such donations:

- Check that the item is in reasonable condition and will not cause an accident when used;
- Ensure that an acceptable final disposal option exists for the material;
- Delete/remove any commercially sensitive information (e.g. data on computer hard drives, documents in drawers); and
- Check with appropriate legal and IT departments before making such donations.

It may also be necessary to render some items as unusable so that it can only be recycled for its material content (e.g. worn out tyres).

Recycle materials

Where an unavoidable waste cannot be used directly in another process it should be recycled by reprocessing the material to create new materials/products. The range of materials that can be

recycled will depend on the local materials markets, availability of recycling facilities and general value of the recovered material. It can be cost-effective to transport high-value materials considerable distances to be recycled.

The specific types of waste from any individual site that can be recycled will be site specific and may vary over time as local markets fluctuate and availability of recycling facilities changes. Depending on location, it may be possible to recycle the following wastes as an example:

- Metals - ferrous and non-ferrous – which should be stored separately;
- Wood - either as a construction material or as a fuel;
- Used lubricating and hydraulic oils;
- Paper and card - typically different grades have different values;
- Plastics - either separate polymer types or as mixed plastic waste;
- Glass - either separate colours or mixed;
- Lead-acid batteries - primarily to recover the lead;
- Rubber – e.g. vehicle tyres;
- Food waste and/or vegetation - via a composting process;
- Slag and overburden materials;
- Wastewater treatment sludge, anode sludge; Pot and furnace linings; etc.

The amount of waste that is recycled should be maximised by:

- Establishing contact with local recycling companies to determine the full range of materials that can be recycled and in what form the materials need to be presented; and

- Segregation and proper storage of different types of waste in different containers, skips or stockpiles to ensure different materials don't become contaminated and remain in good condition.

Recover energy from waste

When as many materials as possible have been recovered, consideration should then be given to recovering energy from the remaining wastes. This typically involves incinerating the waste and utilising the heat that is created – either directly or, for example, to raise steam and generate electricity. Alternatively, it may be possible to treat organic wastes such as food in order to generate a methane-rich biogas.

In either case, it is unlikely that a single operation will generate sufficient waste to make energy recovery feasible but these options should be considered in the context of larger schemes to which the waste could contribute.

Dispose of residues appropriately

When all of the more preferable options have been explored and exhausted, the residual wastes should be safely and responsibly treated and/or disposed. Treatment in this context includes:

- Physical-chemical treatment of chemical wastes (e.g. neutralisation of an acid waste) to render them less harmful; and

- Incineration of non-hazardous waste without energy recovery – to reduce the waste volume and make it more inert (facilitating disposal at a wider range of landfill sites).

Responsible disposal means depositing the waste at a landfill site licensed or permitted to receive the specific types of waste and which is designed and operated to minimise the risk of pollution.

Waste minimisation and the application of the above principles needs to be addressed during the procurement of goods and services and should be taken into consideration when reviewing waste storage and disposal methods.

The following table presents some practical examples of applying the waste hierarchy.

Method	Examples
Waste avoidance	• Where practicable, materials should be ordered in bulk in reusable packaging that can be returned to the supplier • Return unused materials to suppliers
Waste minimisation	• Reusable material should be used as far as is practical to reduce the amount of construction/demolition waste • Ordering and stocking of construction/operational materials should be carefully planned to avoid unnecessary generation of waste • The amount of wastewater should be managed effectively and options identified for re-use • Avoiding surplus or redundant chemicals and oils being generated from activities such as maintenance and engineering
Reuse	• Repair and refurbishment of equipment • Return of old equipment to suppliers for reconditioning • Donation of old furniture and computers to local community s and/or schools
Recycling	• Trees that are stripped from a site prior to excavation should be used, for example as a fuel, where feasible • Soils overlying the ore to be mined should be stripped and stored for reuse in the restoration of the land at the end of the operations. Stockpiles of soils should be carefully managed so as to maintain the soils in good condition

	• Overburden and waste rock from mines should be used for progressively backfilling the void created by the mining operations where feasible • Soils arising from the levelling the ground surface for mine infrastructure should be reused in landscaping works or stockpiled for later use in restoration • Wood, steel and other metals should be separated from construction and demolition waste, to the extent practical, for reuse and/or recycling to reduce the quantity of waste that needs to be disposed • Proper storage and site practices should be employed to reduce the potential for damage or contamination of construction materials • Determine what materials can be recycled and collect and store these separately
Energy Recovery	• Investigate feasibility of on-site incineration with energy recovery • Determine local availability of energy from waste facilities
Responsible Disposal	• Assess standards of local landfill facilities • Use on-site incineration to reduce polluting potential of residual wastes • Develop own landfill site if necessary

3.2 Proximity Principle

Waste should generally be disposed of as near to its point of origin as possible, taking into account the availability of suitable waste treatment or disposal facilities. This will help to minimise energy usage, accident and environmental impacts associated with long distance transport of waste and ensure that potential waste disposal problems are not simply exported to other regions or countries.

It is usually more sustainable for a waste to be transported a greater distance to be recycled than to be landfilled (or even incinerated with energy recovery) at a closer site. Similarly, for certain wastes (typically the more hazardous or more difficult to treat wastes) exporting the waste may be the only environmentally acceptable option. Making the right choice can only be achieved by undertaking an assessment of different waste management options – see Section 6.

3.3 Lifecycle Approach

The potential impacts of resource use and waste should be identified and managed across the lifecycle of a site or facility. It is important to remember that the biggest opportunity to minimise the

impacts of waste management, as well as resource use, is during the design stage of a site. The design phase offers the greatest chance of reducing the volume, hazardous nature and costs associated with waste. However, there are additional practical opportunities to improve how wastes are managed at every stage of the lifecycle.

4. WASTE MANAGEMENT PLANS

Technical Standard TS 9: *Resource Use and Waste Management* requires each HZL site to develop a Waste Management Plan (WMP) as part of the Sustainability Management System. The WMP should state how wastes generated at the site will be managed in order to optimise the use of materials and ensure all wastes are managed effectively.

4.1. Developing the WMP

The scale and detail of the WMP will be dependent on the type of operation[1], the type and quantity of waste generated and the relative availability of local waste management facilities.

It will be usual for the Waste Management Plan to cover all the different stages of an operation's development (from exploration through to post-closure including rehabilitation) even though each phase will generate different types and quantities of waste.

The following table outlines the contents and detail that should be included under each section of a WMP for a typical operation.

[1] Includes on/offshore assets as well as mines and production sites.

Section of WMP	Detail to be included/ Work to be undertaken
Objectives and Targets	This section provides the opportunity to establish the level of waste management that the operation intends to work towards. The starting point for this should be the HZL Standard *TS09 Resource Use and Waste Management* which sets the minimum expectations for waste management such as: • Effective management of all types of waste to ensure that sustainability related impacts are systematically considered in all business decisionmaking processes; • Minimising generation of waste; • Applying the principles of the waste hierarchy; • Managing all unavoidable waste in such a way that the risk of harm to human health is minimised and pollution of the environment is avoided; and • Applying the Proximity Principle, aiming to dispose of all waste as near to its point of origin as possible. Additional specific details can be included based on the identified potential impacts and operation-specific aspects e.g. the storage of liquid wastes near sensitive receptors or setting of recycling targets for specific materials
Applicable Regulations, Standards and Permit Requirements	This should include: • HZL Corporate Standards; • Local laws, regulations and permitting requirements; • International agreements; • Lender commitments if applicable (e.g. does the project/operation need to comply with International Finance Corporation (IFC) requirements?); • Cross reference with site Environmental Clearance documents; and • Cross-reference with ESIA requirements (including worker/contractor accommodation), where applicable.

Section of WMP	Detail to be included/ Work to be undertaken

Roles and Responsibilities	Identify who is responsible for the different aspects of waste management. To do this it is important to clarify: • Who has the responsibility for managing each type of waste generated by the site including by contractors and their sub-contractors; • Who has the responsibility for waste transportation including for vehicles and equipment; and • Who has the responsibility to obtain the required permits. Depending on the complexity of the waste management arrangements, responsibilities will need to be assigned for the following tasks: • Developing and maintaining the WMP including the waste inventory; • Implementing the WMP; • Training staff in the requirements of the WMP and specific waste management procedures; • Arranging contract agreements for external waste management service providers; • Assessing and auditing external waste management service providers; • Monitoring compliance to the WMP and overall waste management performance; • Record keeping; and • Locating and assessing temporary storage.
Waste Inventory	Waste Identification and Characterisation/ Classification • Determine what wastes will be generated though the life cycle; • Classify each waste stream in accordance with HZL Sustainability Framework requirements and, where appropriate, any additional local/national requirements; and • Identify which wastes may require special handling. Quantify waste • Determine quantities of waste at each life cycle stage of the operation of project. This may be an estimate at the start of a project, but should be refined during the lifetime of the site based on waste tracking reports.
Waste Minimisation	• Discuss opportunities to eliminate the generation of waste or at least reduce the volume and toxicity of each type of waste; • Evaluate packaging and unused products to ensure they are returnable to suppliers where possible; and • Once opportunities for waste minimisation have been assessed, the waste inventory may need to be revised.
Section of WMP	**Detail to be included/ Work to be undertaken**

Preferred Waste Management Options	Available Waste Management Infrastructure • Identify and evaluate the local and national certified waste treatment and disposal facilities to see whether they can treat/dispose of the site's wastes and whether they meet HZL HSE standards and all legal requirements. List and evaluate waste management options • All the different options for managing each identified type of waste should be identified and assessed to determine the most appropriate management route for each waste; and • In determining the most appropriate waste management routes, take account of community HSE and social risks. Select the preferred waste management methods (see Section 5) • Document the process of identifying the preferred option for managing each type of waste or waste stream; • Note any constraints and alternatives identified during the review of options; and • For types of waste for which no acceptable disposal is available, develop storage strategies.
On-site Waste Management Procedures	Based on the preferred management strategy for the types of waste produced, develop procedures for the on-site management for each type of waste (including PPE requirements, signage, handling, on-site transport and any pretreatment and storage and assurance/review). This will include civil engineering, mechanical/ electrical equipment and human resource requirements.

Development of the waste management arrangements should be formally documented in a location-specific WMP and specific working procedures should be developed for different elements of the waste management system including:

- Handling (e.g. personal protective equipment (PPE) to be worn when handling each type of waste);
- Storage;
- On-site transport; and
- Arrangements for off-site disposal, including from offshore assets.

4.2. Implementing the WMP

Initial tasks required to implement the WMP include the following:

- Construction of on-site waste storage and treatment facilities and procurement of associated waste handling equipment and signage;
- Procurement of third party waste management services;
- Training staff in waste management procedures – if necessary hiring staff for waste operations; and
- Communication of on-site waste management procedures (e.g. waste segregation) to all staff as appropriate

During the life of the operation, the following tasks will need to be undertaken to ensure the ongoing implementation of the WMP:

- ***Auditing of Waste Management Procedures*** - This should cover internal checks to monitor site performance and also audits of third party waste handlers and disposal companies.

- ***Monitoring and Reporting*** - A system of measuring and recording the waste produced and how it is managed should be developed to meet operation, HZL and any local regulatory authority requirements for record keeping (see Sections 8.3 and 9).

- ***Review and Update Plan*** - The WMP should be subject to a formal review procedure to ensure that it remains up to date and takes account of any site, activity and legislative changes. This review can be linked to the annual ISO 14001 review (if applicable), but the WMP should also be revised to capture any issues arising from significant changes/modifications to site operations and practices as and when they occur.

- ***On-going Training and Competency Assessment*** - It is important to provide waste awareness training for the whole workforce, including any contractors working on site. This should include instruction in any procedures for segregating waste at source. Staff dealing directly with waste management aspects will need more detailed training and regular review of their competency.

5. EVALUATING WASTE MANAGEMENT OPTIONS

A key part of developing the WMP is determining the preferred way of managing the different waste streams generated. It is recommended that, in the case of the more hazardous or difficult to treat wastes, a formal assessment of the best practical environmental option (BPEO) is undertaken. A simplified assessment will be sufficient for other wastes streams. The process should be documented for future reference and should be repeated periodically to ensure the optimum waste management options are still being utilised (e.g. when on-site processes change or new treatment/disposal facilities become available locally).

Determining the preferred option should take into account the following:

- Waste Hierarchy – giving priority to avoidance and minimisation of waste generation followed by recovery, reuse and recycling with the least preferred option being disposal (landfill or incineration);
- Regional Self Sufficiency – this requires that most waste should be managed within the region in which it is produced; and
- Proximity Principle - aiming to dispose of all waste as near to its point of origin as possible

The preferred options should also consider economic and social considerations as well as environmental and resource impacts. In particular, environmental, social and economic costs of transporting waste are all important and part of the evaluation process. In countries with limited waste management options, the risk and long-term liabilities associated with in-country solutions need to be considered as part of the process. For certain hazardous wastes, exporting the waste to countries that have suitable treatment facilities may be the only acceptable option.

As noted previously it will be necessary to review the options periodically because, in many economically developing countries, recycling markets and waste treatment facilities may well evolve over the lifetime of a site.

5.1. Assessment Methodology

The following three stage assessment methodology is recommended:

- ***Stage 1*** - For each material type or s of wastes, identify the potential waste management options. Evaluate the various waste management technologies and their applicability to each of the wastes (see Section 5.4).
- ***Stage 2*** - Screen the identified options to eliminate any that are wholly unacceptable or impracticable due to extreme expense or lack of availability.
- ***Stage 3*** - Assess each remaining option, for each waste types or s, against a set of objective criteria (see below).

5.2. Evaluation Decision Criteria

Decision criteria need to be developed to assess the suitability of the waste management options. Example decision criteria are listed below but the criteria to be adopted, and the weighting that is given to each, should be determined and agreed by the senior management team for the site.

Criteria	Comment
Health & Safety	Risks arising from physical injury/accidents, exposure to wastes, and transportation/movements of materials
Cost	Costs associated with investment and delivery of option, including initial capital expenditure and all associated operational costs
Technical practicability	The chosen option must be practicable. Consideration of technical challenges involved in implementation, overall deliverability, including operational lead time and skills shortages
Operational feasibility	If significant changes to current operational practices are required, this may represent a barrier
Local availability of technology	Availability of the treatment technology in-country or the need to export
Environmental impacts	Environmental impacts from technology option e.g. emissions to air, land and water
Hazard reduction	The extent to which hazards associated with the wastes are reduced
Long-term liabilities	Long term liabilities likely to result from implementation of the option (e.g. long term monitoring/ supervision or financial liabilities)
Resource consumption	Energy usage of the proposed solution and fuel consumption involved in transport of materials. Energy benefits from recovery of materials and off-setting other fuels
Regulatory and legal compliance	Potential to meet local, regional and international regulations conventions or agreements both present and future

Criteria	Comment
Social/socio-economic	Impact on local skills base and potential employment opportunities. Potential for enterprise development at local, regional or national level

5.3. Weightings and Scoring of Options

Weightings need to be agreed for each of the criteria to reflect the relative importance of the different criteria. Each of the short listed options should then be scored between, say, 1 (poor performing for that criterion) and 5 (best performing for the criterion). The scores are then multiplied by the weighted factor for each criterion and totalled to determine the overall score for each waste management option. Based on these overall scores, each of the options can be ranked to determine the 'best' option. Although this appears to be quite an involved process, use of an excel spreadsheet enables it to completed relatively easily and allows it to be updated as required.

The following table presents an example of the output from the evaluation scoring process; this is for illustration purposes only and is not a mandatory HZL methodology and business are encouraged to develop their own method within their own procurement processes.

Criteria	Relative weighting	Option 1		Option 2		Option 3	
		Score	Weighted score	Score	Weighted score	Score	Weighted score
Health and safety	10	2	20	4	40	1	10
Cost	2	1	2	1	2	5	10
Technical practicality	7	4	28	2	14	2	14
Local availability	5	0	0	2	10	4	20
Environmental Impact	7	2	14	1	7	2	14
Social/economic	5	4	20	4	20	4	20
TOTAL			**84**		**93**		**88**

In the example above, Option 2 scores the highest overall although all three options have quite similar scores despite quite different individual characteristics.

5.4. Overview of Main Waste Treatment and Disposal Options

The main options that are likely to be considered for most types of waste are as listed below.

Option	Description / comments

Reuse – onsite	• Where feasible overburden and waste rock from mining activities should be stockpiled and used for progressively backfilling the void created by the mining operations. Similarly the soil stripped from the mine area prior to excavation should also be stockpiled and used for the restoration of the site. • Maximise reuse of equipment by investigating repair and refurbishment options • Potential to reuse containers (e.g. oil drums) to store other materials. Containers MUST be adequately cleaned before reuse to avoid contamination and potential adverse chemical reactions, and properly re-labelled. Dispose of cleaning liquids responsibly – they are also a

Option	Description / comments
	waste Co-ordination between different departments on site may be required to make sure that all opportunities for 'internal reuse' of equipment is maximised
Reuse – offsite	• Potential to sell or donate items for reuse by local third parties • Consider confidentiality issues e.g. access to computer hard drives • Consider liability issues e.g. potential for an accident/incident to be caused by equipment originating from a HZL site • If there is any doubt it may be better for the waste item to be recycled rather than reused
Recycling	• Waste materials that may be recycled include oils, solvents, batteries and tyres • Carefully consider future liability issues, especially when working in countries where HSE legislation and enforcement is not very rigorous • Make sure that items for recycling are rendered unusable prior to leaving the HZL site so that there is no risk inappropriate use • Audit recycling companies before using them to make sure that they meet operation/HZL's minimum Sustainability performance expectations
Composting	• Simple, outdoor windrow composting is suitable for vegetation from site clearance and from maintaining landscaped areas. It generally requires a relatively large area, is not suitable for food wastes (unless the output is to be used on site) and it is not appropriate in all climates • In-vessel (tunnel) composting works well in most climates and can be used for food and other organic wastes. The process can be relatively expensive however and requires an appropriate mix of waste types and appropriate process control
Incineration (with/ without energy recovery)	• Can be used for waste food, mixed wastes, certain liquids, medical wastes, any non-recyclable items that are combustible • Wastes may be consigned to a commercially operated facility (typically an energy from waste plant – see below) • Smaller incinerators of varying sizes are available for exclusive use at project sites

Energy recovery	• Usually involves large-scale incineration of municipal waste and/or other non-hazardous wastes with the heat being used to raise steam which, in turn, is used to generate electricity and possibly also to produce hot water (combined heat and power – CHP). • Energy from waste (EfW) facilities are usually operated by local authorities or commercial waste management companies • Energy recovery from small incinerators is less common but equipment can be bought with heating systems incorporated • Anaerobic digestion of organic wastes to generate methane is another form of energy recovery although the specialist nature of the plant may make it less attractive for most HZL sites. It should be considered where such facilities already exist locally.
Option	**Description / comments**
Landfill (see also below)	• Landfilling usually refers to the deposit on land of non-mineral wastes (e.g. municipal waste and general non-hazardous wastes) • Landfills can give rise to a number of environmental problems e.g. generation of landfill gas and leachate. Therefore landfill disposal should be minimised as far as practicable • It is likely that some waste will need to be landfilled and that landfill will be required for the disposal of the residues from any waste treatment processes e.g. incinerator ash

Following on from the above, the preferred choice of landfill for off-site disposal should be made on the basis of minimising impact to the environment as far as is possible. The poor standard of municipal landfills is frequently a major challenge in many developing countries where such sites can often only be regarded as being 'open dumps' and do not provide adequate protection to the environment. In such cases it may be necessary for an operation to:

- Develop its own landfill site;
- Ensure landfills used by an operation are to a sufficient standard; and
- Ensure,landfills are licensed by the appropriate authorities to receive the specific wastes being sent to them (e.g. environmental protection measures such as clay liners and leachate collection are important considerations where there is the potential to impact the environment).

In addition, hazardous wastes should only be sent to landfills which are equipped to deal with, and dispose of, hazardous materials. Where the landfill standards are not adequate to receive particular wastes, pre-treatment should be undertaken to reduce the hazard and/or pollution potential of the waste prior to it being landfilled.

6. ON-SITE WASTE HANDLING AND STORAGE

The waste storage, treatment and handling facilities required at any particular location will depend on the nature and quantities of waste and how those wastes are to be managed subsequently.

6.1. Waste Segregation

All wastes (whether hazardous or non-hazardous) should be segregated to prevent chemically incompatible materials coming into contact with each other and to prevent contamination of

potentially recyclable materials. The specific types of waste that need to be collected and stored separately will depend on how the wastes are to be handled subsequently, as determined in the WMP. There may also be legal requirements to segregate different wastes as, for example, it is often the case that all hazardous wastes will need to be segregated from all non-hazardous waste streams.

As a guide, the following wastes types may need to be stored separately:

Paper and card	Metal	Hazardous wastes (individual)
Filters	Cables	Concrete wastes
Aluminium	Plastic bottles	Contaminated soil
Washed food cans		
Miscellaneous plastics	Batteries	
Waste oil	Glass	Electronic and electrical Waste (WEEE)
Wood	Tyres	
Mixed non-hazardous waste		

If, however, two or more of these different waste types will be disposed of together, there is no point in collecting and storing them separately – it is better to have as few different categories of waste as possible.

An example of segregated storage of different wastes

Segregated storage of different types of recyclable material

6.2. Storage

6.2.1 Long-term storage

Long-term storage options will be required when no treatment facility is available locally for one or more types of waste (usually the more hazardous wastes) generated by an operation. Options include waiting for a third party waste management facility to be built, evaluating shipping/export options or for HZL to develop its own appropriate treatment facilities. Long-term storage should **not** be considered as an alternative to treatment and/or disposal – a suitable method of managing every waste stream needs to be established and final treatment identified. It is important to plan for the storage of the forecasted volume of waste and allow sufficient contingency in case it takes longer than anticipated to identify the final treatment and disposal option.

6.2.2 Hazardous waste storage:

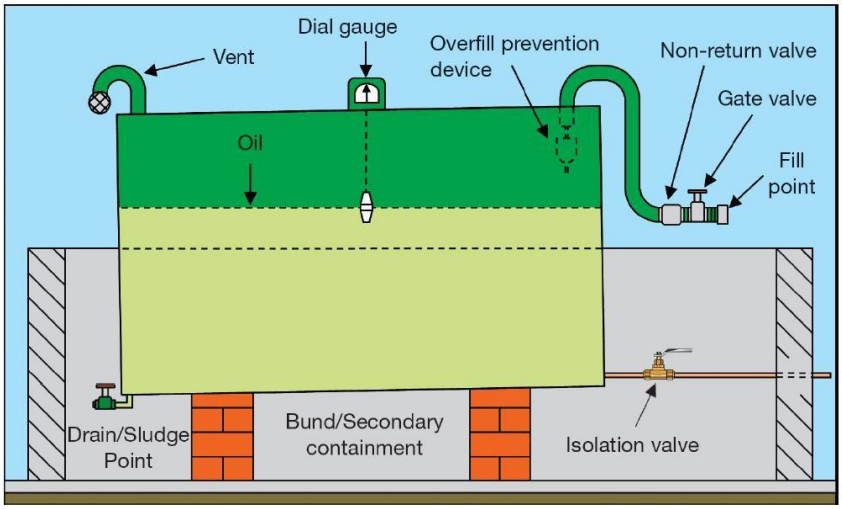
- A list of all products on site should be maintained, together with locations, classifications, handling advice, Material Safety Data Sheets (MSDS) and/or other relevant information ○ Make sure that all site locations are included, including the site laboratory (if there is one)
    - ○ Keep a copy at the waste storage site
- Hazardous wastes should be stored separately from non-hazardous wastes in designated secure areas with access restricted to authorised personnel that have received appropriate training.
- All hazardous waste should be stored above ground.
- Storage areas for hazardous waste should have a sealed surface (e.g. concrete) and a method to contain any leakage or contaminated runoff water. Typically this will comprise a bunded area. The foundations of the storage area should be strong enough to withstand the loads

imposed by the weight of the containers and any vehicles or forklift trucks that need to access the area.

Intermediate Bulk Containers (IBCs) used for storing bulk liquid wastes

- Secondary containment should be provided for the storage of all liquid waste. This should have a capacity of 110% of the largest storage container or 25% of the total storage capacity, whichever is greater.

Example of a bulk storage tank with secondary containment



Cross-section example through a facility for storing waste oil showing typical bunding arrangements

- Bunded areas should be sheltered to prevent accumulation of rainwater and to protect containers from exposure to the heat and UV light from direct sunlight.

Prefabricated storage container providing protection from rainwater ingress

- The compatibility of different types of hazardous waste should be addressed when designing and managing storage facilities.
- Always use the correct PPE when handling hazardous waste.
- Appropriate spill kits for the types of liquids being handled on site should be part of the equipment available on site.
- Storage facilities should also comply with any national requirements.
- If no suitable treatment exists for a particular type of waste, either on site or in country, long term storage may be required until a suitable option is found (see below).

6.2.3 Storage of hazardous and non-hazardous wastes

Use of appropriate containers with adequate labelling is essential to maintain good on-site waste management practices. The type and number of containers (skips, bins and tanks) should be determined after the waste inventory has been prepared.

Key considerations for the storage of non-mineral waste include the following:

- Keeping the waste inventory up to date – an example Waste Inventory format is shown in Annex B.
- Contracting waste contractors in advance - include the definition of the correct type and size of bins and containers (compatible with contractor vehicles). Procure appropriate containers
  - e.g. 6m^3 skips are ideal for construction waste as well as inert waste generated during operating and decommissioning phases
    - closed containers are required for wastes that will attract flies and vermin
- Compatibility of the containers with the wastes contained within them - containers must be chemically and physically suitable to ensure that waste cannot escape or leak (e.g. as a result of corrosion or damage) and they should be of an appropriate size and shape for the type of waste
- Signage - Clearly label each container to highlight its contents. It is particularly important to ensure that containers are clearly re-labelled when their use changes. Labels should be in the local language(s) as well as English.

The following table indicates typical containers that may be used for different types of waste.

Waste Types	Container	Notes and examples
Paper, metals, plastics, tyres, concrete/rubble, general nonputrescible wastes	Open skips, closed skips	Depending on storage location/exposure to weather
Putrescible wastes (food scraps)	Plastic bags, closed plastic bins	Plastic bags should be stored within skips or other rigid containers to protect them from damage

Oil	Tanks, Metal drums, Intermediate Bulk Containers (IBCs)	Bulk tanks can be used for waste oil. 
Liquid chemicals	Metals drums, Plastic drums, IBCs	Chemical compatibility must be checked. Intermediate Bulk Containers (IBCs) used for storing bulk liquid wastes 
Laboratory smalls	Glass jars	To be stored within a locked cabinet or compound. Lockable, fire-proof cabinet for the storage of small quantities of chemicals
Waste Types	Container	Notes and examples

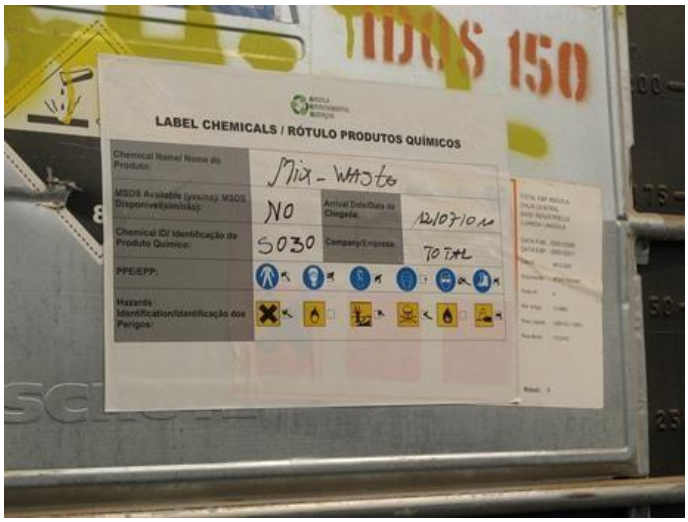
		
General clinical waste	Doublebagged plastic – specific colour	Colour and markings depending on national legal requirements – use proprietary containers where possible.
Clinical waste – sharps (syringe needles)	Rigid plastic containers with secure closure	

Waste storage areas for non-hazardous wastes should:

- be securely fenced and gated to allow access only to authorised persons and to prevent scavenging by animals
- organised in an orderly way such that similar wastes are stored together and it is easy to identify and access containers being used to store particular waste types have adequate signs to indicate:
    - which wastes are stored in the different areas of the compound
    - warn of any particular hazards, including hazardous waste storage area and presence of mobile plant using international symbols
    - indicate contact numbers for responsible persons and emergency services.

 be bunded or otherwise protected.

All signs relating to wastes should (ideally) be written in English and the local language(s) to ensure full understanding. An example is provided below.



Example of a multilingual label for waste container

7. ON-SITE WASTE TREATMENT AND DISPOSAL

This section focuses on on-site treatment and disposal of non-mineral waste. The level of on-site waste treatment required will depend on the availability of local off-site waste management arrangements. For example, where there is a lack of local or regional waste treatment facilities that meet HZL's standards for health, safety and environmental protection, there will be a greater need for on-site treatment to reduce the volume and/or hazardous nature of waste.

7.1. On-site versus Off-site Treatment of Wastes

Onsite treatment of waste has a number of potential advantages:

- Volume reduction can reduce the costs of transportation;
- Treating waste so that it is less hazardous can lower the risk of accidents and reduce subsequent disposal costs; and
- On-site treatment means the process is under HZL's control so it is easier to apply HZL's standards of health, safety and environmental protection.

Alternatively, specialist waste management contractors may be better placed, in terms of equipment, skills and experience, to undertake hazardous waste treatment. For each particular waste stream, an assessment should be made as to the feasibility and value (cost/benefit and mitigated risk) of treating and/or disposing of the waste on-site or of undertaking some form of pretreatment before the waste is consigned to treatment or disposal off-site.

7.2. On-site Waste Treatment (Pre-treatment) Options

The following table lists the pre-treatment, and more comprehensive treatment, techniques that can be applied on-site to reduce waste volumes or to render the wastes less hazardous for subsequent transport and off-site management.

Treatment	Waste types	Purpose

Crushing and baling	Paper, card, plastic bottles, aluminium/steel cans	Volume reduction
Shredding	Tyres, drums, (unusable) wooden items	Volume reduction
Crushing (1)	Fluorescent light bulbs	Volume and hazard reduction
Piercing (2)	Aerosol cans	Hazard reduction
Crushing (1)	Cans and tins	Volume reduction
Crushing (1)	Glass bottles and jars	Volume reduction
Composting	Food, vegetation	Removal of polluting potential, beneficial treatment
Incineration	General mixed (non-hazardous) waste, sewage sludge, dewatered food	Volume reduction, removal of polluting potential (organic content)
Incineration (hazardous waste)	Organic solvents, specific hazardous wastes	Hazard reduction

Note (1) Specialised equipment for the specific waste type
(2) Including collection of drained liquids

When purchasing equipment for treating waste on-site, it is important to consider how the waste needs to be fed into, and the treated residue removed from, the equipment. Certain equipment may require forklift trucks or other means of lifting the waste containers. If the expectation is that manual handling will be used, the loads involved must be of an appropriate size (e.g. typically less that 20-25kg). Wherever possible, waste containers should be emptied mechanically to minimise the risk of operators coming into contact with waste. The more hazardous the waste the more important this is. A comprehensive risk assessment should be carried out on the proposed system before ordering.

Example of a waste baling machine

Example waste shredder

Example aerosol destructor

7.3. On-site Waste Treatment Areas

Example of a containerised incinerator

To conduct on-site treatment properly, a dedicated area should be established for any waste treatment that is undertaken on site. Typically this could be part of a centralised area for the storage and treatment of different types of non-mineral wastes.

Such a centralised waste handling facility may include the following key features:

- Security fencing/gates and signs as indicated in Section 6.2;
- Office and welfare facilities (including shower/washing facilities if appropriate);
- Waste processing building or container;
- Area for unloading waste and sorting;
- Parking and vehicle turning area;
- Utilities (water, power, communications etc.);
- Hard-standing area for large items e.g. made from concrete/tarmac/asphalt;
- Safety equipment including fire extinguishers, emergency shower/eye wash;
- Storage area, possibly in used shipping containers;
- Separated hazardous storage area if required (and bunded); □ Incinerator(s), if required; and

- Composting area if required.

Examples of typical waste storage areas are provided below.

An example of segregated storage of different wastes in a single waste treatment area

A typical secure, sheltered, storage area

A typical dedicated storage area for multiple waste types

8. WASTE TRANSFER AND OFF SITE TREATMENT AND DISPOSAL

HZL recognises that it has a 'duty of care' to ensure that any and all waste it produces is handled safely meeting HZL requirements and expectations and in accordance with local and international legal requirements. This duty extends beyond the management of waste at HZL's sites to ensure the safe and proper disposal, or recovery, of waste that it produces, even after the waste has been passed on to another party (e.g.such as a waste contractor, scrap metal merchant or municipal authority).

8.1. Use of Third Party Contractors

Each operation should check that any third party used to transport, treat and/or dispose of its waste is legally authorised and competent to undertake the task. This should be undertaken by contacting the licensing or permitting authorities and inspecting the contractor's operations as part of the contract evaluation process.

The following table indicates the key requirements expected of a waste management contractor and checks that should be undertaken by the HZL site.

Contractor requirement	Checks to be undertaken
Registered/licensed by the relevant authorities for waste collection/ transport/ recycling/ disposal (depending on contract requirement), and track record of working within the legal structure	Review the authorisation documentation / site licence/permit. Check with regulator whether contractor has ever been prosecuted for breach of waste management regulations.
Vehicles that meet the operation/HZL health and safety and environmental standards	Inspect vehicles against operation/HZL standards and guidelines.
Site and operations that meet requirements of the operation/HZL	Are wastes stored safely in appropriate, leakproof, containers with adequate labelling and
Contractor requirement	**Checks to be undertaken**
standards for waste management and general environmental and health and safety standards including storage, staff welfare, waste processing, safety systems, security, reuse-recycling and disposal routes, trained workforce, and a site that is tidy and safe.	safety measures?
	Is there a workers welfare area?
	Are safety systems incorporated into the processing equipment?
	Is the site secure from intruders?
	Are wastes tracked to their final destination?
	Does workforce have adequate waste handling training?
	Has the workforce been provided with appropriate PPE and is its use being enforced?
	Can the contractor demonstrate staff competence?
	Is the site tidy and generally safe?
Able to supply evidence of previous contracts and customers	Do other customers recommend the services? References available?
Agree to the waste tracking system, and return forms stamped and dated following shipment	Is the waste tracking system effectively applied?
Agree to work with the operation on improving waste management practices locally (may be required if current practices are below standard expected by HZL but no practical alternatives)	Are there other waste management practices available?

The contracts for handling the site's waste should be explicit about HZL's expectations in terms of the standard of treatment and disposal and should include clauses regarding HSE performance.

Audits of third party waste contractors should be undertaken periodically throughout the contract to ensure that the contractor is working in accordance with the agreed contract and HZL performance expectations. The frequency of the audits should be adjusted depending on the risks associated with the types and quantities of wastes involved and also the past performance of the contractor. As a minimum, waste contractor audits should be conducted once every three years.

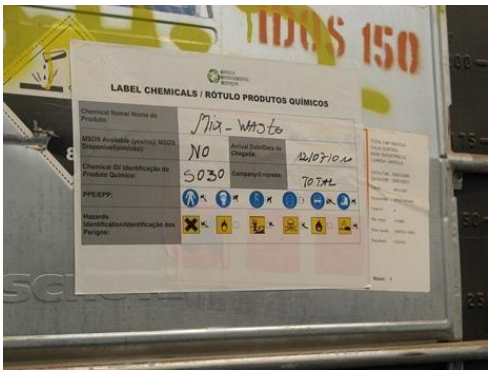
Working with the Local Waste Management Service Providers to Improve Standards

Where there are inadequate local disposal facilities, the site should seek to work with local waste management service providers to promote the development of improved methods of waste treatment and disposal. This could involve encouraging local third-party arranegments or, in specific circumstances, it may be appropriate to provide investment in local municipal waste infrastructure. This might include helping the local municipality to upgrade its dump site to an engineered landfill. In this way, HZL may not only benefit from a suitable disposal option for its own general waste stream but it would be providing the local community with the lasting legacy of an improved facility for its household waste and hence an improvement to the local environment. This benefit to the local community may continue beyond the operation's use of the facility.

8.2. Containers and Labels

Prior to allowing a consignment of waste to leave site, each waste container should be checked by a responsible person to ensure that it meets the requirements of the HZL Guidance Note GN 06 *Safety Signs* and is:

- Clearly labelled to describe the waste it contains. Any old labels or markings on the container (e.g. from its original use) must be completely removed or totally obscured to avoid confusion as to the contents of the container;
- In good condition and not leaking;
- Appropriate to the waste it contains;
- Appropriately sealed (e.g. with a lid or bung); and
- Not emitting any harmful gases or generating heat (this could be a sign that incompatible wastes have been stored together resulting in an adverse chemical reaction.).



Example of a labelled waste container

If any container of waste is discovered to be inadequately labelled or not in a good condition, as specified above, it should not be allowed to leave the site. The operation Environment Manager, or other responsible person, should be contacted and he/she should take all necessary corrective action(s) to rectify the situation before allowing the waste to leave the site.

8.3. Waste Tracking

In order to confirm the proper transport and transfer of each load of waste from the point of leaving the site until final disposal at an authorised facility, the HZL *Resource Use and Waste Management* Standard requires a waste tracking system to be used. The site should use the HZL system of Waste Transfer Notes (WTNs). If national legislation specifies other requirements they must be added to the HZL System,

For each load of waste that leaves the site, a paper consignment / transfer note (WTN) should be completed that details exactly what the waste comprises in terms of type and quantity of waste. A copy of the WTN should be retained by the operation (e.g. it is recommended that hazardous waste transfer documents are retained for a minimum of three years and non-hazardous documents for two years – unless local regulations require longer periods) and the WTN should then accompany the consignment of waste as it is transported. A chain of custody must be established such that at each point that the waste load is handed from one authorised handler to another, the person receiving the waste is required to sign the form to acknowledge safe receipt and the person handing over the waste retains a copy. At the point of final treatment/disposal the form should be signed by an authorised person at the licensed facility and a copy of the form returned to the operation as evidence of the safe receipt of the consignment at the intended final location.

In the absence of a standard format prescribed nationally, the example WTN provided in Annex A of this Guidance Note should be used as a basis for recording waste disposal. Key information that should be recorded includes:

- Type/nature of the waste, including any national coding or classification
- Quantity or volume of waste
- Final disposal location
- Dates and times of dispatch, transfer and disposal
- Waste contractor details for transport and treatment/disposal

Completed forms should be retained on site for the period specified in any national regulations or for a minimum period of two years. A similar system of WTNs should be used for the treatment and disposal of wastes at on-site facilities.

In the event that a final disposal acknowledgement is not received for a particular load of waste, an investigation should be undertaken to determine what has happened to the consignment of waste and should:

- track down the particular load and ensure it has been properly disposed or, if necessary, arrange for its proper disposal (if feasible); and
- identify the reasons why the tracking system/designated management arrangements failed and put in place measures to ensure that a similar problem does not occur again.

9. RECORD KEEPING

Information and data on the quantities of the different types of waste that arise on site and the treatment/disposal methods that are used, as recorded on the waste transfer notes, should be collated and kept in a register or database in accordance with the site's environmental

management system and/or any system required by the regulatory authorities. This should include details of waste treated or disposed on site.

This will enable the operation to:

- provide information to the regulatory agencies if required by national legislation; and
- analyse waste arising and treatment /disposal methods to facilitate proper control and allow the impact of waste minimisation or other campaigns to be assessed.

A member of site staff must be designated to maintain the waste register (waste log) and copies of all consignment notes (WTNs) that have been produced for waste generated on site. The waste register should be maintained as an electronic database to facilitate analysis and it will also serve as an index for all WTN consignments. Hard copies of WTNs should be kept as back up evidence of the disposal of individual waste loads.

The Waste Register should include the following information:

- Information on each waste stream;
- Source of wastes (e.g. accommodation block, offices, ore processing);
- Detailed waste description;
- Classification of waste (hazardous/non-hazardous);
- Quantity (by mass or volume);
- Disposal/treatment site;
- Disposal/treatment method;
- Unique WTN reference number;
- Dates of transfer; and
- Dates of receipt at disposal/treatment site.

An example format/template for a waste register is presented in Annex C.

10. AWARENESS AND TRAINING

As part of their site induction, and at regular intervals thereafter, all employees should be trained to make them aware of the waste management requirements and procedures for the site. This should include proper handling of hazardous wastes, waste minimisation, segregation and storage and waste documentation/WTN procedures. Employees that have specific waste management responsibilities should receive more in-depth, tailored, training to ensure that they can perform their duties effectively.

Although training to be developed and delivered will be dependent on the types of wastes being generated at any one location, waste management training/awareness materials should, as a minimum, include the following:

- Applicable regulatory requirements on waste management;
- Outline on the waste hierarchy;
- Overview of hazardous and non-hazardous wastes;
- Separation of wastes;
- Storage of wastes e.g. what containers to use, dedicated areas;

- Handling of waste materials e.g. use of PPE where appropriate; Disposal of wastes e.g. using licensed waste contractors; and
- Inspection of waste areas; etc.

Periodic poster campaigns and other forms of communication/training should be used to ensure an on-going awareness of correct waste management procedures and to address any identified shortfalls or deficiencies in implementation of the waste management plan (WMP). Poster campaigns are an effective way of raising the awareness of why wastes should be managed in an appropriate manner. Poster campaigns should be simple and pictorial and used for short periods to ensure they have the maximum effect.

RELATED DOCUMENTATION

A summary of the references and supporting documents relevant to this document is provided in the following table.

Doc. Ref.	Document name
HZL documents	
POL06	HSE Policy
TS06	Supplier and Contractor Management
TS09	Resource Use and Waste Management
TS11	Environmental Management
MS07	Management of Change
GN 02	Hazardous Materials
GN 06	Safety Signs
GN 10	PPE
GN 31	*Mineral Waste and Tailings Management*
Other documents	

International Finance Corporation (IFC) Performance Standard 1 Guidance Note 1	Assessment and Management of Environmental and Social Risks and Impacts
International Finance Corporation (IFC) Performance Standard 3 Guidance Note 3	Resource Efficiency and Pollution Prevention
Basel Convention	Control of Transboundary Movement of Hazardous Waste and their Disposal
OECD	Guidelines for Multinational Enterprises, 2011 edition

DEFINITIONS

Definitions of key terms used in this document are shown in the following table.

Term	Definition
Best Practical Environmental Option (BPEO)	The outcome of a systematic, consultative and decision-making procedure which emphasises the protection and conservation of the environment across land, air and water. The BPEO procedure establishes, for a given set of objectives, the option that provides the most benefits or the least damage to the environment as a whole, at acceptable cost, in the long-term as well as the shortterm.(1)
Environmental and Social Impact Assessment (ESIA)	A formalised process designed to identify, assess and document environmental and social impacts associated with a project, along with the mitigation measures and management arrangements for ensuring such measures are implemented.
Environmental and Social Management System (ESMP)	The structured framework that provides the arrangements for managing the environmental and social aspects throughout the lifetime of the project.

Hazardous waste	Wastes listed in Annex I of the Basel Convention and/or those wastes that exhibit one or more of the following characteristics of hazardous waste listed in Annex III of the Convention: • explosive, • flammable liquids, • flammable solids, • wastes liable to spontaneous combustion, • substances or wastes which, in contact with water emit flammable gases, • oxidizing, • organic peroxides, • poisonous (acute), • infectious substances, • corrosives, • liberation of toxic gases in contact with air or water, • toxic (delayed or chronic), • ecotoxic, or • capable of yielding another material after disposal, e.g. leachate, which possesses any of the characteristics listed. In addition, any other waste defined as Hazardous by local country legislation shall be assumed to be 'hazardous waste'.
HSE	Health, safety and environment
ICMM (International Council on Mining and Metals)	The International Council on Mining and Metals (ICMM) was established in 2001 and seeks to drive performance improvement through its members which comprise 22 mining and metals companies as well as 30 national and regional mining associations and global commodity associations.
IFC (International Finance Corporation)	Member of the World Bank that finances and provides advice to private sector ventures and projects in developing countries.
Impact Assessment	The stage in the ESIA development process in which the potential positive and negative impacts on the various environmental and social receptors identified during the baseline data collection phase are assessed to determine their significance.
International Standards	The environmental and social Performance Standards set out by the International Finance Corporation

(1) *Best Practicable Environmental Option*. Twelfth Report of the Royal Commission for Environmental Pollution, 1988. Paragraph 2.1, page 5.

Mineral waste	Waste rock and overburden, tailings and spent heap leach ore from mineral processing, rejects from beneficiation or concentration of minerals, bauxite residue from alumina production, dross, refinery discards and sludges, smelter and other furnace slags, dredging materials and soils contaminated by mineral waste.
MSDS	Materials safety data sheet – leaflet or form that presents standardised information about hazardous materials
Operation(s)	A location or activity that is operated by a HZL Company and is part of the HZL . Locations could include mines, refineries, ports or transportation activities, wind farms, oil and gas development sites, offices including corporate head offices and research and development facilities.
PPE	Personal protective equipment
HZL Company	A subsidiary of HZL either fully or majority owned that has its own management structure (e.g. Hindustan Zinc Limited, HZL Aluminium Limited, Sterlite Industries limited, etc.)
Waste Transfer Note (WTN)	A form used to track movement of individual load of waste and to acknowledge transfer of responsibility as the waste is handed from one person to another. Copy of WTN to accompany consignment of waste from arising to final treatment/disposal.

Note (1) From the Twelfth Report of the Royal Commission for Environmental Pollution, 1988.

Annex A – Example Waste Transfer Note (WTN)

vedanta	**Waste Transfer Note**	WTN No.

A – Description of the Waste		
Description of the waste being transferred:		
Non-hazardous or Hazardous waste:		
List of Wastes Attached (Y/N):		
Waste code (if applicable):		
How is the waste contained: (indicate number of each container)	Sacks	
	Skip (size)	
	Drums	
	Other, please describe:	
Estimated total weight (kg/t):		

B – Transferor (current holder of waste)	
Site location:	
Contact name (in full):	
Contact telephone number:	

Destination of wastes (name of off-site or on-site waste management facility):			
Confirmation that the wastes are as listed and shall be transferred to the proposed destination			
Signature:		Date:	
		Time:	
Comments:			
C – Transferee (person collecting the waste - Waste Contractor):			
Company:			
Driver name (in full):			
Contact telephone number:			
Vehicle registration number:			
Date collected:			
Confirmation that the wastes are as listed and have been allocated for onward transfer to the proposed destination:			
Signature:		Date:	
		Time:	
Comments:			
D – Transfer (consignment receipt)			
Waste facility name:			
Site location/ address:			
Contact name (in full):			
Contact telephone number:			
Date received:			
Confirmation that the wastes listed have been received and can be managed in accordance with facility permit or licence:			
Signature:		Date:	
		Time:	
Comments:			

Annex B – Example Waste Inventory

Waste type	Storage Location (reference plan)	Storage Requirements	Storage Duration	Collection contractor	Collection frequency	Treatment / disposal options	Treatment / disposal facility
e.g. construction debris, non-ferrous metals, food / kitchen waste, used oil, organic solvents)	Make reference to appropriate site plan	e.g. Sealed containers with volume of Xm^3	e.g. maximum time to be stored on site	Include name of company and any licence or company reference number	e.g. fortnightly or within 24 hours of notification	Option(s) that may be used for the particular waste stream e.g. recycling, hazardous landfill	Include name and location of facility and its licence or permit reference

Annex C – Example Waste Register

Waste type	Source of Waste	Description	Hazardous or Non hazardous	Quantity	Disposal / Treatment Site	Treatment or disposal method	Waste Transfer Note Ref	Date Transferred	Dates of Receipt at Disposal / Treatment Site
e.g. ferrous metal, adhesive, paper	e.g. vehicle workshop, office	e.g. off-cuts of metal, oily rags, waste paper	H or N	e.g. weight in kg, volume in m^3	Name of site to which waste is taken	e.g. recycling, landfill	Reference number from WTN, attach copy of WTN	date transferred from site	Data received – as per part D of WTN
