مـــوان MWAN
المركز الوطني لإدارة النفايات
National Center for Waste Management

الضوابط والأدلة الفنية
للتخزين المؤقت للنفايات

Technical Guidelines
Temporary Storage of Waste

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LIST OF ACRONYMS

AWRC	Area Residential Waste Recycling Center
EIA	Environmental Impact Assessment
GHS	Globally Harmonized System
HDPE	High Density Polyethylene
HGV	Heavy Goods Vehicle
IBC	Intermediate Bulk Container
IR	Implementing Regulations
KSA	Kingdom of Saudi Arabia
MoH	Ministry of Health
MSDS	Material Safety Data Sheet
MWAN	National Centre for Waste Management
PCB	Polychlorinated Biphenyls
PET	Polyethylene Terephthalate
PPE	Personal Protective Equipment
RCV	Refuse Collection Vehicle
TG	Technical Guideline
WEEE	Waste Electronic and Electrical Equipment
WML	Waste Management Law

DEFINITIONS

Centre	National Centre for Waste Management
Competent Authority	The government entity responsible for operationally managing waste in accordance with a special regulatory provision.
Hazardous Waste	Waste classified as hazardous based upon the provisions of the Law and Regulations, which is resulting from industrial or non-industrial activities that contain toxic, flammable, or reactive materials, or corrosives, solvents, degreasers, oils, colorants, paste residuals, acids and alkalis.
Industrial Waste	Any Waste that is generated from industrial operations, or derived from manufacturing processes (including but not limited to mining waste); may be solid, sludge (wet solids) or liquid wastes and may be considered hazardous as per the definition of hazardous wastes.
Law	Waste Management Law
Licence	A written permission issued by the Centre for the purpose of carrying out any activity related to waste management in accordance with the controls determined by the Law and Regulation.
Municipal Solid Waste	Includes Residential Waste, which is Waste resulting from the usual activity of households whether or not they are collected mixed or separately, and also includes Commercial and Administrative Waste, which is Waste that is produced from other sources that are similar in nature and composition to Residential Waste.
Non-hazardous Waste	Waste that does not impose any risks to the general health or environment, and that may not be classified as Hazardous Waste.
Permit	A document granted by the Centre to waste recycling facilities attesting that they fulfil the Centre's controls and requirements before they obtain the licences issued by the competent entities in accordance with their regulations.
Segregation of Waste at the Source	The action of the generator of the Waste of segregating their waste to its components as defined by the nature of such waste, to enable higher resource recovery through recycling or reuse.
Service Provider	The person licensed or authorized to engage in one of the waste management activities.
Temporary storage	Storing the waste components or some of them temporarily for transfer or later use.

Transport Document	The form specified by the competent entity to follow up on the waste from the point of production to the point of safe storage, handling, or disposal.
Waste	All materials that are discarded or disposed of, and that directly or indirectly affect public health or the environment.
Waste Management	Organizing any activity or practice related to waste commencing from waste collection, transportation, sorting, storage, treatment, recycling, import, export, and safe disposal, including aftercare at waste disposal sites.
Waste Producer	Every person who produces classified waste according to the provisions of the Law.
Waste Electric and Electronic Equipment (WEEE)	Waste resulting from equipment operating with electric current (or electromagnetic fields). This shall include without limitation all components, sub-assemblies and consumables which are part of the product at the time of discarding, including but not limited to: mobile phones, chargers, printing machines, computers and automatic disponers.

1 PURPOSE AND SCOPE

1.1 Purpose

This Technical Guideline (TG) sets out the information that will be used by the National Centre for Waste Management (MWAN/ the Centre) to regulate and license temporary storage facilities for waste in the Kingdom of Saudi Arabia (KSA). Furthermore, this document provides guidance on the proper temporary storage of waste at the point of generation, prior to transfer to licensed storage facilities or final recovery/treatment facilities.

However, this technical guideline is not a design manual for temporary waste storage facilities and sound judgement and the appropriate technical expertise needs to be applied to ensure that, when constructed, temporary waste storage facilities will comply with the principles set out here and with any conditions of a licence issued by the Centre.

1.2 Scope

According to Chapter 2 and Annex 5 of the Implementing Regulation of the WML, there are two types of facility/activity involving the temporary storage of waste that are licensed by the Centre. These are:

- Temporary storage of recyclables1; and
- Temporary storage of hazardous wastes.

Therefore, the following are covered in these guidelines:

- Temporary storage of hazardous waste, including recyclable hazardous waste either at waste producers or at stand-alone facilities prior to transfer for treatment/recovery or final disposal;
- Temporary storage of recyclable waste including Bring sites for recyclables delivered by residents and householders and Area residential waste centres.

It does not cover:

- Temporary storage prior to, or after, processing at other waste management facilities, for example, composting plant, energy from waste facilities;
- Sites for bulking up of waste for transfer to another waste management facility;
- Temporary storage at sites specifically designed for sorting such as material recovery facilities;
- Sites for bulking up waste with mechanical, manual, or manually operated mechanical sorting to separate different waste streams; and
- Healthcare wastes, which are the subject of a separate, specific technical guideline.

[1] Note the segregation (sorting into different materials) and trading of recyclables is also licensed by the Centre but is not covered in this technical guideline.

2 LEGAL REQUIREMENTS

2.1 The Waste Management Law

The Law for Waste Management (WML) sets out the overarching principles, definitions, roles, responsibilities, requirements, and penalties in relation to waste management. It defines storage as *'Storing the waste components or some of them temporarily for transfer or use later'.*

And a waste producer is defined as *'Every person who produces classified waste according to the provisions of the Law.'*

Article XI sets out that the waste producer is required to adhere to the following measures:

1. Rationalization of the use of materials and natural resources;
2. Reusing the products;
3. Minimizing waste;
4. Storage of waste in the places designated therefor, in accordance with the requirements specified by the Regulation;
5. Sorting of waste that can be reused or recycled by placing them in their designated places after its production. The Regulation defines the types of these wastes.

And Article XXVI stipulates that the Waste Producer and Service Provider bear civil and criminal liability for any damage or hazards to the environment, public health and safety as determined by the relevant statutory provisions, in addition to bearing the responsibility to treat and remove various damages and hazards to the environment or to third party if such damages and hazards are resulting from his management of waste and the generated by-products.

2.2 Implementing Regulations

The detailed legal requirements for temporary waste storage are set out in the Implementing Regulations of the Waste Management Law (IR)[2]

Articles 92, 93 and 94 of Section 7 - Chapter IV cover the requirements for temporary waste storage.

Article (92) states that waste producers and service providers must store waste at waste storage sites and operate storage sites in accordance with these technical guidelines from the Centre and in compliance with conditions and provisions of the relevant licence.

Article (93) requires different categories of hazardous waste to be stored separately, depending on the physico-chemical properties, compatibility and nature of the extinguishing agents that can be used for each category of such Waste in the event of fire, so as to ensure the highest degree of protection of the general health, Environment, and public and worker health and safety.

Article (94) requires that storage areas are located as far as practically possible from sensitive receptors.

[2] Implementing Regulations of the Waste Management Law issued pursuant to Royal Decree no (m/3) dated 5/1/1443H, corresponding to 13/08/2021G

In addition to the above, all waste producers and service providers operating at waste producers must store waste and operate temporary waste storage sites in accordance with this TG as well as in compliance with the specific conditions and provisions of the relevant licence or permit issued by the Centre.

2.3 Roles and Responsibilities

This technical guideline should be used by all parties involved in the temporary storage of waste from producers to waste service providers. The parties involved in temporary waste storage activities as defined in the IR include: the competent authorities (the government, the Centre), waste producers or generators and waste service providers (of collection, transport, storage, treatment, and disposal facilities). Figure **2-1** lists the main organizations responsible for temporary waste storage facilities and some of their responsibilities.

The Ministry of Environment, Water and Agriculture (MEWA)

- the sponsoring department in the government of KSA for MWAN, with overall responsibility for the environment and waste management;
- Policy maker for the sector;
- Sets the overall direction for waste management.

MWAN – the National Center for Waste Management

- Regulating the waste management sector: Effectively to improve the quality of services across the entire value chain;
- Reducing waste disposal by stimulating the use of best practices of resource recovery techniques;
- Enhancing the capabilities, competencies and knowledge of the workforce in the sector;
- Reviewing and determining licence applications for waste storage;
- Granting licences for storage where it can be done subject to conditions which protect the environment and human health;
- Monitoring storage sites through reported data and inspection to ensure that the licence conditions are being met and there is no no adverse impact on the environment or human health.

Waste Producers

- To store the waste they produce in a manner that does not harm the environment or human health;
- to store waste in accordance with the requirements of any licence or exemption granted by MWAN;
- to improve recycling by keeping different types of waste separate.

Service providers of waste storage facilities

- Not to store waste without a valid licence, permit or exemption;
- To receive only the types and amounts of waste authorized by MWAN;
- To operate and maintain any storage site within any conditions in that licence, permit or exemption and without impacting adversely on the environment or human health;
- To pay the required fees for the licence, permit or exemption to MWAN when required;
- To keep proper records of their activities, including recording details of wastes received and transferred out, and to provide these to MWAN when required.

Figure 2-1 Organizations responsible for temporary waste storage and some of their responsibilities

3 TEMPORARY STORAGE OF HAZARDOUS WASTE AT THE WASTE PRODUCER

3.1 Overview

The overall management process of temporary storage at the waste producer is shown in Figure **3-1** below.

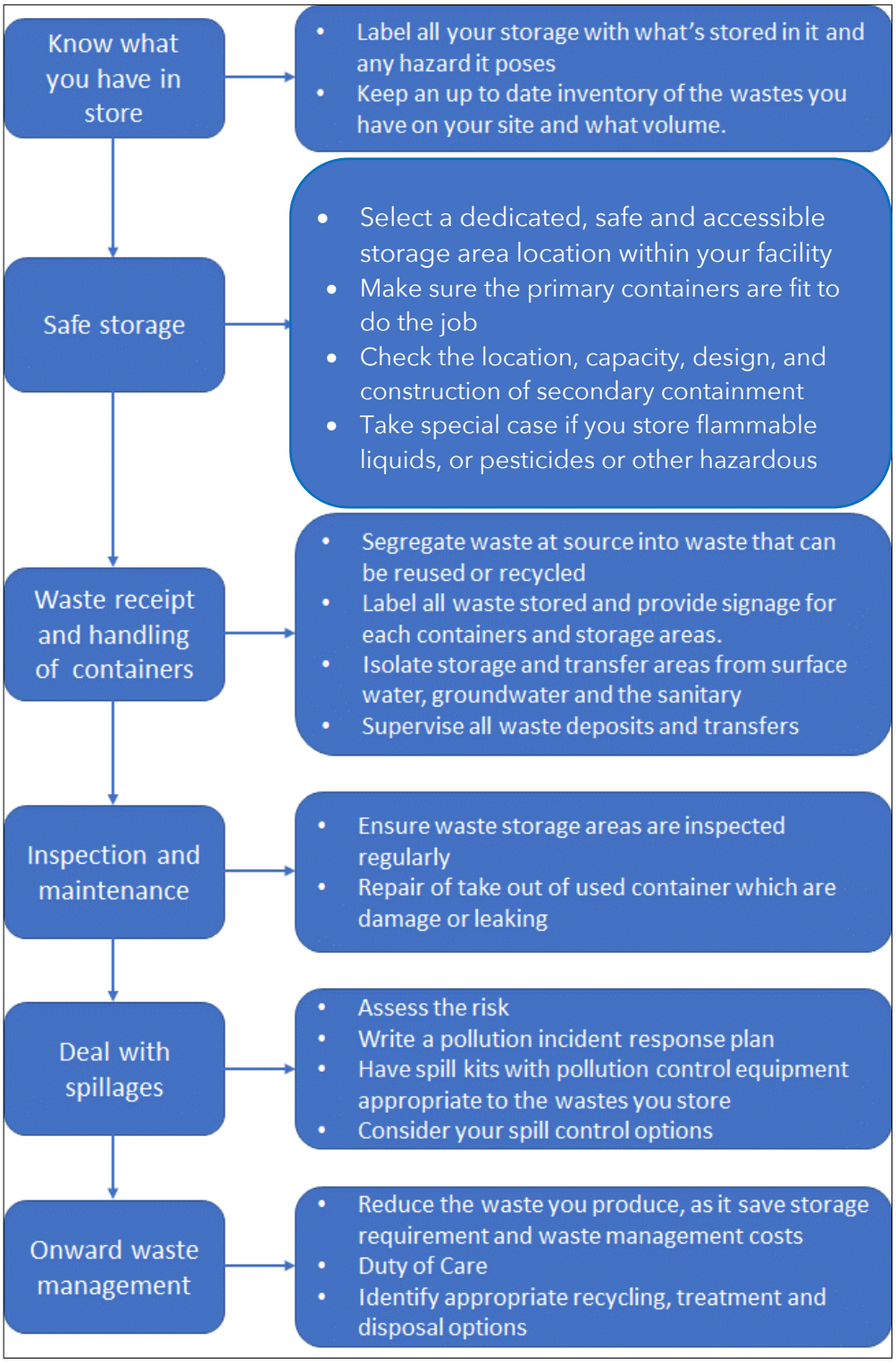

Figure 3-1 Steps in the management of temporary storage at the waste producer

3.2 General principles of temporary storage

The general requirements for temporary storage of hazardous waste are that stored waste is contained to prevent or at least minimise releases to the surrounding environment. These releases may be via:

- The air - through gases, particulates, dust, and odour;
- Water - through the discharge of any liquids or solids to watercourses or groundwater;
- Land - through the deposit of any solids or the discharge of any liquids; and
- Flies, birds, and vermin – through allowing access to waste, breeding, and escape.

This TG is intended to provide guidance for the proper environmental, health and safety protection and control to be implemented during the design and operation stages of the relevant facilities.

Temporary waste storage areas within a facility should be located, constructed, and operated in accordance with this TG and the IR. The degree of containment, the stringency of operational and other controls that are required will be governed by the amount and type of waste that is stored and the proximity of the site to sensitive receptors, including local residents and businesses.

Temporary waste storage areas should be designed with segregated storage for different materials to facilitate reuse and recycling. For all waste there should be appropriate, clearly marked containers provided for each type of waste received.

3.3 General siting considerations

When determining where a temporary waste storage area should be located, a waste producer should consider:

- Siting to eliminate or minimise the triple handling of waste where practicable;
- The types and quantities of waste to be stored at any one time to ensure that there is sufficient space for the wastes being produced, taking account of:
    - The segregation requirements for different waste types (for example, wastes for recycling, hazardous wastes, liquid wastes, wastes that are easily windblown etc.);
    - The types of containers to be used, considering how waste with be delivered to the storage area, how the containers are accessed and filled (for example, by forklift truck or pedestrian access).
- Areas that present a higher risk of environmental pollution, including those in proximity to watercourses; and areas close to sanitary or stormwater run-off systems; and
- The ability to prevent unauthorised access to the stored wastes.

A waste producer is likely to be more restricted in where a temporary waste storage area can be located with regards to the area or neighbourhood than a dedicated waste management facility because any temporary storage area will have to be on the same premises as the business.

On very large industrial and commercial sites, such as refineries, several temporary waste storage areas will probably be required, close to each point of waste production, in different locations and for different types of waste. Such large sites generally require an onsite waste management team, perhaps contracted in, who take overall responsibility and control for all waste.

3.4 Design Considerations

One of the principal duties of any waste producer is to prevent waste from escaping from their control, or of their employees' control, and they must make sure it is handled and stored safely and securely to prevent harm towards individuals, society, or the environment. In addition, waste producers have a duty to segregate waste

at source into waste that can be reused or recycled (WML, Chapter III, Article 11). Any temporary waste storage area should be designed to fulfil these requirements.

Figure 3-2: Typical signage around a hazardous temporary waste storage area

Temporary waste storage should generally meet the following requirements[3]:

- A dedicated waste storage area should be designated;
- All wastes should be suitably and securely contained;
- General warning signs identifying the area or building as a temporary waste storage area and identifying the types of waste stored and the associated hazards (see Figure **3-2** above);
- The area should be delineated wherever possible by a secure fence;
- Access should be restricted to authorised personnel;
- It should be suitable for the different types and size of waste collection vehicles that need to empty or remove the containers; and
- It should be reasonably close to the different points of production[4].

[3] It is recognised that for small businesses producing smaller amount of waste (for example, less than twenty cubic metres of waste per week) a separate securely fenced area may not be practical and, where this is the case consideration should be given to the use of sealed, lockable containers.

[4] On very large industrial and commercial sites, such as refineries and shopping complexes, there will probably be several temporary waste storage areas in different locations and for different types of waste. Such large sites generally require an onsite waste management team, perhaps contracted in, who take overall responsibility and control for all waste.

Most wastes produced by a business, even hazardous chemical wastes, will be familiar to that business, both in terms of their constituents and their properties and in relation to the storage used for those materials before they become wastes. The properties of the different materials and their storage requirements as input to the process should provide a good guide to the type of containment required when they are waste and, where this is the case, the Material Safety Data Sheet (MSDS) and/or the material supplier should be consulted for information on safer storage and disposal.

Where the waste is a hazardous reaction product, a suitably qualified member of staff, such as a site chemist or the production or technical manager, should be consulted for details of what is in the waste, its properties and safe storage considerations.

If the temporary storage area is an intermediate storage area:

- It should be as close as possible to the point of waste generation;
- Only one container and one waste stream should be kept at the satellite storage area;
- Waste should not be stored for more than three days before being moved to the main temporary waste storage area, unless it is hazardous waste, when it should be moved at the end of each working day; and
- No more than 5 x 200 litres (1.0 m3) of hazardous waste should be stored there.

3.5 Signage and labelling of temporary storage areas and containers

All temporary waste storage areas, both inside and outside, should be clearly marked with the appropriate warning labels and should be clearly delineated, with access restricted to designated staff. There should be general warning signs identifying the area or building as a temporary waste storage area and identifying any hazards (see *Figure* **3-2** above). There should be:

- Agreed procedures for the use of the storage area, including waste segregation requirements;
- Instructions about what to do in the event of a spillage or other escape of waste;
- Instructions on what to do in the event of an emergency; and
- Signage/picograms by each secondary container/containment system detailing the categories of waste that can be deposited there.

Outdoor temporary waste storage areas using bulk waste containers (for example skips, wheeled bins etc.) should be identified with a sign specifying that it is a temporary waste storage area (See Figure **3**-**2**). There should be:

- A list of instructions for the use of each waste storage area, including waste segregation requirements;
- Instructions about what to do in the event of a spillage or escape of waste; and
- Signage/pictograms on or by each bulk waste container detailing the waste that can be deposited in that container.

3.6 General management practices for temporary waste storage areas

Sound risk and waste management practices will in most cases prevent, or at least mitigate, accidents and pollution incidents. Suitable procedures and management practices for waste should be developed with key personnel and properly communicated to all appropriate staff.

All staff working with waste should be trained in, and use, the procedures and management practices developed, particularly with regards to safety and emergencies. The responsible person appointed should ensure that the necessary systems are implemented to facilitate this.

Apart from reaction products, waste is generally not significantly different from the raw materials handled by a company, including hazardous raw materials and the same safety and management procedures should be applied, for example, for contaminated raw materials, the relevant material safety data sheets (MSDSs) should

be consulted. Those provide clear guidelines for proper environmental and health and safety protection and handling for the main constituents.

3.6.1 Limits on temporary storage

Waste should only be stored for collection in the storage areas defined on the relevant site plan. Each section of the storage area needs to be managed to ensure there is sufficient storage space, including any gaps required for access, for each waste type based on their anticipated generation rates.

No wastes of any type should be stored in excess of the limits on weights and periods stipulated in the licence (e.g., environmental licence or waste licence) for that waste type. The responsible person needs to ensure the timely remove of waste, so that there is sufficient storage capacity for the waste being generated.

3.6.2 General housekeeping and maintenance of surfaces

The temporary waste storage area should always be kept clear and tidy and free from litter, debris etc. The surfaces must be inspected at least at monthly intervals throughout the operational life of the facility and a record kept of the results of each inspection.

If action becomes necessary to maintain the cleanliness of these areas, the surface should be cleaned by any manual or mechanical means available to the site management. Cleaning may include, but not be limited to hosing down, manually sweeping, or shovelling, or mechanical sweepers.

All necessary repairs should be made to any defects in the surface to ensure that it remains even, does not become rutted or subject to differential settlement and remains free draining and free from standing water.

3.6.3 Waste removal

All hazardous wastes to be removed should be pre-notified to the recovery or disposal site and the documentation checked by a suitably qualified and experienced member of staff, particularly any analysis or other details of chemical constituents. The detailed components of each container of waste removed must accompany the load.

All waste removed from temporary storage must be accompanied by a waste manifest that sets out *inter alia*:

- The waste producer;
- Final destination of waste;
- The transporter, vehicle, and driver;
- The type of waste;
- The quantity;
- The description and principal components; and
- Any safety or environmental hazards associated with the waste.

The person appointed with overall responsibility for the temporary storage should ensure that an adequate record is maintained of all wastes received at, and removed from, the facility and that this is reconciled with a physical check on wastes stored every three months.

3.7 Storage periods

Storage periods for waste will vary depending upon the characteristics of a particular site, the type of waste and the method of containment. *Table* 3.1 below sets out are recommended and maximum storages periods.

Table 3.1 Recommended and maximum temporary storage periods for different waste types

Waste Type	Storage period		Reason
	Recommended	Maximum	
Hazardous wastes solids	1 months	3 months	Hazardous wastes can be corrosive and cause failure of primary containment or can become more reactive with time
Hazardous wastes liquids	2 weeks	6 weeks	Hazardous wastes can be corrosive and cause failure of primary containment or can become more reactive with time
Separated Dry Mixed Recyclables	3 days or 2 weeks if rinsed/washed	10 days or 1 month if rinsed/washed	Contamination from food residues, if present will give rise to odours and may attract vermin, insects, and birds
Separated Food waste	1 day	3 days	Food waste will degrade quickly and will give rise to odours and attract vermin, insects, and birds
Separated green waste	2 to 3 days	1 week	Green waste will degrade quickly and can turn anaerobic, giving rise to odours, attracting insects, and producing methane
Residual municipal waste	1 day	3 days	The food content in residual waste will degrade quickly and will give rise to odours and will attract vermin, insects, and birds. If food waste is collected separately than the maximum storage period of residua l waste can increase to one week.
Construction and Demolition Waste	1 months	3 months	12 months is the maximum allowable for any temporary storage.
Inert Waste	1 months	3 months	12 months is the maximum allowable for any temporary storage.

3.8 Inspection and monitoring

The storage arrangements should be inspected at least weekly, including a visual inspection of container storage areas to check for leaking and deteriorating containers. Fencing and signage should also be checked for any damage or missing signs.

Written records of all inspections should be kept along with records of incidents, spills and corrective actions, and cleaning and maintenance records.

3.9 Emergencies and storing contact details

The site emergency procedures should include any temporary waste storage and should ensure that a responsible person to deal with any waste emergencies is always available.

If an emergency arises, and the person who discovers it has not called the appropriate emergency services, the responsible person should do so immediately, and the Centre informed as soon as possible afterwards.

Contact details for all emergency services, the responsible person(s), must be readily accessible at the temporary storage area and in the site security office, gatehouse, or weighbridge along with the contact details for the Centre. This should include the names and phone numbers of the designated emergency co-ordinator and their deputy(ies).

4 LICENSED TEMPORARY STORAGE OF HAZARDOUS WASTE

Hazardous waste is by its nature, potentially more reactive and more harmful to human health and the environment than non-hazardous waste. Although they may not present problems with flies and vermin etc. as some non-hazardous wastes, hazardous waste can present significant environmental and health risks if not properly managed, because of:

- Their often highly mobile nature;
- The reactivity of many chemicals;
- The fact that many chemicals are incompatible; and
- The general high concentration and availability of elements such as toxic metals.

Therefore, wherever hazardous waste is stored, particular care needs to be taken to avoid fires, explosions, reactions between incompatible materials, releases, or other accidents.

4.1 General sitting consideration

The first decision for all waste facilities for temporary storage should be the site location. This applies to all types of temporary storage and at all scales, from the temporary storage of small amounts of hazardous waste through to large-scale temporary storage facilities for multiple waste streams. The location will always be a balance between remoteness from human and other sensitive receptors and closeness to the users. However, if sited correctly, the basic design requirements should ensure the waste is contained so that it does not impact adversely on the locality.

The temporary waste storage area should be sited so that it is the maximum practical distance from any residential or other sensitive land uses, such as schools. It should be accessible for the different types and size of waste collection vehicles that need to empty or remove the containers in which waste is stored and it also needs to be reasonably close to the different points of production.

Temporary storage areas should be located as far as practical from any sensitive receptors in the vicinity. If there are sensitive receptors in close proximity, measures to protect the sensitive receptors should be included, such as storing the waste within a building. In addition, waste should be kept contained, under cover or under controlled temperatures, e.g., in an air conditioned or ventilated room where:

- Exposure to the elements will prevent a waste from being reused or recycled, or cause contaminated run-off;
- The waste materials are combustible; or
- Waste will degrade under strong sunlight.

4.2 Design considerations

Temporary storage areas should be designed and constructed to contain, control, and allow recovery of any spillage or leakage of waste. They should be located and/or engineered so that accidental spills and discharges will not flow into sewage or stormwater run-off systems. This is particularly important where flammable or reactive materials are stored. In addition, temporary storage areas should be set out and marked with gaps which:

- Permit waste handling equipment, such as forklift trucks, and emergency vehicles, to access all stored waste; and
- Provide fire breaks or gaps across which it is difficult for fire to spread between smaller amounts of the stored waste to make extinguishing any fire easier.

The design requirements depend on several factors, including:

- The function of the temporary storage;
- The type of facility;
- The type of access required;
- The waste type stored;
- The amount of waste stored; and
- The proximity of the site to sensitive receptors.

The storage arrangements should be marked on site plans which clearly show the whole site with the temporary waste storage areas, waste types and capacities; and the correct access routes for vehicles and forklift trucks along with pedestrian walkways. Access routes should be kept clear at all times.

Temporary waste storage areas should have an impervious floor and should have provision for washing down and where incompatible wastes are stored, should have separate drainage systems that prevent these coming into contact with each other.

Where primary containers for waste are supplied by the waste transporter, the contract should clearly state the condition in which containers are required to be maintained.

Other general design considerations may include:

- Effect of extreme weather, particularly high temperatures;
- Ventilation at high and low level, particularly if wastes are stored within a building;
- Handling and accessibility: could the secondary containment system have implications for handling containers, for example, are ramps required to allow forklift trucks access over kerbs or bunds;
- Fire prevention and control:
    - Separation of wastes from ignition sources, process areas, occupied buildings, and site boundaries;
    - Maintain a safe distance between storage areas and stacks within the same area (fire breaks), to stop fire spreading;
    - Install fire detection systems;
    - Install fire suppression/extinguishing systems;
    - A secure or dedicated water supply for firefighting;
    - Fire water containment; and
    - Free access for fire service vehicles and personnel.

4.3 Waste acceptance

The waste management licence will contain, among other things, conditions that stipulate the types and quantities of waste that can be stored and the maximum storage period for which each is allowed to be retained.

The types and quantities of wastes that are to be stored at the site and their condition/packaging must comply with these licence requirements. Therefore, the receipt, storage, transfer, and waste removal processes should all be under the direct supervision of a responsible person or persons.

Before any waste is accepted at the facility, steps should be taken to ensure it conforms with the relevant licence conditions. Acceptance principles:

- Other than in an emergency, the operator only receives onto the site prebooked wastes that have been adequately pre-accepted and that are consistent with the pre-acceptance information;
- All wastes are checked and verified against pre-acceptance information and transfer documentation (transportation manifest) before being received on site;

- The operator sets out and follows clear and unambiguous criteria for the rejection of wastes;
- Waste is only received and accepted under the supervision of a suitably qualified person;
- All transfer documentation (transportation manifest) is checked and validated;
- The operator ensures that the facility has the necessary capacity to receive the waste for all storage areas (quarantine, reception, general and bulk). Wastes are not received if the capacity is not available. The physical and licensed capacity must be sufficient for the storage;
- Where the waste is hazardous waste, the detailed components of each container of waste received into temporary storage must accompany the delivery.

Sampling

Other than some wastes (such as pure waste chemicals; asbestos; contaminated clothing, packaging, or rags; 'articles'; laboratory smalls; contaminated wood and roofing material) all wastes, bulk or containerised (including from every container), are representatively sampled and undergo verification and compliance testing. Reliance solely on the written information supplied is not sufficient.

A representative sample is one that takes account of the full variation and any partitioning of the load such that worst case scenarios are accounted for. Sampling takes place on site under the supervision of the site's qualified staff. Where the driver arrives at the site with a sample taken elsewhere, there is a full risk assessment to check that the sample is representative, reliable and was only taken for specific health or safety purposes.

Inspection and analysis

The tests required for verification purposes at acceptance are listed in the computerised waste process control system. If visual inspection is not feasible (e.g., for occupational safety reasons), the compliance of the waste input is checked by analytical equipment, laboratories, and adequate human resources. Analysis of waste is carried out by a laboratory with suitably recognised test methods.

Reception

It is ensured that all containers are adequately labelled and in sound condition (undamaged and not corroded; lids are well fitted; and caps, valves, bungs are present and secure) before being offloaded. Any unsound or unlabelled containers are put into quarantine and dealt with appropriately. Labelling includes the unique tracking system reference number, the date of arrival on site and at least a primary hazard code.

Following visual inspection, waste containers are offloaded into a dedicated reception area to await sampling and verification. Any containers in the reception area are sampled and verified as compliant as soon as possible (e.g., within one working day of receipt) and transferred to the relevant general storage area on site, or quarantine if appropriate.

Bulk loads (liquid or solid) can only be offloaded once they have been fully verified as compliant. Interim storage of incompliant bulk load is not done except in an emergency situation. Verification testing includes consistency with pre-acceptance information, compatibility with appropriate bulk load storage, and checking compatibility.

The reception area is equipped with a suitably sealed drainage system to prevent contaminated run-off, and a separate collection system for spills which is separated from rainwater collection drains.

The offloading, sampling point/reception and quarantine areas have an impervious surface with self-contained drainage, to prevent any spillage entering the storage systems or escaping off site.

Wastes are immediately segregated to remove possible hazards due to incompatibility, which could result in the waste failing to meet acceptance criteria.

4.4 Containment

The maxim of three levels of containment, irrespective of whether the waste is solid, or liquid should be adopted wherever possible:

1. Sound primary containment;
2. Secondary spill trays, bunded areas or sumps or similar; and
3. A concreted site with a sealed drainage system for any temporary hazardous waste storage areas.

Where a building provides part of the containment, it will be subject to construction permit specifications and civil defence requirements. Typically, only professional engineers or consulting firms may file for the design. The building must meet relevant standards for structural soundness and, where hazardous waste is stored, for hazardous waste leak prevention. The construction company should certify that the unit is designed and constructed according to the following or similar specification:

- Steel/aluminium framed, enclosed with an impermeable floor and a roof;
- All surfaces in the containment building that come into contact with wastes during treatment or storage must be chemically compatible with such wastes;
- Air conditioning should be installed and used to maintain safe low temperatures and low humidity for reactive and flammable wastes with low flash points; and
- A separate rainwater drainage system with separate storage.

4.4.1 Primary Containment

The primary means of containment is that in contact with the waste. The licence holder must make sure all primary storage containers have sufficient strength and structural integrity, so they do not leak or burst in normal circumstances. This may require such drums being lined and compatible with any waste stored.

In cold weather or at night, waste containers should not be filled more than 90 percent of the rated capacity of the container. For a 200-litre drum this equates to at least 10 cm of freeboard above the liquid surface to allow sufficient free space to compensate for expansion due to heating.

Primary containers should normally be stored inside a building, under cover or otherwise protected from the elements by another method. Container reuse should be encouraged. Where containers are reused, it is the waste producer's responsibility to ensure the specification, particularly the construction material(s), is suitable for the waste for which it is to be used and containers are both clean and dry.

4.4.2 Secondary containment

All drums, IBCs etc. should be stored on, or in, an impermeable secondary containment system. Secondary containment systems should be designed to catch any leaks or spills, including 110% of the volume from a complete failure of the largest primary container of any liquid stored above the secondary containment. Such containment systems should be inspected at least twice-weekly and also after every significant rainfall event and emptied as required to remove any water. This will significantly reduce the risk of a spill causing pollution and should allow the controlled recovery or treatment of any spilled waste, as well as reducing the spread of fire through burning liquids.

Containment methods include bunds, drip trays, kerbs, lined concrete-block walls, and any other similar system that will prevent a spilled product escaping. The secondary containment should not have any drainage, because this can be left open, for example to drain stormwater or may become unsealed and leak, without any visible sign.

Secondary containment systems may be prefabricated from steel, plastic or fibre glass or an in-situ concrete or masonry bund with suitable lining or treatment to make it impermeable. All containment system walls and

floors should be impermeable to the required containment height and resistant to attack from chemicals in the stored waste. Such systems should not have a damp-proof course. Floor joints should be avoided but, where they are required for constructional purposes, care that the joint sealing results in a complete and lasting liquid-proof seal, which is resistant to heat, for example during a fire. Sealants must be able to withstand attack from any waste material likely to be stored within the bund.

A sloping floor together with a sump cast in the base slab will facilitate the recovery of spillages and any accumulated rainwater. Ensure that gradients are within the safe working limits recommended by the manufacturer for any forklift trucks or other plant used.

4.5 Storage tanks

Tanks for the temporary storage of waste must be designed with adequate foundations, structural support, and protection from corrosion to prevent them from collapsing or leaking. New temporary waste storage tanks should be constructed from materials appropriate for the wastes to be stored and incorporate corrosive protection methods including:

- Construction materials that are corrosion resistant;
- Corrosion resistant coating in combination with cathodic protection; and/or
- Electrical isolation devices.

Existing temporary waste storage tanks need to be inspected, by a suitably qualified engineer, to evaluate their structural integrity and suitability for the storage of the intended waste.

Spills or overflows from the tank system must be prevented by using, as a minimum:

- Spill prevention controls, such as valves designed to prevent the backflow of waste during fill-up of the tank;
- Overfill prevention controls, such as alarms that sound when the waste level in the tank gets too high and valve systems that automatically close when overfill is likely;
- 60 centimetres of freeboard at the top of uncovered tanks, unless the tank is equipped with a containment structure, drainage systems or a standby tank with adequate capacity.

All new hazardous temporary waste storage tanks must have leak detection and secondary containment before being used. Existing systems must be equipped with secondary containment, based on an improvement schedule determined by the condition of each tank and the waste it contains.

All hazardous temporary waste storage tanks, including existing systems, must at least be equipped with adequate secondary containment, which should be installed as determined by the age and/or condition of the tank.

Tanks used for hazardous temporary waste storage must:

- Be operated in a manner that eliminates or at least minimises releases. Chemicals that may cause any part of a storage tank system to fail must not be placed the tanks;
- Be of appropriate material for the type of waste being stored in them; and
- Be contained within a concrete or otherwise impermeable bund.

Hazardous temporary waste storage tanks should also be constructed, engineered, and inspected and tested regularly to ensure their integrity. They may be required to be:

- Equipped with a leak detection system able to detect failure in either the main tank or secondary containment system generally within 24 hours;
- Equipped only with valves and fittings suitably rated for fire and corrosion;

- Subject to an annual non-destructive test, such as an ultrasonic thickness survey or similar;
- Suitably spaced from one another;
- Tested to ensure they are suitably earthed where they contain low flashpoint flammable liquids;
- Incorporate systems to prevent the build-up of static electricity or use inert gases as required in any transfer operation to preclude ignition and combustion;
- Individually bunded;
- Equipped with flame arresters on the vent outlet where tanks contain liquids with flashpoints below 21°C; and
- Equipped, where continuously fed, with a means of stopping inflow, such as a waste feed cut off or a bypass system to a standby truck.

Additionally, where wastes are going for recovery or for high temperature incineration, non-halogenated and halogenated solvents should be kept separate. Where hazardous wastes are stored with another category of mutually incompatible hazardous wastes, the primary containers for each category should be physically separated by a distance of at least two metres or by a partition or wall that prevent the incompatible materials mixing should there be a leak or spillage.

4.6 Signage and labelling

All primary containers and/or drums of waste should be clearly labelled with:

- A unique code linking it to the transportation manifest and therefore to load it was delivered in so that the record of the chemical(s) and their proportions can be checked;
- The code for the date it was received into temporary storage (for example, where a waste was received on 1 October 2022, all containers should be coded 221001;
- The relevant hazard code(s); and
- The appropriate hazard warning sign, which must be displayed on containers and drums containing hazardous waste for onward transportation (see Waste Transportation Standard).

In addition, all buildings, storage areas and containers containing waste should be labelled with the appropriate hazard warning symbols for the waste that is contained there and, where appropriate and practicable, the relevant UN numbers. This labelling should include separate storage areas identified for each waste type/category by name, by IR code (for hazardous wastes) and by EU List of Waste number for all wastes. Each sub-storage area should be marked with the same sign(s) as will be used for the individual containers to be stored there.

Figure 4-1: Drums stored with inadequate labelling and without secondary containment and sufficient fire breaks in the row

Figure 4-2: Drums of hazardous waste stored over secondary containment showing hazard warning labels

Containers that are being reused should have any previous labelling that is no longer relevant removed, and the correct new hazard labelling affixed to the container. The labels should be those required by the international Globally Harmonized System of Classification and Labelling of Chemicals (GHS). The main GHS pictograms are shown in Figure **4-3** below but there are others.

Figure 4-3: The main UN GHS hazard pictograms

4.7 Storage periods

In general storage periods prior to treatment, recovery or final disposal should be as short as reasonably practicable. Table 3.1 in Section 3.7 lists recommended and maximum storage periods for different categories of waste, including liquid and solid hazardous wastes.

Neither the recommended nor the maximum storage periods should be viewed as a period that cannot be reduced; storage limits, types of waste, container condition and waste transport contracts will all influence the actual temporary storage period.

4.8 Storage conditions

Hazardous waste should not be stored for longer than the stipulated period and no category of hazardous waste should be stored in excess of the quantities stipulated in the licence. Except when using specialist racks, hazardous waste in 200 litre drums should not be stored more than two drums high and then only on suitable pallets capable of storing four drums. Hazardous waste drums, even of the same waste category, should be stored in separate groups or stacks containing a maximum of thirty-two drums separated from other stacks by at least six metres to allow access for forklift trucks and emergency vehicles as necessary.

Safe temporary storage of hazardous waste can be achieved by:

- Classifying and quantifying the different waste types produced;
- Using a designated, secure, temporary storage area, where the different waste types can be accumulated in a controlled manner before being removed for recycling, treatment, or disposal;
- Displaying warning signs, for example appropriate hazardous substances symbols (pictograms), at access points to dedicated stores;
- Segregating different categories of waste to maximize reuse and recycling, not mixing non-hazardous/hazardous wastes, and not mixing different categories of hazardous waste;
- Ensuring that incompatible wastes are not mixed, stored together or in close proximity;
- Applying suitable secondary containment and recovery systems;
- Storing flammable materials away from other materials, protected from accidental ignition;
- Using containers that are:
    - In good condition;
    - Clearly and correctly labelled with their contents with any previous labels removed so that the correct waste is stored in them and anyone who takes charge of the waste will know what they contain;
    - Suitable for the storage, transport, and subsequent management activities; and
    - Designed to prevent leakage, contamination or spoiling of waste (spoilt waste is waste that cannot be managed in the way intended).

In addition:

- Storage at height should be avoided. if wastes are stored at height, for example stacking of containers on top of each other, make sure suitable guard rails are in place if people could fall when stacking or collecting materials or equipment;
- Drums and other such containers should be stored vertically, not horizontally;
- Drums should not be stored more than two drums high, unless stored in purpose-built racking, and should wherever possible be stored on pallets made from non-flammable materials;
- All temporary storages areas should be maintained in a clean and tidy condition;
- Access should be limited to only those persons who are authorised, as this will help prevent accidents, pests, incidents of vandalism and theft; it will also stop unauthorised people adding the wrong waste to a container and so invalidating the waste description or mixing incompatible wastes and creating a hazard; and
- A clear and accurate record should be maintained of the wastes added, stored, and removed, with an annual stock check to ensure the record is accurate.

Figure 4-4 Left: Acceptable drum storage at correct height – two drums high and supported by pallets. Right: Unacceptable drum storage – drums stored on side, four high and requiring many drums to be removed to gain access

4.9 Incompatible wastes

Hazardous wastes can be highly reactive, particularly with other hazardous wastes of different types. There are many thousands of such adverse reactions, and it is not possible to list them here. They may not always be particularly obvious, for example, chloroform will react with acetone under certain conditions, generating heat and vaporising the reaction product chlorobutanol, with potentially explosive force.

Incompatible wastes are wastes which could react with another waste or material to produce heat or pressure, fire or explosion, violent reaction, toxic dusts, mists, fumes, or gases, or flammable fumes or gases.

Temporary storage design needs to take into account the different types of waste it is proposed to receive and their compatibility. It is good practice to allow for the separate storage each different category of waste, irrespective of their mutual compatibility, recognising that different categories will arise in different volumes.

Wastes that are incompatible with each other must be segregated and stored separately. For example, flammable liquids and other organics must be segregated from acidic and caustic wastes. The following wastes should not be mixed or packed together:

- Acids with hypochlorites – generate chlorine gas;
- Acids and cyanides – generate hydrogen cyanide gas;
- Acids and alkalis – generate heat;
- Acids and sulphides – generate hydrogen sulphide;
- Acid and metals – generate toxic gas and/or flammable gas;
- Oxidising and reducing agents – can cause fires;
- Flammable or combustibles with oxidizers; and
- Resins with hardeners or catalysts.

Where hazardous wastes are stored with waste or other materials that are mutually incompatible, the containers must be physically separated by means of a partition or wall that prevent the incompatible materials mixing should there be a leak or spillage.

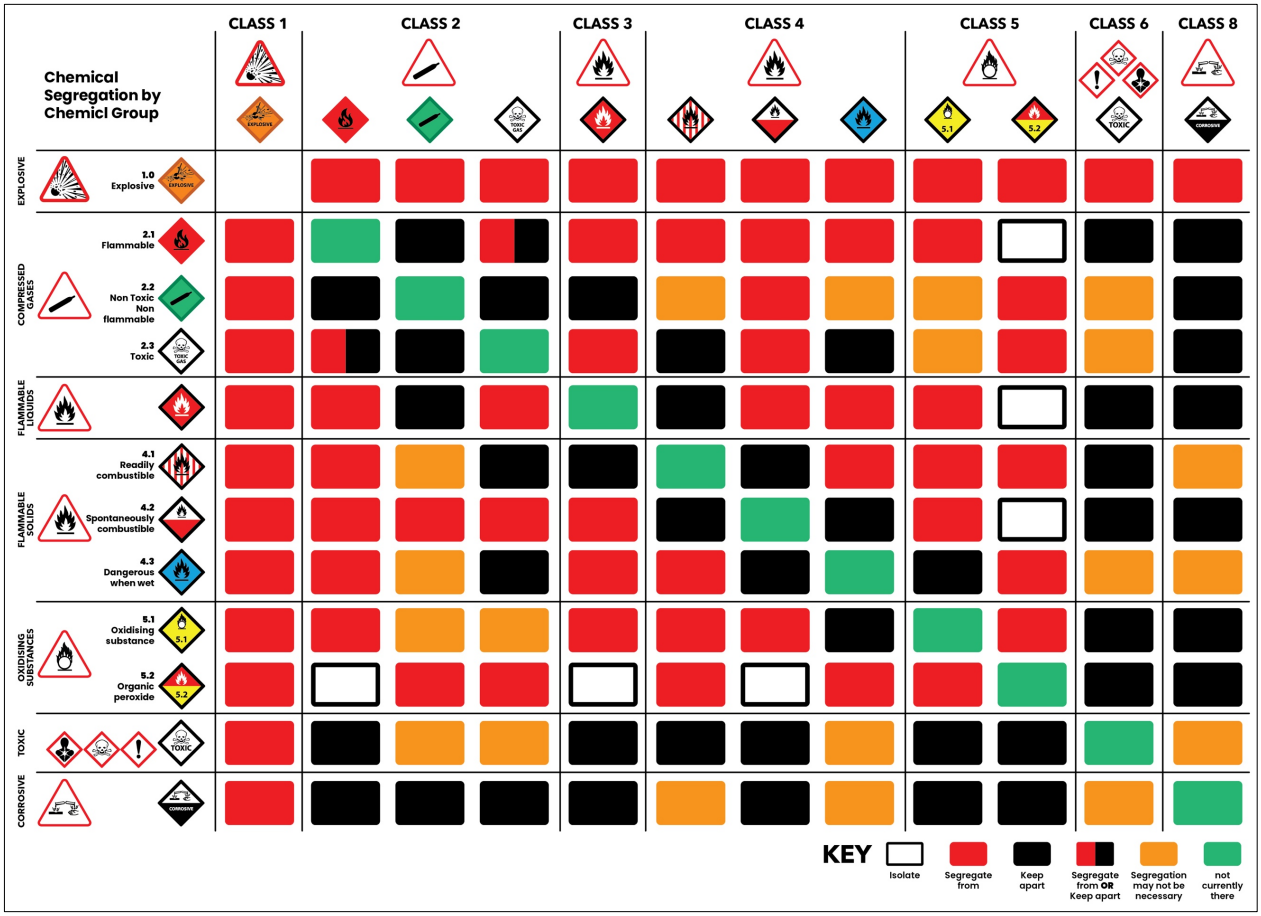

Figure 4-5: General recommendations for the segregation of different classes of dangerous substances

Figure **4-5**[5] above gives an overall guide to the separation and isolation required for different categories of dangerous chemicals.

4.10 Managing incompatibilities in hazardous waste

The following initial segregation guidelines should be followed when sorting and storing hazardous waste:

- Inorganic substances must be separated from organic waste types, and solids must not be mixed with liquids;
- Halogenated and non-halogenated organic solvents should be collected in different containers;
- Individual non-halogenated organic solvents should be collected separately; when they must be mixed, each constituent and its percentage composition in the mixture must be clearly stated;
- Metals should not be mixed with organic solvents as such mixtures cannot be incinerated because of the metal or sent to landfill because of the organic solvent;
- Waste oils should be kept as uncontaminated as possible in order to be recycled; waste oils must be segregated from other chemicals, particularly solvents, pesticides, and PCBs;
- Accumulate waste that is both flammable and corrosive separately from waste that is either flammable or corrosive; and
- All mixtures containing mercury in any form must be disposed of as mercury contaminated waste.

[5] Chemical warehousing: the storage of packaged dangerous substances, 4th Edition, Health and Safety Executive, 2000.

4.11 Transferring liquids and mixing

Unless specifically permitted under the waste management licence, mixing the contents of different containers should be avoided. If mixing is permitted, it should only be carried out under the control of a qualified and suitably experienced chemist. And before any mixing takes place, it is advisable that small-scale test mixing is carried out to establish that there will not be any adverse reaction.

If the temporary storage also includes handling and transfer of waste, this should be carried out in a separate area and clearly marked. When transferring or decanting wastes it should be carried out in an impermeable area, isolated from the surface water drainage system.

Drum carriers, drum taps, funnels and containers with lids should be used to minimise the risk of spillage during handling and transfer.

Plant used for transferring waste in areas containing flammable liquids and vapours, such as pumps and forklift trucks, should be suitably flameproofed and any exhausts fitted with suitable spark arrestors.

4.11.1 Storage times

Hazardous waste may be stored for up to 90 days at a main temporary waste storage area. However, for a facility situated in a sensitive location storing hazardous wastes, storage times should be limited to 1 month. Each waste stream should be given a unique code on each container linked to its documented composition and incorporating the date of receipt into storage. This can be painted on or affixed as a label. However, it should enable two things:

- Being able to link the container with its chemical description; and
- Permit easy identification of the date when waste was stored and therefore whether any storage limit is being exceeded.

All labelling must be sufficiently resilient to remain attached and legible throughout the duration of storage at the facility and must be clearly visible at all times. Any labelling that does not relate to the contents of the container or drum at the time it is stored within the temporary waste storage facility should be removed before it is accepted.

4.12 Waste removal

All waste removed from temporary storage must be accompanied by a waste manifest that sets out *inter alia*:

- The waste producer;
- The transporter, vehicle, and driver;
- The type of waste, the quantity and the description and principal components;
- Any safety or environmental hazards associated with the waste;
- The waste receiver.

The person appointed with overall responsibility for the temporary storage should ensure that an adequate record is maintained of all wastes received at, and removed from, the facility and that this is reconciled with a physical check on wastes stored every three months.

4.13 Internal inspection

Hazardous temporary waste storage facilities should be checked daily by staff and at least every week by the person appointed as responsible for hazardous waste management.

Any inspection should check primary and secondary containment for:

- Any damaged or leaking, for example corrosion, deformities, cracks, or stains from the material stored;
- Bunds or drip trays etc are clean and clear of waste and debris;
- Labels, signs, and other hazard information are undamaged;
- maximum storage amounts and stack heights have not been exceeded and wastes are stored in the correct area; and
- All taps that are not in use are closed and any pipework attached to a container is completely inside the secondary containment.

Any structural or other defects should be reported immediately and repaired promptly using the appropriate technique to ensure the container or containment system retains its integrity. If the problem cannot be repaired, the container or containment system should be taken out of use as soon as possible.

The drainage systems should be inspected at least annually throughout the operational life of the facility to ensure their integrity. The solids interceptor should be inspected at monthly intervals and will be subject to periodic maintenance to remove any accumulated silt and maintain capacity.

Maintenance and inspection of the site fencing and gates along the site boundary should be undertaken on a routine basis and temporary repairs should be implemented either upon identification during the inspection or by the end of the day that the defect is found. A note of the inspection and repairs will be kept on site and a record kept of the results of each inspection. Permanent repairs to the fencing and gates must be completed within seven working days and when they are complete, a note made in the site diary to this effect.

5 LICENSED TEMPORARY STORAGE OF RECYACBLE WASTE

5.1 General considerations

This section covers requirements specific to the temporary storage and bulking of commonly collected recyclable waste for recovery at another place. Non-hazardous recyclable waste, including C&D waste, may be stored outside, provided that sufficient control of dust and litter is in place and exercised so that no waste can escape from the site and no malodourous wastes are received except where they are and remain in sealed containers.

Recyclable waste, including paper and card, earth, concrete, bricks, timber, and plasterboard; HDPE and PET plastics should be stored in separate bays and waste whose quality is affected by moisture, such as paper and card, should be stored under cover. If light or dusty materials are stored, these should preferably be stored in covered or lidded containers and/or inside a building to prevent littering and transmission by the wind.

Where light wastes are stored outside, there must be an additional line of defence against littering in the form of an effective litter screen as well as a 2m high boundary fence; and against dust, in the form of operational controls to ensure such waste is kept damp.

Different waste materials that can be, or may potentially be, recycled should be tipped and stored in separate bays or containers so that they can be removed as separate waste to different facilities if required.

Wastes should only be stored in areas marked on a plan of the site with the working plan. Any light materials should be stored in suitable, enclosed containers or baled.

Where waste is stored on hard standing and in the open, without a primary means of containment, baled light waste such as paper and plastics should be stored in discrete stacks or piles, each pile and storage area should be limited to a maximum amount stipulated under the licence and with adequate space between each stack to permit access for fire service vehicles or plant.

Combustible materials, including plastics, paper, and card, should be stored in separate primary containers or in bays separated by walls with the appropriate fire resistance up to a maximum amount designated by the Centre. Access to each bay must be always maintained for emergency services and waste piles should be maintained below a maximum size, separated from other waste by approximately three metres for a fire break.

All temporary waste storage areas, where combustible waste is stored, (e.g., wood, paper, and plastics), should have automatic fire detection systems. Larger temporary storage areas should also be equipped with automatic fire suppression systems, such as sprinklers.

5.2 BRING SITES for Recyclable Waste

This section covers the bring sites for use by the general public to deposit recyclable materials, such as plastic and glass bottles and jars, paper, and card.

Bring sites provide large, durable containers for the temporary storage of different recyclable materials at sites that are not waste management facilities but in locations to which the public has easy access, such as supermarkets, shopping centres, car parks etc. They therefore provide a useful function to allow for the separate collection of selected recyclable materials from residential wastes.

The materials collected at bring-banks are typically paper, card, glass (bottles and jars), metal (steel and aluminium cans) and rigid plastic packaging. Some bring-banks may also accept clothes, shoes, and other materials. The materials collected at bring sites are usually sorted and bulked up at other facilities prior to being delivered to reprocesses.

Bring sites are solely collection points. No sorting or bulking is carried out at these facilities. Full containers are either regularly exchanged for empty containers, exchanged when full or nearly full, or picked up by a vehicle with a hi-ab and emptied into a larger open-top container on the same vehicle.

Bring sites should also include temporary parking for users and should themselves be sited on paved areas. They may also be sited in areas where there is artificial lighting to allow for use in the hours of darkness.

Figure 5-1: Typical Bring site showing clearly marked containers for different recyclables

5.2.1 Permits and licensing

The owner, operator or applicant of a temporary waste storage facility must obtain a license from the Centre, which may include carrying out an appropriate environmental impact assessment (EIA), including any necessary ecological investigations and environmental risk assessment.

Depending on the scale of operation, bring sites may also require licensing. This is subject to the Centre's discretion and operators should apply to the centre for consideration.

5.2.2 Locating Bring sites

The primary consideration in controlling the impacts of any waste management facility is the location. Bring sites are usually located at sites that already have good public access and are frequently used by the public. Therefore, when selecting a site to store non-hazardous recyclables the first choice should be to utilize space at existing locations, such as supermarket and shopping mall car parks. Correct siting is vital, as frequent collection may be required to combat odour and litter.

5.2.3 Design considerations for Bring sites

Access to the site should be from permanent roads from the main highway and any consideration of a proposed site should take into account the nature of the local roads and other infrastructure and its capability to support the operation of a bring site. Although careful choice of location should ensure that it is unlikely to increase road traffic substantially, the capacity of the local road network to cope safely with any increased traffic movements at peak times with a minimum of disturbance to the local community should be assessed prior to final site selection.

Once a suitable location has been determined which meets the objectives above, it is still important to design temporary storage sites to further minimise any impact, including any visual impact, e.g., by screening from the surroundings. To achieve this, the design should:

- Eliminate or minimise any environmental impacts resulting from the operation of the site;
- Minimise health and safety risks for operators and the public;
- Facilitate waste recovery; and
- Use onsite resources efficiently.

HGVs, light vehicles such as cars and vans, and pedestrians should be segregated from each other as far as possible, including:

- Separating entry to and exit from the site as far as possible for HGVs and cars, preferably with separate access and egress points or, where this is not possible, using separate lanes for each.
- Constructing dedicated pedestrian walkways or preventing HGVs from using a site when it is being used by the public;
- Constructing roads and other paved areas of ground supported reinforced concrete to a specification and thickness designed to withstand the manoeuvring of HGVs for the life of the facility. The floor should:
    - Adequately support heavy goods vehicles;
    - Be finished with non-slip/anti-slip surface; and
    - Be free from asphalt, especially where combustible wastes are handled, or high temperatures are experienced.

Where bring sites are manned, a separate building should be provided for accommodation for on-site personnel. This/these should provide:

- Accommodation for the staff;
- A rest room/accommodation for staff for meals and refreshments;
- Sanitation facilities for site staff;
- Storage space for site plant and equipment and for maintenance purposes; and
- A suitably equipped first aid room.

In addition, containers should be designed to minimise noise when being used and should preferably be exchanged rather than emptied on site.

5.2.4 Operation and control

Bring sites should include temporary parking for users and should themselves be sited on paved areas. They may also be sited in areas where there is artificial lighting to allow for use in the hours of darkness.

Although bring sites tend to be small, there are still potential impacts arising from their use from:

- Congestion and noise from vehicles using the site;
- Noise from filling containers, particularly with glass packaging;
- Noise from servicing by the operator, particularly if glass banks are emptied into the vehicle at the bring site;
- Odour, vermin flies and wasps can also be a problem due to food and drink in and on unwashed recyclables; and
- Litter can also be generated due to overfilling of the containers or spillage of wastes by the public users.

Therefore, as highlighted above, the location of any bring site should be the primary means of controlling these nuisances and should be carefully considered. In addition, containers should be designed to minimise noise when being used and should preferably be designed to be exchanged on site rather than emptied.

The principal means of control of odour and of pests should be the regular emptying or exchange of the containers, but pest control measures should also be used where required. Importantly, to combat litter, the area should be maintained in a clean and tidy condition. To achieve this, it is important that the area and containers are inspected at least daily to check how full containers are, that they are emptied frequently and to clear up any spillages. Security cameras can help reduce litter and dumping but tidiness of the area and frequent exchange of bins are the prime means of control.

5.3 AREA RESIDENTIAL recyclable waste centres (ARWCs)

Area Residential Recyclable Waste Centres (ARWCs) act as neighbourhood or area collection and temporary storage centres of various waste streams from private households that may include recyclables, household hazardous and non-hazardous wastes and organics pending further processing at appropriate recycling centres.

AWRCs provide additional capacity for both recycling and disposal by providing temporary storage. For areas where not all waste from households is collected by collection vehicle rounds, provision needs to be made for householders themselves to deliver waste that is not collected from households or streets to centres where it can be collected together under different types and sent onwards for reuse, recycling, recovery, or disposal.

AWRCs can usually handle a range of wastes arising from households and should have provision for the user to segregate different recyclable materials under supervision and dispose of additional mixed municipal wastes into large containers.

Like bring sites, AWRCs are licensed by the Centre but, whereas bring sites are sited at an existing location already used by the public, such as a car park for a shopping mall, AWRCs are dedicated sites and typically are capable of receiving more waste streams than bring sites.

5.3.1 Planning an AWRC

The size and layout of an AWRC will be affected by desired ancillary facilities such as:

- Separation of different materials for recycling;
- Acceptance of wastes that are not generally collected by RCVs, for example:
    - Non-packaging glass and metals, tyres;

- Household hazardous waste;
- Construction and demolition materials from house improvements; and
- WEEE.

The need for such facilities will vary from location to location and may be determined based on other facilities and services in the area. For example, where recycling collections or other recycling facilities, such as bring banks, exist locally, the sizing of recycling activities may be very small.

5.3.2 Waste types

As well as residual municipal waste and the commonly recycled packaging and similar materials, AWRCs may accept the following materials for recycling:

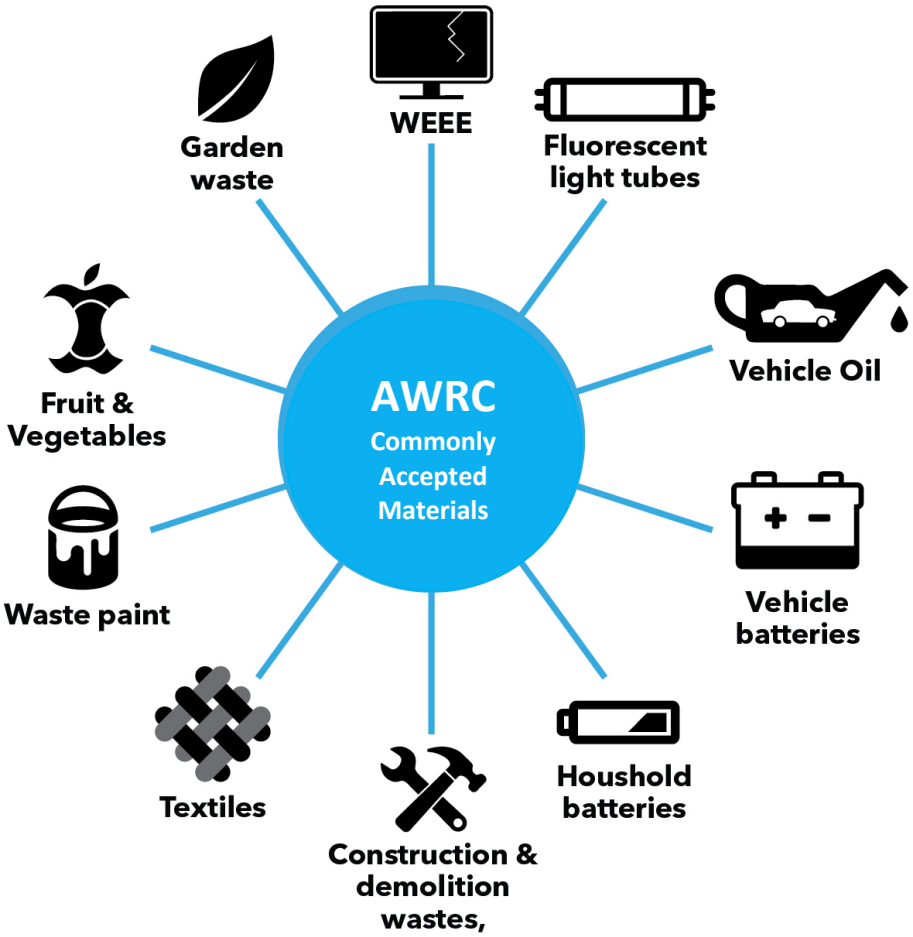

Figure 5-2: AWRC commonly accepted materials

5.3.3 Location and siting

AWRCs are generally open-air facilities. Some may have covered areas for weather protection, although this is not common. They should be hard paved sites, fenced with a secure fence and gates which can be locked when not in use. These facilities need to be located on sites which:

- Are hard paved;
- Can be secured;
- Are not prone to flooding;

- Have the potential for future expansion and re-distribution of containers to allow flexibility for enhanced collection of materials;
- Can enable the development of options for basic physical treatment (sorting, compaction, baling etc.) if this is needed; and
- Are located on sites where the impacts upon sensitive receptors are minimal.

They should be dual level, allowing the public easy access to multiple large containers and the public should be supervised to encourage proper separation of different materials and types of household waste.

Figure **5-3** shows a generic layout plan for an AWRC, with Figure **5-4** showing a photograph of a typical AWRC (Greater Manchester, UK). Note the traffic management system with the direction of travel clearly marked, the use of two levels which also facilitates separation of cars and HGVs, well-marked parking spaces and the range of segregated collection containers beyond the public car parking areas.

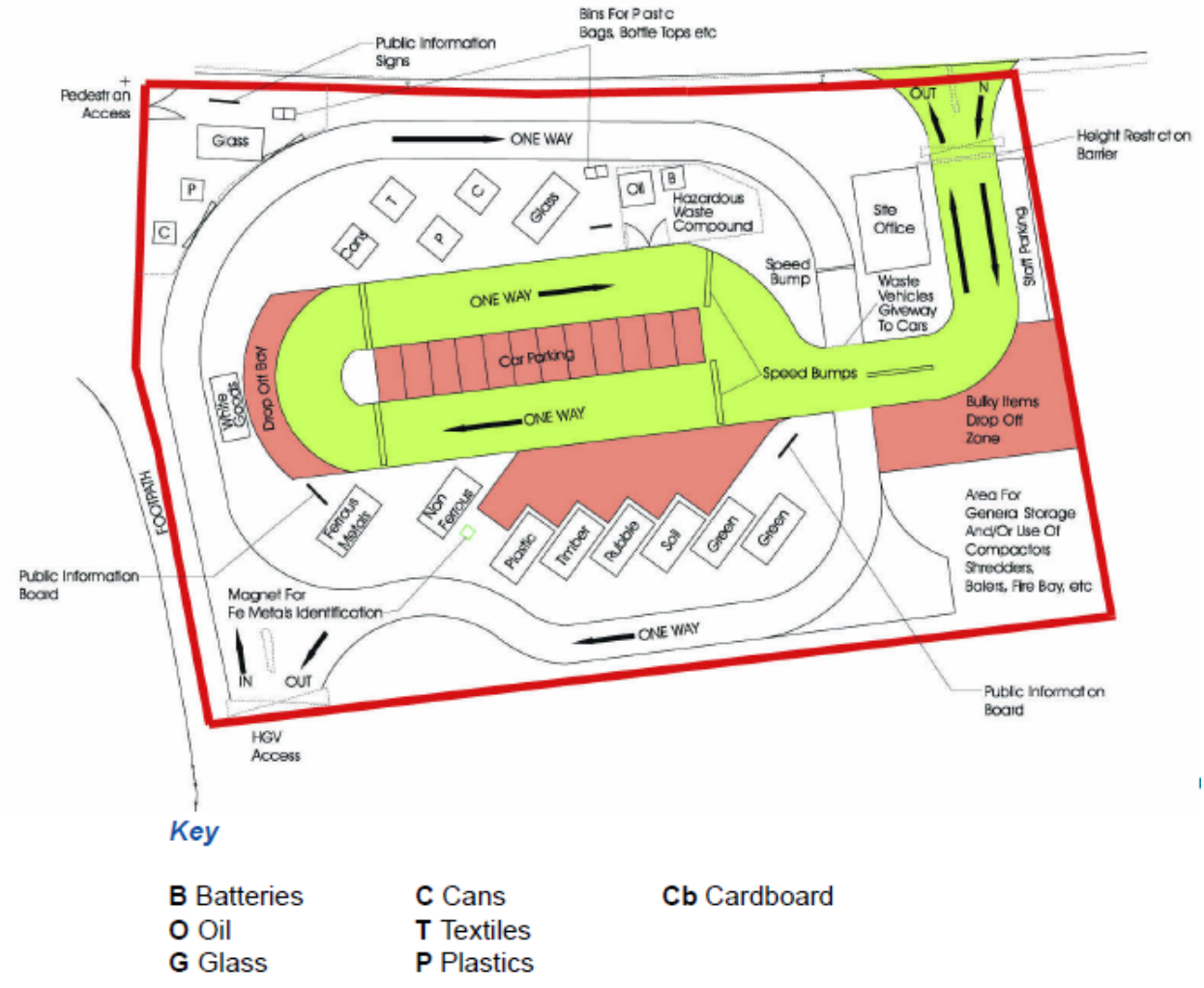

Figure 5-3 Generic Layout Plan for an AWRC

Figure 5-4: Household waste recycling centre in Greater Manchester, UK

5.3.4 Operation

The type and scope of operation and activities is subject to licensing requirements by the Centre.

Often both recyclable and residual waste are sent forward in bulk, either directly or via transfer stations (for materials) to reprocesses or to energy from waste plant or sanitary landfill.

AWRCs may also compact waste to improve transport efficiency, either using fixed compaction equipment or, for example, using a 360^{o} excavator to compact waste with its hydraulic arm and bucket.

The use of AWRCs can complement the collection of recyclable, residual waste, and bulky wastes, through providing additional capacity, particularly (subject to the licence conditions) for materials not normally collected at the kerbside, for example, batteries.

5.3.5 Impacts

The impacts associated with the use of AWRCs' are potential nuisance impacts, and impacts associated with vehicles and vehicle access.

One of the biggest impacts of such facilities is traffic. At busy times, traffic can build up and care must be taken in the design and layout of the site to ensure there is adequate queuing space off from any public roads.

AWRCs will produce noise impacts from vehicles, particularly HGVs and mobile plant, including reversing warnings and filling bulk containers; and they have the potential to produce dusts, odours, and pest infestations, for example, from food waste. They therefore need careful siting, so they are reasonably close to centres of population for access without being next to any individual housing or other sensitive development. AWRCs should also be operated to ensure wastes are not stored for long periods, all putrescible waste is cleared at least at the end of each day and the paved areas sprayed and swept to clean them and suppress dust.

6 SPILLAGES, SPILL RESPONSE AND CONTROL

Spillages of wastes occur frequently at all waste management facilities and dealing with them promptly, efficiently, and effectively is a matter of not just good housekeeping but of the safety of staff. More major incidents such as fires, or large spillages due to containment failure should be regarded as emergencies and be subject to special procedures, approved by the Centre.

All temporary storage facilities must have emergency plans including spill response plans that are comprehensive and up to date to comply with licence requirements. The plan should include clear guidance on when to contact the appropriate emergency services.

The main temporary storage area should be located and/or engineered so that accidental spills and discharges will not flow into sewage or stormwater run-off systems. Additional secondary containment should be provided if the storage area cannot be isolated from the drains or run off areas.

All staff authorised to handle waste should be trained how to use spill kits. These should be located both within or near the temporary storage area and away from it (in case during an incident it is not possible to reach the equipment near the storage containers). More detail of spill kits is given in Section 6.2.

A detailed site drainage plan should be provided to help prevent pollution in the event of a major spillage or a fire.

Any waste that is spilt represents a potential hazard or impact on the surrounding area and should be cleaned up as soon as possible.

6.1 Spillage of non-hazardous waste

Non-hazardous waste spills can attract flies, birds, and rats cause odours, create litter and impact visually on the surrounding area. All areas where waste is discharged, transferred, or is otherwise handled and potentially liable to be spilt should have equipment suitable for cleaning up waste spillages. For small spillages of non-hazardous waste this will probably include a broom, a shovel, and a wheeled bin. For larger spillages, a front-end loading shovel or similar plant may be used.

Non-hazardous waste spillages should be cleaned up as soon as practicable by the member of staff responsible for the area where the spill occurred and recovered if possible. Contaminated spill response material must be collected and disposed of properly. Contaminated spill response material must be collected and disposed of properly. Unless the spillage results in litter or malodour affecting those outside the site boundary, there is no need to record this type of spillage as an incident.

6.2 Spillage of hazardous waste

If hazardous waste is spilt, the spilt waste should be regarded as a danger requiring immediate action and the procedure outlined in Figure **6-1** implemented.

Where hazardous waste is handled, particularly liquid hazardous wastes, spill kit equipment specific to the types of chemicals handled, including suitable PPE, should be placed close to all hazardous waste handling areas. Spill kits tend to be classified according to the type of material they are designed to collect general, oil/organic, and corrosive/unknown. Spill kits should contain products suitable for dealing with the wastes stored on site. The kits are usually designed to absorb up to approximately 150 litres and contents could include:

- Leak-sealing putty;
- Over-drums;
- Drain seals - such as an emergency clay drain plugging mat to seal a drain from spilt oils and/or chemicals;

- Chemical absorbents pads/socks of different sizes;
- Oil or chemical sorbents;
- Neutralizing agents for acid spills;
- Neutralizing agents for alkali spills;
- Plastic scoops and other equipment such as brooms, pails, bags, dust pans, as appropriate; and
- Appropriate personal protective equipment (PPE).

If there is an evident chemical reaction, or the waste is labelled as toxic or flammable, or there is evidence of gas or vapour, people should be kept away from the area of the spill. In any case the responsible member of staff should be informed immediately.

As soon as possible the responsible member of staff should assess the danger presented by the spill, either directly or by delegating someone who is properly trained to assess the spill and report back straightaway.

The responsible member of staff should determine the necessary action, including the use of the correct spill kit by appropriately trained staff with adequate PPE. This assessment should be based on the type of hazardous waste spilt, the size of the spill, the location and the likelihood of any impacts increasing and/or spreading.

The spilt waste should be dealt with promptly by the appropriate department in accordance with any Spills' procedure, with all required PPE and other safety measures.

After organising the initial response, if the spill has not been dealt with and they have not already done so, the responsible member of staff should attend the scene and, if required, contact any other member of staff (e.g., the plant chemist) for advice.

If the spill is not yet under control and/or is becoming more serious, the responsible member of staff should assess whether it is an emergency.

In an emergency situation the appropriate internal or external emergency services should be contacted and the area should be sealed off and/or the area or department evacuated.

Where evacuation of the immediate vicinity was not carried out, the affected area should in any case be cordoned off as soon as possible until dealt with.

The waste spill recovered should be managed as hazardous waste and the used spill kit replenished immediately.

Figure 6-1: Emergency procedure for dealing with spillages

Spill kits should be located both within or near the temporary storage area and away from it (in case during an event it is not possible to reach the equipment near the storage containers). All staff authorised to handle

waste should be trained how to use this equipment. After a spill, replace any spill kits and equipment to make sure they are ready for the next time they are needed.

It is good practice to:

- Use any 'quarantine area' where leaking containers can be placed safely;
- Have a leak-sealing kit available in temporary waste storage and handling areas, and other high-risk locations, to temporarily seal leaking containers until they can be put somewhere safe or taken out of use, for example, temporary secondary containment may be able to be used for small portable containers or portable tanks;
- Carry a spill kit on all vehicles transporting waste around the site;
- Ask the fire service for advice about distance between storage sections, road widths and fire prevention; and to
- Never wash away spilt material or use detergents or dispersants unless it is part the incident response plan.

All contained spills and sorbents, or pollution control equipment used to control the spill should be stored safely until they can be disposed of legally.

In addition, inert absorbents such as sand or vermiculite may be stored for dealing with larger spills.

Every member of staff should be trained in dealing with spills, in particular dealing with spills inside buildings, containers or other confined spaces, when specialist breathing apparatus may be required.

6.3 Emergencies and storing contact details

A fire, explosion or other release of hazardous waste that could threaten human health, or where a spill has reached surface waters, should be regarded as an emergency.

Staff should be trained to recognise and assess incidents that occur as a result of human errors, abnormal operations, or equipment malfunctions. The assessment should include whether they can deal with the incident safely themselves, or they need assistance, or to inform someone at a higher level, or to seek immediate assistance from a specialist team (e.g., a spills team) to deal with an emergency while they evacuate to a safe distance to maintain observation.

Wherever possible, the storage area should be monitored by remote cameras and, where combustible materials are stored, should have smoke and heat detection in place.

Each area of the temporary waste storage that is not visible to another staff member should be in radio contact with site security or a central office so that they can easily raise an alarm if required. The central office and/or the site security office should have a list of emergency contacts, both within the operating company and for the emergency services. A copy of this internal emergency contact list should be stored in the site security or weighbridge building closest to the site entrance, in a plastic wallet in a safe place known to the emergency services.

Where waste producers store hazardous non-waste materials any written contingency plan that is required to minimise hazards from fires, explosions or any unplanned releases should include hazardous waste. Copies of the plan must be:

- Kept on site at all times, usually at a designated place such as the site security office, gatehouse, or weighbridge; and
- Must be submitted to all local emergency service providers.

Any emergency should be recorded at the time, reported to the appropriate level of management and, if required, the relevant public authorities, and documented as soon as possible after the incident. All incidents should be independently investigated to establish the cause if possible and appropriate corrective action implemented.

For facilities which store 1,000 kg or less of hazardous waste, basic safety and response procedures must be established.

7 GENERAL HEALTH AND SAFETY PROVISIONS AT LICENSED TEMPORARY STORAGE FACILITIES FOR HAZARDOUS WASTES AND RECYCLABLES

7.1 First aid provision

Adequate and appropriate equipment, facilities and personnel should be available on site to provide first aid to be given to an employee if they become ill or injured while at work. Each waste should have a first aid room capable of being used to treat a range of minor injuries, such as cuts and grazes. One or more designated persons should be trained and appointed as a first aider responsible for the assessment and treatment of minor injuries and a first aider should be present on site at all times when the temporary storage area is operational.

The number of employees and the wastes/hazardous wastes handled on site will determine the level of first aid provision required. However, the minimum first-aid provision on any work site should be:

- A suitably stocked first-aid kit (the content of the first-aid kit will depend on the nature of the operation and the wastes being stored and handled);
- An appointed person to take charge of first-aid arrangements; and
- Information for employees about first-aid arrangements.

The health and safety of staff and the public should be a major consideration in the management of temporary storage facilities and a senior person should be made responsible for the health and safety of staff and the public in relation to the temporary storage of waste.

7.2 Periodic preventative medical checks

Staff should receive a medical examination before they commence employment. Where necessary the following vaccinations should be administered: hepatitis B, tetanus, tuberculosis, and any other vaccinations determined by the MoH.

7.3 Occupational health

The organisation or facility management must:

- Provide changing rooms and toilets for personal hygiene and somewhere safe to eat and drink;
- Provide personal protective equipment; such as overalls, safety boots, safety gloves, masks, goggles or safety glasses, and head covers, if required; and
- Implement an occupational health and safety program for those handling waste, including:
    - Maintain a special file for each employee including the dates of examinations and vaccinations they received and any findings or reactions (this file shall be kept in the workplace); and
    - Report work injuries and, unless otherwise specified by the KSA government, record these against each employee, each job function, location worked and overall, for the facility.

7.4 Safety equipment

All licensed waste facilities should be equipped with the following:

- Suitable personal protective equipment (PPE) appropriate for the type(s)waste being handled, including hazardous wastes, for all staff involved. Such PPE should include, as a minimum:
    - Eye protection, such as safety glasses, goggles, or a visor;
    - Gloves of suitable material to prevent penetration by sharp objects or by chemicals according to what is handled;
    - Safety boots;
    - Safety helmets if working under beams with high objects;

  - Suitable skin protection/covering;
  - Face masks to prevent inhalation of particulates in dusty atmospheres; and where working with plant or where vehicles are present;
  - High-visibility vests or similar.

- An internal communications or alarm system capable of providing immediate emergency instruction or warning to all personnel;
- A device, such as a telephone (immediately available at the scene of operations) or a hand-held, two-way radio, capable of summoning emergency assistance from local fire departments, ambulance, or emergency response teams;
- Where combustible and/or flammable wastes are stored, storage areas should be equipped with automatic smoke detection and, where necessary, fire suppression systems such as automatic sprinklers or other fire suppression systems;
- Portable fire extinguishers, fire control devices (including special extinguishing equipment, such as that using foam, inert gas, or dry chemicals), spill control materials and decontamination supplies; and
- Water at adequate volume and pressure to supply hoses, foam-producing equipment if appropriate.

All PPE and emergency equipment must be tested regularly and maintained to ensure proper operation.

Where combustible wastes or flammable hazardous wastes are stored, it is good practice to develop a fire prevention and management plan, agreed with the relevant emergency services and approved by the Centre, which covers the storage of combustible and/or flammable wastes, fire detection, suppression and fighting equipment and emergency procedures.

Whether or not such a plant is produced, suitable gaps or breaks between stored materials should be planned and maintained to allow the unobstructed movement of personnel, fire protection equipment, spill control equipment and decontamination equipment to any area of the waste store.

In addition, where combustible wastes or flammable hazardous wastes are stored, appropriate firefighting equipment should be available close to each area where such wastes are kept.

7.5 Training

Employees must be trained to accomplish the work with high efficiency and to care for their own safety and the safety of others. To achieve this goal, each facility or organization must carry out the following training.

Before commencing work, employees should be trained on the following aspects of their job:

- The layout of the site, including the different storage areas and their functions, the location of emergency equipment;
- The characteristics of the waste they will deal with, including all the different categories of any hazardous waste, where these arise and how to manage them;
- The hazards presented by the wastes and ways to prevent or to mitigate any danger;
- Different types of emergencies, such as spills, fires etc. and how to deal with them as safely as possible, including where it is within an employee's duties, the different types of fire and how to operate the appropriate type of firefighting equipment in each case;
- PPE, its purpose, how to use it, care for it and when to change it;
- Temporary waste storage facilities, operating procedures, and any restrictions, for example on temporary storage quantities and period of storage;
- Special procedures for dealing with particular wastes; and
- An overview of the wastes received into temporary storage, their transport and disposal/management.

Prior to commencing work involving handling hazardous wastes, all personnel must be familiar with the relevant hazardous properties of the waste and instructed on what to do in case of emergency. Such instruction or training must include, as a minimum, the following:

- how to report a fire, injury, chemical spill, or other emergency;
- the location of emergency equipment, such as safety showers and eyewashes;
- the location of fire extinguishers and spill control equipment;
- the locations of all available exits for evacuation; and
- The names and phone numbers of the designated emergency co-ordinator and any deputy(ies). Such information should also be posted on or by the point of generation and at temporary waste storage areas.

In addition to the induction training above, all employees working with waste shall be given refresher training and/or information at least:

- Annually; and
- Whenever a significant change occurs that means a change in the way of working, e.g., a change in the designation of a temporary waste storage areas or a new means of containment or a new department.

8 DATA RECORDING, MONITORING AND REPORTING

8.1 Data recording

It is the responsibility of the service provider to record the following data and to ensure these records are kept up to date:

- The details of all waste received at the site, including date and time, weight, type of waste, including any waste code(s), details of the transporter, the vehicle, and the driver;
- The time the waste has been on site compared to the permitted time limit;
- The details of all waste removed from the site, including date and time, weight, type of waste, including any waste code(s), details of the transporter, the vehicle, and the driver;
- The waste management facility, including any disposal site or other waste transfer station to which the waste was taken;
- Any incidents that did result, or could have resulted, in an uncontrolled or unpermitted release from the site, such as a spillage of waste into the surface water drainage system; and
- Any accidents involving waste or waste transporting vehicles or waste handling plant that result in injury to staff or the public or serious damage to property.

8.2 Periodic inspections and internal audits

Each facility should be monitored, either at random or at regular intervals to ensure that the site is being operated in accordance with:

- The working plan agreed with the Centre and incorporated into the licence; and
- Any conditions in the licence issued by the Centre.

This monitoring should be conducted by the designated responsible person, who should, *inter alia*:

- Periodically but irregularly, the designated responsible person should inspect the storage of waste in each area of the site, the degree to which any containers are filled, the labelling of any containers in temporary storage areas, including the length of time any containers have been stored, the storage arrangements and configuration, e.g. of drums, the procedures adopted for drum handling and the segregation of wastes in accordance with its type and any fire prevention plan;
- The responsible person should ask questions of those responsible for handling the waste as to whether they have encountered any problems and what suggestions, if any, they may have for improvements; and
- The data on waste inputs and outputs should be interrogated and the amount and types of different wastes in store compared with the amount of waste visible in the temporary storage area and any differences noted and acted upon.

8.3 Reporting

The designated person should use the data recorded above to monitor the production and/or the management of waste at the temporary storage facility on an ongoing basis. The designated person must prepare reports regarding all aspects related to both hazardous and non-hazardous waste such as production, storage, transport, and processing and provide a copy of these to the Centre competent authorities periodically as determined by these authorities.

In addition, the Centre should analyse the data from each facility to compare the amounts of different categories of waste reported and seek reasons or explanations for any significant differences.

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