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11.1 General

Wastes can be produced from all activities of industry and commerce. Waste streams can include but not limited to general, construction / demolition, industrial, radioactive and medical.

Waste, according to the United Nations Statistics Division Glossary of Environment Statistics, is defined as materials that are not prime products (that is products produced for the market) for which the initial user has no further use in terms of his own purposes of production, transformation or consumption, and of which he wants to dispose. Wastes may be generated during the extraction of raw materials, the processing of raw materials into intermediate and final products, the consumption of final products, and other human activities. Residuals recycled or reused at the place of generation are excluded.

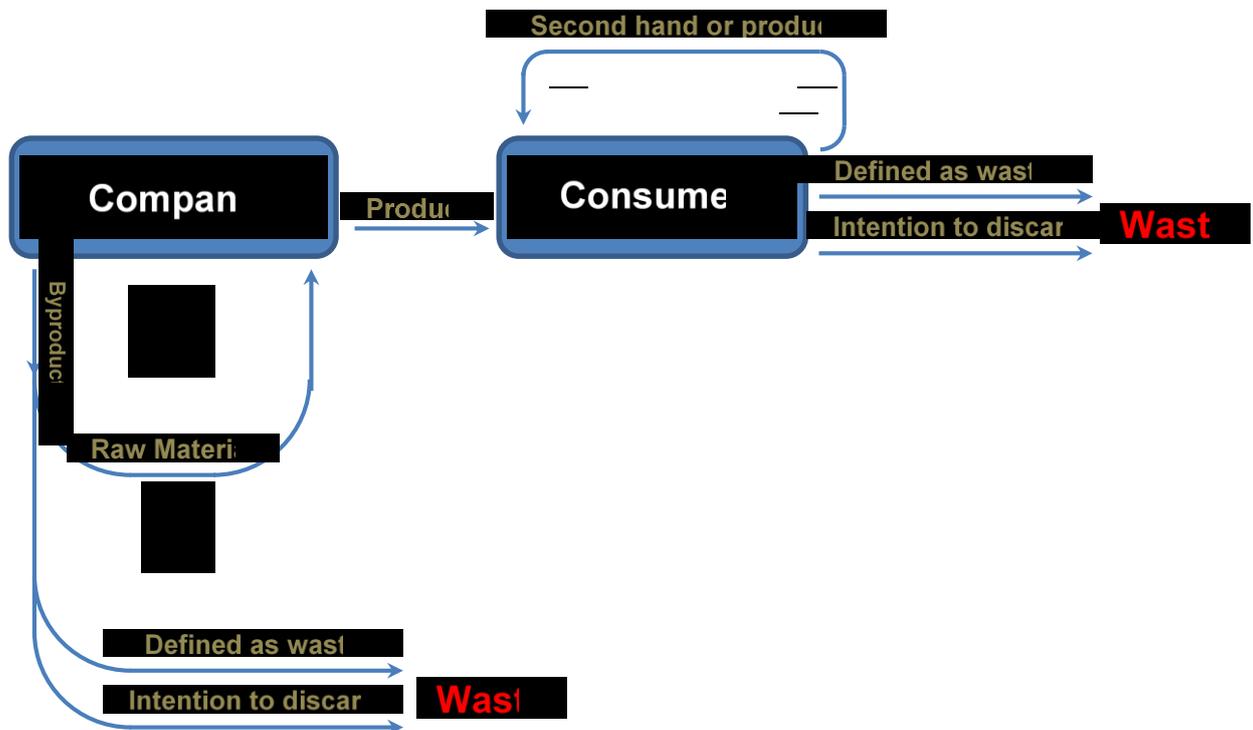


Figure 11.1 – Schematic Illustration of the Legal Definition of Waste as per European Union

Improper waste management has resulting environmental and economic costs. Waste itself attracts pests such as rodents and insects which are known carrier of different diseases. Toxic waste materials such as those coming from industrial and medical activities and those that have been contaminated with a radioactive material have the ability to cause problems not only to living life in the environment but these can also cause contamination to the atmosphere, soil, groundwater and surface water. Some waste treatment and disposal methods emit significant amounts of greenhouse gases especially methane which is the major cause of the global warming phenomenon. The cost of waste management is often high. Efficient waste management and utilizing other options such as reuse, recycling and minimization can significantly reduce the economic costs.



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11.2 Duty of Care Principle

Waste if not appropriately managed has the potential to cause harm to the environment and other life forms including human beings. Duty of Care and Cradle to Grave principles have the intention of self-regulation wherein it makes anybody generating and/or handling waste accountable for its proper management. The duty stretches from the time that the waste has been generated up to the period that the waste has been reprocessed or disposed.

Waste Management Roles and Responsibilities under Duty of Care Principle	
Role	Responsibilities
Waste Generator	<ul style="list-style-type: none"> ✓ Ensure that all waste generated is handled and stored in a manner that will not cause any harm to human beings and/or pollution to the environment by the generator itself and/or the commissioned third party waste management service provider. ✓ Ensure that the generated waste is classified accordingly and accurately and the associated waste description consists all the details to be referred to by the commissioned third party waste management service provider during subsequent waste handling ✓ Ensure that the transport and subsequent recycling / processing / disposal are through an approved third party waste management service provider only. The transfer and further processing / disposal are covered by all appropriate approvals and properly documented. ✓ Ensure that all relevant waste management records are kept for future references.
Waste Transporter	<ul style="list-style-type: none"> ✓ Ensure that the waste collection and transport shall not cause any harm to human beings and/or pollution to the environment. ✓ Ensure that the waste collection and transport is covered by all appropriate approvals and documentations. ✓ Ensure that the waste description received from the waste generator is correct and all details with regards to proper handling and transport are included. ✓ Ensure that your business operations have all the necessary licenses and permits to perform the waste collection and transport service. ✓ Ensure that the receiving facility, e.g., recycling, processing or disposal, is authorized to receive the type of waste being transported to. ✓ Ensure that the transfer of waste to the receiving facility is properly documented. ✓ Ensure that all relevant waste management records are kept for future references.
Waste Recycling / Waste Processing / Waste Disposal	<ul style="list-style-type: none"> ✓ Ensure that the receipt of the waste shall not cause any harm to human beings and/or pollution to the environment. ✓ Ensure that the transfer of waste into and / or out of your facility is covered by all appropriate approvals and documentations. ✓ Ensure that your business operations have all the necessary licenses and permits to perform the waste collection and transport service. ✓ Ensure that your facility is authorized to receive the waste for recycling / processing / disposal. ✓ Issue a certificate of completion of the waste recycling / processing / disposal. ✓ Ensure that all relevant waste management records are kept for future references.
Waste Exporter	<ul style="list-style-type: none"> ✓ Ensure that the export of waste is covered by all appropriate approvals and documentations both from the countries of origin and destination.



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11.3 Waste Management Options Hierarchy

The general waste management rule is to implement the options as per the below order (Figure 11.2). The main objective of the waste hierarchy is to gain the maximum useful benefits and to minimize waste generation. The effective implementation of waste management hierarchy will result in a number of useful benefits such as pollution reduction, save energy and resource conservation.



Figure 11.2 – Waste Management Options Hierarchy

It is a mandatory requirement that all waste generators should exhaust all efforts of utilizing the most favored options primarily prior to the least favored ones.

11.3.1 Prevention and Minimization

These options mean to avoid and reduce the generation of waste at source. Modification of the current practices and operational activities will help achieve the objectives of these two options.

These two options when done effectively will be able to provide the most number of benefits to the waste generator in terms of environmental and financial costs.

11.3.2 Reuse

Reuse involves the utilization of an item again after it has been used. The material can be utilized again for the same purpose or for a different purpose. With this option, no processing has been done on the material for reuse, hence, time, money, energy and resources have been saved.

11.3.3 Recycling

Recycling involves the process of changing waste materials into new materials preventing the disposal of potentially valuable materials. It helps lessen the consumption of fresh raw materials and the volume of wastes to be directed into the landfills; thus, the effects of disposal are also reduced.

There are a number of industrial facilities locally that are allowed to utilize waste materials as feedstock in their process. These facilities need to be prequalified prior to collection of waste materials from the source. There are also waste trading facilities approved to do the collection and transport of paper, plastic and metal.

11.3.4 Energy Recovery



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Energy recovery or waste-to-energy is the conversion of non-recyclable waste materials into functional forms of energy such as heat, electricity or fuel. This option reduces the emissions of methane gas from landfills and creates a renewable energy source thereby compensating the utilization of fossil fuels which will lessen carbon emissions.

11.3.5 Disposal

Disposal is any activity that involves the dumping of waste without energy recovery. This option shall only be considered once all other options have been fully explored. Landfill is the most common method of disposal.

There are no existing facilities for waste disposal under the management of Trakhees – Inspection Department. The Dubai Municipality (DM) operates two (2) disposal sites at Jebel Ali, one for domestic and non-hazardous types of industrial wastes and one for hazardous wastes and the municipality has to be consulted about disposal of each type of wastes, which originates from the Free Zone. The Municipality will only accept solid waste for disposal after every effort has been made to minimize the generation of such waste, and to practice recycling and pre-treatment as much as possible.

When submitting an application for establishing works in the Free Zone, the applicant must give details about the quantities and qualities of wastes to be generated. Hazardous wastes for disposal, so that they can be considered on their merits to establish whether they are disposable on the Municipality's hazardous materials dump, require prior treatment by the company before disposal or the safe export in some other country where facilities are available. All wastes transport to follow Trakhees – Inspection Department and DM requirements. Hazardous wastes management and disposal including medical and radioactive wastes to be conducted as per DM requirements.

11.4 Waste Classification

Waste can be classified based on a number of principles such as but not limited to form and source. Under this Regulation, waste shall be classified as follows:

- a.) General Waste
- b.) Industrial Waste
- c.) Construction and Demolition Waste
- d.) Horticultural Waste
- e.) Medical Waste
- f.) Radioactive Waste

11.5 General Waste

Waste generated from day-to-day activities which are not in any way related to industrial activities shall be classified as general waste.

11.4.1 Types of General Waste



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- a.) General Solid Waste – includes paper, cardboard, plastic, metal, glass and food waste. Waste management option hierarchy can be easily adopted for this type of general waste.
- b.) General Liquid Waste – any liquid waste that has been generated from common human activities (e.g., hand washing, toilet flushing, etc.) and does not come from any industrial or trade activities.

11.4.2 General Waste Management Requirements

a.) General Solid Waste

As far as reasonably practicable, general solid waste shall be segregated at source. Segregated waste shall be sent to an authorized and appropriate waste recycling or processing facility.

Dedicated containers with labels for identification for each stream of general waste shall be made available. Additionally, the specifications of general solid waste storage area and skip shall be as per the requirements of relevant regulations.

General solid waste shall not in any way be stored together with other classifications of waste. A designated storage area shall be provided. No waste shall be found scattered in any areas other than the designated one even the waste has been merely windblown. Appropriate covers should be provided. Waste that becomes wet due to rain or any other liquid is unacceptable as wet / damp waste may cause contaminated run-off or prevent the waste material to be reused or recycled.

b.) General Liquid Waste

General liquid waste shall have a dedicated storage tank constructed as per the facility's operational requirements and relevant regulations. No other materials shall be stored in the general liquid waste container.

Imdaad does the collection of general liquid wastes in the free zone area whereas other approved waste management service providers can collect sewage wastes in port and other areas.

The waste generator may set-up an on-site sewage treatment plant (STP) for their facility's use. The treated sewage water can be reused on the following options:

- Irrigation Water – treated sewage can be utilized as irrigation water provided that the quality is meeting the relevant standards and permit shall be primarily secured from the Authority.
- Water for Domestic Use – domestic activities that do not involve any human contact such as but not limited toilet flushing will be allowed provided that there is a closed loop system between the on-site STP and toilet drainage.

11.6 Industrial Waste

Waste which has been generated from any industrial (e.g., manufacturing process and operations, etc.) or trade activities shall be considered as industrial waste.

There are some processing facilities within the emirate of Dubai that are allowed to receive and utilize the waste as their feedstock. If there is no waste processing facility locally available for the type of industrial



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wastes being generated, then the wastes shall be properly disposed to Dubai Municipality's (DM) hazardous wastes treatment facility. Transfer of waste to a processing facility in other Emirate or country shall be bounded by the Basel Convention Protocols (later Section).

11.6.1 Types of Industrial Waste

The following are the types and sub-types of industrial waste:

Types of Industrial Waste	Sub-Types of Industrial Waste
Pharmaceutical Waste	<ul style="list-style-type: none"> expired solids and unsafe medicines, drugs, pharmaceuticals expired liquids and unsafe medicines, drugs and pharmaceuticals wastes from manufacturing or formulation controlled substance / antineoplastics
Pesticides and Biocides Waste	<ul style="list-style-type: none"> solids aqueous
Organic Solvent Wastes	<ul style="list-style-type: none"> spent solvent in liquid form solvent mixed with solids
Cyanide Wastes	-

Oils and Oily Wastes	<ul style="list-style-type: none"> waste lube oil and similar oil in liquid form used oil filters and other oil-contaminated wastes oil sludge
Polychlorinated Biphenyl (PCB) Wastes	<ul style="list-style-type: none"> any aqueous wastes of PCBs, Polychlorinated Terphenyls (PCT), Polybrominated Biphenyls (PBB) or their congeners equipment or articles contaminated with any PCB, PCT, PBB or their congeners
Waste Tarry Residues	-
Waste Paint, Ink, Resin, Latex, Etc.	<ul style="list-style-type: none"> expired (unused) product residues from use or process
Explosive Not Subject to Other Legislations and Reactive Wastes	<ul style="list-style-type: none"> substance that gives off heat when explode substance that emits toxic fumes when explode flares and other safety device with explosives
Waste Treatment Residues	<ul style="list-style-type: none"> precipitated sludge settled solids
Metal Treatment Wastes	<ul style="list-style-type: none"> sludge aqueous
Toxic Metal Wastes	-
Inorganic Chemical Wastes	<ul style="list-style-type: none"> expired product spent catalyst process refuse
Organic Chemical Wastes	<ul style="list-style-type: none"> expired product process refuse
Acid Wastes	<ul style="list-style-type: none"> solids aqueous



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Alkaline Wastes	<ul style="list-style-type: none"> • solids • aqueous
Asbestos Wastes	<ul style="list-style-type: none"> • friable • non-friable
Phenols Wastes	-
Halogenated Organic Solvents	<ul style="list-style-type: none"> • solids aqueous
Waste of Dioxin or of its Congeners	-
Organo-halogen Wastes	<ul style="list-style-type: none"> • expired unused product • process refuse
Waste Chemicals	<ul style="list-style-type: none"> • expired unused product • process refuse
Contaminated Containers	-
Spent Batteries	<ul style="list-style-type: none"> • spent lead-acid batteries, whole or crushed • alkaline and other types
Spent Pot Lining	-
Spent Blasting Grits	<ul style="list-style-type: none"> • garnet • copper grits • grits of iron / other metals
STP Sludge	<ul style="list-style-type: none"> • pump pit / . Holding tank cleaning • digested / treated
Wastewater	<ul style="list-style-type: none"> • oily source • organic source • inorganic source

11.6.2 Industrial Waste Storage

The following are the minimum storage requirements for industrial waste:

- ✓ There shall be a dedicated storage area for industrial waste. The dedicated storage area shall be secured from unauthorized entry; however, the area shall be accessible in case of emergency and during inspection.
- ✓ Industrial waste segregation shall be observed at all times.
- ✓ Ensure that each industrial waste container holds only one type of industrial waste, or, only compatible chemicals shall be mixed in a single container.
- ✓ Industrial waste container shall be in sound condition and made from materials appropriate for the characteristics of the industrial waste to be stored.
- ✓ Industrial waste container shall be sealed and labelled.
- ✓ Industrial waste container shall be regularly checked for any possible leaks. Drip trays or any other fixture that is impermeable shall be provided in order to retain any leaks.
- ✓ Drums containing industrial waste shall be placed on appropriate pallets or similar structures.



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The above storage requirements are in addition to the provisions stated in any other relevant regulations.

11.6.3 Industrial Wastes Generator ID

All companies generating wastes classified as industrial wastes shall be required to secure a unique generator ID that needs to be renewed on an annual basis. The generator ID will be Client and facility's location specific. No disposal approval shall be issued to Companies without a valid generator ID.

During initial issuance of generator ID, the Client shall be required to identify all industrial wastes currently or expected to be generated in their facility based on their current and future operational activities. Waste Audit Report (Refer to Trakhees Guideline No. ID-EN-G27) prepared by or on behalf of the Client by a Trakhees – Inspection Department Pre-qualified Environmental Consultant shall be required for submission and approval during renewal of the generator ID.

The generator, transporter and processing / treatment / disposal facility shall affix the signature of the authorized representative and company's stamp in the form. Any missing details and/or marks shall make the manifest void. The completed manifest shall be considered as an acceptable waste management record.

11.6.4 Industrial Waste Manifest

In order to have a single tracking document of industrial wastes from its point of generation to the point of recycling / processing / disposal, Waste Manifest shall be initially filled-up by the wastes generator and subsequently completed by the waste transporter and waste processing / recycling / disposal facility.

The manifest shall include the details waste generator, transport and recycling / processing / disposal facility. The form shall be completed in triplicate copies. The waste generator, waste transporter and waste recycling / processing / disposal facility shall have one (1) copy of the completed manifest which shall be kept as record for future reference. Signature of the authorized representative and company's stamp of the waste generator, waste transporter and waste recycling / processing / disposal facility is mandatory to be affixed on the document. Any missing information / stamp / signature shall make the manifest unacceptable. One (1) manifest shall be used for each transport and for every type of waste to be managed.

11.7 Construction and Demolition Waste

Waste resulting from construction and demolition activities such as wood, steel, concrete, dirt, sand and all other uncontaminated or potentially hazardous materials such as but not limited to paint / oil cans and asbestos containing material.

11.8 Horticultural Waste

Any material from gardening activities shall be classified as horticultural waste. Any company producing horticultural waste shall commission Dubai Municipality (DM) Waste Management Department approved organic waste collecting service companies only for the collection and transport.

11.9 Medical Waste

Any waste which may pose harm and/or cause infection to any person coming into contact with it, which contains human or animal tissues, blood or other body fluids, excretions, dressings, swabs, syringes, needles or other sharp instruments and drugs and which has been generated from medical treatment,



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nursing care, dental, veterinary, investigation, teaching, research, collection of blood for transfusion, and from any other similar works is considered to be medical waste.

The following are the minimum requirements in order to achieve sound medical waste management:

- ✓ Medical waste shall be separated from all other classification of waste in order to eliminate the risk of harming the environment and health of an individual.
- ✓ A secured area shall be designated for the collection of medical waste.
- ✓ The healthcare facility shall have policies and procedures related to the handling, storing, transporting and disposal of medical waste with the aim of reducing the risk of infection.
- ✓ Appropriate storage and containers shall be provided to all medical waste being generated in the healthcare facility.

11.10 Radioactive Waste

Radioactive waste is defined as any waste that contains or is contaminated with radionuclides at concentrations or activities greater than levels as established by the Federal Authority for Nuclear Regulation (FANR). Disposal of any material with radioactive substance shall be in accordance with Trakhees Regulation IO 10.0 Radioactive Source Monitoring Protocol.

Importation or disposal of any material with radioactive substance in any form within United Arab Emirates is strictly prohibited.

11.11 Third Party Waste Management Service Providers

Waste management services are being provided by a number of third party companies. Waste management service includes collection and transport and waste recycling / processing.

11.11.1 Collection and Transport

All companies intending to conduct the collection and transportation of wastes shall comply with the following operational requirements:

- ✓ Only the type of waste approved to collect and transport shall be transported.
- ✓ The vehicle to be used for the transport of industrial waste must be approved for the particular type of industrial waste.
- ✓ Vehicle to be used for the collection and transport shall be roadworthy at all times and registered with the Roads and Transport Authority (RTA).
- ✓ Waste to be collected and transported shall be properly packaged and transferred only to the approved waste recycling / processing / disposal facility.
- ✓ The waste transport vehicle shall be properly equipped to prevent any leakages and/or spillages, any wastes to be windblown and to contain the waste safely in case of any accidents. Appropriate equipment shall include but not limited to the following: safety gloves, boots,



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coverall attire, scooping tools or spade, absorbent materials, spare containers and fire extinguisher.

- ✓ Filled-up waste manifest and its attachment (if any) shall be carried all throughout the collection and transport process of general and industrial wastes.
- ✓ Avoid road routes that have dense population or environmentally sensitive areas

Further to the above minimum requirements, the following are additional requirements for industrial waste collection and transport companies:

- ✓ Company name, address and telephone number shall be clearly marked on the vehicle.
- ✓ No industrial waste shall be taken from the place of generation without the appropriate Waste Disposal Permit issued by relevant Authority.
- ✓ The vehicle shall be properly placarded on left, right and rear sides. The placard shall be marked with relevant hazard symbol and identification of the load. The words and symbol shall be in bold format and readable as far as thirty (30) meters away.

11.11.2 Waste Recycling / Processing

There are a number of approved waste materials trading companies locally wherein the collected materials will be sold to recycling facilities. These waste materials include paper, plastic and metal.

Aside from the locally available waste trading companies, there are some industrial facilities that utilize waste materials as their feedstock. These waste processing facilities must be able to prove that their process shall not generate waste that will be more difficult to manage or waste that will be more hazardous in nature than its original form.

11.12 Export of Waste – Basel Convention Protocols

The Authority follows Basel Convention Protocol requirements, as UAE is a signatory to the same since 17th November 1992. Table 11.1 specifies the restrictions of UAE on transboundary movement.

	Final Disposal	Recovery
Export	<i>No restriction on waste exportation</i>	
Import	<i>Restricts any waste importation</i>	
Transit	<i>Restricts the transit of wastes</i>	

The Basel Convention was set up to control the transboundary transport of hazardous wastes for disposal in other countries especially to developing countries where controls are minimal and dangers could develop. The Convention defines categories of wastes to be controlled, divided into waste streams and waste containing certain constituents. The Federal Environmental law bans import and transit of hazardous wastes because the UAE is a party to the Basel Convention of Transboundary Movements on Hazardous Wastes. Export for recycling, recovery and other purposes that are not available within the UAE with Ministry of Climate Change and Environment (MOCCA) approval is shall not be allowed. No Objection Certificate (NOC) shall be issued by Trakhees – Inspection Department to Companies planning to export wastes upon presentation of relevant documents such as but not limited to filled-up notification and movement documents (form as per the Basel Convention), etc.



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The Basel Convention rules are also being applied on inter-emirate transport of wastes. No wastes shall be transported to other Emirates without prior approval from the concerned Authorities. Inter-emirate transport of waste shall only be permitted if the waste recycling / processing / disposal facility has a higher standard than that of which is already available in the emirate of Dubai.

11.13 Reference

Federal Law No. (24) of 1999 for the Protection and Development of the Environment

Dubai Municipality Technical Guidelines

Basel Convention Country Fact Sheets

(<http://www.basel.int/Countries/Countryfactsheets/tabid/1293/Default.aspx>)