



# الضوابط والأدلة الفنية لتصنيف النفايات

## Technical Guidelines Waste Classification

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## LIST OF ACRONYMS

C&DW	Construction and Demolition Waste
C&L Inventory	Classification and Labelling Inventory
ECHA	European Chemical Agency
EWC	European Waste Catalogue
WEEE	Waste from Electrical and Electronic Equipment
EPR	Extended Producer Responsibility
HP	Hazardous Property
IARC	International Agency for Research on Cancer
INERIS	French National Institute for Industrial Environment and Risks
IR	Implementing Regulations
KSA	Kingdom of Saudi Arabia
LoW	List of Waste
MFSU	Manufacture, Formulation, Supply and Use
MSDS	Material and Safety Data Sheet
MWAN	National Centre for Waste Management
OECD	Organisation for Economic Co-operation and Development
PCB	Polychlorinated Biphenyls
PCDD/PCDF	Polychlorinated Dibenzo-p-Dioxins and Dibenzofurans
PFOs	Perfluorooctane sulfonic acid
POP	Persistent Organic Pollutant
SDS	Safety Data Sheets
SCC	Specific Contaminant Concentration
SCCB	Short-Chain Chlorinated Paraffins
STLC	Soluble Threshold Limit Concentration
STOT	Specific Target Organ Toxicity
TCLP	Toxic Characteristic Leaching Procedure
TEFs	Toxic Equivalency Factors
TG	Technical Guideline
US EPA	United States Environmental Protection Agency
WHO	World Health Organization
WML	Waste Management Law



## DEFINITIONS

Green Waste	Any Waste that is produced from accumulations of cut grass, plants, tree leaves and tree corners, and other accumulations resulting from public and private gardening and green landscape caring at roadsides and parks.
Construction and Demolition Waste	All solid Waste arising from construction and demolition activities. This includes waste produced from construction of buildings and infrastructure, destruction or demolition of buildings and infrastructure, and the maintenance, renovation, rehabilitation and refurbishment of buildings and infrastructure. Construction and demolition waste includes without limitation brick, concrete, hardcore, subsoil and topsoil, materials resulting from excavation works, and it can also include quantities of timber, metal, plastics and, occasionally, hazardous materials.
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 dispensers.
Extended Producer Responsibility	The producer and importer of products imported, locally manufactured, or derived from another material, intended for sale or consumption, shall bear the legal and financial responsibility for the management, treatment, and safe disposal of residues and waste during their life cycle.
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.
Hazard Statement	Means a statement assigned to a hazard class and category that describes the nature of the hazard(s) of a chemical, including, where appropriate, the degree of hazard.
Healthcare Waste	Waste that is produced from facilities that provide various health care services, laboratories, drug production centers, pharmaceuticals and vaccines, veterinary treatment centers and research institutions, and from treatment and nursing in the home.
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 or may not be considered hazardous as per definition of hazardous waste.
Marine Waste	Waste in the marine environment and in the coastal areas in direct contact with the sea, which results from human activities.

Service Provider	The person licensed or authorized to engage in one of the Waste Management activities.
Treatment	It means the use of physical, biological, or chemical means, or a combination of these means, or others to bring about a change in the specifications of waste in order to reduce its volume or facilitate the processes of treating it when reusing or recycling or extracting some products from it or to remove organic pollutants and others in order to reduce or utilize some of the waste components or eliminate the possibility of harm to humans or the environment.
Municipal Waste	Solid 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.
Waste	All materials that are discarded or disposed of, and that directly or indirectly affect public health or the environment.
Waste Producer	Every person who produces classified waste according to the provisions of the Law.

# 1 Purpose and Scope

## 1.1 Purpose

The purpose of this document is to establish a technical guidance document for the classification of waste in the Kingdom of Saudi Arabia, in accordance with the provisions of the Waste Management Law and the associated Implementing Regulations. The waste classification system will be employed nationally by all the parties involved in the waste sector from producers, waste service providers, public competent authorities, and other interested parties, to record and report waste related data and to monitor and inspect waste related activities.

The document has effect for purposes connected with the regulation of waste to provide methodologies and standards to:

- Classify whether a material/substance is waste or is excluded from the definition of waste;
- Classify waste as hazardous or non-hazardous; and
- Classify and assign codes to all waste streams according to its physical and chemical characteristics and source of generation.

## 1.2 Scope

Waste classification is used by a range of stakeholders and for a variety of purposes, including in relation to the duty of care and regulation of different waste streams, to the identification of an appropriate place to take waste for reuse, resource recovery or disposal and the collection and reporting of information on waste. The main scope of a classification system is to assist users to understand the characteristics of waste so that it can be managed and monitored appropriately in a manner that protects humans health and the environment.

The Implementing Regulations establish a set of procedures and tools to classify waste and facilitate its management by all relevant parties. This Technical Guideline further provides guidance on the classification of waste through all its stages, including the definition of waste and related products.

The provision of this Technical Guideline applies to all waste types as defined by the Waste Management Law and its associated Implementing Regulations.

This Technical Guideline does not apply to the following waste streams:

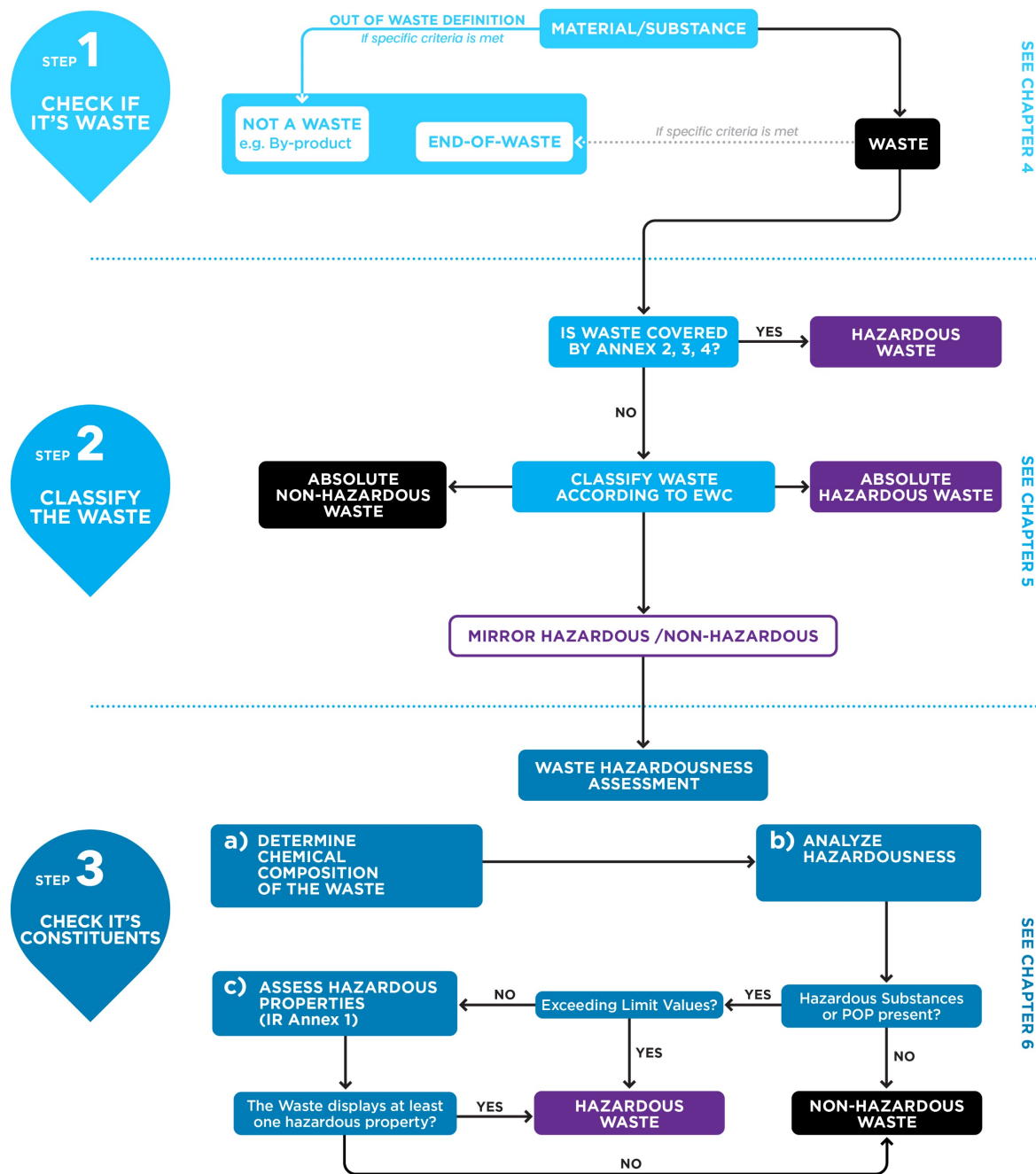
- Nuclear waste;
- Radioactive waste; and
- Military waste.

The following are out of the scope of this Technical Guideline to the extent that they are covered by other legislation:

- Wastewater;
- Gaseous effluents emitted into the atmosphere; and
- Land including unexcavated contaminated soil and buildings permanently connected with land.



The following figure shows an overview of the classification of waste and the correspondence with the sections of this document.



**LEGEND**

**IR** - Implementing Regulations

**EWC** - European Waste Catalogue  
(same as LoW)

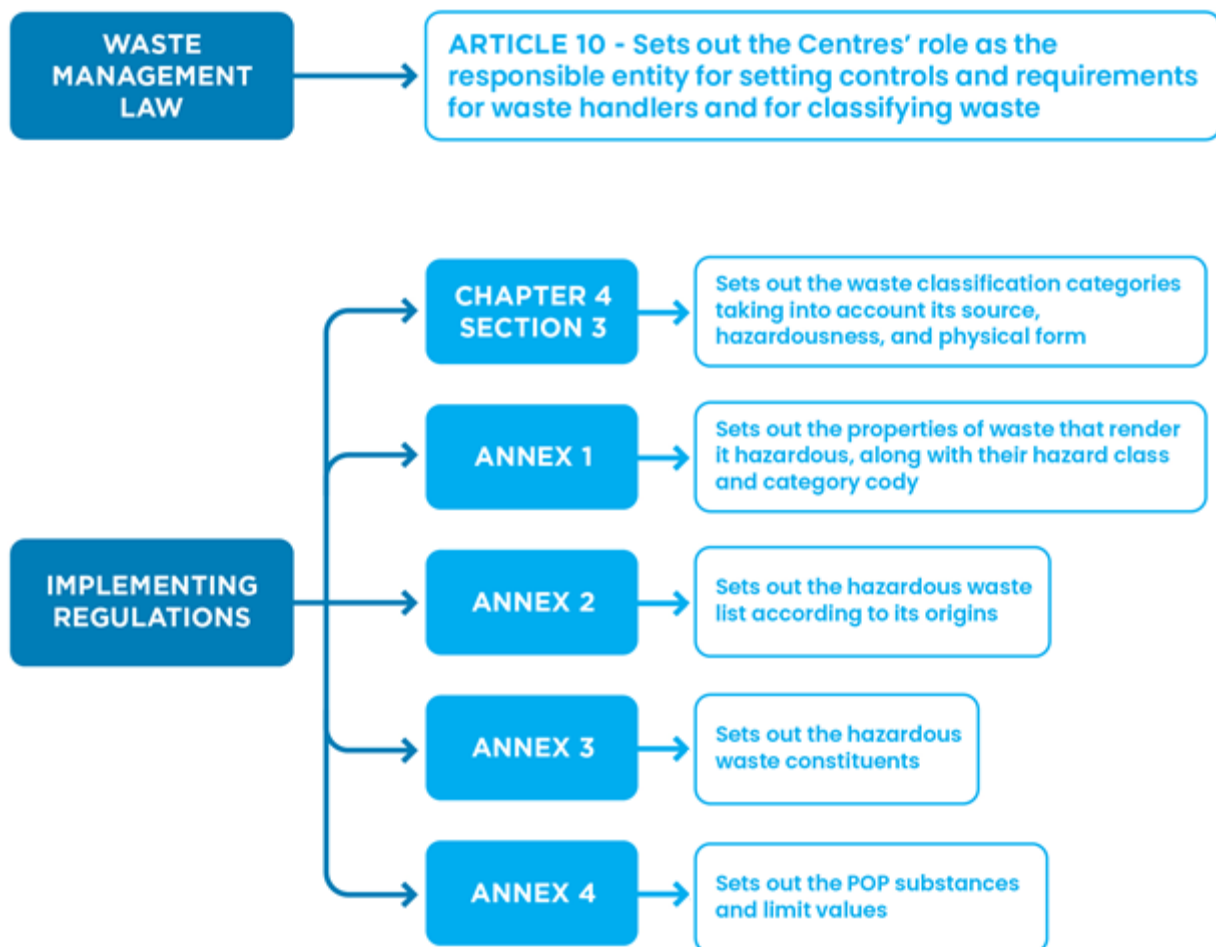
**POP** - Persistent Organic Pollutant

Figure 1-1: Overview of the classification of waste

## 2 Legal requirements

### 2.1 Legal requirements in the waste sector

The Technical Guideline on the Classification of Waste complements the information provided by the Waste Management Law and the corresponding Implementing Regulations, with a more step-by-step approach to guide users through the waste classification process. For legal requirements on waste classification, however, users should consult both the WML and the IR, particularly the following provisions:



### 3 Roles and Responsibilities

This Technical Guideline should be used by all parties involved in all the stages of the waste value chain from generators to waste service providers. The parties involved in the waste management as defined in the WML, include: the competent authority (the Centre), waste generators and waste service providers (of collection, transport, storage, treatment, and disposal facilities).

#### Roles and Responsibilities of the Centre



##### **Ensure compliance with the requirements**

Ensure compliance with the waste classification attributed by the waste managers.



##### **Ensure use appropriate licenses and permits**

Ensure that permits and licenses issued for the service provider include the waste streams based on the assigned code, properties, and hazardousness.



##### **Carry out inspections**

Carry out inspections, measurements and test on premises, articles or records found on any such premises, and take away such samples of waste or articles, as may be considered appropriate for the purpose of enabling such investigation.



##### **Assess Records**

At any time require any relevant party to supply him with copies of, or of extracts from, any records kept for the purpose of demonstrating compliance with the waste classification.

## Roles and Responsibilities of the Waste Producers



### **Ensure material or substance status**

Ensure that the material or substance generated is waste in accordance with the provisions of the WML and its IR and as detailed in chapter 3 of the present Technical Guideline;



### **Ensure proper classification of waste throughout all stages**

Ensure that the waste generated is classified accordingly and accurately, in accordance with the provisions of the WML and its IR and as detailed in chapters 4 and 5 of the present Technical Guideline, and the associated waste description consists of all the details to be referred to by the commissioned third-party waste service providers during subsequent waste handling



### **Ensure due data recording and reporting**

Ensuring the recording and reporting of waste in line with the waste characteristics and classification

## Roles and Responsibilities of the Waste Service Providers



### **Ensure compliance of information**

Ensure that the waste description received from the waste producer or previous waste manager is correct and all details with regards to waste transport, treatment and/or final disposal are included.



### **Ensure due data recording and reporting**

Ensuring the recording and reporting of waste in line with the waste characteristics and classification

## 4 Waste Definition and Scope

### 4.1 Overview

The initial step on the process of classifying waste is understanding whether the material being assessed is, in fact, waste in line with the conditions established in article 63 of the Implementing Regulations.

In order to make sure that no resources are wasted, and materials and substances are kept in the loop for as long as possible, it is essential to properly address and classify these materials accordingly throughout their life cycle.

Waste classification will influence further handling and its valorisation, which is why it's paramount to set proper standards and procedures so that all relevant parties can properly address this issue, as detailed in the Sections below.

### 4.2 Waste Status

Waste is defined in the WML as *“all materials that are discarded or disposed of, and that directly or indirectly affect public health or the environment”*. According to Article 63 from the Implementing Regulations, a material is classified as waste if it meets one of the following criteria:

- The inability to directly use it;
- It is not able to be used until it has been processed;
- It's production is not intended;
- The material holds no market value or constitutes a financial burden;
- It's owner has no purpose of keeping it;
- The substance/material is used in any waste management activity;
- The substance/material is polluted in a way that poses a danger to the environment or public health;
- It's customarily referred to as waste, or it is handled and managed in a manner that is customarily considered intended for the purpose of the disposal, recovery and/or treatment.

From the moment a material meets any of the abovementioned criteria it shall be classified as waste and dealt with accordingly to the established regulations and procedures, taking into account it's characteristics and properties, as further detailed through this document.

## 5 Waste Classification by List of Waste

Waste classification intends, as its primary goal, to avoid and reduce human health and environmental issues arising from waste management, ensuring that all waste is properly treated according to its characteristics and no adverse effects like water, air and soil pollution, fauna and flora contamination, or any kind of damage to any receptors occurs. To achieve that, it's essential that waste is duly segregated and classified at place of generation, so that its properly transported and treated/disposed in the most appropriate and consequently least hazardous for humans and the environment. This classification should occur based on several considerations, as detailed below.

Following article 49, waste can be classified into 8 categories according to its source of generation, namely Municipal Solid Waste, Construction and Demolition Waste, Healthcare Waste, Marine Media Waste / Maritime Transport Waste, Agricultural / Green Waste, Industrial Waste and Sludge Waste. Special Waste is not a source but a category of waste with unique regulatory requirements usually associated with EPR products, for which reason they are mentioned under this section. In addition to the source of generation, waste can also have different physical properties as displayed in Section 5.1 and can be classified according to its hazardousness, as addressed in Section 6.

At the time of issuing this Technical Guideline, the Kingdom has not yet developed a national coding system to be used for the classification of waste according to its source and characteristics. As such, and until a new system is developed, the European Waste Catalogue (EWC) will be used as a transitional system to classify waste, paired with Annex 2, 3 and 4 of the IR for hazardous waste.

### 5.1 Identification of the physical form of waste

Based on the physical form, waste shall be classified as liquid, solid and semi-liquid. Waste in liquid form should be:

- Any waste that near instantaneously flows into an indentation void made in the surface of the waste; or
- Any waste load containing free draining liquid substance in excess of 250 litres or 10% of the load volume, whichever represents the lesser amount. "Free draining" means a liquid as defined in this Article, irrespective of whether that liquid is in a container.

The second interpretation shall be used where liquids are known to be present in small amounts in a generally solid waste, for example, cartons of milk or juice in Mixed Commercial Waste or are adventitious in a Waste, for example, liquid that has drained or been squeezed from components of the waste.

Liquid Waste shall be classified into the following five groups:

- Water containing larger quantities of filterable or non-filterable solids. Examples are dredge spoil, mine tailings, and slurries, provided that they are not contaminated with suspended or dissolved chemicals to an extent that requires them to be disposed of in a controlled manner;
- Water containing larger quantities of dissolved chemical substances;
- Water containing larger quantities of nutrients, that is, wastewater effluent;
- Non-aqueous liquids. Examples are oils, solvents and solvents containing liquids such as coatings and paints; and
- Combinations of two or more of the above groups.

The following liquids shall not be deemed as Waste in accordance with the provisions of the WML and its IR:

- Domestic sanitary wastewater and other wastes passing through the sanitary drainage network to the treatment facility. This exclusion does not cover sludge resulting from the sanitary wastewater treatment facility or wastewaters being collected, stored, or treated before discharge;
- Final discharge of treated industrial wastewater. This exclusion does not cover wastewater prior to discharge;
- Agricultural drainage runoff and irrigation return flows; and
- Mining residual matter remaining at their natural location in the mine during excavation.

For Waste to be considered solid, it must meet all the following criteria:

- It has an angle of repose of greater than five degrees (5°);
- It has no free liquids in excess of 10% of the load volume, when tested;
- It liberates no free liquids when transported;
- It does not become free flowing at or below 60°C or when transported, and
- It is spreadable.

All other Waste that is not gaseous is considered liquid Waste.

Semi solid Waste or sludge is a by-product of the treatment process. A sludge will be defined as a liquid or solid Waste depending on whether its particular characteristics meet the criteria set out for solid waste or liquid waste, of this Section.

## 5.2 Waste Identification by Source of Generation and Type of Waste Material

The classification according to the LoW uses a set of 20 chapters, detailed below, with a two-digit code (01 to 20) to classify waste according to source, type, or other general waste. Each chapter is then constituted by a set of subchapters, each with a corresponding two-digit code, and the subchapters contain a number of specific entries that would allow for the final classification of the waste, with an additional two-digit code for each, totalling a 6-digit code to classify each waste (2 from chapter + 2 from subchapter + 2 from specific entry). The diagram below provides one example classification corresponding to biodegradable waste from garden and park wastes.

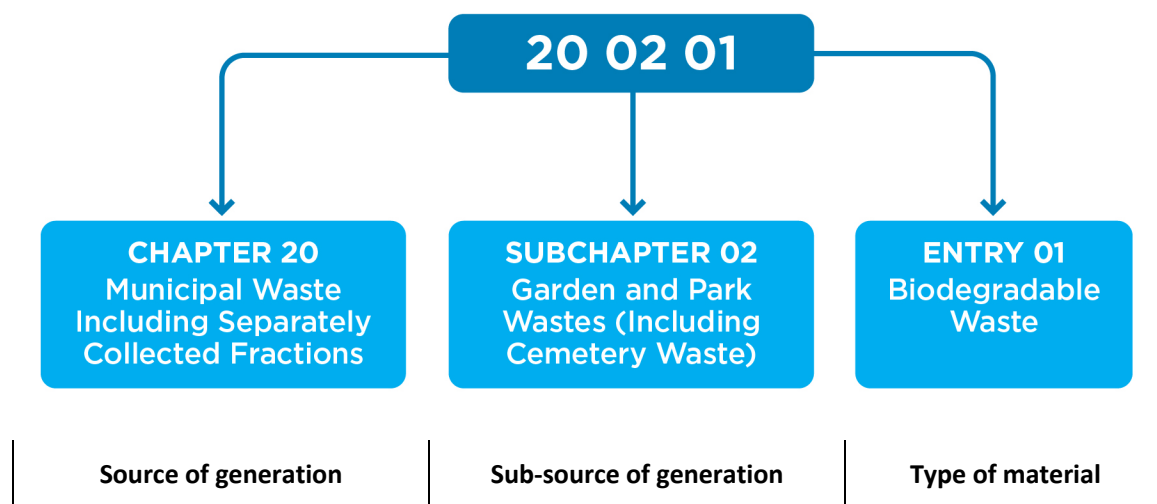


Figure 5-1: Waste classification example using EWC.

The following classification process is required by Waste Generators, to ensure that the waste is handled appropriately and in accordance with the legal requirements:

- Identification of the source of waste, whether it is from population, commercial or industrial activities or others, according to one of the 16 chapters of the LoW corresponding to classification by source (chapters 1 to 12 and 17 to 20);
- If no appropriate entry is found in any of the 16 chapters mentioned above, a classification by type of waste should be applied, resorting in this case to chapters 13, 14 and 15 of the Low;
- If none of the 19 chapters mentioned above can characterize the waste, then chapter 16 should be checked for other general waste such as vehicles, electronic equipment, batteries, etc.

Additionally, waste should also be classified according to its hazardousness. Hazardous entries in the LoW are marked with an asterisk (\*) after the 6-digit code. Waste that falls under an entry with an asterisk will be hazardous regardless of composition or properties.

There are also situations in which a given waste stream may be classified as hazardous or non-hazardous, depending on its composition and properties. These are called “mirror or mixed entries” and are usually present in the List of Waste as consecutive, similar entries, in which one has an asterisk, and the other doesn’t. These situations require thorough assessment of the waste, as detailed further down this document.

All substances or materials considered waste and that are not classified under Annex 2, 3 or 4 of the IR, shall be classified in accordance with one of the waste categories as displayed in article 49 of the Implementing Regulations. These categories are divided, for classification purposes, into sixteen categories of waste defined based on their source of generation:

Table 5-1: Correspondence between IR waste categories and the EWC.

Waste Categories by Source According to Article 49 of the IR	Waste Categories by Source According to EWC
Municipal Solid Waste	20
Industrial Waste	01; 03; 04; 05; 06; 07; 08; 09; 10; 11; 12



Waste Categories by Source According to Article 49 of the IR	Waste Categories by Source According to EWC
Construction and Demolition Waste	17
Healthcare Waste	18
Marine Media Waste / Maritime Transport	Regulated under Marpol Convention
Green / Agricultural Waste	02
Sludge Waste	19
Special Waste	15

The abovementioned categories from the EWC that categorize the waste by source are further described below, detailing the sources broadly.

- 01 Wastes resulting from exploration, mining, quarrying, physical and chemical treatment of minerals;
- 02 Wastes from agriculture, horticulture, aquaculture, forestry, hunting and fishing, food preparation and processing;
- 03 Wastes from wood processing and the production of panels and furniture, pulp, paper, and cardboard;
- 04 Wastes from the leather, fur, and textile industries;
- 05 Wastes from petroleum refining, natural gas purification and pyrolytic treatment of coal;
- 06 Wastes from inorganic chemical processes;
- 07 Wastes from organic chemical processes;
- 08 Wastes from the manufacture, formulation, supply, and use (MFSU) of coatings (paints, varnishes, and vitreous enamels), adhesives, sealants, and printing inks;
- 09 Wastes from the photographic industry;
- 10 Wastes from thermal processes;
- 11 Wastes from chemical surface treatment and coating of metals and other materials; non-ferrous hydrometallurgy;
- 12 Wastes from shaping and physical and mechanical surface treatment of metals and plastics;
- 17 Construction and demolition wastes (including excavated soil from contaminated sites);
- 18 Wastes from human or animal health care and/or related research (except kitchen and restaurant wastes not arising from immediate health care);
- 19 Wastes from waste management facilities, off-site wastewater treatment plants and the preparation of water intended for human consumption and water for industrial use;
- 20 Municipal wastes (household waste and similar commercial, industrial and institutional wastes) including separately collected fractions.

Additionally, if none of the above chapters and corresponding subchapters can effectively classify the waste, one of the following three chapters should be used to classify waste according to its type:

- 13 Oil wastes and wastes of liquid fuels (except edible oils, 05 and 12);

- 14 Waste organic solvents, refrigerants, and propellants (except 07 and 08);
- 15 Waste packaging; absorbents, wiping cloths, filter materials and protective clothing not otherwise specified.

In the event, that none of the nineteen previously mentioned chapters can appropriately classify waste, an additional chapter can be used to classify waste as general waste, such as vehicles, electronic equipment, batteries, etc, with the following code:

- 16 Wastes not otherwise specified in the list.

The waste classification described above must be followed, in the mentioned order of priority, and disregarding entries ending in 99, which are related to non-specific wastes. Only after going through the 20 chapters of the LoW, and if no entry is found that adequately describes the waste being classified, the entries ending in 99 can be considered, repeating the abovementioned order of priority (waste source first, then type, and finally general waste).

Diagram below provides a summary of the waste classification process described above.

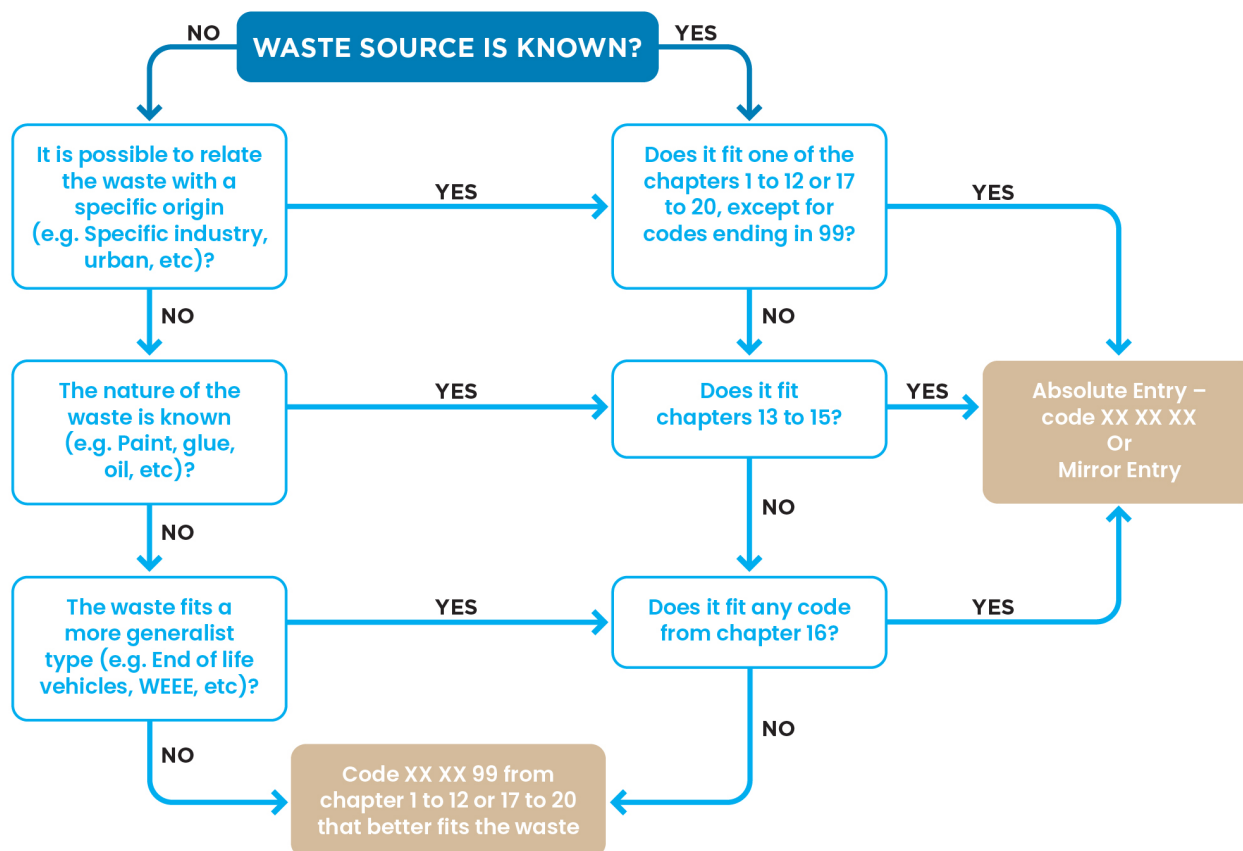


Figure 5-2: Waste classification process summary.

The following sections provide further details of the source of generation and type of material produced for each category mentioned in article 49 of the IR. Special waste is also included as further guidance to the waste category within the definition of special wastes according to IR. Further details on waste streams associated to

each source of waste generated and the associated coding system along with a distinction between hazardous and non-hazardous waste can be found in the European List of Waste<sup>1</sup>.

### 5.2.1 Municipal Waste

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 similar waste to residential which is waste from other sources, where such waste is similar in nature and composition to residential waste.

- A. Residential waste includes paper and cardboard, glass, metals, plastics, food waste, green waste, wood, textiles, packaging, waste electrical and electronic equipment, waste batteries and accumulators, and bulky waste, including mattresses and furniture;
- B. Similar Waste to residential includes waste from economic activities that can be collected with that of households, having regard to their characteristics and the quantities produced, without particular technical constraints. This is waste from businesses (including but not limited to: craftsmen, small commercial, and traders.) and waste from the tertiary sector (including but not limited to: healthcare administrations and healthcare facilities (such as non-hazardous healthcare waste) collected under the same conditions as residential waste;
- C. Municipal Solid Waste also includes waste from municipal services i.e., waste from park and garden maintenance, waste from street cleaning services, such as street sweepings and the content of litter containers.

Table 5-2: Municipal Waste Sources and Materials.

Municipal Waste Sources	Type of Waste Material
Households	Plastic (packaging and non-packaging);
Institutions: schools, museums, governmental institutions, healthcare facilities	Metal (packaging and non-packaging); Paper and cardboard (packaging and non-packaging); Glass (packaging and non-packaging);
Commercial Activities: retail, malls, wholesale, markets, hotels, restaurants, catering services	Wood (packaging and non-packaging); Food waste.
Business Activities: offices, industrial activities	Textiles; Edible oil; Rubber, leather, paint;

<sup>1</sup> [EUR-Lex - 02000D0532-20150601 - EN - EUR-Lex \(europa.eu\)](https://eur-lex.europa.eu/eli/dir/2000/0532/20150601/EN)

Municipal Waste Sources	Type of Waste Material
Public Realm	Medicines; Bulky Waste; Household hazardous waste: solvents, acids, pesticides, photochemical, detergents, paint, inks, adhesives, equipment containing chlorofluorocarbons, fluorescent tubes, oil, batteries and WEEE containing hazardous substances.
Parks and gardens	Biodegradable Waste (Green Waste); Soil and stones; Other non-biodegradable waste.
Street sweeping	Street cleaning residues.

### 5.2.2 Industrial Waste

Industrial waste is defined as waste generated by manufacturing or industrial processes. Depending on the industries' activities this waste will have different compositions and characteristics.

Table 5-3: Industrial Waste Sources and Materials.

Industrial Waste Sources	Type of Waste Material
Waste resulting from exploration, mining, quarrying, and physical and chemical treatment of minerals	Waste from mineral excavation; Waste from physical and chemical processing of metalliferous minerals; Waste from physical and chemical processing of non-metalliferous minerals; Drilling muds and other drilling waste.
Waste from food preparation and processing	Waste from the preparation and processing of meat, fish, and other foods of animal origin; Waste from fruit, vegetables, cereals, edible oils, cocoa, coffee, tea and tobacco preparation and processing, conserve production, yeast and yeast extract production, molasses preparation and fermentation; Waste from sugar processing; Waste from the dairy products industry; Waste from baking and confectionery industry; Waste from the production of non-alcoholic beverages (except coffee, tea, and cocoa).

Industrial Waste Sources	Type of Waste Material
Waste from wood processing and the production of panels and furniture, pulp, paper, and cardboard	Waste from wood processing and the production of panels and furniture; Waste from wood conservation; Waste from pulp, paper and cardboard production and processing.
Waste from the leather, fur and textile industries	Waste from the leather and fur industry such as: flashings and lime split waste, tanning liquor, sludges etc; Waste from the textile industry such as waste from composite materials, organic matter from natural products, dyestuffs and pigments, sludges etc.
Waste from petroleum refining, natural gas purification and pyrolytic treatment of coal	Waste from petroleum refining such as desalter sludges, tank bottom sludge, acid tars, boiler feedwater sludges, bitumen etc; Waste from natural gas purification such as waste containing mercury, sulphur, and others; Waste from pyrolytic treatment of coal such as acid tars, other tars, waste from cooling columns etc.
Waste from inorganic chemical processes	Waste from manufacture, formulation, supply, and use (MFSU) of acid; Waste from the MFSU of bases; Waste from the MFSU of slats and their solutions and metallic oxides; Waste from the MFSU of sulphur chemicals, sulphur chemical processes and desulphurisation processes; Waste from the MFSU of silicon and silicon derivatives; Waste from the MFSU of phosphorous chemicals and phosphorous chemical processes; Waste from the MFSU of nitrogen chemicals, nitrogen chemical processes and fertiliser manufacture; Others.
Waste from organic chemical processes	Wastes from the manufacture, formulation, supply, and use (MFSU) of basic organic chemicals; Wastes from the MFSU of plastics, synthetic rubber, and man-made fibres; Wastes from the MFSU of organic dyes and pigments; Wastes from the MFSU of organic plant protection products, wood preserving agents and other biocides; Wastes from the MFSU of pharmaceuticals; Wastes from the MFSU of fats, grease, soaps, detergents, disinfectants, and cosmetics; Wastes from the MFSU of fine chemicals and chemical products not otherwise specified.

Industrial Waste Sources	Type of Waste Material
Waste from the manufacture, formulation, supply and use of coatings, adhesives, sealants, and printing inks	Waste from MFSU and removal of paint, varnish, and other coatings; Waste from MFSU of printing inks; Waste from MSFU of adhesives and sealants.
Waste from the photographic industry	Water based developer and activator solutions, fixer solutions, photographic film and paper containing silver or silver compounds, single-use cameras without batteries, bleach solutions and bleach fixer solutions.
Waste from thermal processes	Waste from power stations and other combustion plants; Waste from the iron and steel industry; Waste from aluminium thermal metallurgy; Waste from lead, zinc, and copper thermal metallurgy; Waste from silver, gold, and platinum thermal metallurgy; Waste from other non-ferrous thermal metallurgy; Waste from casting of ferrous and non-ferrous pieces; Waste from manufacture of glass products, ceramic goods, bricks, tiles, construction products, cement, lime and plaster and articles and products made from them; Waste from crematoria.
Waste from chemical surface treatment and coating of metals and other materials	Waste from chemical surface treatment and coating of metals and other materials; Waste from non-ferrous hydrometallurgical processes; Sludges and solids from tempering processes; Waste from hot galvanising processes.
Waste from shaping and physical and mechanical surface treatment of metals and plastics	Waste from shaping and physical and mechanical surface treatment of metals and plastics; Waste from water and steam degreasing processes.
Waste from waste management facilities	Waste from incineration or pyrolysis of waste; Waste from physic-chemical treatment of waste (including dechromatation, decyanidation, neutralisation); Stabilised/solidified waste; Vitrified waste and waste from vitrification; Waste from aerobic treatment of solid waste; Waste from anaerobic treatment of waste; Landfill leachate; Others.

### 5.2.3 Construction and Demolition Waste

Construction and Demolition Waste, which is all solid waste arising from construction and demolition activities. This includes waste arising from construction of buildings and infrastructure, destruction or demolition of buildings and infrastructure, and the maintenance, renovation, rehabilitation, refurbishment of buildings and

infrastructure. Construction and demolition waste encompasses brick, concrete, hardcore, subsoil and topsoil, materials resulting from excavation works, and it can also include quantities of timber, metal, plastics and, occasionally, hazardous materials.

Table 5-4: Construction and Demolition Waste Sources and Materials.

C&D Waste Sources	Type of Waste Material
Construction	Concrete, bricks, tiles, ceramics;
Demolition	Woods, glass, plastics; Bituminous mixtures;
Renovations	Metals (including their alloys): Aluminium, Lead, Zinc, Iron and steel, cables etc; Soil (including excavated soil from contaminated sites), stones and dredging spoil; Insulation materials; Gypsum-based materials; Hazardous C&D Waste: non-hazardous C&D waste contaminated with hazardous substances, asbestos containing construction materials, bituminous mixtures containing coal tar, coal tar and tarred products, construction and demolition wastes containing mercury, construction and demolition wastes containing PCB (for example PCB-containing sealants, PCB-containing resin-based floorings, PCB-containing sealed glazing units, PCB-containing capacitors).

### 5.2.4 Healthcare Waste

Healthcare Waste, which is waste produced from facilities that provide various health care, laboratories, drug production centers, pharmaceuticals and vaccines, veterinary treatment centers and research institutions, and from treatment and nursing in the home. It is divided into two types:

- a. Non-Hazardous Healthcare Waste, which is any waste containing materials such as those found in municipal waste, produced from administrative sections and hygiene work within health facilities, account for the bulk of total health-care waste, and this type is treated as municipal waste;
- b. Hazardous Healthcare Waste, which is any waste produced from contaminated or potentially contaminated sources by infectious, chemical factors and constitutes the lowest proportion of hazardous health-care waste.

Typically, around 85% of the healthcare waste is non-hazardous, similar to household waste, and 15% is hazardous waste.

Table 5-5: Healthcare Waste Sources and Materials.

Healthcare Waste Sources	Type of Waste Material
Hospitals	Infectious waste: waste contaminated with blood and other bodily fluids (e.g., from discarded diagnostic samples), cultures and stocks of infectious agents from laboratory work (e.g., waste from autopsies and infected animals from laboratories), or waste from patients with infections (e.g., swabs, bandages, and disposable medical devices);
Clinics and doctors' surgeries	
Dental practices	
Nursing and care homes	Pathological waste: human tissues, organs or fluids, body parts and contaminated animal carcasses;
First aid rooms in schools and offices	Sharps waste: syringes, needles, disposable scalpels, and blades, etc.;
Private households	Chemical waste: for example, solvents and reagents used for laboratory preparations, disinfectants, sterilant and heavy metals contained in medical devices (e.g., mercury in broken thermometers) and batteries;
	Pharmaceutical waste: expired, unused, and contaminated drugs and vaccines;
	Cytotoxic waste: waste containing substances with genotoxic properties (i.e., highly hazardous substances that are, mutagenic, teratogenic, or carcinogenic), such as cytotoxic drugs used in cancer treatment and their metabolites;
	Radioactive waste: such as products contaminated by radionuclides including radioactive diagnostic material or radiotherapeutic materials; and
	Non-hazardous or general waste: waste that does not pose any particular biological, chemical, radioactive, or physical hazard and is therefore treated as municipal waste.

### 5.2.5 Marine Media Waste / Maritime Transport Waste

Marine Media and Maritime Transport waste is waste resulting from all means of transportation and floating units that are used to carry out marine activities, including ships, fishing boats, marine excursions, or marine sports media.

Table 5-6: Marine Media / Maritime Transport Waste Sources and Materials.



Marine Media/Maritime Transport Waste Sources	Type of Waste Material
Marine Transport	Waste similar to household waste from passengers and the crew (e.g., food waste, plastic, metal, glass, wood etc);
Fishing Boats	Operational waste (oil waste, waste from tools and materials used for maintenance works, cleaning agents and additives contained in cargo hold wash water;
Marine Excursions	Animal carcasses;
Marine Sports	Cargo residues, fishing equipment and corpses of animals that arose during the normal operation of a ship;  Others including plastics, synthetic ropes, fishing gear, plastic garbage bags, incinerator ashes, clinkers, cooking oil, floating dunnage, lining, and packing materials, paper, rags, glass, metal, bottles, crockery, and similar refuse.

### 5.2.6 Green Waste

Green waste is waste arising from activities and premises including growth of crops, animals, and livestock production, hunting and trapping, forestry, logging, fishing, and aquaculture. It may include natural waste such as manure, vegetable waste, crop residues, etc, but also non-natural waste such as containers, packaging, and other types of waste not specific from agriculture.

Table 5-7: Green Waste Sources and Materials.

Green Waste Sources	Type of Waste Material
Wastes from activities and facilities related to the development of crops, animals, livestock production, hunting, trapping, forest management, logging, fishing, and aquaculture.	Animal-tissue waste; Plant-tissue waste (e.g., crops residue, husk, hull, stalk, shells, bagasse, etc); Animal faeces, urine, and manure; Waste from forestry; Non-hazardous agrochemical waste (e.g., pesticide residue, herbicides residue); Plastic, metal, paper/cardboard (non-packaging) *; Sludges form washing and cleaning**; Hazardous Agricultural Green Waste: Agrochemical waste containing dangerous substances.

\* Packaging waste covered under special waste streams

### 5.2.7 Sludge Waste

Sludge Waste under this category means sludge which is any of the following:

- a. Residual sludge from sewage plants treating domestic or urban waste waters and from other sewage plants treating waste waters of a composition similar to domestic and urban waste waters;
- b. Residual sludge from septic tanks and other similar installations for the treatment of sewage; and
- c. Residual sludge from sewage plants other than those referred to in (a) and (b).

Table 5-8: Sludge Waste Sources and Materials

Sludge Waste Sources	Type of Waste Material
Sewage plants	Sludges from treatment of urban wastewater;
Septic tanks and similar installations	Sludges from biological treatment of industrial wastewater; Sludges from other treatment of industrial wastewater; Sludges containing dangerous substances from biological treatment of industrial wastewater; Sludges containing dangerous substances from other treatment of industrial wastewater.

### 5.2.8 Special Waste

Special waste streams typically include packaging waste, end-of-life vehicles, batteries and accumulators, oils, and others. These waste streams have unique regulatory requirements and are associated with EPR products.

Table 5-9: Special Waste Streams and Materials

Special Waste Streams	Type of Waste Material
Packaging Waste	Paper & Cardboard, plastic, metal, wood, composite, glass, textile, mixed packaging; Hazardous packaging waste: packaging containing residues of or contaminated by dangerous substances; metallic packaging

Special Waste Streams	Type of Waste Material
	containing a dangerous solid porous matrix (for example asbestos), including empty pressure containers.
Waste Electric and Electronic Equipment	TVs, radios, toasters, clocks, toys, lighting equipment, chargers, smartphones, computers, audio devices, fridges, microwaves, vacuum cleaners, consoles, thermostats, and any other electrical or electronic equipment.
End-of-Life Vehicles	End-of-life vehicles from different means of transport and waste from dismantling of end-of-life vehicles and vehicle maintenance such as: end-of-life tyres; oil filters, brake fluids, brake pads, containing asbestos.
Batteries and accumulators	Lead batteries; Ni-Cd batteries; Mercury-containing batteries; Alkaline batteries; Separately collected electrolyte from batteries and accumulators.
Oil waste and waste of liquid fuels (except edible waste)	Waste hydraulic oils; Waste engine, gear, and lubricating oils; Bilge oils; Oil/waste separator contents; Waste of liquid fuels.

### 5.3 Identification of the Characteristics of Waste

In addition to the classification of the waste based on its origin, waste must also be identified taking into account the level of hazard it carries. In that regard, waste can be classified under one of the following two options:

- **Hazardous Waste** - Waste which is classified as hazardous based upon the provisions of the Law and Regulation, 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, and that because of its quantity, concentration, or physical, chemical, or infectious characteristics may:
  - Cause, or significantly contribute to an increase in mortality or an increase in serious irreversible incapacitation, or illness; or
  - Pose a substantial present or potential hazard to human health or the environment when improperly treated, stored, transported, or disposed of, or otherwise managed.

- **Non-hazardous Waste** - Any waste that does not cause harm to people or the environment, being any waste that cannot be classified as hazardous.

Additionally, and exclusively for the purpose of waste disposal to landfill, waste can also fall under the inert category, which is essentially waste that does not undergo any significant physical, chemical, or biological transformations. Inert waste will not dissolve, burn, or otherwise physically or chemically react, biodegrade, or adversely affect other matter that it comes into contact with, in a way likely to cause environmental pollution or harm to human health. The total leachability and pollutant content of the waste and the ecotoxicity of the leachate must be insignificant and not endanger the quality of surface water or groundwater. For further information on inert waste, please refer to Technical Guideline on Waste Acceptance to Landfill.

### 5.3.1 Identification of Hazardous Waste

In accordance with the provisions of the IR, if a waste falls under one or more of these criteria, shall be classified as hazardous:

- If a waste is identified as one of the waste streams in the Hazardous Waste List as per Annex 2 of the IR, then it must be classified and treated as hazardous, irrespective of whether a hazardous waste constituent or property is present or not in the Waste. The Annex lists Waste from generic industrial processes, Wastes from certain sectors of industry and unused pure chemical products and formulations. Any waste fitting a narrative listing description is considered a listed hazardous waste;
- If a waste contains any of the hazardous constituents listed in Annex 3 of the IR, in concentrations exceeding the relevant limit values;
- If a Waste contains any of the Persistent Organic Pollutants listed in Annex 4 of the IR, in concentrations exceeding the relevant limit values;
- If a Waste is not listed in the Hazardous Waste List or does not contain one of the hazardous waste constituents listed at paragraph 2 and 3, the Waste Producer must determine the waste's composition to establish whether it contains a hazardous property, as listed in Annex 1 of the IR. Where a substance is present in the Waste below its cut-off value, it shall not be included in any calculation of a threshold. Where a hazardous property of a Waste has been assessed by a test and by using the concentrations of hazardous substances as indicated in Annex 1 of the IR, the results of the test shall prevail.

Obtaining sufficient information about the presence and content of hazardous substances in the Waste, in order to be able to determine if the Waste might display any of the hazardous properties, is an important step in Waste classification. There are several ways to gather information on the relevant composition of the Waste, the hazardous substances present, and potential hazardous properties displayed:

- Information on the 'waste-generating' manufacturing process/chemistry and its input substances;
- Information from the original producer of the substance or object before it became waste, e.g. Safety Data Sheets (SDS), product label or product fiches;
- Sampling and chemical analysis of the Waste.

If the gathered information on the composition of the Waste does not allow concluding on or assessing the hazardous properties displayed by the Waste, then the holder should classify the Waste as hazardous.

Further information on the assessment of the composition and hazardousness of the waste can be checked on Section 6 of this Technical Guideline.

## 6 Classification of Hazardous Waste

### 6.1 Hazardous Waste Assessment

All waste produced is either hazardous or non-hazardous, and Basel Convention coding, as included in the IR Annexes 2 and 3, shall be used for the classification of hazardous waste on a first instance, followed by the application of the European Waste Catalogue (EWC), also known as List of Waste (Low) to classify non-hazardous waste and other hazardous wastes not included in Basel coding.

As producers are responsible for the waste they produce, they are required to assess if the waste resulting from their activity can be considered hazardous. The first step in this assessment is to check the IR Annexes 2, 3 and 4 and verify if the waste generated can be described by any entry in these annexes. Annex 2 is related to the source of the waste, making it the easier to assess, while annexes 3 and 4 are related to its constituents, for which information is not always readily available, making it harder to assess. If no match is found, the waste should be classified according to the EWC, under which it can be considered non-hazardous, hazardous or a mixed entry, for which further assessment is required to evaluate if the waste displays any hazardous properties as detailed in Annex 1 of the IR. Producers are the best positioned to make the assessment since they possess all the information from materials and substances used, along with the processes and methodologies employed that may alter its characteristics.

At this stage, the material is already considered waste under the waste definition of article 63 of the Implementing Regulations and is just being assessed for its hazardousness. Figure 6-1 displays a simplified flow chart of this assessment.

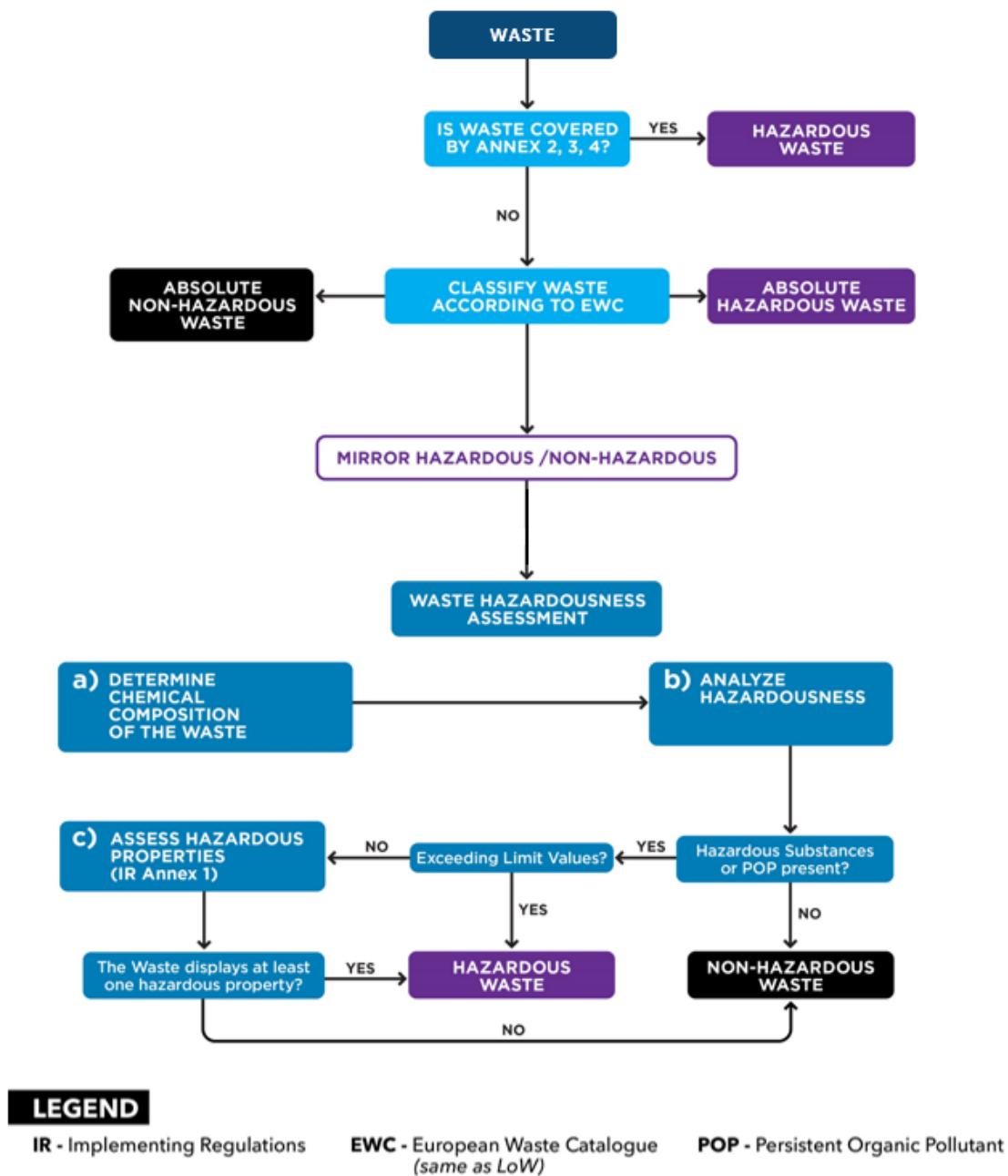


Figure 6-1: Hazardous waste identification process.

The hazardousness assessment of any given waste is usually performed in three steps, mentioned below and further developed throughout this Section.

- a) **Chemical Composition Assessment** – at this stage, all the available information regarding the waste will be compiled in order to identify the substances contained and their concentration. Information is usually available in existing documents and databases, however, in situations where it is not available, technical, and laboratorial analysis may be required;
- b) **Individual Substances Hazardous Characteristics and POP Assessment** – once the chemical composition of the waste has been identified, an assessment of the hazardous characteristics of each substance is due, including a verification of whether any of them is considered a Persistent Organic Pollutant;

c) **Hazardous Properties Assessment** – each time hazardous substances are detected, an assessment is required to verify if those substances display any of the hazardous properties mentioned in Annex 1 of the Implementing Regulations, resorting to the methodologies detailed in this section.

A schematic representation of the process is displayed in Figure 6-2.

At the end of this assessment, it should be possible to properly characterize the waste and all its components, identifying the correct hazardous property to attribute, thus allowing proper management and routing through the required steps.

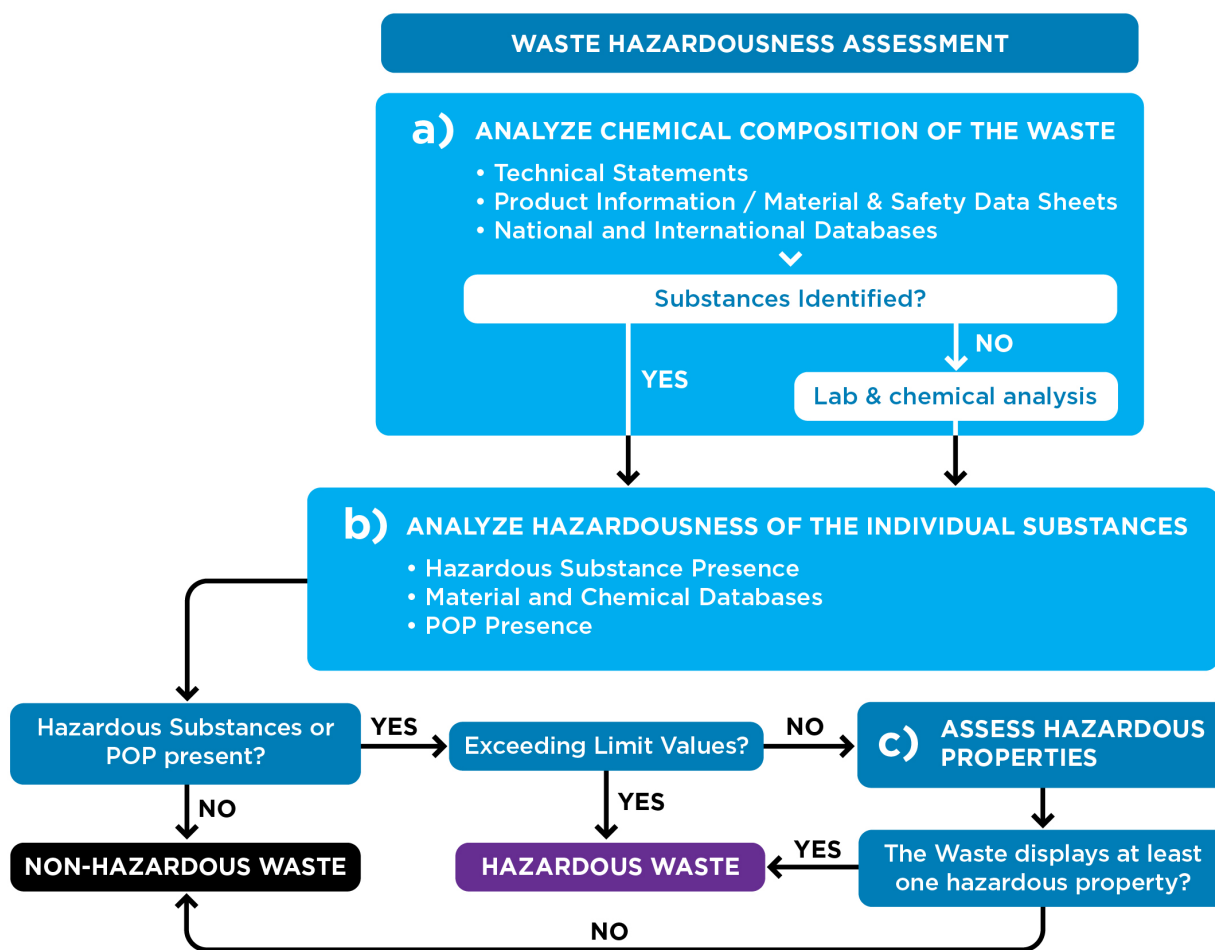


Figure 6-2: Hazardous Waste Assessment Process.

### 6.1.1 Chemical characterization of waste

The chemical characterization of waste is the first major step in order to assess the hazardousness of a given waste, as it will allow to identify each substance present and its individual hazardous characteristics, and how they translate into hazardous properties of the waste. As the first step, it's also the most important one since it will establish the basic information to be considered for further assessment, and any substance not identified or wrongly identified can lead to misclassification of waste and many issues through the waste management process, in particular if a hazardous waste is treated as non-hazardous.



By the end of this stage, enough information should be available about the chemical composition of waste in order to characterize it. However, if it is not possible or viable, for any given reason, to collect enough quality information regarding the constituents of the waste, then it must be considered hazardous waste, according to the worst possible scenario involving the expected constituents of the waste.

It is not always necessary to resort to laboratorial tests to determine the chemical composition of a waste. In most cases, sufficient information is already available in the existing documentation, so the characterization of waste does not require further steps. The following are some of the most relevant sources of information:

- Technical statements from the waste producer, including any information on the process that originated the waste (temperature, oxidation and pH conditions, chemical reactions involved, etc);
- Material and Safety Data Sheets of the substances or materials involved in the process that originated the waste;
- Information on similar, already classified waste (industrial or waste databases);
- Any chemical analysis performed on the waste.

#### 6.1.1.1 Technical Statements

The identification and quantification of the substances present in a waste may be performed based on the existing information from the waste generator, particularly on the industrial or chemical process that originated the waste, including all the raw materials and reagents used and the intermediaries formed throughout the process or reaction. In this case, a technical analysis performed by experts is required, based on industrial process manuals and Best Available Techniques Reference Documents, along with the information provided by the producer, in which all different substances present in the waste along with their mass concentration are identified.

#### 6.1.1.2 Product Information

Whenever the waste keeps the same composition and properties of the substance or material it originated from, and that substance or material is accompanied by a Material and Safety Data Sheet (MSDS) from the supplier, the information of the MSDS can be used to characterize the chemical composition of the waste. If the waste results from a mixture of substances, but no MSDS of that mixture exists, the individual MSDS of each substance can be used to characterize the waste. In the event that no MSDS exists, other sources of information made available by the supplier can be used as product sheets, labels, pictograms, etc. However, if any of the following statements is verified during the assessment, other sources of information should be considered:

- The available information might be out-of-date;
- The available information is incomplete, inaccurate, or inappropriate;
- There is information about the process that originated the waste that indicate that it might contain additional substances, other than those mentioned in the substance or material or mixture MSDS.

#### 6.1.1.3 Waste Databases

Information on waste may be available in national and international databases. These databases can provide data on usual waste composition of some waste typologies, including physical-chemical properties and some waste flows classification. These tools provide specific guidance on waste, particularly directed towards producers and holders of waste and competent authorities. As an example, there is the HazWasteOnline<sup>2</sup> software, made available by the United Kingdom.

#### 6.1.1.4 Lab and Technical Analysis

In the event that the abovementioned methods can't be applied, or that insufficient information was gathered through them, additional analysis may be required resorting to laboratorial tests in order to identify the substances contained in a given waste. These tests usually involve two stages, which are essential for obtaining high quality information i) the sampling; and ii) the physical-chemical characterization of the waste.

##### 6.1.1.4.1 Sampling

Waste can have highly variable composition, even from similar sources and streams. In order to ensure accurate and representative results from the laboratorial analysis it is essential that the samples are collected through a proper sampling method and adapted to the waste in question.

The sampling process should be handled only by properly qualified, independent people and institutions, that have also adopted an effective quality assurance system. The process may also be performed by the waste producer himself or the handler that will receive the waste for treatment or disposal, as long as a proper quality assurance system is in place, and it includes periodic independent control.

The methodology to apply for the waste sampling is recommended to be the KSA norms or the European Norm 14899:2005. Different, additional methodologies may be accepted, as long as they take into account all the relevant aspects of the mentioned methodologies and produce equally reliable results, ensuring and properly proving sample representativity.

##### 6.1.1.4.2 Physical-chemical Characterization

Several methods are available for the chemical analysis of waste that allow the determination of the individual substances present in a waste. The main issue with this analysis is that it doesn't usually provide information regarding the chemical compounds present in a given waste, in particular regarding inorganic substances, allowing only to identify ionic species, cations and anions (e.g., they indicate the concentration of copper (Cu) ions instead of the concentration of copper sulphate (CuSO<sub>4</sub>)). Taking into account that the main objective of this study is to assess the hazardousness of a waste, knowing its exact composition is essential as one chemical element may have different hazardous characteristics depending on the chemical compound it's inserted on. Thus, the identification of which compound corresponds to the elements present in the waste, along with its concentration, is required, and one possible solution is the use of complementary techniques such as x-ray diffraction, infrared spectroscopy, differential thermal analysis, mass spectrometry, among others, that allow to identify the compounds present. These complementary techniques may be considerably expensive and imply the use of a significant amount of waste.

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<sup>2</sup> <https://www.hazwasteonline.com/>

Alternatively, if the additional tests are not viable, the “worst case scenario” methodology may be applied regarding the hazardousness of the possible compounds of the identified elements. This implies that the worst possible chemical compound involving the identified elements will be considered without further testing, which may also result in an overestimation of the waste hazardousness. This classification can, however, exclude some chemical compounds that do not have a possibility to be present in the waste either due to their physical-chemical properties or even the waste physical-chemical properties such as pH, redox potential, stoichiometry analysis, etc. These exclusions, whenever applied, must be properly evaluated and validated by an expert.

The “worst case scenario” for a given chemical element may consist of more than one compound. For example, element X is present on a waste, and it may be under two different compounds, A and B. A corresponds to a carcinogenic hazard and B corresponds to mutagenic hazard. Since it is not known which of the two compounds is present in the waste, both possibilities should be considered in the Assessment of the Hazardous Properties of Waste, addressed in Section 6.1.3.

## 6.1.2 Determine Individual Hazardousness of Each Substance

Assessing the composition of a given waste is the first step on evaluating its hazardousness. After establishing each component present in the waste and their quantities, it's necessary to assess the associated physical, environmental, and human health impacts of all of them. To assess the hazardous properties of each substance or compound, all the available information regarding its hazardousness needs to be analysed. This information will mostly originate from MSDS, the Classification and Labelling (C&L) Inventory and other chemical databases, as detailed below.

The most relevant information to assess are the hazardous statement codes, that are associated to certain hazardous properties, as defined in the Annex 1 of the Implementing Regulations, which indicate the nature of the hazard, and the respective hazardous class and category. For example, hazardous statement code H200 is included in hazardous class “Unstable Explosive” and code H301 is included in class and category “Acute Toxicity 3 (Toxic if Swallowed)”.

In order to assess the hazardousness of a given substance or material it is necessary to verify whether they evidence any hazardous statement code through the available information and are therefore classified under a hazard class and category. If so, the substance or material is considered hazardous, and its hazardousness must be considered to determine the waste hazardous properties. For the substances that do not evidence any hazardous statement code, and are, therefore, not classified under any hazardous class or category, do not need to be considered for the next stage of waste hazardous properties assessment, as described in the following section.

Additionally, some hazardous substances can be identified through a different process, resorting to the information available in Appendix 1, which indicates the limit values over which the waste is considered hazardous due to Persistent Organic Pollutants (POP) presence.

### 6.1.2.1 Product Information

Material and Safety Data Sheets are invaluable tools not only to assess the waste composition as mentioned in Section 6.1.1.2, but also to assess its hazardousness. So, whenever the waste keeps the same composition and properties of the substance or material it originated from, and that substance or material is accompanied by a Material and Safety Data Sheet (MSDS) from the supplier, the information of the MSDS can be used to assess the hazardousness of the respective waste. If the MSDS of a substance or mixture of substances which

originated a waste displays at least one hazard statement code, it means that the substance or mixture of substances is hazardous, and, as such, an assessment is needed to verify if the resulting waste is hazardous as well. To assess the hazardousness of the waste, section 2 of the MSDS should be analysed which identifies that substance's hazardous characteristics and the corresponding hazardous classification.

#### 6.1.2.2 Classification and Labelling Inventory<sup>3</sup>

The C&L Inventory is a database maintained by the European Chemicals Agency (ECHA) with records and information of over 200,000 substances. It is freely accessible and provides insights on the various classifications that can be applied to some substances, including hazardous characteristics and the hazard statement codes.

#### 6.1.2.3 Other Chemical Databases

In addition to the already mentioned sources of information, other sources, in particular databases, can be used to determine the individual hazardousness of certain substances and compounds. Below is a list with some of those tools:

- **eChemPortal** – International database on chemical products, managed by the OECD;
- **Portail Substances Chimiques** – Chemical products database, made available by the French National Institute for Industrial Environment and Risks (INERIS);
- **List of Carcinogenic Substances** – List of substances with carcinogenic properties, elaborated by the International Agency for Research on Cancer (IARC), an agency of the World Health Organization (WHO);
- **Gestis** – Information system on hazardous substances of the German Social Accident Insurance.

Can be used simultaneously with C&L Inventory and the MSDS.

Besides the abovementioned tools, any others can be used to assist in the classification of hazardous waste, as long as they have proven scientific quality.

#### 6.1.2.4 POP Presence

Persistent Organic Pollutants (POP) are organic chemical substances that possess very unique physical and chemical properties, in the sense that when they are released into the environment they persist for long periods of time. They can originate from pesticide use in agriculture, but also from chemical industrial processes, with many being produced unintentionally in some processes, like manufacturing, incinerating, and others.

These substances spread far from their sources, crossing even international borders, and are bioaccumulated through the food chain in animal's fat tissue, including humans, which might endanger both the human health and the environment, since they are toxic for humans and animals.

Whenever the analysis of the composition of the waste reveals the presence of a substance or compound as mentioned in Annex 2 of the Implementing Regulations, and Appendix 1 of this TG, in quantities exceeding the

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<sup>3</sup> <https://echa.europa.eu/pt/information-on-chemicals/cl-inventory-database>

displayed values, the waste must be treated or disposed of in line with hazardous waste procedures, ensuring that the POP substance is either destroyed or irreversibly transformed, so that the waste and any particles released do not possess POP characteristics.

### 6.1.3 Determine Hazardous Properties of Waste

As all substances are identified and quantified, and their hazardous characteristics assessed through the abovementioned processes, it is then necessary to evaluate whether those characteristics translate into the hazardousness of the waste, since the presence of hazardous substances does not necessarily mean that the waste itself will be considered hazardous. The classification of a waste as hazardous will depend on the individual hazardousness of its constituents and their concentrations, with the exception of absolute hazardous waste which will always be hazardous no matter the concentration.

Previous sections addressed the methodology to identify and quantify hazardous substances present in a waste. This section will detail the methodology to assess the hazardous properties of a waste, taking into account the individual hazardous characteristics and concentrations of the substances it contains.

#### 6.1.3.1 Waste Hazardous Properties

The hazardous properties of waste are mentioned in the Annex 1 of the Implementing Regulations. In total there are 15 hazardous properties which correspond to physical hazards, hazards for human health and other living beings, and hazards for the environment. Table 6-1 refers each of these properties, along with a brief description of its hazardous characteristics.

Table 6-1: Hazardous properties of waste.

Code	Hazardous Property	Description
<b>Physical Hazards</b>		
<b>HP 1</b>	<b>Explosive</b>	Waste that, through chemical reaction, may produce gases to a temperature, velocity, and pressure such that it may cause damage to the surroundings.
<b>HP 2</b>	<b>Oxidizing</b>	Waste that may cause or contribute to the combustion of other substances, usually by providing oxygen.

Code	Hazardous Property	Description
HP 3	Flammable	<ul style="list-style-type: none"> <li>- Flammable liquid waste: liquid waste having a flashpoint below 60°C or waste gas oil, diesel and light heating oils having a flashpoint above 55°C and below 75°C.</li> <li>- Flammable pyrophoric liquid and solid waste: solid or liquid waste which, even in small quantities, is liable to ignite within 5 minutes after contacting with air.</li> <li>- Solid flammable waste: solid waste which is readily combustible or may cause or contribute to fire through friction.</li> <li>- Flammable gaseous waste: gaseous waste which is flammable in air at 20°C and at a normal pressure of 101,3 KPa.</li> <li>- Water reactive waste: waste which, when in contact with water, emits flammable gases in dangerous quantities.</li> <li>- Other flammable waste: flammable aerosols; self-heating flammable waste; flammable organic peroxides; self-reactive flammable waste.</li> </ul>
<b>Hazardous for Human Health and Other Living beings</b>		
HP 4	Irritant	Waste that on application may cause skin irritation or eye damage.
HP 5	Specific Target Organ Toxicity (STOT) / Toxic on Aspiration	Waste that may cause specific organ toxicity in result of single or repeated exposure, or that it may cause acute toxic effects through aspiration.
HP 6	Acute Toxicity	Waste that may cause acute toxic effects following inhalation or oral or cutaneous exposure.
HP 7	Carcinogenic	Waste that induces cancer or increases its incidence.
HP 8	Corrosive	Waste that, through application, may cause skin corrosion.
HP 9	Infectious	Waste containing viable microorganisms or their toxins, in relation to which it is known or suspected that may cause illness on human beings or other living organisms.
HP 10	Toxic for Reproduction	Waste that has adverse effects on sexual function and fertility of adult males and females, as well as developmental toxicity in the offspring.

Code	Hazardous Property	Description
HP 11	Mutagenic	Waste that may cause mutations, or in other words, permanent alteration of quantity or structure of the genetic material of a cell.
HP 12	Release of an Acute Toxic Gas	Waste that, in contact with water or acid, releases gases characterized by acute toxicity (Toxicity 1, 2 or 3).
HP 13	Sensitizing	Waste that contains one or more substances which have proven sensitizing effects on skin or respiratory system.
<b>Environment Hazards</b>		
HP 14	Ecotoxic	Waste which presents or may present immediate or delayed risks for one or more sectors of the environment.
<b>All Hazards</b>		
HP 15	-	Waste capable of exhibiting a hazardous property listed above, not directly displayed by the original waste.

The abovementioned hazardous properties are associated with the previously mentioned hazard statement codes, which are in turn associated with chemical compounds and substances. This means that the steps mentioned so far allow us to make a correspondence between the substances and materials present in a given waste and the corresponding hazardous properties of that waste. However, the process to classify the waste into one of the hazardous properties mentioned in Table 6-1 may still require a few extra steps, depending on the substances and the possible hazardous property, as described below.

#### 6.1.3.2 Hazardous Properties of Waste Assessment Methodology

The classification of the waste in accordance with its hazardous properties is usually performed through two different methods:

- **Classification based on concentration limits** – This method takes into account the concentration values mentioned in Annex 1 of the Implementing Regulations, further described in Section 6.1.3.3 of this Technical Guideline, in which the concentration values of each substance identified through the previously mentioned processes are compared with the established concentration limits. This method is usually associated with hazards for human health and other living beings.
- **Laboratory tests** – This method consists of determining the presence of a given hazardous property through tests on the waste. This method is mostly used to determine hazardous properties related to physical and environmental hazards.

##### 6.1.3.2.1 Classification Based on Concentration Limits

The classification based on concentration limits consists simply of the comparison of the concentration of the substances identified with the concentration limit set in Annex 1 of the IR, as detailed below.

**Concentration Limit** - If the concentration of a substance is equal or above the set limit, the waste is hazardous in accordance with the hazardous property corresponding to the hazardous class/category of that substance. If the concentration is below, it is necessary to assess whether cumulative concentration of substances applies. In those cases, even if the concentration of all substances with the same hazardous class or category is below the limit set, if their sum is above the limit, the waste is considered hazardous with the corresponding hazardous property. The cumulative consideration is only applicable for HP4, HP6, HP8 and HP14, and is detailed below for each hazardous property.

**Cut-off Value** – Certain substances are subject to minimum concentration values to be considered when assessing the hazardous properties of the waste. Whenever a substance’s concentration is below the cut-off value, that substance is disregarded in the assessment of the hazardous properties. Only hazardous classes/categories corresponding to the hazardous properties HP4, HP6, HP8 and HP14 have cut-off values defined.

Figure 6-3 displays a summary of the substance concentration assessment process.

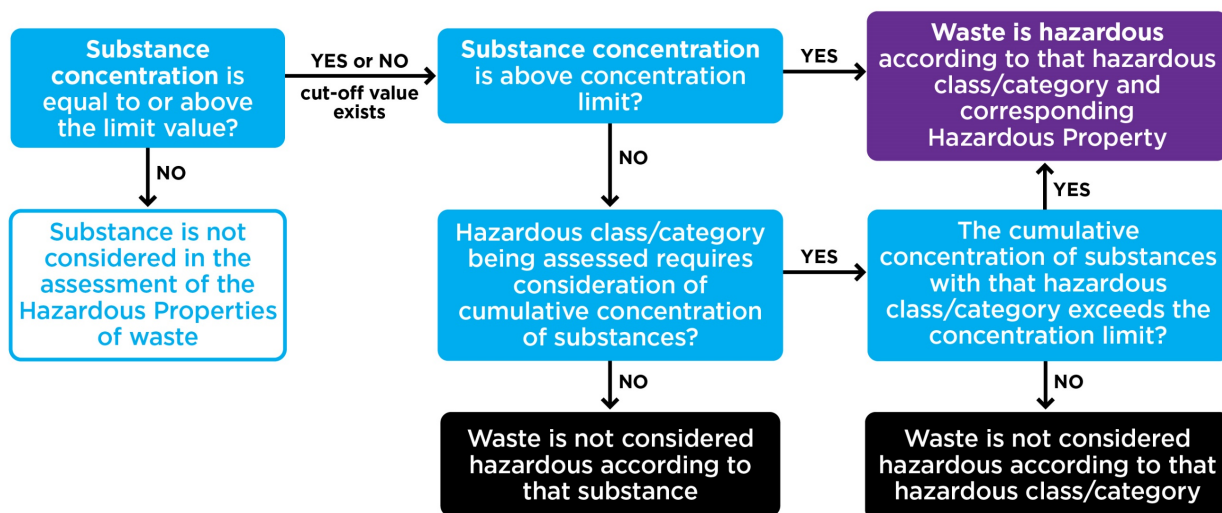


Figure 6-3: Concentration limits assessment process.

6.1.3.2.2 Classification Based on Laboratory Tests

Laboratory tests to assess the hazardous properties of waste are mostly used when those properties are related to physical dangers, in particular HP1, HP2 and HP3, so for those cases, a final assessment resorting to laboratory test is most likely required. In the event that waste containing hazardous substances with hazardous statement codes corresponding to the mentioned hazardous properties is not submitted to tests, it must be assumed that the waste is hazardous regarding the corresponding hazardous properties.

Additionally, HP4, HP8, HP12 and HP15 may also require tests under some circumstances. The tests to be performed will depend on the hazardous property being assessed.

6.1.3.3 Hazardous Waste Classification



Taking into account all the information gathered up to this point, waste must be assessed in relation to the substances with hazardous statement codes identified. The hazardous statement codes have each a corresponding hazardous class and category. Hazardous classes are related to the properties of the waste. For example, physical hazards classes would be flammable gases, flammable solids, organic peroxides, oxidizing solids, etc, while health hazard classes would be acute toxicity, carcinogenicity, aspiration hazard, etc. Hazardous categories are related to the severity of the risk and are usually presented with a number from 1 to 4. The lower this number, the more serious the hazard. For numbers followed by letters the same logic applies, so 1A represents a more serious hazard than 1B.

The assessment will detail if the waste is considered hazardous regarding a corresponding hazardous property as mentioned below, or non-hazardous.

**HP 1 – Explosive**

Waste with substances classified by one or more hazardous statement codes identified in Table 6-2 must be tested in laboratory regarding HP1. If no tests are performed, the waste must be considered hazardous in relation to HP1.

Table 6-2: Hazardous class and corresponding hazard statement codes in relation to HP1.

Hazardous Class and Category Codes	Hazard Statement Codes
Unstable Explosive	H200
Explosive 1.1	H201
Explosive 1.2	H202
Explosive 1.3	H203
Explosive 1.4	H204
Self-reacting A	H240
Organic Peroxide A	
Self-reacting B	H241
Organic Peroxide B	

Additionally, waste containing substances identified by the hazard statement code H240 or H241 that after laboratory tests is deemed as not hazardous in relation to HP1, must be tested for hazardousness in relation to HP3.

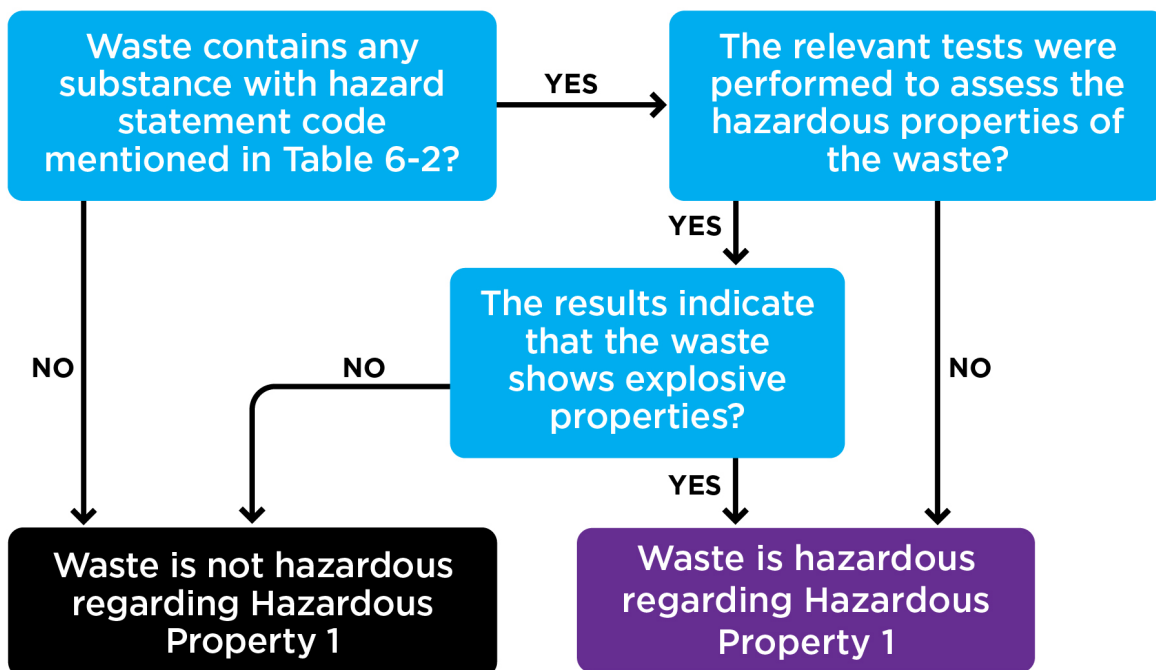


Figure 6-4: Hazardous Property 1 assessment flow chart.

**HP 2 – Oxidizing**

Waste with substances classified by one or more hazardous statement codes identified in Table 6-3 must be tested in laboratory regarding HP2. If no tests are performed, the waste must be considered hazardous in relation to HP2.

Table 6-3: Hazardous class and corresponding hazard statement codes in relation to HP2.

Hazardous Class and Category Codes	Hazard Statement Codes
Oxidizing Gas 1	H270
Oxidizing Liquid 1	H271
Oxidizing Solid 1	
Oxidizing Liquid 2, Oxidizing Liquid 3	H272
Oxidizing Solid 2, Oxidizing Solid 3	

**HP 3 – Flammable**

Waste with substances classified by one or more hazardous statement codes identified in Table 6-4 must be tested in laboratory regarding HP3. If no tests are performed, the waste must be considered hazardous in

relation to HP3. However, if any of the substances is present only in residual amounts, the waste may be considered non-hazardous in relation to HP3.

Table 6-4: Hazardous class corresponding hazard statement codes in relation to HP3.

Hazardous Class and Category Codes	Hazard Statement Codes
Flammable Gas 1	H220
Flammable Gas 2	H221
Aerosol 1	H222
Aerosol 2	H223
Flammable Liquid 1	H224
Flammable Liquid 2	H225
Flammable Liquid 3	H226
Flammable Solid 1	H228
Flammable Solid 2	
Self-reacting CD	H242
Self-reacting EF	
Organic Peroxide CD	
Organic Peroxide EF	
Pyrophoric Liquid 1	H250
Pyrophoric Solid 1	
Self-heating 1	H251
Self-heating 2	H252
Water-reacting 1	H260
Water-reacting 2	H261
Water-reacting 3	

For hazardous-statement codes H220 and H221, in situations where sufficient data is available, the flammability of waste may be determined through calculations, exempting the need for laboratory tests.

Whenever the flammability or non-flammability of a waste can be demonstrated through calculations, it is feasible to do so as long as the calculations are performed through national (if any) or international standards, by competent professionals, and the results are approved by the centre.

#### HP 4 – Irritant

Waste with substances classified by one or more hazardous statement codes identified in Table 6-5 must be assessed regarding the concentration limits.

Table 6-5: Hazardous class and corresponding hazard statement codes in relation to HP4.

Hazardous Class and Category Codes	Hazard Statement Codes	Concentration Limits (sum of substances)	Cut-off Value
Skin Corrosion 1A, 1B or 1C	H314	≥ 1% and ≤ 5%	1%
Skin Irritation 2	H315	≥ 20%	
Eye Damage 1	H318	≥ 10%	
Eye Irritation 2	H319	≥ 20%	

In relation to HP 4, the cut-off value of substances applies, being in this case 1%. This means that any substance with a hazard statement code mentioned in Table 6-5 and a concentration below 1% can be disregarded in the hazardous properties assessment.

Additionally, for HP4 the sum of the substances with the same hazard statement code applies. This means that all substances with a concentration above 1% (due to the cut-off value minimum) and the same hazard statement code must be added up to assess the hazardous property. Example, substance A with hazardous statement code H315 and a concentration of 5%, and substance B with hazardous statement code H315 and a concentration of 15%. Individually, each of these substances is below the concentration limit of 20%. However, since they have the same hazardous statement code and for this HP the sum applies, they add up to 20% which equals the limit and, as such, the waste would be considered hazardous in relation to HP4.

Worth noting that when the waste composition is not fully known and the concentration of the known substances does not exceed the concentration limits, or if the waste contains strong acids or bases, the pH value must be checked to assess hazardous properties 4 and 8. A waste with a  $\text{pH} \leq 2$  or  $\geq 11.5$  should be considered hazardous regarding HP8, unless laboratory tests indicate that is not corrosive but irritant.

For waste containing substances with hazard statement code H314, if the concentration value is equal to or above 5%, the waste must be considered hazardous in relation to HP8 and not HP4.

#### HP 5 – Specific Target Organ Toxicity (STOT) / Toxic on Aspiration

Waste with substances classified by one or more hazardous statement codes identified in

Table 6-6 must be assessed regarding the concentration limits. No cut-off value exists for hazardous classes and categories under HP5.

Table 6-6: Hazardous class and corresponding hazard statement codes in relation to HP5.

Hazardous Class and Category Codes	Hazard Statement Codes	Concentration Limits
STOT Single Exposure 1	H370	≥ 1%
STOT Single Exposure 2	H371	≥ 10%
STOT Single Exposure 3	H335	≥ 20%
STOT Repeat Exposure 1	H372	≥ 1%
STOT Repeat Exposure 2	H373	≥ 10%
Aspiration Toxicity 1	H304	≥ 10%

For a waste to be classified as hazardous under HP5 at least one substance needs to be present in a concentration equal to or above the limits displayed in

Table 6-6, as the sum of substances does not apply.

There is an exception for substances with hazard statement code H304. In those cases, if the waste is liquid or has a liquid phase, and the waste contains substances classified under H304, it should be considered hazardous regarding HP5 if the sum of those substances is equal to or above the concentration limit (20%) and the total cinematic viscosity at 40°C does not exceed 20.5mm<sup>2</sup>/s.

### HP 6 – Acute Toxicity

Waste with substances classified by one or more hazardous statement codes identified in Table 6-7 must be assessed regarding the concentration limits.

Table 6-7: Hazardous class and corresponding hazard statement codes in relation to HP6

Hazardous Class and Category Codes	Hazard Statement Codes	Concentration Limits (sum of substances)	Cut-off Value
Acute Toxicity 1 (oral)	H300	≥ 0.1%	0.1%
Acute Toxicity 2 (oral)	H300	≥ 0.25%	
Acute Toxicity 3 (oral)	H301	≥ 5%	
Acute Toxicity 4 (oral)	H302	≥ 25%	1%
Acute Toxicity 1 (dermal)	H310	≥ 0.25%	0.1%
Acute Toxicity 2 (dermal)	H310	≥ 2.5%	
Acute Toxicity 3 (dermal)	H311	≥ 15%	
Acute Toxicity 4 (dermal)	H312	≥ 55%	1%
Acute Toxicity 1 (Inhaled)	H330	≥ 0.1%	0.1%
Acute Toxicity 2 (Inhaled)	H330	≥ 0.5%	
Acute Toxicity 3 (Inhaled)	H331	≥ 3.5%	
Acute Toxicity 4 (Inhaled)	H332	≥ 22.5%	1%

For the assessment of substances in relation to HP6, the sum of substances applies. For this HP however, the sum is performed in a different way from HP4, as the sum considers substances with the same hazard statement codes, and also substances under the same category (1, 2, 3 and 4) whenever multiple acute toxic substances are present.

Additionally, a cut-off value is also applicable for all substances, under which they can be disregarded, even in relation to a sum.

### HP 7 – Carcinogenic

Waste with substances classified by one or more hazardous statement codes identified in Table 6-8 must be assessed regarding the concentration limits.

Table 6-8: Hazardous class and corresponding hazard statement codes in relation to HP7.

Hazardous Class and Category Codes	Hazard Statement Codes	Concentration Limits
Carcinogenic 1A	H350	≥ 0.1%
Carcinogenic 1B		
Carcinogenic 2	H351	≥ 1%

For the assessment of substances in relation to HP6, the sum of substances does not apply, so each substance must be assessed individually.

### HP 8 – Corrosive

Waste with substances classified by one or more hazardous statement codes identified in Table 6-9 must be assessed regarding the concentration limits, not being required to perform laboratory tests, unless not all substances are known.

Table 6-9: Hazardous class and corresponding hazard statement codes in relation to HP8.

Hazardous Class and Category Codes	Hazard Statement Codes	Concentration Limits (sum of substances)	Cut-off Value
Skin Corrosion 1A, 1B or 1C	H314	≥ 5%	1%

For the assessment of substances in relation to HP8, the sum of substances applies. Additionally, a cut-off value of 1% is also applicable for all substances, under which they can be disregarded, even in relation to a sum.

When waste contains substances with the hazard statement code H314 in concentrations below 5% and equal to or above 1%, it is not considered as hazardous under HP8 and is instead classified as hazardous under HP4.

Worth noting that when the waste composition is not fully known and the concentration of the known substances does not exceed the concentration limits, or if the waste contains strong acids or bases, the pH value must be checked to assess hazardous properties 4 and 8. A waste with a  $\text{pH} \leq 2$  or  $\geq 11.5$  should be considered hazardous regarding HP8, unless laboratory tests indicate that is not corrosive but irritant.

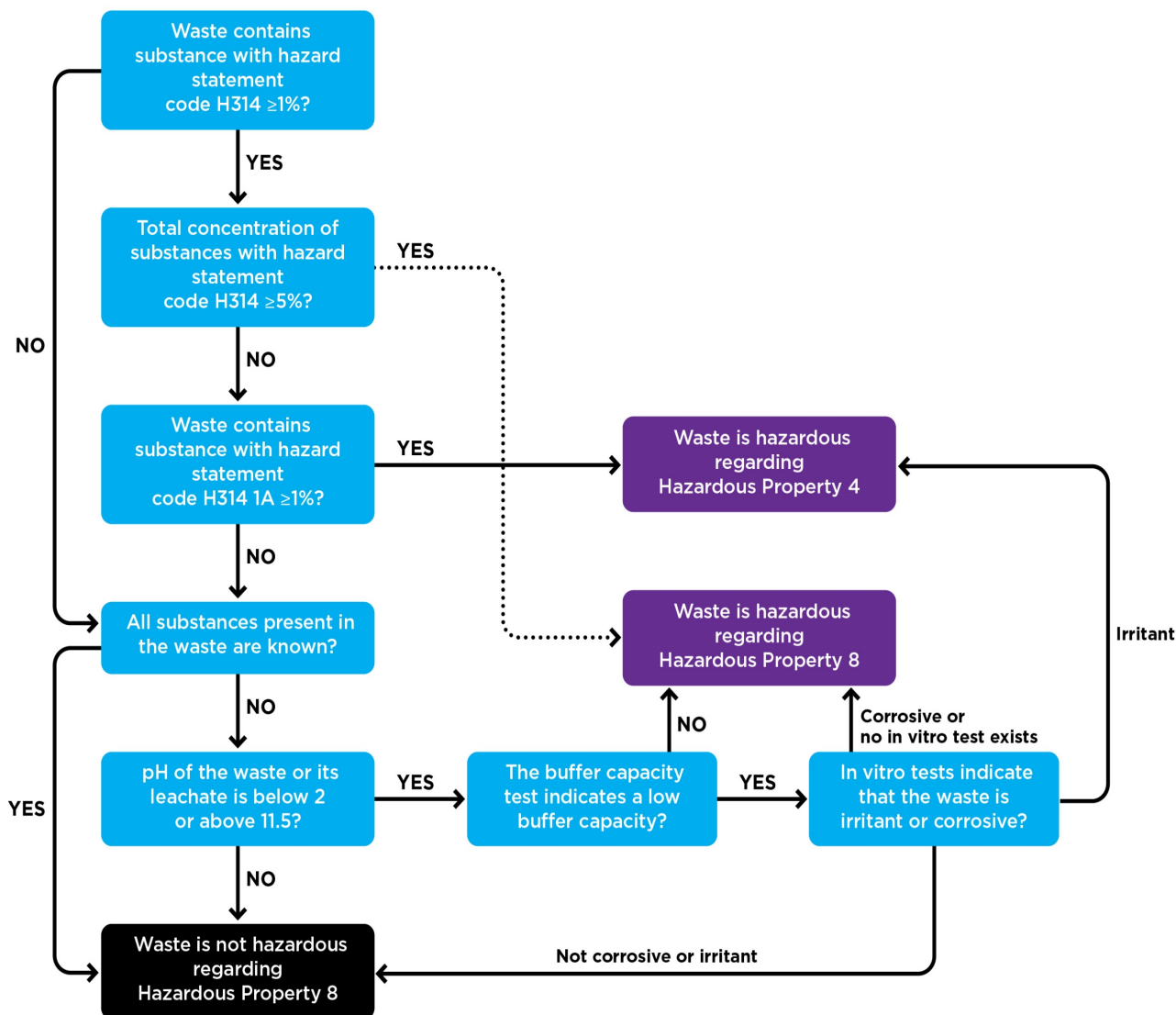


Figure 6-5: Hazardous Property 8 assessment flow chart.

**HP 9 – Infectious**

For the HP9 there are no hazardous classes or categories defined nor hazard statement codes. The assessment of HP9 shall be dictated by rules laid down in reference documents or legislation.

**HP 10 – Toxic for Reproduction**

Waste with substances classified by one or more hazardous statement codes identified in Table 6-10 must be assessed regarding the concentration limits.

Table 6-10: Hazardous class and corresponding hazard statement codes in relation to HP10.

Hazardous Class and Category Codes	Hazard Statement Codes	Concentration Limits
Reproduction 1A	H360	≥ 0.3%
Reproduction 1B		
Reproduction 2	H361	≥ 3%

For the assessment of substances in relation to HP10, the sum of substances does not apply, so each substance must be assessed individually.

#### HP 11 – Mutagenic

Waste with substances classified by one or more hazardous statement codes identified in Table 6-11 must be assessed regarding the concentration limits.

Table 6-11: Hazardous class and corresponding hazard statement codes in relation to HP11.

Hazardous Class and Category Codes	Hazard Statement Codes	Concentration Limits
Mutagenic 1A	H340	≥ 0.1%
Mutagenic 1B		
Mutagenic 2	H341	≥ 1%

For the assessment of substances in relation to HP11, the sum of substances does not apply, so each substance must be assessed individually.

#### HP 12 – Release of an Acute Toxic Gas

Waste with substances classified by the hazardous statement codes EUH029, EUH031 and EUH032, must be assessed for the HP12 through laboratory analysis.

Whenever the toxic gas release and corresponding HP assessment related to a waste can be demonstrated through calculations, it is feasible to do so as long as the calculations are performed through national (if any) or international standards, by competent professionals, and the results are approved by the centre.

#### HP 13 – Sensitizing

Waste with substances classified by one or more hazardous statement codes identified in Table 6-12 must be assessed regarding the concentration limits.

Table 6-12: Hazardous class and corresponding hazard statement codes in relation to HP13.

Hazardous Class and Category Codes	Hazard Statement Codes	Concentration Limits
Sensitizing Skin 1, 1A and 1B	H317	≥ 10%
Sensitizing Respiratory 1, 1A and 1B	H334	≥ 10%

For the assessment of substances in relation to HP13, the sum of substances does not apply, so each substance must be assessed individually.

#### HP 14 – Ecotoxic

Waste with substances classified by one or more hazardous statement codes identified in Table 6-13 must be assessed regarding the concentration limits. However, for this HP, laboratory test may be considered to assess the hazardous properties of waste. In the event that laboratory tests are conducted, they should prevail over the concentration limits set.



Table 6-13: Hazardous class and corresponding hazard statement codes in relation to HP14.

Hazardous Class and Category Codes	Hazard Statement Codes	Concentration Limits (sum of substances)	Cut-off Value
Aquatic Acute Toxicity 1	H400	≥ 25%	0.1%
Aquatic Chronic Toxicity 1	H410	≥ 0.25%	
Aquatic Chronic Toxicity 2	H411	≥ 2.5%	1%
Aquatic Chronic Toxicity 3	H412	≥ 25%	
Aquatic Chronic Toxicity 4	H413	≥ 25%	
Hazardous Class and Category Codes	Hazard Statement Codes	Concentration Limits	Cut-off Value
Ozone 1	H420	≥ 0.1%	-

For the assessment of substances in relation to HP14, the sum of substances applies. However, for this hazardous property, the sum is processed according to:

- Waste containing substances with hazard statement code H400 – Sum of substances with the code H400, with the concentration limit being 25%;
- Waste containing substances with hazard statement codes H410, H411, H412 – Sum of substances with hazard statement code H410 x 100, plus sum of substances with hazard statement code H411 x 10, plus sum of substances with hazard statement code H412, with the concentration limit being 25%. In summary,  $[100 \times \Sigma c (H410) + 10 \times \Sigma c (H411) + \Sigma c (H412) \geq 25 \%$ ]. (Note:  $\Sigma$ = sum; c=concentration);
- Waste containing substances with hazard statement codes H410, H411, H412 – Sum of all substances with hazard statement codes H410, H411, H412 and H413, with the concentration limit being 25%.

Additionally, a cut-off value is also applicable for all substances, under which value they can be disregarded, even in relation to a sum. The exception is related to substances with hazard statement codes H420, as the sum does not apply and there is no cut-off value defined.

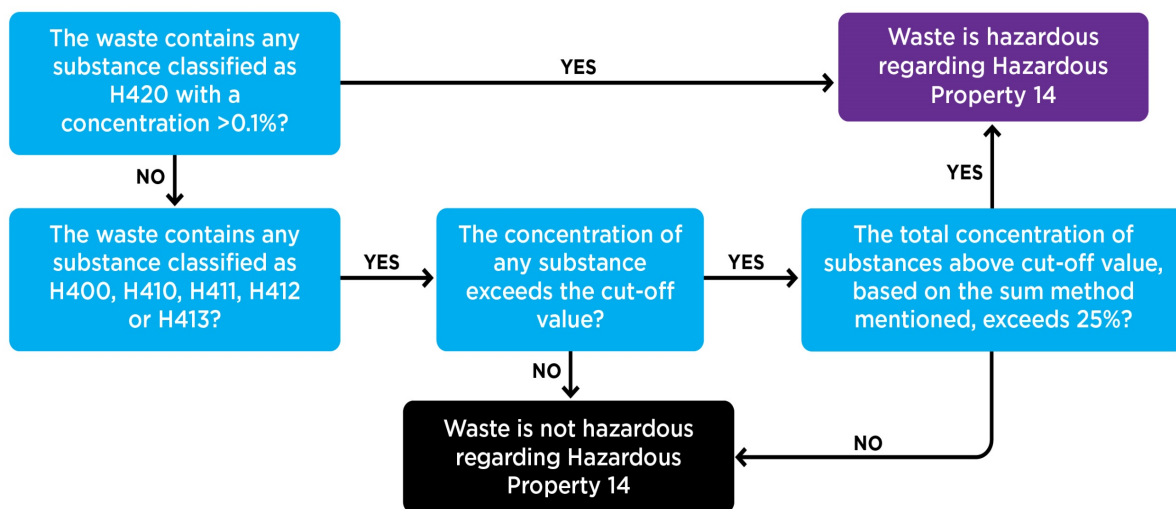


Figure 6-6: Hazardous Property 14 assessment flow chart.

**HP 15 – Waste capable of exhibiting a hazardous property listed above, not directly displayed by the original waste.**

Waste with substances classified by the hazardous statement codes H205, EUH001, EUH019, and EUH044, must be considered hazardous in relation to hazardous property 15, unless it is presented in such a way that it can't, under no circumstances, exhibit explosive or potentially explosive characteristics. Laboratory tests are required to assess its characteristics, and if no tests are performed the waste must be considered hazardous under HP15.

Additionally, waste may also be classified under hazardous property 15 based on other applicable criteria, such as an assessment of the leachate through, for example, TCLP testing. In that regard, if a substance, through a TCLP test, exceeds the limit values displayed in Annex 3, based on US EPA list<sup>4</sup>, shall be considered hazardous in relation to hazardous property 15.

<sup>4</sup> [https://www.epa.gov/sites/default/files/2015-10/documents/chap7\\_0.pdf](https://www.epa.gov/sites/default/files/2015-10/documents/chap7_0.pdf)

## Appendix 1 - POP concentration limits.

Substance	Concentration limit
Endosulfan	50 mg/kg
Hexachlorobutadiene	100 mg/kg
Polychlorinated naphthalenes (1)	10 mg/kg
Alkanes C10-C13, chloro (short-chain chlorinated paraffins) (SCCPs)	10 000 mg/kg
Tetrabromodiphenyl ether	Sum of the concentrations of tetrabromodiphenyl ether, pentabromodiphenyl ether, hexabromodiphenyl ether and heptabromodiphenyl ether: 1 000 mg/kg
Pentabromodiphenyl ether	
Hexabromodiphenyl ether	
Heptabromodiphenyl ether	
C <sub>12</sub> H <sub>3</sub> Br <sub>7</sub> O	
Perfluorooctane sulfonic acid and its derivatives (PFOS)	50 mg/kg
C <sub>8</sub> F <sub>17</sub> SO <sub>2</sub> X (X = OH, Metal salt (O-M <sup>+</sup> ), halide, amide, and other derivatives including polymers)	
Polychlorinated dibenzo-p-dioxins and dibenzofurans (PCDD/PCDF)	15 µg/kg (2)
DDT (1,1,1-trichloro-2,2-bis(4-chlorophenyl)ethane)	50 mg/kg
Chlordane	50 mg/kg
Hexachlorocyclohexanes, including lindane	50 mg/kg
Dieldrin	50 mg/kg
Endrin	50 mg/kg
Heptachlor	50 mg/kg
Hexachlorobenzene	50 mg/kg

Substance	Concentration limit
Chlordecone	50 mg/kg
Aldrin	50 mg/kg
Pentachlorobenzene	50 mg/kg
Polychlorinated Biphenyls (PCB)	50 mg/kg
Mirex	50 mg/kg
Toxaphene	50 mg/kg
Hexabromobiphenyl	50 mg/kg
<p>(1) Polychlorinated naphthalenes means chemical compounds based on the naphthalene ring system, where one or more hydrogen atoms have been replaced by chlorine atoms.</p> <p>(2) The limit is calculated as PCDD and PCDF according to the following toxic equivalency factors (TEFs):</p>	
PCDD	TEF
2,3,7,8-TeCDD	1
1,2,3,7,8-PeCDD	1
1,2,3,4,7,8-HxCDD	0.1
1,2,3,6,7,8-HxCDD	0.1
1,2,3,7,8,9-HxCDD	0.1
1,2,3,4,6,7,8-HpCDD	0.01
OCDD	0,0003
PCDF	TEF
2,3,7,8-TeCDF	0.1
1,2,3,7,8-PeCDF	0.03
2,3,4,7,8-PeCDF	0.3

Substance	Concentration limit
1,2,3,4,7,8-HxCDF	0.1
PCDD	TEF
1,2,3,6,7,8-HxCDF	0.1
1,2,3,7,8,9-HxCDF	0.1
2,3,4,6,7,8-HxCDF	0.1
1,2,3,4,6,7,8-HpCDF	0.01
1,2,3,4,7,8,9-HpCDF	0.01
OCDF	0,0003

## Appendix 2 – List of Waste Summary (Chapters and Subchapters)

Chapter	Subchapter
01 - Wastes resulting from exploration, mining, quarrying and physical and chemical treatment of minerals	01 - Wastes from mineral excavation
	03 - Wastes from physical and chemical processing of metalliferous minerals
	04 - Wastes from physical and chemical processing of non-metalliferous minerals
	05 - Drilling muds and other drilling wastes
02 - Wastes from agriculture, horticulture, aquaculture, forestry, hunting and fishing, food preparation and processing	01 - Wastes from agriculture, horticulture, aquaculture, forestry, hunting and fishing
	02 - Wastes from the preparation and processing of meat, fish, and other foods of animal origin
	03 - Wastes from fruit, vegetables, cereals, edible oils, cocoa, coffee, tea and tobacco preparation and processing; conserve production; yeast and yeast extract production, molasses preparation and fermentation
	04 - Wastes from sugar processing
	05 - Wastes from the dairy products industry
	06 - Wastes from the baking and confectionery industry
	07 - Wastes from the production of alcoholic and non-alcoholic beverages (except coffee, tea, and cocoa)
03 - Wastes from wood processing and the production of panels and furniture, pulp, paper, and cardboard	01 - Wastes from wood processing and the production of panels and furniture
	02 - Wastes from wood preservation
	03 - Wastes from pulp, paper and cardboard production and processing
04 - Wastes from the leather, fur, and textile industries	01 - Wastes from the leather and fur industry
	02 - Wastes from the textile industry
05 - Wastes from petroleum refining, natural gas purification and pyrolytic treatment of coal	01 - Wastes from petroleum refining
	06 - Wastes from the pyrolytic treatment of coal
	07 - Wastes from natural gas purification and transportation
06 - Wastes from inorganic chemical processes	01 - Wastes from the manufacture, formulation, supply, and use (MFSU) of acids

Chapter	Subchapter
	02 - Wastes from the MFSU of bases 03 - Wastes from the MFSU of salts and their solutions and metallic oxides 04 - Metal-containing wastes other than those mentioned in 06 03 05 - Sludges from on-site effluent treatment
	06 - Wastes from the MFSU of sulphur chemicals, sulphur chemical processes and desulphurisation processes 07 - Wastes from the MFSU of halogens and halogen chemical processes 08 - Wastes from the MFSU of silicon and silicon derivatives 09 - Wastes from the MFSU of phosphorous chemicals and phosphorous chemical processes 10 - Wastes from the MFSU of nitrogen chemicals, nitrogen chemical processes and fertiliser manufacture 11 - Wastes from the manufacture of inorganic pigments and opacifiers 13 - Wastes from inorganic chemical processes not otherwise specified
07 - Wastes from organic chemical processes	01 - Wastes from the manufacture, formulation, supply, and use (MFSU) of basic organic chemicals 02 - Wastes from the MFSU of plastics, synthetic rubber, and man-made fibres 03 - Wastes from the MFSU of organic dyes and pigments (except 06 11) 04 - Wastes from the MFSU of organic plant protection products (except 02 01 08 and 02 01 09), wood preserving agents (except 03 02) and other biocides 05 - Wastes from the MFSU of pharmaceuticals 06 - Wastes from the MFSU of fats, grease, soaps, detergents, disinfectants, and cosmetics 07 - Wastes from the MFSU of fine chemicals and chemical products not otherwise specified
08 - Wastes from the manufacture, formulation, supply, and use (MFSU) of coatings (paints, varnishes and vitreous enamels), adhesives, sealants and printing inks	01 - Wastes from MFSU and removal of paint and varnish 02 - Wastes from MFSU of other coatings (including ceramic materials) 03 - Wastes from MFSU of printing inks 04 - Wastes from MFSU of adhesives and sealants (including waterproofing products) 05 - Wastes not otherwise specified in 08

Chapter	Subchapter
09 - Wastes from the photographic industry	01 - Wastes from the photographic industry
10 - Wastes from thermal processes	01 - Wastes from power stations and other combustion plants (except 19)
	02 - Wastes from the iron and steel industry
	03 - Wastes from aluminium thermal metallurgy
	04 - Wastes from lead thermal metallurgy
	05 - Wastes from zinc thermal metallurgy
	06 - Wastes from copper thermal metallurgy
	07 - Wastes from silver, gold, and platinum thermal metallurgy
	08 - Wastes from other non-ferrous thermal metallurgy
	09 - Wastes from casting of ferrous pieces
	10 - Wastes from casting of non-ferrous pieces
	11 - Wastes from manufacture of glass and glass products
	12 - Wastes from manufacture of ceramic goods, bricks, tiles, and construction products
	13 - Wastes from manufacture of cement, lime and plaster and articles and products made from them
	14 - Waste from crematoria
11 - Wastes from chemical surface treatment and coating of metals and other materials; non-ferrous hydro-metallurgy	01 - Wastes from chemical surface treatment and coating of metals and other materials (for example galvanic processes, zinc coating processes, pickling processes, etching, phosphating, alkaline degreasing, anodising)
	02 - Wastes from non-ferrous hydrometallurgical processes
	03 - Sludges and solids from tempering processes
	05 - Wastes from hot galvanising processes
12 - Wastes from shaping and physical and mechanical surface treatment of metals and plastics	01 - Wastes from shaping and physical and mechanical surface treatment of metals and plastics
	03 - Wastes from water and steam degreasing processes (except 11)
13 - Oil wastes and wastes of liquid fuels (except edible oils, 05 and 12)	01 - Waste hydraulic oils
	02 - Waste engine, gear, and lubricating oils
	03 - Waste insulating and heat transmission oils
	04 - Bilge oils



Chapter	Subchapter
	05 - Oil/water separator contents
	07 - Wastes of liquid fuels
	08 - Oil wastes not otherwise specified
14 - Waste organic solvents, refrigerants, and propellants (except 07 and 08)	06 - Waste organic solvents, refrigerants, and foam/aerosol propellants
15 - Waste packaging; absorbents, wiping cloths, filter materials and protective clothing not otherwise specified	01 - Packaging (including separately collected municipal packaging waste)
	02 - Absorbents, filter materials, wiping cloths and protective clothing
16 - Wastes not otherwise specified in the list	01 - End-of-life vehicles from different means of transport (including off-road machinery) and wastes from dismantling of end-of-life vehicles and vehicle maintenance (except 13, 14, 16 06 and 16 08)
	02 - Wastes from electrical and electronic equipment
	03 - Off-specification batches and unused products
	04 - Waste explosives
	05 - Gases in pressure containers and discarded chemicals
	06 - Batteries and accumulators
	07 - Wastes from transport tank, storage tank and barrel cleaning (except 05 and 13)
	08 - Spent catalysts
	09 - Oxidising substances
	10 - Aqueous liquid wastes destined for off-site treatment
	11 - Waste linings and refractories
17 - Construction and demolition wastes (including excavated soil from contaminated sites)	01 - Concrete, bricks, tiles, and ceramics
	02 - Wood, glass, and plastic
	03 - Bituminous mixtures, coal tar and tarred products
	04 - Metals (including their alloys)
	05 - Soil (including excavated soil from contaminated sites), stones and dredging spoil
	06 - Insulation materials and asbestos-containing construction materials
	08 - Gypsum-based construction material

Chapter	Subchapter
	09 - Other construction and demolition wastes
18 - Wastes from human or animal health care and/or related research (except kitchen and restaurant wastes not arising from immediate health care)	01 - Wastes from natal care, diagnosis, treatment, or prevention of disease in humans
	02 - Wastes from research, diagnosis, treatment, or prevention of disease involving animals
19 - Wastes from waste management facilities, off-site wastewater treatment plants and the preparation of water intended for human consumption and water for industrial use	01 - Wastes from incineration or pyrolysis of waste
	02 - Wastes from physic-chemical treatments of waste (including dechromatation, decyanidation, neutralisation)
	03 - Stabilised/solidified wastes
	04 - Vitrified waste and wastes from vitrification
	05 - Wastes from aerobic treatment of solid wastes
	06 - Wastes from anaerobic treatment of waste
	07 - Landfill leachate
	08 - Wastes from wastewater treatment plants not otherwise specified
	09 - Wastes from the preparation of water intended for human consumption or water for industrial use
	10 - Wastes from shredding of metal-containing wastes
	11 - Wastes from oil regeneration
	12 - Wastes from the mechanical treatment of waste (for example sorting, crushing, compacting, pelletising) not otherwise specified
	13 - Wastes from soil and groundwater remediation
20 - Municipal Wastes (Household Waste and Similar Commercial, Industrial and Institutional Wastes) Including Separately Collected Fractions	01 - Separately collected fractions (except 15 01)
	02 - Garden and park wastes (including cemetery waste)
	03 - Other municipal wastes

## Appendix 3 - TCLP concentration limits.

Contaminant	CASNumber	Limit Value (mg/l)
Arsenic	7440-38-2	5
Barium	7440-39-3	100
Benzene	71-43-2	0.5
Cadmium	7440-43-9	1
Carbon Tetrachloride	56-23-5	0.5
Chlordane	57-74-9	0.03
Chlorobenzene	108-90-7	100
Chloroform	67-66-3	6
Chromium	7440-47-3	5
o-Cresol	95-48-7	200
m-Cresol	108-39-4	200
p-Cresol	106-44-5	200
Cresol	*****	200
2,4-D Acid	94-75-7	10
1,4-Dichlorobenzene	106-46-7	7.5
1,2-Dichloroethane	107-06-2	0.5
1,1-Dichloroethylene	75-35-4	0.7
2,4-Dinitrotoluene	121-14-2	0.13
Endrin	72-20-8	0.02
Heptachlor (and its epoxides)	76-44-8	0.008
Hexachlorobenzene	118-74-1	0.13
Hexachlorobutadiene	87-68-3	0.5
Hexachloroethane	67-72-1	3
Lead	7439-92-1	5
Lindane	58-89-9	0.4
Mercury	7439-97-6	0.2
Methoxychlor	72-43-5	10

Contaminant	CASNumber	Limit Value (mg/l)
Methyl Ethyl Ketone	78-93-3	200
Nitrobenzene	98-95-3	2
Pentachlorophenol	87-86-5	100
Pyridine	110-86-1	5
Selenium	7782-49-2	1
Silver	7440-22-4	5
Tetrachloroethylene	127-18-4	0.7
Toxaphene	8001-35-2	0.5
Trichloroethylene	79-01-6	0.5
2,4,5-Trichlorophenol	95-95-4	400
2,4,6-Trichlorophenol	88-06-2	2
2,4,5-TP (Silvex)	93-72-1	1
Vinyl Chloride	75-01-4	0.2



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