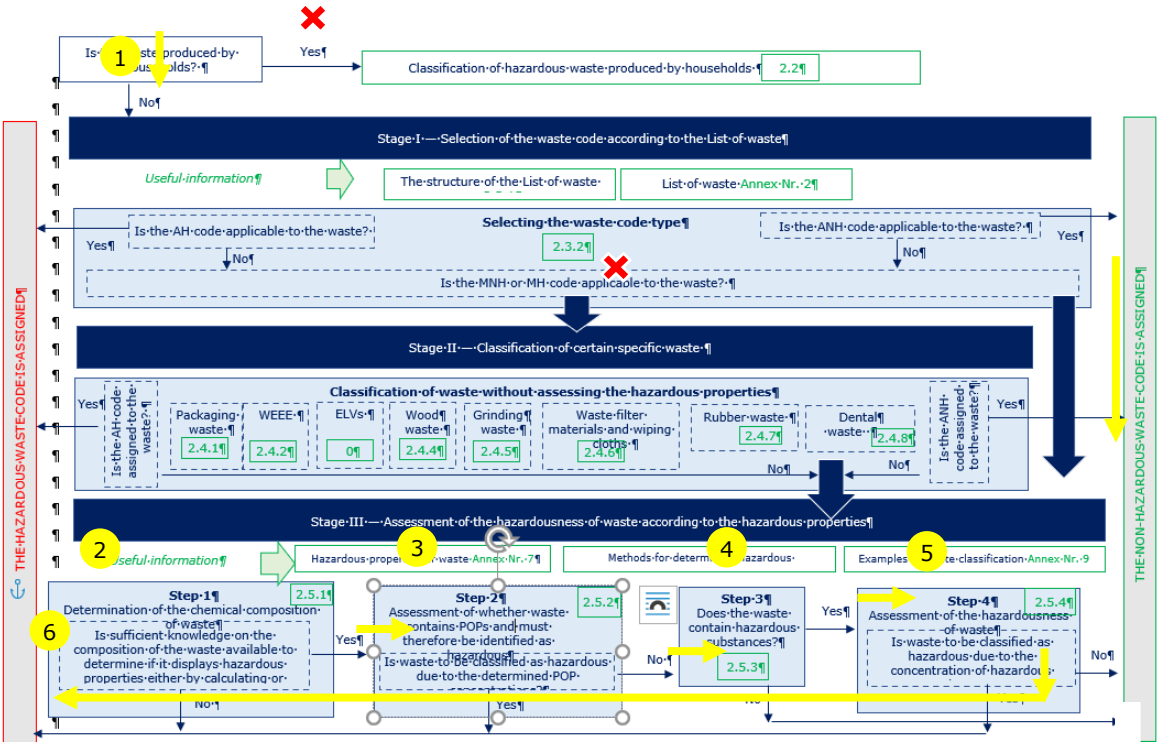
HAZARDOUS WASTE IDENTIFICATION GUIDE

ANNEX 9-1

EXAMPLE OF THE CLASSIFICATION OF CONSTRUCTION WASTE CONTAINING TAR (BITUMEN)

This Annex gives an example of the identification of liquid waste generated during the construction (reconstruction), which seem to contain tar (bituminous mixture)[1]. There are no documents on the origin of the substances producing the waste. The purpose of this example is to provide a description of the steps necessary for the identification of hazardous waste, where the results of the waste composition tests are used for the assessment of hazardous properties.

The steps for the identification of waste based on the flowchart shown in Figure 1 of the Guide are described below (they are marked by yellow arrows in the figure).



Steps for the identification of waste

1

First, Stage I steps are performed to determine which type of waste code is to be attributed to the waste. Waste has been generated during the construction process and should therefore be classified under one of the entries in *Chapter 17 of the List of Waste (Construction and demolition wastes (including excavated soil from contaminated sites)).* This chapter of the List of Waste consists of several sub-chapters, the most suitable of which is *17 03 Construction waste containing tar* including the following entries that could be considered for identifying the waste in question:

17 03	**bituminous mixtures, coal tar and tarred products**	
17 03 01*	bituminous mixtures containing coal tar	MH
17 03 02	bituminous mixtures other than those mentioned in 17 03 01	MN

[1] The example is based on the *Europese afvalstoffenlijst EURAL. Handleiding* (Belgium).

Since the suitable entries happen to be mirror entries, it is necessary to assess whether the waste has hazardous properties to determine the waste code to be assigned. That is, the transition to Stage II or Stage III of the Guide is required. As construction waste does not fall within any of the waste streams listed in Stage II of the Guide, it is proceeded to the Stage III steps.

2

First, Step 1 of Stage III is performed, i.e. information on the waste composition is collected. As indicated above, since there is no documentation on the substance from which the waste is originated, tests on the composition of the waste have been carried out to determine the concentration of certain heavy metals, hydrocarbons, and PCBs in the waste (see the table below).

Element/ Parameter		**Identified concentration of the element, mg/kg**
Name	**Labelling**	
Copper	Cu	10
Lead	Pb	15
Nickel	Ni	11
Zinc	Zn	46
Hydrocarbons	C10-C40	9400
Hydrocarbons	C12-C20	533
Hydrocarbons	C20-C30	4170
Hydrocarbons	C30-C40	4670
fluoranthene		287
pyrene		234
benzo[a]pyrene		146
benzo[b]fluoranthene		144
benzo[k]fluoranthene		137
	PCB 101	0.003
	PCB 118	0.002
	PCB 153	0.006
	PCB 138	0.005
	PCB 180	0.003

3

Tests have shown that the waste contains PCBs. PCBs are included in Annex 1, point 2.2.3 of the Waste Management Rules; therefore, steps of Stage III are carried out, comparing the concentrations identified with the concentration limits listed in Annex IV of the POP Regulation (see also Annex 6 to the Guide).

Annex IV to the POP Regulation specifies that the concentration limit for PCBs is 50 mg/kg; therefore, waste should not be identified as hazardous due to the available concentrations of POPs (PCBs).

4

The objective of Step 3 of Stage III is to determine whether the substances contained in waste identified by testing are hazardous (i.e. whether there is information of one or more hazard statements being assigned) and, if so, to collect information on their hazardous properties. Various sources of information (for different types of set parameters) may be used for this purpose, as specified in point 2.5.3 of the Guide.

- **Heavy metals.** Since the heavy metals test results are determined at the element level and given that metals are mostly present in the composition of other chemical compounds, a 'worst case' compound has been selected for each metal (see Annex 7-3 to the Guide for possible worst case compound examples); this data is used for

subsequent steps. The information on whether the 'worst case' compounds of the heavy metals identified in the waste are classified as hazardous substances, i.e. whether they are assigned hazard statements and, if so, what hazard statements, has been verified against the CLP inventory, https://echa.europa.eu/information-on-chemicals/cl-inventory-database. (for the instructions on use of the CLP inventory, see also Annex 7-2 to the Guide; the information on hazard statements of certain hazardous substances, as well as on compounds according to their respective hazardous properties is also provided in Annex 7-3 to the Guide);

- **Hydrocarbons.** Data of hazard statements is based on the Hazard classification and labelling of petroleum substances in the European Economic Area – 2021[2].

Since the heavy metals test results are available at the element level and given that metals available in construction waste are mostly present in the composition of other chemical compounds, a 'worst case' compound has been selected for each metal (see Annex 7-3 to the Guide for possible worst case compound examples), the potential concentrations of which in the waste are to be converted according to the molar mass of the compound and the atomic masses of its constituent elements. Accordingly:

To structure the data collected from the above data sources, it has been listed in the table (see below) containing the following information:

- Name/labelling of the parameter/element identified by testing;
- Concentrations determined during testing, mg/kg;
- Where a 'worst-case' compound is applied to elements, the atomic mass of the element, the molar mass of the compound, i.e. the data required for the recalculation of concentration assuming that the waste contains 'worst-case' compounds;
- Since the concentration limit in Annex III to the WFD is expressed as a percentage, the concentrations (mg/kg) determined by testing have also been converted to a percentage for evaluation purposes (where 'worst case' compounds have been selected, their concentrations have been recalculated).

To convert the concentrations determined in mg/kg into the percentage concentration, the determined value should be divided by 10,000; e.g. 5 mg/kg = 0.0005%.

The formula used to recalculate the concentration of the 'worst case' compound is as follows: *Compound concentration = (element concentration * molar mass of the compound)/atomic mass of the element, e.g.:*

for chromium (Cr atomic mass 51.990, concentration 110 mg/kg), the selected 'worst case' compound is CrO_3 (molar mass 99.990), which means that the 'worst case' compound concentration is

*110*99.99/51.99=212 mg/kg*

Information on the possible 'worst case' compounds of certain substances, the atomic masses of the elements and the molar masses of the compounds concerned is provided in Annex 7-3 to the Guide.

[2] https://www.concawe.eu/publication/hazard-classification-and-labelling-of-petroleum-substances-in-the-european-economic-area-2021/.

The table below provides summary information on the results of the waste composition tests, as well as information on the H statements of the substances contained in waste, by each hazardous property (HP). This data clearly indicates that the substances contained in waste are hazardous; therefore, it should be proceeded to Step 4 of Stage III.

Results of the waste composition tests, 'worst case' compounds, hazard statements and relevant hazardous properties

Element/ Parameter	Identified concentration of the element, mg/kg	Additional data (for the worst case scenario calculations)					Hazardous Properties									
		Compound	Atomic mass of the element	Molar mass of the compound	Calculated concentration of the compound, mg/kg	Recalculated concentration, %	HP3	HP4	HP5	HP6	HP7	HP8	HP10	HP11	HP13	HP14
Cu	10	CuCl2	63.55	134.450	21	0.002		H315, H318		H302, H312						**H411**
Pb	15	PbCl2	207.2	278.100	20	0.002			H372	H302, H332	H351		H360			**H410**
Ni	11	NiCl2	58.69	129.590	24	0.002		H315	H372	H301 (3), H331	H350		H360	H341	H317	**H410**
Zn	46	ZnCl2	65.38	136.280	96	0.010		H314		H302		H314				**H410**
C10-C40	9400					0.940	H224	H315	H304, H372		H350		H361	H340		**H410**
C12-C20	533					0.053	H226	H315	H304, H373	H332	H350					**H411**
C20-C30	4170					0.417	H226	H315	H304, H373	H332	H350					**H410**
C30-C40	4670					0.467			H304, H372		H350		H361			**H410**
fluoranthene	287					0.029				H302						**H410**
pyrene	234					0.023		H319								**H410**
benzo[a]pyrene	146					0.015							H360	H340	H317	**H410**
benzo[b]fluoranthene	144					0.014					H350					**H410**
benzo[k]fluoranthene	137					0.014					H350					**H410**

5

Step 4 of Stage III intended to identify, based on the information collected in the previous steps, whether waste has one or several hazardous properties due to the concentration of substances contained in waste. If waste is found to have at least one hazardous property, the waste is identified as hazardous.

Initial analysis of available data:

Step 4 of Stage III intended to identify, using the information collected in the previous steps, whether waste has one or several hazardous properties due to the concentration of substances contained in waste. If waste is found to have at least one hazardous property, the waste is identified as hazardous.

Initial analysis of available data:

To avoid unnecessary actions, it is plausible to compare the data on the concentrations of substances contained in waste and on the hazard statements, which has been collected in previous steps, with the cut-off values referred to in Regulation No 1357/2014 before starting the assessment of the available data, thus determining which hazardous properties are to be assessed in accordance with the provisions of Regulation (EU) No 1357/2014 and whether all substances identified in the waste (in this case, the 'worst case' compounds) are to be included in the assessment. To this end, the above table has been supplemented with data on cut-off values set out in Regulation (EU) No 1357/2014 (see the green-marked row in the table below) and concentration limits (see the yellow-marked row in the table below) in cases where cut-off values are not set.

Results of the waste composition tests, 'worst case' compounds, hazard statements and relevant hazardous properties

Element/ Parameter	Identified concentration of the element, mg/kg	Additional data (for the worst case scenario calculations)					Hazardous properties/cut values[3]/concentration limits[4]									
							HP3	HP4	HP5	HP6	HP7	HP8	HP10	HP11	HP13	HP14
		Compound	Atomic mass of the element	Molar mass of the compound	Calculated concentration of the compound, mg/kg	Recalculated concentration, %		1%		min. 0.1%		1%			10%	min. 0.1%
									min.1%		min. 0.1%		min. 0.3%	min. 0.1%		
Cu	10	CuCl2	63.55	134.450	21	0.002		H315, H318		H302,H312						**H411**
Pb	15	PbCl2	207.2	278.100	20	0.002			H372	H302,H332	H351		H360			**H410**
Ni	11	NiCl2	58.69	129.590	24	0.002		H315	H372	H301 (3), H331	H350		H360	H341	H317	**H410**
Zn	46	ZnCl2	65.38	136.280	96	0.010		H314		H302		H314				**H410**
C10-C40	9400					0.940	H224	H315	H304, H372		H350		H361	H340		**H410**
C12-C20	533					0.053	H226	H315	H304, H373	H332	H350					**H411**
C20-C30	4170					0.417	H226	H315	H304, H373	H332	H350					**H410**
C30-C40	4670					0.467			H304, H372		H350		H361			**H410**
fluoranthene	287					0.029				H302						**H410**
pyrene	234					0.023		H319								**H410**
benzo[a]pyrene	146					0.015							H360	H340	H317	**H410**
benzo[b]fluoranthene	144					0.014					H350					**H410**
benzo[k]fluoranthene	137					0.014					H350					**H410**

[3] According to Regulation (EU) No 1357/2014; where the table does not include a cut-off value, cut-off values are not used for the assessment of the relevant hazardous property. Note: in the Lithuanian version of Regulation (EU) No 1357/2014, the term 'cut-off value' is used. In some cases, threshold values (cut-off values) are different for various hazard statements, in which case the table shows the minimum concentration limits with the reference 'min.' next to them.

[4] In accordance with Regulation (EU) No 1357/2014; see also Annex 7-1 and Annex 8 to the Guide. In some cases, concentration limits are different for various hazard statements, in which case the table shows the minimum concentration limits with the reference 'min.' next to them. Where cumulative concentration limits are applied, the table indicates 'sum.'.

To avoid unnecessary actions, an initial analysis of the available data has been carried out prior to the assessment of the available data:

- The test results show that the waste does not contain components with the H statements indicating the possible hazardous properties of the waste, such as HP 1 (explosive), HP 2 (oxidising), HP 12 (emission of toxic gas), and HP 15 (waste having any of the above hazardous properties).

Information on the classification of hazard statements as hazardous properties can also be found in Annex 7-1 to the Guide.

Preliminary assessment of whether waste can have the properties HP 1 (explosive), HP 2 (oxidising), and HP 3 (flammable) can be based by visual examination, which then might be followed by testing for these properties, if suspected. In the case under consideration, it is likely that the waste could have one of the specified properties — HP 3 (flammable) — and tests should therefore be carried out, if possible.

- In addition, the waste contains substances with hazard statements H224 and H226; therefore, it should be considered hazardous due to the hazard property HP 3 (flammable);
- Depending on the origin of the waste (waste from contaminated soils is unlikely to be infectious), no assessment is carried out for the hazardous property HP 9 (infectious);
- Some organic components have low concentrations (< 1 mg/kg), which means that the percentage is < 0.0001%. The concentrations of the properties HP 4, HP 5, HP 6, HP 7, HP 8, HP 10, HP 11 are too low because the minimum threshold or the lowest concentration limit is 0.1%.
- **This means that waste can only be classified as hazardous because it can have the properties HP 3 and HP 14.**

HP 3 (flammable) assessment of waste

Identification: if the waste contains flammable substances (substances assigned H statements H220 H221 H222 H223 H224 H225 H226 H228 H242 H250 H251 H252 H260 H261), the flammability of the mixture should in principle be tested (the method is described in Regulation EC No 440/2008).

In this case, which is not solid waste, there are substances with H statements H224 and H226; therefore, the flash point must be determined by testing.

Information on the assessment of hazardous properties (threshold values, cut-off values, assessment algorithms, etc.) is given in Annex 8 to the Guide.

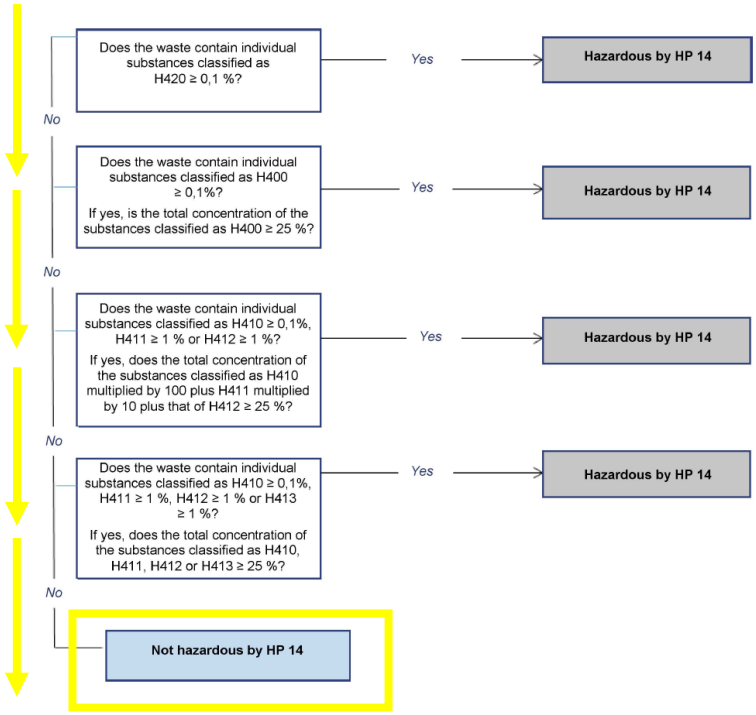
If no flash point tests are carried out, the waste code 17 03 01* is assigned, and no further assessment for other hazardous properties is required.

If the flash point is determined by testing:

- **where the flash point is ≤ 55 °C, the waste code 17 03 01* is assigned, and no subsequent assessment is required;**
- If the flash point is > 55 °C, the waste must be assessed for HP 14 (see below).

HP 14 (ecotoxicity) assessment of waste

The information in the table above and the diagram in Annex 8 to the Guide (see below) is used for the assessment.



Thus, the steps in Stage III of the Guide have led to the conclusion that the assessment of the hazardous substance concentrations in the waste by the 'worst case' compounds do not reveal the hazardous property HP 14 in the waste.

6

As indicated above, the steps of the Stages I and III of the Guide have revealed that waste contains hazardous substances; however, their concentrations are below the respective thresholds (cut-off values) or concentration limits laid down in Regulation (EU) No 1357/2014; **therefore, the waste should be identified under the code 17 03 02 unless there is evidence that the flash point is ≤ 55 °C, in which case the waste is classified under 17 03 01* as having the property HP 3 (flammable).**