

Waste Classification for Soils

An AGS Practitioners' Guide

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What is waste?

Legal definition:

“A substance or object that the holder discards or intends to discard, or is required to discard”

This includes excavation spoil

– unless it’s uncontaminated *“naturally occurring soil excavated in the course of construction activities where it is certain that the material will be used for the purposes of construction in its natural state on the site from which it was excavated”*



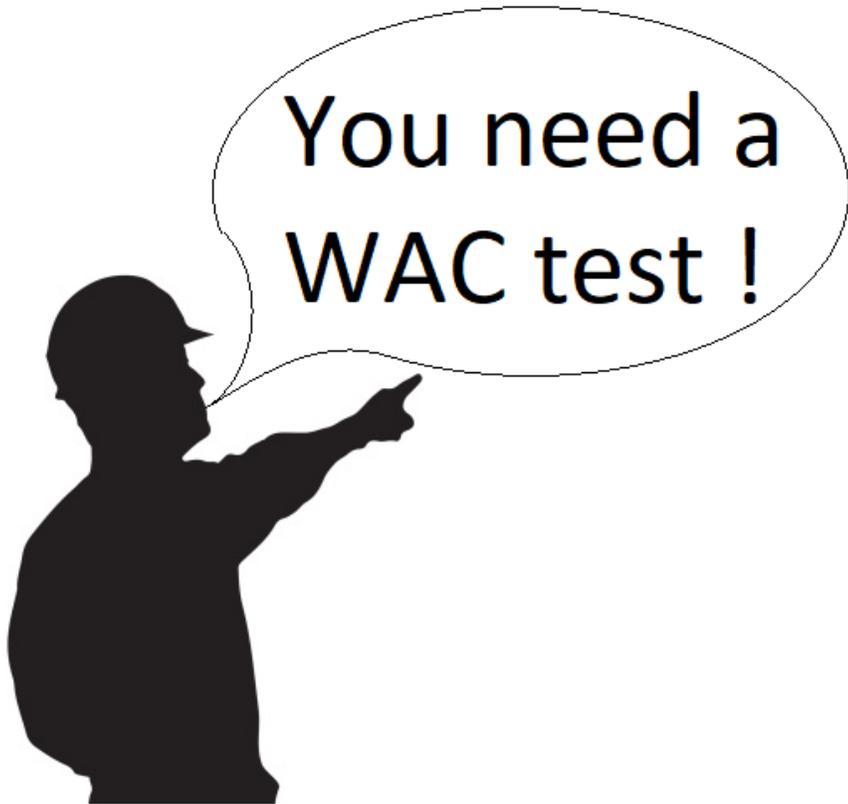
Excavation spoil ceases to be waste if used in accordance with the CL:AIRE DoWCoP



Waste classification

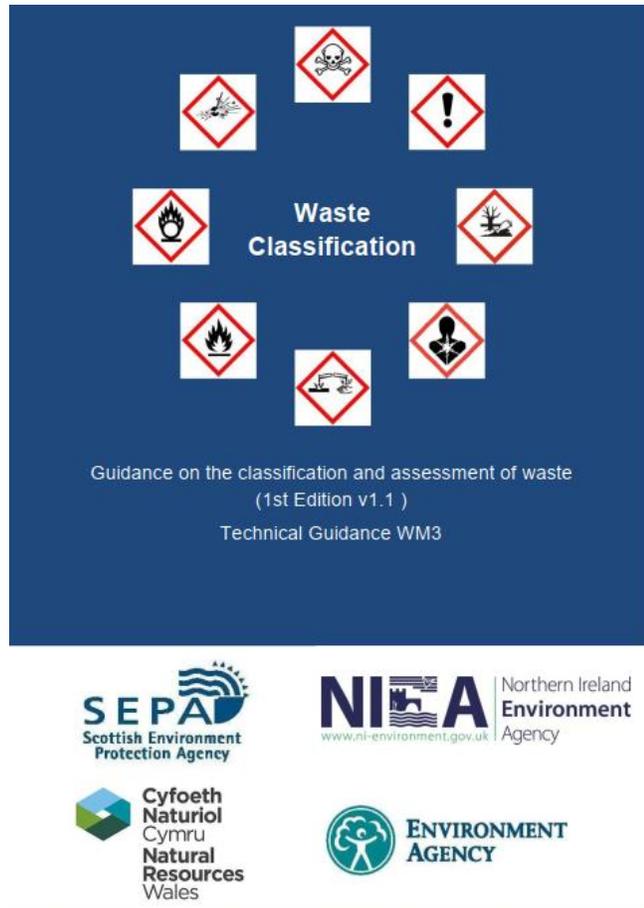


How do you know if the waste is Hazardous?



NO

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WM3 sets out the UK interpretation of the waste directive

This covers all types of waste not just soils

When is waste Hazardous?

When it possesses one of the hazardous properties



HP1
Explosive



HP2
Oxidising



HP3
Flammable



HP4
Irritant



HP5 HP6
Toxic



HP7
Carcinogenic



HP8
Corrosive



HP9
Infectious



HP10
Toxic for
Reproduction



HP11
Mutagenic



HP12
Produces
toxic gases



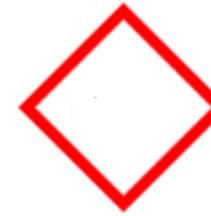
HP13
Sensitising



HP14
Ecotoxic



HP15 Capable
of exhibiting a
hazardous
property



HP16
Persistent
organic
Pollutant



Consequences of incorrect classification

Wrongly classifying waste is an offence under the Environmental Permitting Regime (EPR) and the Hazardous Waste (England and Wales) Regulations 2005 and Hazardous Waste (Wales) Regulations 2005 (HWR)

- Prosecution
- Cost
- All waste from a site may be rejected if one load is turned away
- Reputational damage

Confusion in waste soil classification

Soils are variable and of unknown composition unlike most other wastes, so...

- What substances need to be assessed and so what testing is required?
- How many samples need to be tested?
- How to deal with Flammability and Oxidisability?
- What are the worst case metal compounds in a soil?
- How to deal with oily waste?
- How to deal with Corrosivity?
- How to assess Persistent Organic Pollutants?
- How to assess asbestos contamination?
- How to classify mixed waste?
- What if only one sample in a batch is hazardous?

AGS supplementary guidance

Specific to waste soil

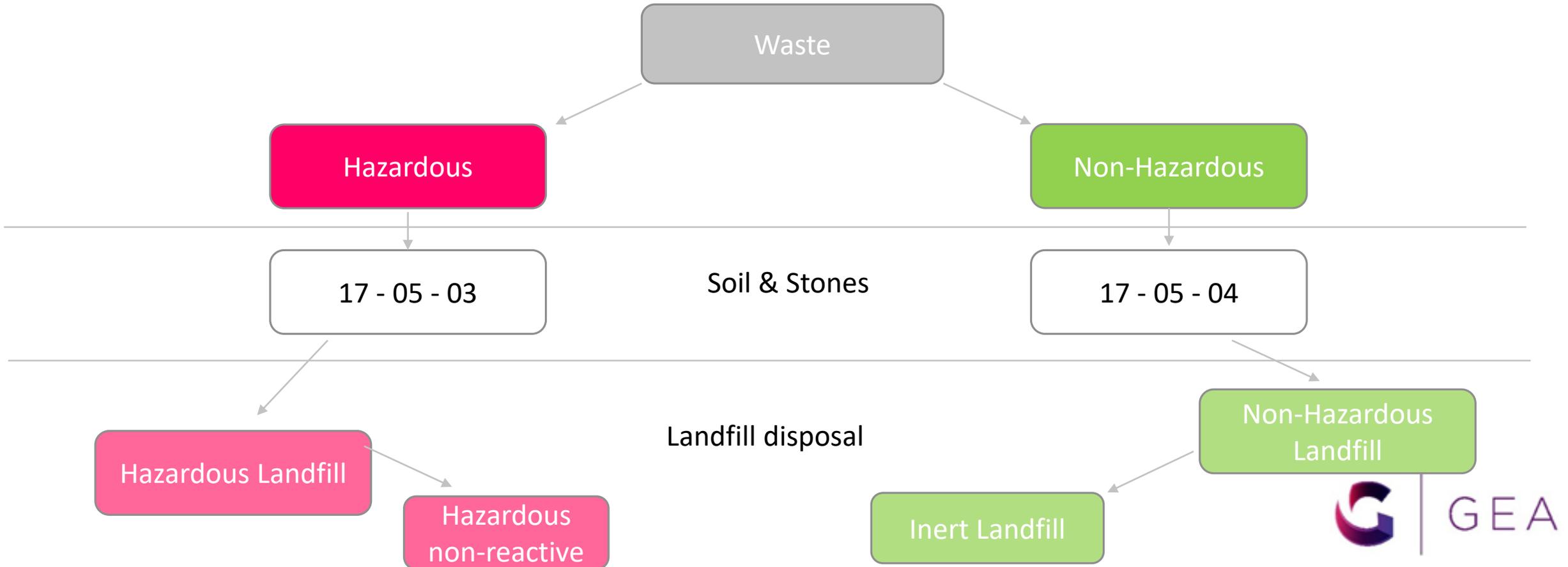
Provides guidance on the amount of sampling required

Segregation of the site in to zones of differing properties / waste class

Assistance in assigning the likely metallic species in the soil, so that appropriate hazardous properties can be adopted

Discusses the use of statistics to interpret data sets

Waste classification



How many samples are required?

- Number of samples is dependent on the degree of variability
- Target likely zones of different material based on desk study findings and initial investigation and only consider soils which are to become waste

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(from Environment Agency guidance *Waste Sampling and Testing for Disposal to Landfill*).

Volume of Waste (tonnes)	Number of Samples (homogeneous waste)	Number of Samples (new/heterogeneous waste)
< 100	2	5
< 500	3	8
< 1,000	5	14
10,000	11	22
+ per additional 10,000	+5 (pro rata)	+10 (pro rata)

Have we tested enough samples?

Test for statistical significance is discussed in Appendix D of WM3

A statistical analysis can confirm if, with the variability measured, sufficient testing has been carried out

Draft AGS Guidance

where 'hotspots' have been excluded, the number of samples required for waste classification is likely to be similar to, or less than, the number required for other purposes. However, where there is a wide range in results and the average is close to the threshold, the number of samples required to reach a statistically valid conclusion could be impractically large.

Flammability & Oxidisability

Testing not routinely available in UK

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Flammability of a soil waste is unlikely and the concentrations required would typically trigger hazardous by other properties at lower concentrations

Oxidisability of a soil waste is unlikely and the concentrations required would typically trigger hazardous by other properties at lower concentrations

Soils with moderate TOC could not be oxidising

Assessing likely worst case metal species

Laboratory analysis = total metal concentration : Waste classification = worst likely metal compound

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Soil Condition	Assumption
Soil has been exposed to the elements for a considerable period	Soluble compounds such as copper sulphate and most chlorides unlikely to be present
Acidic soils	Carbonates unlikely to be present
Reducing conditions, dark grey anoxic soils, such as would be encountered within the soil at the base of a backfilled pond or canal*	Oxidising compounds such as chromium VI highly unlikely to be present, sulphides more likely than sulphates etc.
Strongly oxidising conditions, pale or brightly coloured soil with very low organic content	Chromium could be present in the hexavalent form, arsenic could be present in the pentoxide form

Corrosivity

HP4 (Irritant) and HP8 (Corrosive)

Laboratory crushing of cement or concrete prior to testing can result in pH >11.5

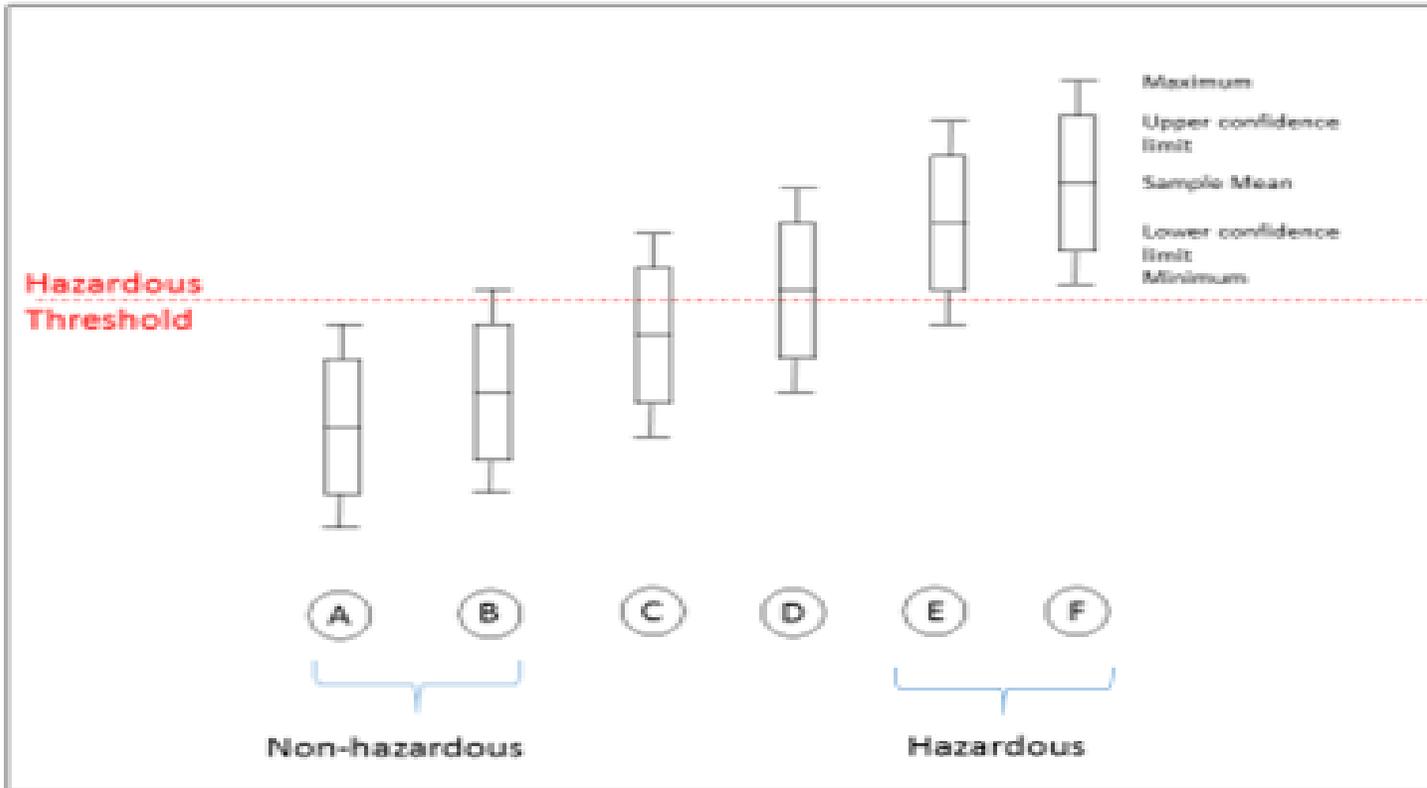
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Remove large fragments – concrete from demolition is non-hazardous (LoW code 17-01-01)

Test 'as received' sample without crushing – analysis representative of the waste load

If all the substances present in the waste are known, classification of the waste based on pH is not required

What if only a few samples from a batch trigger a Hazardous waste classification?



A & B – Non-Hazardous

C & D - Inconclusive, further analysis may be helpful for C but D is likely to be Hazardous

E & F - Hazardous

Conflict in the use of statistics

Technical Guidance WM3 states that “*as an alternative to using the statistics the producer or holder may assume that a waste possesses a hazardous property*”:

- ♦ *If any individual sample has exceeded the threshold for that hazardous property,*
- or*
- ♦ *such a sample could reasonably be taken by another party, for example the regulator.*

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Where a sufficient data set is available for you to have 95% confidence that the average (median) concentration is below the threshold, this statistical approach should be adopted.

A note on Landfill Tax



Significant cost implication

Standard rate £88.95/tonne

Lower rate £2.80/tonne

However, the qualification for the lower rate is **completely independent** of waste classification

Summary

Use the AGS guidance to assist in interpreting how WM3 applies to waste soils

Please...NEVER EVER use WAC Leaching Tests to classify waste

The number of soil samples required for waste classification should be similar to that required for other uses but these analyses must be representative of the waste

If one or two samples in a single population marginally trigger a hazardous waste classification, the waste could still be classed as non-hazardous as long as there is sufficient data to justify the use of the non- parametric statistical method

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AGS has sought the opinion of:

- The Environment Agency
- HazWasteOnline™
- CAT-WASTE Soil