

Evidence

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Material comparators for end of waste decisions

Project summary

The Environment Agency has published a series of reports detailing the findings of research to characterise non-waste materials as comparators for use as a benchmark against which other materials and wastes can be assessed. The non-waste comparators examined were identified by market research.

The information presented in these reports will inform decisions by the Environment Agency and others about end-of-waste assessments. The data on physical properties and chemical analyses can be used by companies and individuals to assist in the process of applying for end-of-waste status for their products, either by confirming their product's comparable composition or identifying problems to be rectified before such status can be achieved.

The various ordinary material comparators covered by the reports are:

- For materials applied to land:
 - manufactured fertilisers
 - non-waste biochar
 - PAS 100 compost
 - peat
 - soil improver
 - straw
- For fuels:
 - biomass
 - charcoal
 - coal
 - natural gas
- For construction materials:
 - concrete blocks
 - natural limestone aggregate
 - non-waste wood used in construction and manufacturing
- For animal bedding:
 - straw

For each material, samples were obtained from various suppliers across England.

The samples were analysed by the Environment Agency's National Laboratory Service and other laboratories for parameters and determinands appropriate for the particular material comparator. These included:

- physical properties including particle size distribution, pH, electricity conductivity, dry solids @ 30°C and 105°C, loss on ignition @ 500°C (organic matter content), bulk density and moisture content
- metals including aluminium, antimony, arsenic, barium, beryllium, boron, cadmium, calcium, chromium, cobalt, copper, iron, lead, lithium, magnesium, manganese, mercury, molybdenum, nickel, phosphorus, potassium, selenium, silver, sodium, strontium, thallium, tin, titanium, vanadium and zinc
- elemental analysis including organic carbon, hydrogen, nitrogen, oxygen, fluoride, chloride, bromide, ammoniacal nitrogen, nitrate, nitrite and sulphate
- organic contaminants such as polycyclic aromatic hydrocarbons (PAHs), polychlorinated biphenyls (PCBs), dioxins and furans, organochlorine pesticides (OCPs), phenols and BTEX (benzene, toluene, ethylbenzene and xylenes)
- nutrients – primary, secondary and trace
- microbiological contaminants (*Escherichia coli* and *Salmonella* spp.)
- calorific value
- leachability

A literature review was carried out to identify any existing published data.

The mean, median, minimum and maximum values for each analyte were calculated. When the sample size was sufficient (that is, 10 or more), the 90th percentile was also calculated.

We recommend comparing the concentrations of analytes in the comparators dataset to the concentrations in the waste-derived material, paying attention to the higher values. This comparison does not constitute a pass/fail test or an end of waste view. It will provide an indication of whether the waste material contains similar levels of analytes to non-waste materials and whether an end-of-waste application may be appropriate or that further analysis or improved treatment processes may be warranted.

The data in the reports have been incorporated, along with other comparator data, into a spreadsheet tool released along with a user guide.

This summary relates to information reported in detail in the following output(s):

Report: SC130040/R1
Title: Material comparators for end-of-waste decisions: Materials applied to land: PAS 100 compost

Report: SC130040/R2
Title: Material comparators for end-of-waste decisions: Materials applied to land: soil improver

Report: SC130040/R3
Title: Material comparators for end-of-waste decisions: Materials applied to land: peat

Report: SC130040/R4
Title: Material comparators for end-of-waste decisions: Materials applied to land: straw

Report: SC130040/R5
Title: Material comparators for end-of-waste decisions: Materials applied to land: non-waste wood

Report: SC130040/R6
Title: Material comparators for end-of-waste decisions: Materials applied to land: non-waste biochar

Report: SC130040/R7
Title: Material comparators for end-of-waste decisions: Fuels: biomass

Report: SC130040/R8
Title: Material comparators for end-of-waste decisions: Fuels: charcoal

Report: SC130040/R9
Title: Material comparators for end-of-waste decisions: Fuels: coal

Report: SC130040/R10
Title: Material comparators for end-of-waste decisions: Construction materials: concrete blocks

Report: SC130040/R11
Title: Material comparators for end-of-waste decisions: Construction materials: natural limestone aggregate

Report: SC130040/R12
Title: Material comparators for end-of-waste decisions: Construction materials: non-waste wood (construction and manufacturing)

Report: SC130040/R13
Title: Material comparators for end-of-waste decisions: Animal bedding: straw

Report: SC130040/R14
Title: Material comparators for end-of-waste decisions: Materials applied to land: manufactured fertilisers

Report: SC130040/R15 (ShARE 25)
Title: Material comparators for end-of-waste decisions: Fuels: natural gas

Report: SC130040/R16
Title: A Waste Comparator Tool to support end-of-waste applications, user guide

Excel file
Title: Waste comparator tool

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These projects were funded by the Environment Agency's Environment and Business Division and the ShARE programme. The projects were managed by Evidence Directorate, which provides scientific knowledge, tools and techniques to enable us to protect and manage the environment as effectively as possible.

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