



**WAS-G-EASR-10**

**EASR guidance - recovery of waste on land for the purpose of soil improvement**

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# PART 1 – Introduction

This document provides guidance for anyone carrying out the recovery of waste to land for the purpose of soil improvement under The Environmental Authorisations (Scotland) Regulations 2018 (EASR) and applies to Registrations for single locations as well as Permits which authorise multiple locations.

For a Registration, SEPA may treat up to three farms as a single location where the:

* Fields to be used lie within a 10-kilometre radius, and
* Area of fields at each farm is less than 15 hectares.

Schedule 18 of EASR sets out minimum standards for the recovery of waste to land for the purpose of soil improvement. SEPA will set appropriate conditions in Registrations and Permits to ensure these standards are met.

This guidance is technical guidance produced by SEPA under Regulation 66(2) of EASR.

The guidance provided in this document is not definitive, and it does not replace the general obligation to manage each activity in the context of its specific location and characteristics. In certain situations, a higher standard of environmental protection may be necessary, for example, where there are local sensitive receptors.

## Authorised person

The Authorised Person is named on the Permit or Registration. The Authorised Person must be in control of the activity and be a fit and proper person.

The Authorised Person could be a:

* Waste producer, such as a sewage sludge producer
* Waste management business
* Farmer or other land manager
* Land agent or consultant

The Authorised Person may subcontract parts of the activity. For example, they may:

* Use a local agricultural contractor for field operations.
* Contract a [fertiliser advisers certification and training scheme](https://www.basis-reg.co.uk/scheme-facts) (FACTS) qualified adviser to review the written management system, determine waste application rates or review the annual report.

When subcontracting, the Authorised Person is still responsible for ensuring that the activity is carried on in accordance with the conditions of the authorisation so should ensure subcontractors are aware of any relevant requirements of EASR and the conditions of the authorisation together with this guidance.

## Meaning of ‘recovery’ & ‘soil improvement’

“Recovery” is defined as “any operation the principal result of which is waste serving a useful purpose by replacing other materials which would otherwise have been used to fulfil a particular function, or waste being prepared to fulfil that function, in the plant or in the wider economy”.

For the application of waste on land to be classified as recovery, the waste must serve a useful purpose, in this case, the improvement of soil.

"Soil improvement" is defined in Schedule 18 of EASR as:

1. Provision of required plant nutrients to the soil.
2. Provision of organic matter to the soil.
3. Improvement of the chemical properties of the soil.
4. Improvement of the physical properties of the soil.
5. Reduction of any soil moisture deficit.

for the purpose of enhancing plant growth.

"Soil improvement" does not include the creation of new soils as part of the restoration of former industrial land. There is separate technical guidance that covers restoration of former industrial land.

To be classified as a recovery operation the waste must be applied when there will be benefit to the crop and in amounts that the crop can take up. Applying waste to land at inappropriate times, in unsuitable conditions or at excessive rates may be considered disposal.

## Written management system

Permits and Registrations require Authorised Persons to prepare and maintain a written management system, detailing how the activity is to be carried out in compliance with the conditions of the authorisation. This guidance should be considered when preparing a written management system. At permit level, written management systems must be included with the application and will be reviewed by SEPA as part of the determination.

The written management system should describe how Authorised Persons will:

1. Manage staff, contractors and subcontractors.
2. Select the receiving land.
3. Ensure soil and waste analysis results are true and accurate.
4. Determine appropriate application rates to deliver soil improvement.
5. Ensure waste storage facilities are suitably designed, constructed, and operated.
6. Ensure waste is appropriately handled and transferred into and out of the storage facilities.
7. Ensure waste is inspected before it is applied to land. The inspection could be at the site of the application to land or at the place of production provided that the characteristics of the waste are not altered subsequently.
8. React if a visual inspection indicates that waste is unsuitable for use and that any staff, contractors and subcontractors also know what to do in these circumstances.
9. Ensure machinery is calibrated and maintained to demonstrate accurate application of the waste.
10. Understand when conditions are unsuitable for the application of waste to land and ensure that any staff, contractors and subcontractors also understand this.
11. Ensure that there is an emergency procedure for dealing with incidents and that it is followed.
12. Ensure the location map highlighting sensitive receptors is available to any staff, contractors or subcontractors applying waste to land.

It should also provide details of the person(s) who will be responsible for carrying out the activities detailed in (b), (c) and (d) and their suitability (qualifications and experience) to do so.

## Risk Assessment

The Authorised Person should ensure an assessment of environmental risk from the storage and use of waste is carried out for each location. Appropriate information should be recorded and kept with the written management system.

A non-exhaustive list of possible environmental risks and mitigation measures is included in Appendix 2 which may be used to help carry out the risk assessment.

It is the Authorised Person’s responsibility to identify all waste-specific and site-specific risks and mitigations and to share this with contractors.

Where possible, risk mitigation methods (buffer zones next to burns/ditches, location/method of waste storage, buffer strips, etc.) should be identified on the map of each location where waste may be used. This must be submitted to SEPA with the annual report.

## Annual reports

Permits and Registrations require Authorised Persons to make an annual report to SEPA. The annual report should consist of data collected by the Authorised Person, returned via the reporting template, plus supporting files and information such as lab reports and maps, as detailed below.

Each year before 18 February, the Authorised Person must submit to SEPA for the previous calendar year:

* Details of the areas where waste has been stored and used (see Part 2 ‘Site Information’).
* Details of the types and quantities of wastes stored and used (see Part 2 ‘Waste types and waste analysis’ and ‘Waste application benefit assessment’).
* Evidence the activity is likely to result in soil improvement including all relevant waste and soil analysis (see Part 2 ‘Waste types and waste analysis’, ‘Soil analysis’ and ‘Waste application benefit assessment’).
* Evidence that the activity will not breach any of the limitations imposed on waste applications to land (see Part 2 ‘Limitations’).
* Maps showing risk mitigation methods for storage and use of the waste.

All data should be submitted to SEPA using the annual reporting template.

The annual report should be reviewed by an appropriate technical expert with the relevant qualifications and experience prior to submission.

The preferred qualification is [Fertiliser advisers certification and training scheme (FACTS)](https://www.basis-reg.co.uk/scheme-facts) qualification.

# PART 2 – Site selection, analysis and assessment

## Overarching aim

The use of waste should aim to result in soil improvement as defined in EASR.

The use of waste is site specific. It depends on the analysis of the waste and the receiving soil, the needs and timing of the crop or plant being grown, taking account of other materials applied.

To demonstrate the activity is likely to result in soil improvement, the following information should be provided to SEPA in the Annual Report:

* Site information (including maps).
* Waste types and analysis.
* Soil analysis.
* Site limitations.
* A brief review of the quantities of waste used, the site and soil characteristics and limitations, and the needs of the crop.

The following sections provide further guidance on these areas.

## Site information

Record each location where the activity has taken place in the annual reporting template.

For each location where the activity has taken place, e.g. each farm or other land holding, provide:

* The name and full postal address of the recipient.
* The name of the location where the waste was stored and used (e.g. farm name).
* A description of the land use; for example, an arable farm, forestry.
* The total area of land receiving waste in hectares.
* An 8 figure (or more) grid reference. Use the following format: NS 1234 5678. [SEPA’s NGR tool](https://map.sepa.org.uk/ngrtool/) can be used to check the National Grid Reference. This should be for a key point of the waste-receiving location, e.g. farm steading, site office, main access gate etc.

For each discrete area of land with its own soil analysis (parcel of land <= 5ha), also include:

* A unique identifier (e.g. field number or name).
* A National Grid Reference for the centre of the area.
* The area receiving waste, in hectares.
* The crops or plants that benefit from the waste.

For proximity to watercourses, including springs, boreholes and drinking water supply a map of the location where the activity will take place must be provided. The map should:

* Be at a suitable scale.
* Provide context (e.g. roads, buildings, boundary lines) to identify the location.
* Show location and boundary of where the waste will be stored (if applicable).
* Show location and boundary of each discrete area of land, covered by a set of soil analyses, where waste will be applied.
* Highlight buffer strips and other areas which are not to receive waste.

Each discrete area of land, covered by a set of soil analyses, should be marked on the map and should be coloured in such a way that the underlying field / site boundaries can be seen. If a field is split into 2 or more sections, each individual area should be accurately marked on the site map and given a unique identifier.

The map should be easy to understand and not contain unnecessary detail. All text / information on the map must be suitably sized and easy to read.

## Waste types and analysis

### Suitable waste types

The Permit and Registration conditions contain a list of wastes that can be used for soil improvement. These are replicated in Annex 1 to this guidance.

### Sewage sludge – treatment standards

Untreated sewage sludge cannot be used for soil improvement on agricultural land. Sewage sludge must be ‘conventionally treated’ or ‘enhanced treated’ before it can be used on agricultural land. Untreated septic tank sludge also cannot be used.

To qualify as conventionally treated sludge, the treatment process must be able to achieve at least a 2 log10 (99 %) reduction in *E.* *coli* numbers, and through routine sampling, a maximum concentration of 100,000 *E. coli*/gram dry solids in the treated sludge.

To qualify as enhanced treated sludge, the treatment process must be able to achieve at least a 6 log10 (99.9999 %) reduction in *E. coli* numbers, and through routine sampling, a maximum concentration of 1,000 *E. coli*/gram dry solids in the treated sludge and be free from *salmonella* spp.

Demonstrating adequate *E. coli* reductions in the production of enhanced treated sludge can be difficult. For sites where the untreated sludge contains a mean *E. coli* concentration of <8.0 Log10, the treated sludge will still qualify as enhanced where it meets the maximum concentration of 1,000 *E. coli*/gram dry solids and is free from *salmonella* spp.

To minimise the risk of diffuse pollution during storage, sewage sludge cake destined for field storage should be treated so it is solid enough to be stored in a free-standing heap, without slumping and not likely to give rise to free drainage from within the stacked material.

### Required information for each waste used

The following information is required for each waste:

* European Waste Catalogue (EWC) code and description.
* Waste source (place of origin).
* Geographical origin.
* Waste treatment method (if applicable).
* Information on whether the waste is a mixed waste.
* Waste application method.
* Waste sampling date.
* Laboratory that carried out the analysis.
* Waste analysis results required for the waste material.

### Mixed wastes

If two or more wastes are mixed at the site of production, sampling should be carried out after all components have been fully incorporated into the mixture. Mixed wastes must be assigned an appropriate EWC code.

Where a waste is mixed with a non-waste material, analysis should be provided for the waste only, not the mixture. However, application rate should be determined considering all nutrients supplied by the mixture.

### Waste sampling method

Sampling methods vary according to the waste but should be documented and consider the following general principles:

* Samples should be representative of the waste.
* Where possible, samples should be composite samples with volume reduced by a representative method. If samples collected are not composite samples, the annual report should explain why composite samples were not collected and why the non-composite samples can be considered representative.
* Wastes should be mixed as thoroughly as possible before sampling.
* Samples should be preserved to prevent deterioration between sampling and analysis, usually by transportation in a cool box. Temporary storage, if required, should be in a fridge at a temperature of 2-7 degrees Celsius. Samples must arrive at the analysis location as soon as practicably possible after collection, especially if analysis for microbiological parameters is required. In any case, samples should be received at the analysing location within 7 days of collection.

### Waste analysis

Waste should be analysed for the following parameters:

* Dry solids content.
* pH.
* Organic matter or total carbon.
* Total nitrogen.
* Available N (Navail) Or Ammonium nitrogen (NH4-N) (and nitrate nitrogen (NO3-N)), unless the waste used falls under one of the following EWC codes: 01 04 10; 01 04 12; 02 03 99; 02 04 01; 03 01 01; 03 01 05; 03 03 01; 03 03 05; 03 03 09; 03 03 11; 06 01 99; 10 01 01; 10 01 03; 10 13 04; 17 05 04; 17 05 06; 19 01 12; 19 01 14; 20 02 02.
* Total phosphorus, potassium and magnesium, unless the waste used falls under one of the following EWC codes: 02 03 99; 02 04 01; 17 05 04; 17 05 06; or 20 02 02, when analysis for *extractable* phosphorus, potassium and magnesium (same test as for soil samples) should be carried out.
* Potentially toxic elements (PTE); these are cadmium (Cd), chromium (Cr), copper (Cu), mercury (Hg), nickel (Ni), lead (Pb), zinc (Zn).
* Arsenic (As), fluoride (F), molybdenum (Mo) and selenium (Se) – if the waste is sewage sludge (EWC code 19 08 05).
* Neutralising value - if the waste has been subject to lime treatment for stabilisation or pathogen destruction purposes or if it is a waste material that is expected to increase soil pH in a similar manner to lime. This includes any waste containing calcium carbonate, chalk or limestone (EWC codes 01 04 12; 10 13 14; potentially also 01 04 10 and 06 01 99), as well as some wastes from pulp, paper and carboard production and processing (EWC codes 03 03 05; 03 03 09; 03 03 11) and biomass ashes (EWC codes 10 01 01; 10 01 03; 19 01 12; 19 01 14).
* Total sulphur – if the waste consists of gypsum (EWC code 06 01 99; potentially also 07 07 12).
* Physical contaminants and separately reported plastic contaminants (>2 millimetres) if the waste falls under one of the following EWC codes: 19 05 03; 19 06 04; 19 06 06.

In addition, analysis for parameters listed in Table 1 should be undertaken if an assessment of the waste indicates that these may be present at concentrations high enough to have a negative impact on the environment and/or human health, or if SEPA requests it.

SEPA may require additional analyses over and above the parameters in Tables 1 and 2 for particular waste types or sources. This is more likely for novel waste types or in the event of an emerging issue with a particular source or type of waste. If this may apply, please contact SEPA to discuss.

**Table 1. Additional testing requirements.**

| **EWC Code** | **Description of waste allowed to be used** | **Additional testing that might be required** |
| --- | --- | --- |
| 01 04 12 | Calcium carbonate from the washing/cleaning of hectorite. | Electrical conductivity. |
| 02 01 03 | Plant tissue waste from agriculture, horticulture and forestry only. | Prescribed substances (e.g. pesticides). |
| 02 02 03 | Materials unsuitable for consumption or processing consisting of blood and gut contents from abattoirs, poultry preparation plants or fish preparation plants; wash waters and sludges from abattoirs, poultry preparation plants or fish preparation plants; and shells from shellfish processing. | Microbiology (*E. coli* count, *salmonella* species – assessment of present or absence), oils and fats, electrical conductivity. |
| 03 03 05 | De-inked paper sludge and de-inked paper pulp from paper recycling only. | Prescribed substances (e.g. organic solvents). |
| 03 03 09 | Lime mud waste. | Prescribed substances (e.g. organic solvents). |
| 03 03 11 | Sludges from on-site effluent treatment plants treating only virgin paper wastes which contain no inks. | Prescribed substances (e.g. organic solvents). |
| 04 01 07 | Sludges, from on-site effluent treatment plants free of chromium. | Oils and fats, prescribed substances (e.g. organic solvents). |
| 04 02 10 | Organic matter from natural products. | Oils and fats. |
| 07 07 12 | Sludges from on-site effluent treatment other than those mentioned in 07 07 11. | Prescribed substances (e.g. organic solvents). |
| 10 01 01 | Bottom ash from boilers burning untreated biodegradable waste only. | Prescribed substances (dioxins and furans). |
| 10 01 03 | Fly ash from boilers burning untreated biodegradable waste only. | Prescribed substances (dioxins and furans). |
| 17 05 04 | Peat, subsoil and topsoil other than those mentioned in 17 05 03. | Prescribed substances (e.g. polychlorinated biphenols) – if excavated soil from contaminated sites. |
| 17 05 06 | Dredging Spoil other than those mentioned in 17 05 05. | Prescribed substances (e.g. polychlorinated biphenols) - if from a potentially contaminated site, electrical conductivity if from marine site. |

### Sampling frequency

Waste must be tested for the required parameters not more than 6 months before the first application to land and thereafter, every 6 months.

### Analytical methods

The methods set out in Table 2 must be used for waste analysis. Alternative methods should be agreed with SEPA in advance.

**Table 2. Analytical methods for waste.**

| **Parameter** | **Unit** | **Method[[1]](#footnote-2)** | **UKAS accreditation required?** |
| --- | --- | --- | --- |
| Dry matter (DM), dry solids (DS) | % (w/w) fresh weight | BS EN 14346: 2006 (Gravimetric method) | Yes |
| pH | N/A | BS EN 13037:2011 (Extraction in calcium chloride solution, extraction in potassium chloride solution, or extraction in deionised water) | Yes |
| Organic matter or total carbon (OM, Ct) | %, mg/l (fresh weight) or mg/kg (dry matter) | BS EN 15935:2021 if determining organic matter content by the loss on ignition method or BS EN 13654-2:2001 (Dumas combustion) method, if determining total carbon | Yes |
| Total nitrogen (Nt) | %, mg/l (fresh weight) or mg/kg (dry matter) | BS EN 13654-1:2001 (Kjeldahl extraction), or BS EN 13654-2:2001 (Dumas combustion) method | Yes |
| Available N (Navail)  Or Ammonium nitrogen (NH4-N)  (and nitrate nitrogen (NO3-N)) | %, mg/l (fresh weight) or mg/kg (dry matter) | BS EN 13652:2001 | No |
| Total phosphorus (P) | %, mg/l (fresh weight) or mg/kg (dry matter) | BS EN 13650:2001 (Aqua Regia digest) | Yes |
| Total potassium (K) | %, mg/l (fresh weight) or mg/kg (dry matter) | BS EN 13650:2001 (Aqua Regia digest) | Yes |
| Total magnesium (Mg) | %, mg/l (fresh weight) or mg/kg (dry matter) | BS EN 13650:2001 (Aqua Regia digest) | Yes |
| Total sulphur (S) | %, mg/l (fresh weight) or mg/kg (dry matter) | BS EN 13650:2001 (Aqua Regia digest) | No |
| Extractable phosphorus (P) | mg/l dry matter | Morgan (Morgan, 1941) or Modified Morgan extraction (McIntosh, 1969; SAC method)[[2]](#footnote-3); or BS 3882:2015 (Olsen’s extraction) - specify which method used | Yes |
| Extractable potassium (K) | mg/l dry matter | Morgan (Morgan, 1941) or Modified Morgan extraction (McIntosh, 1969; SAC method)2 or BS 3882:2015 (Ammonium nitrate extraction () – specify which method used | Yes |
| Extractable magnesium (Mg) | mg/l dry matter | Morgan (Morgan, 1941) or Modified Morgan extraction (McIntosh, 1969; SAC method)2 or BS 3882:2015 (Ammonium nitrate extraction) - specify which method used | Yes |
| Cadmium (Cd) | mg/l (fresh weight) or  mg/kg (dry matter) | BS EN 13650:2001 (Aqua Regia digest) | Yes |
| Chromium (Cr) | mg/l (fresh weight) or  mg/kg (dry matter) | BS EN 13650:2001 (Aqua Regia digest) | Yes |
| Copper (Cu) | mg/l (fresh weight) or  mg/kg (dry matter) | BS EN 13650:2001 (Aqua Regia digest) | Yes |
| Mercury (Hg) | mg/l (fresh weight) or  mg/kg (dry matter) | BS EN 13650:2001 (Aqua Regia digest) | Yes |
| Nickel (Ni) | mg/l (fresh weight) or  mg/kg (dry matter) | BS EN 13650:2001 (Aqua Regia digest) | Yes |
| Lead (Pb) | mg/l (fresh weight) or  mg/kg (dry matter) | BS EN 13650:2001 (Aqua Regia digest) | Yes |
| Zinc (Zn) | mg/l (fresh weight) or  mg/kg (dry matter) | BS EN 13650:2001 (Aqua Regia digest) | Yes |
| Arsenic (As) | mg/l (fresh weight) or  mg/kg (dry matter) | BS EN 13650:2001 (Aqua Regia digest) | Yes |
| Fluoride (F) | mg/l (fresh weight) or  mg/kg (dry matter) | BS EN 13650:2001 (Aqua Regia digest) | Yes |
| Molybdenum (Mo) | mg/l (fresh weight) or  mg/kg (dry matter) | BS EN 13650:2001 (Aqua Regia digest) | Yes |
| Selenium (Se) | mg/l (fresh weight) or  mg/kg (dry matter) | BS EN 13650:2001 (Aqua Regia digest) | Yes |
| Physical contaminants | kg/t fresh weight | NRM Method JAS-497/001[[3]](#footnote-4) | No |
| Plastic contaminants | kg/t fresh weight | NRM Method JAS-497/0013 | No |
| Neutralisation Value | % CaO (dry matter) | BS ISO 20978:2020 | No |

Record all results in the SEPA annual reporting template. Retain the original laboratory report(s) and provide these to SEPA when submitting the annual reporting template. The original laboratory reports should state the name and address of the laboratory that carried out the test, the date of testing and the analysis method used. The accreditation status of each test result should be indicated and the UKAS logo and registration number, where applicable, displayed with the results.

A minimum of three waste analysis results should be provided to SEPA to allow confirmation of the required application rate. Not all these analyses need to have been carried out within the last 12 months.

Clearly indicate where analyses are subcontracted by one laboratory to another. Original reports from the subcontracted laboratory must be supplied; reproducing results from the subcontracting laboratory’s analysis report alone will not be accepted.

UKAS accreditation is specifically required for the indicated tests. Results from unaccredited tests performed by a laboratory that has UKAS accreditation, but not for the indicated tests, are not acceptable unless specifically accompanied by an exception report detailing why those results are not accredited (for example, a temporary loss of accreditation due to a change in the analytical instrument used or a laboratory facility move may be acceptable). Report accreditation status in the SEPA annual reporting template, and whether test results are subject to an exception report, including the ID number of that exception report. All exception reports should be submitted to SEPA alongside waste results.

## Soil Sampling and analysis

### Required information for each soil sample

The following information is required for each soil sample:

* Sampling date.
* Sampling depth.
* Laboratory that carried out the analysis.
* All information outlined in Table 3.

### Soil sampling areas

A representative soil sample is required for every 5 hectares of land.

On agricultural land, at least one representative sample should be taken from each field.

On non-agricultural land only areas with similar/identical land use, topography and soil type should be sampled.

Where the field or other area of land is greater than 5 hectares, take a sample for each 5-hectare part of the field or area of land, i.e. 1 sample is required for a field or area of land up to 5 hectares, 2 samples if the area is up to 10 hectares, 3 samples if the area is up to 15 hectares etc. Where a field or other area of land has been divided into sections that are 5 hectares or less, these should remain consistent, i.e. do not change the way that a field or other area of land that is greater than 5 hectares is subdivided into sections for sampling when returning to the same land to take new soil samples.

Do not create sampling areas which cut across field boundaries, even if these ‘blocks’ have areas <5 hectares each. This is because fields may have differing management histories, so composite soil samples cutting across field boundaries may not be representative.

Take soil samples at an interval of four or more weeks after the most recent application of any waste material used on land under Schedule 18, manures or slurries, compost, anaerobic digestate, lime and/or other commercial fertilisers to the land.

### Taking a representative sample

Each soil sample from a field or area of land should be made up of at least 25 subsamples to be representative of soil conditions.

The subsamples should be collected in a ‘W’ shaped pattern across the field or area of land. The ‘W’ should cover the full area being sampled, with one sample taken at each point of the ‘W’ and at least 5 further samples taken along each leg of the ‘W’ at evenly spaced intervals:

Avoid subsampling in locations that are not representative of general conditions (e.g. within 3 metres of feeder rings, gates, boulders, etc).

Do not sample in areas that will not receive waste (e.g. buffer strips).

If the field or area of land is larger than 5 hectares, use a separate ‘W’ for each 5 hectare area with the resulting composite samples bagged and analysed separately.

### Sampling methods

Use a soil auger to take subsamples. Remove surface vegetation and stones from the subsampling point before auguring. If no auger is available, use a spade or trowel. However, these tools don’t allow equal sampling over the complete soil depth.

Take samples to a depth of 15 centimetres or the depth of the topsoil, whichever is deeper. SEPA will accept soil samples taken to a depth of 7 centimetres or 7.5 centimetres for grass fields. This allows the use of soil samples taken for nutrient planning.

When field sampling is complete, break up larger clumps and thoroughly mix all subsamples to create a single composite sample.

Reduce the composite sample by coning and quartering; the sample is heaped into a cone, then split into even quarters and two opposite quarters are discarded. The remaining sample is then thoroughly mixed, before the process outlined above is repeated until the sample volume has been reduced enough to provide a sufficient volume to allow all required sample containers to be filled, with no sample left over.

After sampling, seal and label the sample container. Samples should be kept as cool as possible and stored in the dark during transportation from the field to the analysing laboratory.

Samples should either be dried in an area where temperature is in the range 15-35 degrees Celsius until completely dry before being sent for analysis or stored in a cool place (cool box, fridge at 2-7 degrees Celsius) before being transported to the analysing lab in a box that protects them from sunlight as soon as possible. Drying areas should be clean and samples protected from the introduction of airborne contaminants when drying. Drying samples in a drying room or cabinet is acceptable if temperature is maintained in the range 15-35 degrees Celsius, but fan-based drying systems should be avoided as they can cause sample dust to become airborne, resulting in cross-contamination.

All soil tests should be carried out on a composite sample.

### Soil analysis

Where land has not previously received waste or where the last time waste was received was more than 5 years ago, soil sampling should take place no more than 12 months before waste is used on that land. After initial sampling the minimum frequencies in Table 3 should be met.

It is acceptable to sample all fields at a new location, use a proportion of them during the following 12 months and then continue to use other fields at that location in subsequent years, provided the soil analysis is not older than the limits set out in Table 3. The relevant date for timescales is when the soil sample was taken rather than when it was analysed or a report received.

**Table 3. Analytical methods for soil.**

| **Parameter** | **Unit (based on dry weight)** | **Preferred method[[4]](#footnote-5)** | **UKAS Accreditation required?** |
| --- | --- | --- | --- |
| **Part 1 – Soil sampling must be no more than 5 years old** | | | |
| pH | N/A | BS ISO 10390:2005 (Extraction in calcium chloride solution is the preferred variant. Extraction in potassium chloride solution, or extraction in deionised water are also acceptable) – specify which method used | Yes |
| Extractable phosphorus (P) | mg/l dry matter | Morgan (Morgan, 1941) or Modified Morgan extraction (McIntosh, 1969; SAC method)[[5]](#footnote-6); or BS 3882:2015 (Olsen’s extraction) - specify which method used | Yes |
| Extractable potassium (K) | mg/l dry matter | Morgan (Morgan, 1941) or Modified Morgan extraction (McIntosh, 1969; SAC method)5 or BS 3882:2015 (Ammonium nitrate extraction) – specify which method used | Yes |
| Extractable magnesium (Mg) | mg/l dry matter | Morgan (Morgan, 1941) or Modified Morgan extraction (McIntosh, 1969; SAC method)5 or BS 3882:2015 (Ammonium nitrate extraction) - specify which method used | Yes |
| Soil Texture | textural class (hand texture) or % sand, silt and clay (laboratory determination) | Hand texture, carried out on the composite sample from the field, after coning and quartering as described above, or  BS ISO 11277 Laboratory determination of particle size distribution | No |
| Any PTE in Part 2 of this table where previous analysis has been shown to exceed 90% of the relevant maximum concentration |  |  | Yes |
| **Part 2 – Soil sampling must be no more than 10 years old** | | | |
| Total carbon (Ct) or,  Organic carbon (Corg) or organic matter (OM) | % (w/w) dry matter | BS 7755-3.8:1995, ISO 10694:1995 (Dumas (combustion) method) for total or organic carbon. BS 15935:2021. Loss on ignition (LOI) for organic matter | No |
| Cd | mg/kg dry matter | BS 7755-3.9:1995, ISO 11466:1995 (Aqua Regia digest) | Yes |
| Cu | mg/kg dry matter | BS 7755-3.9:1995, ISO 11466:1995 (Aqua Regia digest) | Yes |
| Cr | mg/kg dry matter | BS 7755-3.9:1995, ISO 11466:1995 (Aqua Regia digest) | Yes |
| Hg | mg/kg dry matter | BS 7755-3.9:1995, ISO 11466:1995 (Aqua Regia digest) | Yes |
| Ni | mg/kg dry matter | BS 7755-3.9:1995, ISO 11466:1995 (Aqua Regia digest) | Yes |
| Pb | mg/kg dry matter | BS 7755-3.9:1995, ISO 11466:1995 (Aqua Regia digest) | Yes |
| Zn | mg/kg dry matter | BS 7755-3.9:1995, ISO 11466:1995 (Aqua Regia digest) | Yes |
| For locations where sewage sludge is applied to land | | | |
| As | mg/kg dry matter | BS 7755-3.9:1995, ISO 11466:1995 (Aqua Regia digest) | Yes |
| F | mg/kg dry matter | BS 7755-3.9:1995, ISO 11466:1995 (Aqua Regia digest) | Yes |
| Mo | mg/kg dry matter | BS 7755-3.9:1995, ISO 11466:1995 (Aqua Regia digest) | Yes |
| Se | mg/kg dry matter | BS 7755-3.9:1995, ISO 11466:1995 (Aqua Regia digest) | Yes |

UKAS accreditation is required for some soil analysis methods, as indicated in the table. Results from unaccredited tests performed by a laboratory that has UKAS accreditation are only acceptable if accompanied by an exception report detailing why those results are not accredited (for example, a temporary loss of accreditation due to a change in the analytical instrument used or a laboratory facility move may be acceptable). Report whether all soil analysis results that require it are accredited in the appropriate column of the SEPA annual reporting template and also record if any accredited test results are subject to an exception report, and the ID number of that exception report, in the SEPA annual reporting template. All exception reports should be submitted to SEPA alongside soil results.

Analyses of soil carried out for cadmium, chromium, copper, mercury, lead, nickel, zinc, arsenic, fluorine, molybdenum and selenium must have a detection limit that does not exceed 10 % of the appropriate limit value in soil, as set out in Table 4, for each of these parameters. The detection limit achieved for each of these analyses should be reported in the annual reporting template.

## Limitations

### Nitrate vulnerable zones

Nitrate Vulnerable Zones (NVZs) are designated areas of land that are sensitive to nitrate pollution. Much of the East of Scotland is designated as a NVZ, as is the Nith catchment in Dumfriesshire. To identify a NVZ visit the [Scottish Government NVZ Map website](https://www.gov.scot/publications/nitrate-vulnerable-zones-maps/).

If the waste contains 30% or more available nitrogen (or NH4-N plus NO3-N) further precautions should be taken during storage and use and reflected in the management system. Limits imposed by NVZ Regulations on seasonality must also be observed.

### Nutrients

The addition of nutrients must match the needs of the crop, both in terms of absolute requirement for growth over a full growing season (or in the case of P and K over a rotation subject to the limitations detailed below) and at the time of application. All nutrients contained within the waste must be considered when determining the application rate to avoid the over-application of any individual nutrient. The nutrient requirement of the crop(s) should be provided in the annual reporting template.

Where an area to which waste is to be applied, e.g. a field, is managed for the same purpose throughout, is larger than 5 hectares and soil nutrient status differs between the 5 hectare sections sampled, waste application in each 5 hectare section of the area should reflect the nutrient status in that section. It is not acceptable to base application rate on either the lowest nutrient status of the 5 hectare sections sampled, or an average nutrient status taken across these sections.

Do not apply waste to land in such amounts that exceeds the lowest of:

* The Nitrogen Limit Value, as defined in the Action Programme for Nitrate Vulnerable Zones (Scotland) Regulations 2008.
* A total nitrogen addition rate of 250 kilograms per hectare per year.
* The needs of the particular crop(s) for nitrogen, over a maximum period of 12 months. Where wastes contain more than 30% of their total N as readily available nitrogen, the timing of the application must coincide with the plant need for nitrogen.

Do not apply waste to land in excess of that required to maintain the soil phosphorus status at acceptable agronomic levels. Acceptable agronomic level is defined as the level indicated, in agronomic guidance notes produced by SRUC (TN699, TN715, TN716, TN717 and TN718).

For land which is classified at SRUC P index “Very High”:

* No waste should be applied that contains P as this is already above acceptable agronomic levels.

For land which is classified as SRUC P index “High” or where non-responsive crops are grown on land classified as “Moderate”:

* Only apply waste that contains P at a rate where the total P applied is less than the confirmed crop requirement for P, not crop P offtake.
* The crop requirement calculation must be carried out using confirmed uses of the land in question and over a maximum period of 3 years.
* The calculation must be based on Total P, not available P.
* The application of waste must not lead to an increase in the concentration of extractable P in soil at the end of the maximum period of 3 years.
* The application of waste must not raise the classification of the land to SRUC P index “Very High” at any point in time.

For land which is classified as SRUC P index “Low or Very Low” or where responsive crops are grown on land classified as “Moderate”:

* Crop requirements can be calculated over a maximum period of 5 years.
* The crop requirement calculations can be based on the available P (50% of total P) rather than total P in line with the SRUC Technical Notes.

### pH

Do not apply waste to land:

* Where the pH value of the soil is less than 5, unless the waste being used will increase the pH of the soil to 5.5 or above, if the optimum soil pH is 5.5 or above.
* Where the pH value of the soil is less than 5, unless the waste being used will increase the pH of the soil to at least 5.0, if the optimum soil pH is below 5.5.
* Where the application of the waste will cause the pH of the soil to fall below 5. This includes temporary decreases in pH below 5.
* Where the application of waste will cause an increase in soil pH above optimum for the plants growing or to be grown.

### Limits for potentially toxic elements

Do not apply waste to land where the rate of addition of any of the elements listed in Table 4 exceeds the specified limit. Do not apply waste to land if it will cause the potentially toxic element (PTE) levels in the soil to exceed these limits; PTEs supplied from previous applications of waste to land since the last soil PTE analysis was carried out should be taken into account when calculating this. Where one or more PTE levels in the soil exceeds 90 % of specified limit in Table 4, soil PTE levels must be analysed once every 5 years, instead of once every 10 years.

**Table 4. Maximum concentrations and addition rates**

| **Potentially Toxic Elements (PTE)** | **Maximum Concentration of PTE in Soil**  **(mg/kg Dry Solid)** | | | | **Maximum Annual Rate of PTE Addition (kg/ha)** |
| --- | --- | --- | --- | --- | --- |
|  | **pH**  **5.0 - <5.5** | **pH**  **5.5 - <6.0** | **pH**  **6.0 – 7.0** | **pH**  **>7.0** |  |
| **Copper** | 80 | 100 | 135 | 200 | 7.5 |
| **Nickel** | 50 | 60 | 75 | 110 | 3 |
| **Cadmium** | 0.5 | 0.5 | 1 | 1.5 | 0.15 |
| **Chromium** | 400 | 400 | 400 | 400 | 15 |
| **Zinc** | 200 | 200 | 200 | 200 | 15 |
| **Lead** | 300 | 300 | 300 | 300 | 15 |
| **Mercury** | 1 | 1 | 1 | 1 | 0.1 |
| **Arsenic1)** | 50 | 50 | 50 | 50 | 0.7 |
| **Molybdenum1)** | 4 | 4 | 4 | 4 | 0.2 |
| **Selenium1)** | 3 | 3 | 3 | 3 | 0.15 |
| **Fluoride1)** | 500 | 500 | 500 | 500 | 20 |

1) These limits only apply to sewage sludge.

SEPA may grant an exemption to the limit specified in Table 4 for cadmium so as to allow the application of enhanced treated sewage sludge to land where the following conditions are met: (a) the naturally-occurring levels of cadmium in the soil exceed the limit set out in Table 4; (b) the land is located on an island; (c) the land is grassland. “Grassland” in this context means land on which the vegetation consists predominantly of grass species.

### Protected sites

Where it is planned to use waste on or adjacent to a protected site, e.g. Site of Special Scientific Interest (SSSI), Special Area of Conservation (SAC) etc, contact NatureScot before the activity takes place.

## Waste application benefit assessment

Use the results from the waste and soil analyses in combination with the expected nutrient requirement for the plants and the site limitations to assess whether the waste will provide soil improvement and calculate an appropriate application rate for each area for which a discrete soil analysis is available.

As a minimum, use average values derived from the three most recent waste analyses to calculate the required application rate. To accommodate for variability in the waste, use the 80th percentile result for each parameter in the assessment.

If the waste results are from a recently commissioned process or following a major change to an existing process, three waste analyses should still be used in the assessment, with each separated by a period of six weeks or more. If this is not possible, contact SEPA for advice.

The assessment should show that the waste will deliver one or more of the following:

* Provision of required plant nutrients at an appropriate time and in sufficient (but not excessive) amounts to benefit plant growth.
  + This could be an expected:
* Increase in concentration of one or more soil nutrients if below optimum status.
* Full or partial provision (more than 10 %) of required needs of one or more major crop nutrients.
  + The provision of nutrients must take account of applications of synthetic fertiliser and other organic materials (e.g. manure, slurry, compost, digestate, wood ash). The combined provision of nutrients from all sources, including waste, must not result in contravention of the limitations outlined in the Limitations section above.
* Provision of organic matter to the soil.
  + This could be an expected increase in soil organic matter concentration, if below optimum and the waste is expected to provide a source of stable organic matter.
* Improvement of the chemical properties of the soil.
  + This could be an expected:
* Change in soil pH where the combined liming effect of waste and other liming materials is expected to increase soil pH to a level which is optimal for the plants.
* Provision of trace nutrients where these are lacking.
* Improvement of the physical properties of the soil.
  + This could be an expected favourable change, e.g. evidence that a sandy material was added to heavy, poorly-drained clay soil.
* Reduction of any soil moisture deficit.
  + This could be an expected favourable change in the amount of water available to plants, e.g. use of waste with a high moisture content at a time of need.

# PART 3 – Storage & Use

## Transport

Transport of waste to the receiving site must be by a registered transporter of waste. A registered transporter of waste will be required to ensure any waste is transported in suitable vehicles that adequately contain the waste to avoid spillage and that the waste should be covered where necessary to minimise odour nuisance.

## Waste acceptance

The Permit or Registration will list the waste code and description for each waste type authorised for recovery to land.

The waste producer, as part of their duty of care, must code and describe the waste correctly using [waste classification technical guidance WM3](https://www.gov.uk/government/publications/waste-classification-technical-guidance). The authorised person, if they are not the producer of the waste, must satisfy themselves that the waste has been properly classified.

Waste received at the authorised place must be suitable for soil improvement without the addition of any other material.

The authorised person must ensure that procedures are in place such that the waste will only be accepted on site if it has:

* Been classified and assessed.
* A waste code that is listed in the Permit or Registration.

Note that some of the waste descriptions in the Permit or Registration may be more prescriptive than the full EWC code listed in WM3. The authorised person must make sure the waste matches the description given and not just the EWC code. It is the responsibility of the authorised person to ensure that all staff, contractors or subcontractors are aware of the EWC code of the waste and its description.

The authorised person must ensure that waste acceptance procedures are detailed in the written management system and that appropriate records are kept.

If waste is stored, it must be suitably stable so that no significant biological, physical or chemical changes occur during storage. Storage times should be limited to ensure this is the case.

Any waste soil accepted must be accompanied by a written assessment containing the following details:

* Any pollutants that could be present in the waste, assessed on the basis of land use and human activity, past and present, at the location from where it originated.
* Any hazardous properties, based on sampling and analysis, including analysis of pollutants identified as potentially present in the waste, as noted above.
* Confirmation of the appropriate waste code, which will rely on both information on the origin/source of the waste and results from analysis of this waste.

### Unauthorised waste

If unauthorised waste is found at a location authorised by a Registration or Permit, this waste must be removed to an authorised facility as soon as practicably possible. If unauthorised waste is temporarily stored at a location authorised by a Registration or Permit, this storage must keep the unauthorised waste under control (e.g. prevent spillages or run-off), separate from any other waste and on an impermeable surface.

## Storing waste

Record details of the storage arrangements for inclusion in the annual report to SEPA:

* The storage location.
* The storage method (field heap, lagoon, tank, silo etc).
* The capacity of the storage location.
* The delivery date(s).
* Amount of waste delivered.

Waste must only be stored at the place it will be used, for example, a single farm unit under one Integrated Administration and Control System (IACS) code or an area of non-agricultural land under the management of a single entity, e.g. company or individual. This could be on a field headland or concrete pad at the location.

### Secure storage

The waste must be stored securely so that:

* Members of the public are kept away from the waste as far as possible.
* The waste is contained – it must not escape or leak.
* Where waste is stored in a container or containers, these must be fit for purpose, including having sufficient capacity to store the amount of waste required.

Label any facilities storing liquid waste with information on the waste type being stored and any hazards presented by the waste and indicate these facilities on the map of the location where the activity will take place.

Indicate all potential storage locations for stackable solid waste, and the waste type(s) that will be stored there, on the map of the location where the activity will take place.

Storage lagoons with walls made of earth must be appropriately sized to allow operation using fill levels that do not result in less than 750 millimetres of freeboard. The walls must be lined with an impermeable sheet material and have suitable leak detection. Any mixing or filling zones within the lagoon should have the impermeable liner protected by a layer of concrete.

Impermeable material for this purpose includes:

* Synthetic rubbers, Ethylene Propylene Diene Monomer (EPDM) rubber and butyl,
* Plastics including polyvinyl chloride, low density polyethylene (LDPE) and high-density polyethylene (HDPE), and
* Reinforced geomembranes.

Any lagoon constructed under this guidance should have a life expectancy of at least 20 years with proper maintenance. Covering any new lagoon should be seriously considered. Whilst this is currently not a requirement, it may become one and therefore the fitting of a cover would be future proofing.

### Storage duration

It is important that waste is used at the right time of year and in the right conditions.

Waste can be stored for a maximum of 6 months before use.

### Storage quantities

Up to 3000 tonnes of waste can be stored at each location where it is to be used under each authorisation. The Authorised Person must ensure that systems are in place to monitor the quantity of waste against the allowed maximum capacity for example by keeping up to date and accurate records of tonnages of waste received and used and ensuring that additional waste is not received for storage at the location where it is to be applied to land if this will exceed the 3000-tonne storage limit. The Authorised Person must ensure that staff, contractors and subcontractors are aware of the 3000-tonne storage limit. and it is the responsibility of staff, contractors and subcontractors to ensure that this limit is not exceeded.

Where waste is stored in a container, e.g. a silo or tank, clearly document the maximum storage capacity of the container.

### Outdoor storage of solid waste

For outdoor storage, such as field heaps, waste must not be stored on land which:

* Is less than 10 metres from any river, burn, ditch, wetland, loch as measured from the top of the bank, or transitional water, as measured from the shoreline.
* Is less than 50 metres from any spring that supplies water for human consumption, or well or borehole that is not capped in such a way as to prevent the ingress of water.
* (For the storage of sewage sludge) is less than 250 metres from any well, borehole or similar sunk for the purpose of a domestic water supply.
* Is waterlogged. This does not include land that has become waterlogged due to extreme weather conditions but does include land where waterlogging can be reasonably foreseen.
* Has an average soil depth of less than 40 centimetres and overlies gravel or fissured rock, unless stored in an impermeable container.
* Is sloping unless any run-off is intercepted to prevent it from entering any river, burn, ditch, wetland, loch, transitional water or coastal water toward which the land slopes.

Also consider not storing:

* Odorous waste within 250 metres of a residential property or workplace.
* On land that is frozen or snow covered.
* On land prone to flooding.
* In any single position for more than 12 months in a row.
* On land drained in the last 12 months.

### Storage within nitrate vulnerable zones

Within Nitrate Vulnerable Zones, field heaps for stackable waste must occupy as small a surface area as practically required to support the mass of the heap and prevent it from collapsing.

A minimum 2-year gap must be observed before stackable waste can be field stored in the same location as a previous field store.

### Stockpile inspections

Stockpile inspections should consider any risks of environmental harm from waste storage and the need for any preventative measures to mitigate any risks identified and assess the performance of any measures implemented.

An appropriate frequency of stockpile inspections should be established, on the basis of risks identified and preventative measures established to reduce these risks.

Stockpiles should be additionally inspected if disruption due to external events might reasonably be anticipated, e.g. after heavy rainfall.

## Application of waste to land

Waste must not be applied to land:

* That is within 10 metres from any watercourse or loch (as measured from the top of the bank), wetland, transitional or coastal water (as measured from the shoreline), or opening into a surface water drainage system,
* That is within 50 metres from any spring that supplies water for human consumption, or well or borehole that is not capped in such a way as to prevent water ingress,
* During or within 12 hours after heavy rainfall or where heavy rainfall is forecast within the next 24 hours,
* That is waterlogged, snow covered or frozen,
* That has an average soil depth of less than 40 centimetres and overlies gravel or fissured rock, or
* That is sloping, unless any run-off is intercepted to prevent it from entering any watercourse or loch, wetland, transitional or coastal water.

If waste is expected to have high biological oxygen demand (BOD), further precautions should be taken when applying the waste, which should be reflected in the risk assessment, to prevent this material from entering watercourses.

Conventionally-treated sewage sludge must not be applied to land:

* Used to grow fruit or horticultural crops, and fruit or horticultural crops must not be grown on land for 36 months after the last application of conventionally-treated sewage sludge;
* Used to grow salad crops, and salad crops must not be harvested from land within 30 months of the last application of conventionally-treated sewage sludge;
* Used to grow vegetables, and vegetables must not be harvested from land within 12 months of the last application of conventionally-treated sewage sludge;
* Used for grass and forage that will be grazed, unless the sludge is immediately ploughed down or is deep injected. Where this occurs, harvesting and grazing on the land are not permitted within 3 weeks of the sludge application.

Where grass and forage is grown for harvest, application of conventionally-treated sludge is permitted, however where this occurs, harvesting and grazing on the land are not permitted within 3 weeks of the sludge application and grazing is not permitted in the same growing season (defined as the beginning of October to end of September) as the sludge application.

Where enhanced-treated sewage sludge is applied to land:

* Fruit, salad, vegetable and horticultural crops must not be harvested within 10 months of the application;
* Grass and forage must not be grazed or harvested within 3 weeks of the application.

# Annex 1 – List of waste types

| Waste Code | Description | Land Use |
| --- | --- | --- |
| 01 04 10 | Non-hazardous, dusty and powdery wastes from physical and chemical processing of non-metalliferous minerals: Calcareous, basaltic or ultrabasic materials only | Any |
| 01 04 12 | Calcium carbonate from the washing / cleaning of hectorite | Any |
| 02 01 03 | Plant tissue waste from agriculture, horticulture and forestry only | Any |
| 02 01 99 | Straw, wood or paper-based bedding waste, slurry or dirty water from stables, zoos, animal parks or livestock markets, animal faeces, urine and manure | Agricultural |
| 02 01 99 | Spent mushroom compost | Any |
| 02 02 03 | Materials unsuitable for consumption or processing from abattoirs, poultry preparation plants or fish preparation plants; wash waters and sludges from abattoirs, poultry preparation plants or fish preparation plants; and shells from shellfish processing | Agricultural |
| 02 03 01 | Sludges from washing, cleaning, peeling, centrifuging and separation | Agricultural |
| 02 03 04 | Biodegradable materials unsuitable for consumption and processing only | Agricultural |
| 02 03 05 | Sludges from on-site effluent treatment | Agricultural |
| 02 03 99 | Soil from cleaning and washing fruit and vegetables only | Any |
| 02 04 01 | Soil from cleaning and washing beet | Any |
| 02 04 02 | Off-specification calcium carbonate | Any |
| 02 04 03 | Sludges from on-site treatment | Agricultural |
| 02 04 99 | Biodegradable wastes not otherwise specified from the processing of sugar | Agricultural |
| 02 05 01 | Biodegradable materials unsuitable for consumption and processing | Agricultural |
| 02 05 02 | Sludges from on-site effluent treatment | Agricultural |
| 02 05 99 | Biodegradable wastes not otherwise specified from the processing of dairy products | Agricultural |
| 02 06 01 | Biodegradable materials unsuitable for consumption and processing | Agricultural |
| 02 06 03 | Sludges from on-site effluent treatment | Agricultural |
| 02 06 99 | Biodegradable wastes not otherwise specified from the baking and confectionary industry | Agricultural |
| 02 07 01 | Wastes from washing, cleaning and mechanical reduction of raw materials | Agricultural |
| 02 07 02 | Wastes from spirits distillation | Agricultural |
| 02 07 03 | Wastes from chemical treatment | Agricultural |
| 02 07 04 | Biodegradable materials unsuitable for consumption or processing | Agricultural |
| 02 07 05 | Sludges from on-site effluent treatment | Agricultural |
| 03 01 01 | Untreated waste bark and cork | Any |
| 03 01 05 | Untreated sawdust shavings, cuttings, wood, particle board other than those mentioned in 03 01 04 | Any |
| 03 03 01 | Waste bark and wood, and pulp from virgin timber only | Non-agricultural |
| 03 03 05 | De-inked paper sludge and de-inked paper pulp from paper recycling only | Any |
| 03 03 09 | Lime mud waste | Any |
| 03 03 11 | Sludges from on-site effluent treatment plants treating only virgin paper wastes which contain no inks | Agricultural |
| 04 01 07 | Sludges from on-site effluent treatment free of chromium | Agricultural |
| 04 02 10 | Organic matter from natural products | Any |
| 04 02 15 | Biodegradable wastes from finishing other than those containing organic solvents | Any |
| 04 02 20 | Sludges from on-site effluent treatment other than those mentioned in 04 02 19 | Agricultural |
| 04 02 21 | Waste from unprocessed biodegradable textile fibres | Any |
| 04 02 22 | Waste from processed biodegradable textile fibres | Any |
| 06 01 99 | Gypsum | Agricultural |
| 07 07 12 | Sludges from on site effluent treatment other than those mentioned in 07 07 11 | Agricultural |
| 10 01 01 | Bottom ash from boilers burning untreated biodegradable waste only | Any |
| 10 01 03 | Fly ash from boilers burning untreated biodegradable waste only | Agricultural |
| 10 13 04 | Wastes from the calcination and hydration of lime: Calcium carbonate and gypsum only | Any |
| 17 05 04 | Peat, subsoil and topsoil other than those mentioned in 17 05 03 | Any |
| 17 05 06 | Dredging Spoil other than those mentioned in 17 05 05 | Any |
| 19 01 12 | Bottom ash other than those mentioned in 19 01 11: from the incineration of pig or poultry carcasses at premises used for agriculture only | Any |
| 19 01 14 | Fly ash other than those mentioned in 19 01 13: from the incineration of pig or poultry carcasses at premises used for agriculture only | Any |
| 19 01 18 | Biochar produced from the pyrolysis of the following waste codes:  02 01 03 - untreated plant tissue waste from agriculture, horticulture and forestry activities  02 01 07 - untreated wood waste from forestry activities  02 03 04 - vegetable waste unsuitable for consumption or processing  03 01 01 - untreated waste bark and cork  03 01 05 - untreated sawdust, wood shavings and wood cuttings  03 03 01 - untreated waste bark and wood | Any |
| 19 05 03 | Off-specification compost consisting only of biodegradable waste | Any |
| 19 05 99 | Liquor from aerobic treatment of source segregated biodegradable waste only | Any |
| 19 06 03 | Liquor from anaerobic treatment of municipal waste: biodegradable waste only | Agricultural |
| 19 06 04 | Digestate from anaerobic treatment of municipal waste: biodegradable waste only | Any |
| 19 06 05 | Liquor from anaerobic treatment of animal and vegetable waste | Agricultural |
| 19 06 06 | Digestate from anaerobic treatment of animal and vegetable waste | Any |
| 19 08 05 | Sludges from treatment of urban waste water: treated sludge only | Any |
| 19 09 02 | Sludges from water clarification | Any |
| 20 02 01 | Biodegradable waste | Any |
| 20 02 02 | Soil and stones | Any |

# Annex 2 – Risk Assessment Considerations

|  |  |  |
| --- | --- | --- |
| Type of Pollution | Things to consider in assessing risk | Potential mitigation options |
| Odour | * Type(s) of waste and potential to cause odour issues * Storage security and location * Location of “sensitive receptors” such as houses, schools, hospitals, etc. * Method of application * SEPA [NGR advice and map](https://www.sepa.org.uk/help/ngr-help/) (to check for sensitive receptors) | * Timing of waste application to land and weather conditions, e.g. prevailing wind * Store waste away from sensitive receptors * Demonstrate that method of application reduces odour risk |
| Run-off to surface water | * Gradient of field slope * Weather conditions * Flood risk * Compacted soils * Vicinity of burns/ditches/etc. to fields and locations where waste is applied to land * Storage security and location * Field drain(s) discharges * Physical characteristics of waste e.g. low dry matter (DM) content * Method of application * Direction of ploughing * Crop * Timing of waste application to land * SEPA [Flood Risk map](https://map.sepa.org.uk/floodmaps/FloodRisk/PostCode) and [NGR advice and map](https://www.sepa.org.uk/help/ngr-help/) (to check for surface water features) | * Buffers * Timing of waste application to land – not prior to, during or after heavy rainfall or onto frozen ground, not on bare ground * Distance from water bodies: at least 10 m from surface water or wetland * Amount of key nutrients applied does not exceed crop requirements * Mapping flood risk areas in activity area and monitoring flood alerts * Avoid waste application around the location of field drains and their discharge pipes (if present) * Store waste away from potential run-off pathways * Do not apply waste to fields with a gradient of more than 15° * Demonstrate that method of application is satisfactory |
| Run-off to adjacent land | * Gradient of field slope * Direction of ploughing * Weather conditions * Flood risk * Compacted soils * Potential pollution pathways between locations where waste is applied to land and sensitive receptors (houses, habitats etc.) * Storage security and location * Physical characteristics of waste e.g. low DM content * Method of application * Direction of ploughing * Crop * Timing of waste application to land * SEPA [Flood Risk map](https://map.sepa.org.uk/floodmaps/FloodRisk/PostCode) | * Buffers * Timing of waste application to land – not prior to, during or after heavy rainfall or onto frozen ground, not on bare ground * Mapping flood risk areas in activity area and monitoring flood alerts * Avoid waste application around the location of field drains and their discharge pipes (if present). Store waste away from potential run-off pathways * Do not apply waste to fields with a gradient of more than 15° * Demonstrate that method of application is satisfactory |
| Leaching of wastes through soils into groundwater and surface water | * Type(s) of waste * Soil type * Gradient of field slope * Weather conditions * Flood risk * Vicinity of burns/ditches/etc. to fields and locations where waste is applied to land * Storage security and location * Field drain(s) discharges * Method of application * SEPA [NGR advice and map](https://www.sepa.org.uk/help/ngr-help/) to check for surface water features | * Buffers * Timing of waste application to land – not prior to, during or after heavy rainfall * Distance of at least 50 m from springs and uncapped wells and boreholes * Distance of at least 10 m from all surface water * Land has an average soil depth of greater than 40 cm and does not overlie gravel or fissured rock, except where the application is for forestry operations; * Mapping flood risk areas in activity area and monitoring flood alerts * No more than 250kg/ha of total nitrogen * Avoid waste application around the location of field drains and their discharge pipes (if present) * Store waste away from potential leaching pathways * Demonstrate that method of application is satisfactory |
| Chemical reactions caused by mixing materials (same waste type from different sources, or wastes and non-wastes) | * Type(s) of material * Storage security and location | * Safe location and method of mixing * Awareness of types of reactions mixing may have * Material proportions * Adding new materials slowly and carefully to mixture * Using of paddle/stirrer whilst mixing materials that are liquids/sludges from different sources |
| Harm to sensitive habitats/species and/or the spreading shall be in or within 100 metres of a NatureScot Designated Site | * Type(s) and physical properties of waste (e.g. liquid waste could present a surface run-off risk, dry or powdery waste could present a dust risk) * Location of Designated Sites in/within 100 m of land where waste is being applied * Type of Designated Site (Biological/Geological/etc.) – not all relevant * Potential pollution pathways (e.g. field drains, ditches, burns, etc.) between locations where waste is applied to land and Designated Sites * Gradient of field slope * Storage security and location * Method of application * Direction of ploughing * Crop * Timing of waste application to land * NatureScot [Designated Site map](https://sitelink.nature.scot/home) (tick following Layers: SSSI, SPA, SAC, RAMSAR) | * Buffers * Timing of waste application to land– not prior to, during or after heavy rainfall * Time of year of waste application to land – not at times that may be sensitive to certain species (e.g. breeding, etc.) * Mapping flood risk areas in activity area and monitoring flood alerts * Avoid waste application around the location of field drains and their discharge pipes (if present) * Store waste away from potential run-off pathways * Do not apply waste to fields with a gradient of more than 15° * Demonstrate that method of application is satisfactory |
| Escape of material during waste storage or application to land | * Gradient of field slope * Direction of ploughing * Weather conditions * Flood risk * Compacted soils * Potential pollution pathways (e.g. field drains, ditches, burns, etc.) between locations where waste is applied to land and Designated Sites * Physical characteristics of waste e.g. low DM content * Method of application * Direction of ploughing * Crop * Timing of waste application to land * Nutrient content of soils | * Buffers * Timing of waste application to land– not prior to, during or after heavy rainfall or onto frozen ground, not on bare ground * Distance from water bodies: at least 10 m from surface water or wetland * Mapping flood risk areas in activity area and monitoring flood alerts * Avoid waste application around the location of field drains and their discharge pipes (if present) * Store waste away from potential run-off pathways * Do not apply waste on fields with a gradient of more than 15° * Demonstrate that method of application is satisfactory – for example splash plates should not be used if the waste is high in ammonia (pot ale would be acceptable but AD digestate would not) * Weather conditions – for example splash plates should not be used in windy or warm conditions |
| Excessive dust | * Type(s) of waste * Dry matter of waste(s) * Location of “sensitive receptors” (houses, habitats, etc.) near land where waste is being applied * Method of application * Weather conditions including wind direction * [NGR advice and map](https://www.sepa.org.uk/help/ngr-help/) (to check for sensitive receptors) | * Buffers * Timing of waste application to land * Optimal weather conditions * Increase moisture of waste (if viable) * Demonstrate that method of application is satisfactory |
| Mirror Entries of EWCs (e.g. 03 01 05, 04 02 15, 04 02 20, 07 07 12, 17 05 04, 17 05 06) | * Type(s) of waste * Type of process waste is produced by * Reliable source of waste(s) * [European Waste Code list](https://assets.publishing.service.gov.uk/media/6152d0b78fa8f5610b9c222b/Waste_classification_technical_guidance_WM3.pdf) | * Demonstrate that waste is not hazardous (details of production process, waste analysis, company source of waste(s), etc.) |

1. Latest available edition [↑](#footnote-ref-2)
2. The original article outlining the method (McIntosh, 1969) is not readily available online, however for an online

   summary, please see page 44 of Wolf A and Beagle D (2009) [↑](#footnote-ref-3)
3. NRM Laboratories method “Determination of Physical Contaminants and Stones in Digestate” 2012 [↑](#footnote-ref-4)
4. Latest available edition [↑](#footnote-ref-5)
5. The original article outlining the method (McIntosh, 1969) is not readily available online, however for an online

   summary, please see page 44 of Wolf A and Beagle D (2009) [↑](#footnote-ref-6)