



# REPORT ON THE LEGAL RESTRICTIONS FOR USING BBF<sub>s</sub> IN THE EU

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# OPTIMISING BIO-BASED FERTILISERS IN AGRICULTURE – PROVIDING A KNOWLEDGE BASIS FOR NEW POLICIES

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## D1.2: REPORT ON THE LEGAL RESTRICTIONS FOR USING BBFs IN THE EU

### PART A: EUROPEAN LEGISLATION ON FERTILISING PRODUCTS FOR CONVENTIONAL AND ORGANIC FARMING, WASTE MANAGEMENT, GROUND AND SURFACE WATER QUALITY AND OTHER ASPECTS RELEVANT IN THE CONTEXT OF USING NUTRIENT-RICH SIDESTREAMS (NRSS) AS BIOBASED FERTILISERS (BBFs)

#### INTRODUCTION

Part A of Deliverable 1.2 was prepared at the beginning of the LEX4BIO project and prepublished in December 2020 as:

*Kratz S & Hermann L (2020) Report on the legal framework governing the use of nutrient rich side streams (NRSS) as biobased fertilisers (BBFs) - EU legislation. Berichte aus dem Julius Kühn-Institut 208.*

For the purpose of the final deliverable, chapter 1 of Part A (Fertilising products and fertilisation) was updated (last update: 27 January 2023).

At EU level, the legal framework consists of regulations and directives.

Regulations are binding legislative acts decreed by the European Parliament and Council, following a proposal by the European Commission. They are directly valid in all Member States and must be applied in their entirety, without room for diverging national interpretation.

Directives are legislative acts setting a goal that must be achieved by all Member States. To this end, directives need to be transposed into national legislation which shall define how the member state is going to reach that goal. The transposition usually happens by means of national regulations/ordinances/decrees (which are authorised by national legal acts).

The following EU legislation relates to the use of NRSS as BBFs and are described here with respect to their key contents:

## 1. Fertilising products and fertilisation

### Fertilising Products Regulation (EU) 2019/1009, repealing Fertiliser Regulation 2003/2003/EC

The **Regulation (EC) No 2003/2003** relating to fertilisers laid down rules for products which are placed on the market as fertilisers designated 'EC fertiliser' (Art. 1). Its aim was to provide EU wide **harmonized rules for the composition and definition types of these fertilisers, the designations of these types and their identification (labelling) and packaging** (see recitals preceding the legal text). This regulation **only** encompassed **inorganic (mineral) fertilisers**, organic chelating and complexing agents for micronutrients, nitrification and urease inhibitors and liming materials (Art. 16-28 and Annex I). **Organo-mineral and organic fertilisers were not included.**

If a fertiliser met the requirements laid down in the type designations of this regulation, it could be sold as 'EC fertiliser' (Art. 3). This EC designation guaranteed the farmers a minimum nutrient content and solubility, as well as safety of use. If a producer wanted to sell a new product which is not listed in Annex I as EC fertiliser, they had to lodge a request with a national competent authority, including technical documentation of their product (Art. 31 and Annex V). This request was then considered by the European Commission based on the advice of an expert committee set up according to the Regulation. According to Art. 14, a type of fertiliser could only be included in Annex I if

- a) it provided nutrients in an effective manner
- b) relevant sampling, analysis, and if required, test methods were being provided and
- c) under normal conditions of use it did not adversely affect human, animal, or plant health, or the environment.

While the regulation did specify nutrient contents and solubilities as well as analytical methods for their documentation (Annex IV), **no limit values for contaminants** were defined. However, Member States could get a **derogation** from Art. 5 of the Regulation (regarding free circulation of products), granting them to apply their own **national cadmium (Cd) limits** (Art. 35).

As a regulation, 2003/2003/EC was directly applicable in the EU Member States and did not need to be transposed into national law. However, **while its aim was to harmonise rules** in order to facilitate trade between Member States (recital 4 and Art. 5), **it still left room for regulating fertilisers on national level** (recital 4).

Meanwhile, according to the **principle of mutual recognition** stemming from **Regulation (EU) No 2019/515** (replacing Regulation (EC) No 764/2008 as of 19 April 2020) laying down procedures relating to the application of certain national technical rules to products lawfully marketed in another Member State, **Member States are obliged to ensure market access for products that are not subject to EU harmonisation**. This principle guarantees that any product lawfully sold in one EU country can be sold in another, even if it does not fully comply with the technical rules of the other country, as long as valid interests of the destination Member State, such as the protection of health and environment, are not hampered ([https://ec.europa.eu/growth/single-market/goods/free-movement-sectors/mutual-recognition\\_en](https://ec.europa.eu/growth/single-market/goods/free-movement-sectors/mutual-recognition_en), last accessed Nov 26, 2019). Member States must implement this principle into their national legislation on fertilising products, see for example §3 DüngG (German Fertiliser Act).

A guidance document for the application of Regulation (EU) No 2019/515 was adopted on 5 March 2021 and is available under the following link: <https://ec.europa.eu/docsroom/documents/45593>



**Regulation (EC) No 2019/1009** laying down rules on the making available on the market of EU fertilising products (**repealing 2003/2003/EC** and amending 1069/2009/EC) was published in the Official Journal of the European Union on June 25, 2019 and **came into force** 3 years after its publication, i.e. on **16 July 2022**.

A **main objective** of the new Regulation is to further **aid the development of circular economy** and allow a more **resource-efficient general use of nutrients** (recital 1). Therefore, other than 2003/2003/EC, the new Fertilising Products Regulation 2019/1009 **extends its scope from inorganic to organo-mineral and organic fertilisers, including recycled materials**. In addition, it also covers other fertiliser-related product groups intended to improve plants' nutrition efficiency, such as soil improvers and biostimulants (see below).

Like its predecessor, 2019/1009/EC still keeps the possibility open to make non-harmonised fertiliser available on the internal market in accordance with national law. Accordingly, compliance with the harmonised rules of this Regulation remains optional and is required only for those products which are CE marked (recital 5).

2019/1009/EC **gives up the concept of type designations**. Instead, it is based on so-called **product function categories (PFCs) and component material categories (CMCs)**. EC labelled fertilising products may only be produced from designated CMCs.

The Regulation defines **limit values for contaminants and pathogens individually for each PFC** (see Table A1). Regarding **cadmium (Cd)**, Member States keep their right to apply their own national limit values until harmonised limit values for Cd are applicable at Union level which are equal to or lower than the national limits (**derogation** from Art. 3 on free movement).

The following **product function categories (PFCs)** are defined and described with regard to their minimum nutrient contents, organic carbon contents, other allowed ingredients, as well as limit values for contaminants and pathogens in **Annex I** of the new Regulation:

PFC 1: Fertiliser

- (A) Organic fertiliser
- (B) Organo-mineral fertiliser
- (C) Inorganic fertiliser

PFC 2: Liming material

PFC 3: Soil improver

- (A) Organic soil improver
- (B) Inorganic soil improver

PFC 4: Growing medium

PFC 5 Inhibitor

- (A) Nitrification inhibitor
- (B) Denitrification inhibitor
- (C) Urease inhibitor

PFC: 6 Plant biostimulant

- (A) Microbial plant biostimulant
- (B) Non-microbial plant biostimulant

PFC: 7 Fertilising product blend

Table A1: Limit values for inorganic and organic contaminants and pathogens in the Product Function Categories (PFCs) as defined Annex I of Regulation (EU) No 2019/1009

	PFC 1(A)	PFC 1(B)	PFC 1(C)(I)	PFC 1(C)(II)	PFC 2	PFC 3(A)	PFC 3(B)	PFC 4	PFC 6
Contaminant	Organic fertiliser	Organo-mineral fertiliser	Inorganic macronutrient fertiliser	Inorganic micronutrient fertiliser	Liming material	Organic soil improver	Inorganic soil improver	Growing medium	Plant biostimulants
Cd (mg/kg DM)	1.5	3	3	200***	2	2	1.5	1.5	1.5
Cd (mg/kgP <sub>2</sub> O <sub>5</sub> ) Where total P ≥5% by mass		60	60						
Cr VI (mg/kg DM)	2	2	2		2	2	2	2	2
Hg (mg/kg DM)	1	1	1	100***	1	1	1	1	1
Ni (mg/kg DM)	50	50	100	2000***	90	50	100	50	50
Pb (mg/kg DM)	120	120	120	600***	120	120	120	120	120
As (mg/kg DM)	40 (inorganic)	40 (inorganic)	40	1000***	40	40 (inorganic)	40 (inorganic)	40 (inorganic)	40 (inorganic)
Biuret (C <sub>2</sub> H <sub>5</sub> N <sub>3</sub> O <sub>2</sub> ) (g/kg DM)	Must not be present	12	12						
Perchlorate (ClO <sub>4</sub> <sup>-</sup> ) (mg/kg DM)			50						
Cu (mg/kg DM)	300	600*	600*		300	300	300	200	600
Zn (mg/kg DM)	800	1500*	1500*		800	800	800	500	1500
Salmonella ssp.	Absence in 25g or 25ml	Absence in 25g or 25ml	Absence in 25g or 25ml**			Absence in 25g or 25ml		Absence in 25g or 25ml	Absence in 25g or 25ml****
Escherichia coli or Enterococcaceae	1000 CFU in 1g or 1ml	1000 CFU in 1g or 1ml	1000 CFU in 1g or 1ml**			1000 CFU in 1g or 1ml		1000 CFU in 1g or 1ml	1000 CFU in 1g or 1ml*****
<p>* Does not apply if Cu or Zn has been intentionally added as a micronutrient and is declared in accordance with Annex III</p> <p>** Only applies if the fertiliser contains more than 1% by mass of inorganic carbon (C<sub>org</sub>) other than from chelating or complexing agents, nitrification/denitrification/urease inhibitors, coating agents, urea or calcium cyanamide</p> <p>*** in mg/kg of total micronutrient content, which means boron (B), cobalt (Co), copper (Cu), iron (Fe), manganese (Mn), molybdenum (Mo) and zinc (Zn)</p> <p>**** for microbial plant biostimulants (PFC 6(A)), this limit is also applicable for <i>Listeria monocytogenes</i>, <i>Vibrio</i> ssp., <i>Shigella</i> ssp. and <i>Staphylococcus aureus</i>.</p> <p>***** for microbial plant biostimulants, this limit only applies for <i>Escherichia coli</i>. The limit for Enterococcaceae is 10 CFU/g. Additional limits for PFC 6(A): Anaerobic plate count (unless the microbial plant biostimulant is an aerobic bacterium) 10<sup>5</sup> CFU/g or ml. Yeast and mould count (unless the microbial plant biostimulant is a fungus) 1000 CFU/g or ml.</p>									

In PFC 1, *organic, organo-mineral and inorganic fertilisers are differentiated based on their contents of organic matter* or rather, organic carbon (%  $C_{org}$ , by mass).

**PFC 1(A) Organic fertiliser**

1(A)(I) solid organic fertiliser: at least 15%  $C_{org}$

1(A)(II) liquid organic fertiliser: at least 5%  $C_{org}$

**PFC 1(B) Organo-mineral fertiliser**

Shall be a co-formulation of:

- a) One or more inorganic fertilisers as specified in PFC 1(C) and
- b) One or more materials containing organic carbon ( $C_{org}$ ) and nutrients of solely biological origin.

1(B)(I) solid organo-mineral fertiliser: at least 7.5%  $C_{org}$

1(B)(II) liquid organo-mineral fertiliser: at least 3%  $C_{org}$

**PFC 1(C) Inorganic fertiliser**

An **inorganic fertiliser** shall be a fertiliser containing or releasing nutrients in a mineral form, other than an organic or organo-mineral fertiliser, i.e. with a  **$C_{org}$  content of <3% by mass (or 7.5%, for liquid and solid fertilisers, respectively)**.

(If it contains more than 1%  $C_{org}$  other than from chelating or complexing agents, nitrification/denitrification/urease inhibitors, coating agents, urea or calcium cyanide, it must comply with limit values for pathogens like those defined for organic and organo-mineral fertilisers, see Table A2)

As specified in Annex III (Labelling requirements), Part II (Product-specific labelling requirements) PFC 1, No. 4(a), the term '**mineral fertiliser**' may be used only if the inorganic fertiliser **does not contain more than 1% by mass  $C_{org}$**  other than from chelating or complexing agents, nitrification/denitrification/urease inhibitors, coating agents, urea or calcium cyanide.

The *differentiation* between organic and inorganic soil improvers is based on the criterion that **PFC 3(A) Organic soil improver** shall consist of *material 95% of which is of soleley biological origin*. **PFC 3(B) Inorganic soil improver** is defined as soil improver other than an organic soil improver.

As was pointed out by the European Compost Network (ECN) in their position paper on the new Fertiliser Products Regulation (ECN, 2017; updated 2018), the distinction between PFC 1(A)(1) (solid organic fertiliser) and PFC 3(A) (organic soil improver) is not without ambiguities. This is illustrated in Table A2:

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Table A2: Definitions for solid organic fertilisers (PFC 1(A)(1)) and organic soil improvers (PFC 3(A)) according to Annex I of Regulation (EC) No 2019/1009

	<b>Solid organic fertiliser (PFC 1(A)(1))</b>	<b>Organic soil improver (PFC 3(A))</b>
General definition of product function	Fertiliser: To provide nutrients to plants.	Soil improver: to maintain, improve or protect the physical or chemical properties, the structure or the biological activity of the soil to which it is added.
Composition	Organic carbon (C <sub>org</sub> ) and nutrients, solely of biological origin.	Material 95% of which is of solely biological origin.
Dry matter content	In solid form	At least 20%
Nutrient content	Where it contains only one declared primary nutrient, at least: 2.5% total N, or 2% total P <sub>2</sub> O <sub>5</sub> , or 2% total K <sub>2</sub> O. Where it contains more than one declared primary nutrient at least 1% of either N, P <sub>2</sub> O <sub>5</sub> or K <sub>2</sub> O and a sum of those nutrient contents of at least 4% by mass.	Not defined
Organic carbon content (C <sub>org</sub> )	At least 15% by mass	At least 7.5% by mass

It is therefore proposed by ECN (see Veeken et al., 2016) to use stabilised (effective) organic matter (EOM) as a criterion instead of total organic matter (C<sub>org</sub>) in order to emphasize the contribution of the product to the enrichment of soil organic matter and improvement of physical and biological soil quality. In addition, to make a clear distinction between nutrient supply (i.e. fertiliser) and improvement of soil quality, the ratios EOM/mineral N and EOM/total P are suggested by ECN.

There are further critical points mentioned in the position paper by ECN, regarding the sanitation requirement (pathogen control with limit values for *Escherichia coli* /Enterococcaceae), and the proposed time-temperature profiles for composting which according to ECN are not in line with the state of the art for composting.

While it is not likely that the definitions of this Regulation will be amended in the near future, it is desirable that ambiguities are clarified.

**Annex II** designates the **component material categories (CMCs)** allowed to produce an EU fertilising product as follows:

CMC 1: Virgin materials and substances

CMC 2: Plants, plant parts or plant extracts

CMC 3: Compost

CMC 4: Fresh crop digestate

CMC 5: Digestate other than fresh crop digestate

CMC 6: Food industry by-products

CMC 7: Micro-organisms

CMC 8: Nutrient polymers

CMC 9: Polymers other than nutrient polymers

CMC 10: Derived products within the meaning of Regulation (EC) No. 1069/2009 (Animal By-products Regulation)

CMC 11: By-products within the meaning of Directive 2008/98/EC (Waste Framework Directive)

For each CMC, **eligible input materials** are listed in **Annex II of 2019/1009/EC** (see Table A3). In addition, further **specific process and quality requirements** are defined for each CMC in this Annex.

Table A3: Eligible input materials for the component material categories (CMCs) according to Regulation (EU) 2019/1009, Annex II

CMC	Eligible input materials
1 Virgin material substances and mixtures	Substances and mixtures (with REACH registration according to Regulation (EC) 1907/2006), except: (a) Waste within the meaning of Directive 2008/98/EC (b) Substances or mixtures with end-of-waste status (c) Substances formed from precursors with end-of-waste status (d) By-products within the meaning of Directive 2008/98/EC (e) Animal by-products or derived products within the meaning of Regulation (EC) No. 1069/2009 (f) Polymers (g) Compost (h) Digestate.
2. Plants, plant parts or plant extracts	Plants (including mushrooms and algae, but excluding cyanobacteria), plant parts or plant parts having undergone no other processing than cutting, grinding, milling, sieving, sifting, centrifugation, pressing, drying, frost treatment, freeze drying or extraction with water or supercritical CO <sub>2</sub> extraction.
3. Compost	Compost obtained through aerobic composting of exclusively one or more of the following input materials: (a) Biowaste within the meaning of directive 2008/98/EC resulting from separate biowaste collection at source (b) Derived products referred to in Art. 32 of Regulation (EC) No 1069/2009 for which the end point in the manufacturing chain has been determined (c) Living or dead organisms or parts thereof, which are unprocessed or processed only by manual, mechanical or gravitational means, by dissolution in water, flotation,

	<p>extraction with water, steam distillation or heating solely to remove water, or extracted from air, except:</p> <ul style="list-style-type: none"> <li>- the organic fraction of mixed municipal household waste</li> <li>- sewage sludge, industrial sludge or dredging sludge, and</li> <li>- animal by-products or derived products for which no end point in the manufacturing chain has been determined</li> </ul> <p>(d) Composting additives which are necessary to improve the process performance or environmental performance of the composting process (with specific requirements and restrictions, including REACH registration)</p> <p>(e) Any material listed in points a-c which has previously been composted or digested and contains no more than 6 mg/kg DM of PAH<sub>16</sub>.</p>
4. Fresh crop digestate	<p>Digestate obtained through anaerobic digestion of exclusively one or more of the following input materials:</p> <ul style="list-style-type: none"> <li>(a) Plants or plant parts grown for the production of biogas (including algae, excluding cyanobacteria)</li> <li>(b) Digestion additives which are necessary to improve the process performance or environmental performance of the digestion process (with specific requirements and restrictions, including REACH registration)</li> <li>(c) Any material referred to in point (a) that has previously been digested.</li> </ul>
5. Digestate other than fresh crop digestate	<p>Digestate obtained through anaerobic digestion of exclusively one or more of the following input materials:</p> <ul style="list-style-type: none"> <li>(a) Biowaste within the meaning of Directive 2008/98/EC resulting from separate biowaste collection at source</li> <li>(b) Derived products referred to in Art. 32 of Regulation (EC) No 1069/2009 for which the end point in the manufacturing chain has been determined</li> <li>(c) Living or dead organisms or parts thereof, which are unprocessed or processed only by manual, mechanical or gravitational means, by dissolution in water, flotation, extraction with water, steam distillation or heating solely to remove water, or extracted from air, except: <ul style="list-style-type: none"> <li>- the organic fraction of mixed municipal household waste</li> <li>- sewage sludge, industrial sludge or dredging sludge and</li> <li>- animal by-products or derived products for which no end point in the manufacturing chain has been determined</li> </ul> </li> <li>(d) Digestion additives which are necessary to improve the process performance or environmental performance of</li> </ul>

	<p>the digestion process (with specific requirements and restrictions, including REACH registration)</p> <p>(e) Any material listed in points a-c which has previously been composted or digested and contains no more than 6 mg/kg DM of PAH<sub>16</sub></p>
6. Food industry by-products	<p>Consisting of one of the following substances (with REACH registration according to Regulation (EC) 1907/2006) :</p> <p>(a) Food industry factory lime (obtained by carbonation of organic matter, using exclusively burnt lime from natural sources)</p> <p>(b) Molasses (viscous by-product of the refining of sugarcane or sugar beets into sugar)</p> <p>(c) Vinasse (viscous by-product of the fermentation process of molasses into ethanol, ascorbic acid or other products)</p> <p>(d) Distillers grains (by products resulting from the production of alcoholic beverages)</p> <p>(e) Plants, plant parts or plant extracts having undergone only heat treatment or heat treatment in addition to processing methods referred to in CMC2</p> <p>(f) Lime from drinking water production, i.e. residue which is released by production of drinking water from groundwater or surface water and consists, mainly, of calcium carbonate</p>
7. Micro-organisms	<p>Only applicable to PFC 6(A) Microbial biostimulants</p> <p>Micro-organisms, including dead or empty-cell micro-organisms and non-harmful residual elements of the media on which they were produced, which have undergone no other processing than drying or freeze-drying and are listed in the added table (currently, this table only contains the following 4 groups: Azotobacter ssp., Mycorrhizal fungi, Rhizobium ssp., Azospirillum ssp.)</p>
8. Nutrient polymers	<p>Polymers exclusively made up of monomer substances complying with the criteria set out in points 1 and 2 of CMC 1, where the purpose of the polymerisation is to control the release of nutrients from one or more of the monomer substances.</p>
9. Polymers other than nutrient polymers	<p>Polymers with the purpose</p> <p>(a) To control the water penetration into nutrient particles and thus the release of nutrients ('coating agent')</p> <p>(b) To increase the water retention capacity or wettability of the EU fertilising product</p> <p>(c) To bind material in an EU fertilising product belonging to PFC 4.</p> <p>Polymers of this category must comply with biodegradability criteria established by delegated acts (after transition period of 7 years).</p>

10. Derived products within the meaning of Regulation (EC) No 1069/2009 (on animal by-products)	Derived products within the meaning of 1069/2009/EC having reached the end point in the manufacturing chain as determined in accordance with that Regulation: A list specifying such products will be established by delegated acts referred to in Art. 42(5) (see section above)
11. By-products within the meaning of Directive 2008/98/EC (on waste)	By-products within the meaning of Directive 2008/98/EC (with REACH registration according to Regulation (EC) No 1907/2006) <u>except</u> : (a) Animal by-products or derived products within the meaning of Regulation (EC) 1069/2009 (b) Polymers (c) Compost (d) Digestate

In accordance with its aim to aid the development of circular economy, the new Regulation defines an **end point in the manufacturing chain** for **component materials derived from animal-by products** within the meaning of **Regulation (EC) No 1069/2009**. To this end, **Art. 5(2)** of Regulation (EC) No 1069/2009 is modified accordingly (see **Art. 46** of Regulation (EC) No 2019/1009). **CMC 10** is designated to contain a table listing and specifying such derived materials having reached the end point in the manufacturing chain. A footnote to CMC 10 states that this table will be established by delegated acts referred to in Art. 42(5) of this Regulation. As specified in Art. 46 (4) of this Regulation, the Commission shall initiate a first assessment of derived products referred to in Art 32 that are already widely used in the Union as organic fertilisers and soil improvers. This assessment shall cover at least the following products: meat meal, bone meal, meat-and-bone meal, hydrolysed proteins of Cat. 3 materials, processed manure, compost, biogas digestion residues, feather meal, glycerine and other products of Cat. 2 or 3 materials derived from the production of biodiesel and and renewable fuels, as well as petfood, feed and dog chews that have been refused for commercial reasons or technical failures, and derived products from blood of animals, hides and skins, hoofs and horns, guano of bats and birds, wool and hair, feather and downs, and pig bristles. A working group lead by DG Santé performed the stipulated first assessment and submitted a proposal with candidate materials to EFSA for further assessment, aiming to conclude whether these derived products no longer pose any significant risk to public or animal health and, if so, to determine an end point in the manufacturing chain for them. Based on the EFSA assessment, a **draft Delegated Regulation supplementing Regulation (EC) of the European Parliament and of the Council as regards the determination of end points in the manufacturing chain of certain organic fertilisers and soil improvers** was published for feedback (<https://ec.europa.eu/info/law/better-regulation/have-your-say/initiatives/13478-Fertilisers-list-of-animal-by-products-to-be-used-without-further-official-controls-update-en>) until October 2022, adoption by the Commission is expected during the first quarter of 2023.

Regarding **CMC 11, by-products within the meaning of Directive 2008/98/EC** (Waste Framework Directive), Art. 42(7) of Regulation (EC) 2019//1009 defines an **obligation to set criteria on agronomic efficiency and safety of use** for adoption into the Regulation as a delegated act. The timeline for this was 3 years after the entry of this Regulation into force, i.e. July 2022. Based on a



background document by JRC on Technical proposals for by-products as component materials for EU Fertilising products (Huygens and Saveyn, 2020, [https://phosphorusplatform.eu/images/download/JRC-CMC11-ByProducts-1st-report-27\\_4\\_20.pdf](https://phosphorusplatform.eu/images/download/JRC-CMC11-ByProducts-1st-report-27_4_20.pdf)), JRC proposed to create 2 new CMCs, containing separate rules for regular by-products and high purity materials. This proposal was accepted and two delegated acts were adopted in 2022:

**CMC 11:** COMMISSION DELEGATED REGULATION (EU) 2022/973 of 14 March 2022 supplementing Regulation (EU) 2019/1009 of the European Parliament and of the Council by laying down criteria on agronomic efficiency and safety for the use of **by-products** in EU fertilising products

**CMC 15:** COMMISSION DELEGATED REGULATION (EU) 2022/1171 of 22 March 2022 amending Annexes II, III and IV to Regulation (EU) 2019/1009 of the European Parliament and of the Council for the purpose of adding recovered **high purity materials** as a component material category in EU fertilising products

An **end-of-waste status** is defined for certain **recovered wastes (such as struvite, biochar and ash-based products)** as of the moment of compliance with the requirements of Regulation 2019/1009, i.e. **products containing these materials will cease to be regarded as waste** within the meaning of **Directive 2008/98/EC** from the moment that the EU declaration of conformity was drawn up (recital 19 and **Art. 19 of Regulation (EC) No 2019/1009**). Specific recovery requirements for such materials were developed after the publication of 2019/1009/EC by JRC in the form of Technical Proposals (Huygens et al., 2019) and subsequently modified after discussions inside the EU Expert Group on Fertilising Products. The resulting delegated acts which introduce 3 additional CMCs into the FPR were adopted on 5 July 2021 (see following chapter for details). At this point it must be emphasized, however, that, as Huygens et al. (2019) explain in the JRC Technical Proposals (pages 28-29): **'The CE product status shall only apply to those materials that meet all the requirements for relevant PFCs, in particular the conformity assessment requirements applicable to fertilising products. This implies that materials that meet the requirements of the CMC, but not those of the PFC, shall still have the same status as the input material from which they have been manufactured (e.g. waste status for CMCs derived from waste input materials; unless these have achieved end-of-waste status at Member State level). CMC materials that are waste are thus still subject to waste legislation, including possible restrictions on, for example, transport and permit requirements for processing such materials. Therefore, the recovery rules proposed in this document CANNOT be interpreted as possible end-of-waste criteria, as they do not go as far as attributing PFC status, but stop at providing CMC material status.'**

#### Delegated acts for the so-called "STRUBIAS-materials" to complement the Fertilising Products Regulation 2019/1009

Based on Technical Proposals prepared by JRC Huygens et al. (2019), new **CMCs 12-14** were drawn up as delegated acts. The respective CMCs are known as "STRUBIAS" CMCs due to their original scope which was limited to **struvites, biochars and ash-based materials**. However, their scope has been expanded since the beginning of the STRUBIAS project and now includes the following (renamed) candidate materials:

- Precipitated phosphate salts and derivatives (i.e. materials of a different chemical composition derived from them)

- Thermal oxidation materials and derivatives
- Pyrolysis and gasification materials (i.e. organic materials that were thermally degraded in the total or partial absence of oxygen)

The European Commission presented a first proposal in November 2019 to adopt these materials as additional component material categories (CMCs) into the EU regulation 2019/1009. After expert discussions inside the Commission (EU Expert Group on Fertilising Products), the draft delegated acts were under public consultation until 15 February 2021 and finally adopted on 5 July 2021.

All three CMCs (12-14) must obtain REACH registration according to Regulation (EC) 1907/2006, unless they are covered by one of its exemptions listed in Annexes IV and V.

Detailed provisions laid out for CMC 12-14 are found in the following delegated acts:

**CMC 12:** COMMISSION DELEGATED REGULATION (EU) 2021/2086 of 5 July 2021 amending Annexes II and IV to Regulation (EU) 2019/1009 of the European Parliament and of the Council for the purpose of adding **precipitated phosphate salts and derivatives** as a component material category in EU fertilising products

**CMC 13:** COMMISSION DELEGATED REGULATION (EU) 2021/2087 of 6 July 2021 amending Annexes II, III and IV to Regulation (EU) 2019/1009 of the European Parliament and of the Council for the purpose of adding **thermal oxidation materials and derivatives** as a component material category in EU fertilising products

**CMC 14:** COMMISSION DELEGATED REGULATION (EU) 2021/2088 of 7 July 2021 amending Annexes II, III and IV to Regulation (EU) 2019/1009 of the European Parliament and of the Council for the purpose of adding **pyrolysis and gasification materials** as a component material category in EU fertilising products

### [Technical updates to the Fertilising Products Regulation 2019/1009](#)

For the purpose of adapting the FPR to technical progress, two delegated acts were already adopted since 2019:

COMMISSION DELEGATED REGULATION (EU) 2021/1768 of 23 June 2021 amending, for the purpose of its adaptation to technical progress, Annexes I, II, III and IV to Regulation (EU) 2019/1009 of the European Parliament and of the Council laying down rules on the making available on the market of EU fertilising products

COMMISSION DELEGATED REGULATION (EU) 2022/1519 of 5 May 2022 amending Regulation (EU) 2019/1009 of the European Parliament and of the Council as regards the requirements applicable to EU fertilising products containing inhibiting compounds and the post processing of digestate

### [FAQ Document to the FPR 2019/1009](#)

This document tries to answer the most frequently asked questions (FAQs) related to the new FPR 2019/1009.

It is legally non-binding.

It was published first online on 20 July 2021 and is now updated with new questions at irregular intervals. The recent version (v4 of 14 July 2022) is found under:  
<https://ec.europa.eu/docsroom/documents/50874>

### [Guidance Document on labelling of fertilising products according to Annex III of FPR 2019/1009](#)

A guidance document concerning the visual appearance of the label on EU fertilising products referred to in Annex III of the FPR was published online on 23 February 2021 and is available under the following link: <https://ec.europa.eu/docsroom/documents/44831>

This is a legally binding document.

### [Conformity assessment for new fertilising products according to Annex IV of FPR 2019/1009](#)

Other than Reg. (EC) 2003/2003, Reg. (EU) 2019/1009 no longer contains a list of fertilising products that fulfil its requirements, but stipulates an **individual conformity assessment** for each product. Depending on the type of product, **4 different modules** are described for the assessment in Annex IV of the FPR. Further information on the concept of conformity assessment is found in the so-called **'Blue Guide' on the implementation of EU product rules 2022**:

[https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=uriserv:OJ.C\\_.2022.247.01.0001.01.ENG](https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=uriserv:OJ.C_.2022.247.01.0001.01.ENG)

### [REACH Regulation 1907/2006/EC, last amended on June 11, 2019](#)

Regulation (EC) No 1907/2006 concerns the **registration, evaluation, authorisation and restriction of chemicals (REACH)**.

The purpose of this Regulation is to ensure a high level of **protection of human health and the environment**, including the promotion of alternative methods for assessment of hazards of substances, as well as the free circulation of substances on the internal market (Art. 1 No 1).

It lays down **provisions on substances and preparations** applying to the manufacture, placing on the market or use of such substances on their own, in preparations or in articles (Art. 1 No 2). According to Art. 3 No 1, 'Substance' means a chemical element and its compounds in the natural state or obtained by any manufacturing process. No 2 defines 'preparation' as a mixture or solution composed of two or more substances.

The Regulation is based on the principle that it is for the manufactures, importers and downstream users to ensure that the manufacture, placing on the market or use of such substances do not adversely affect human health or the environment (Art. 1 No 3). In line with this, manufacturers and importers are required to collect and provide information on the properties of their chemical substances which will allow their safe handling when registering their substances according to the **general obligation to register** before placing them on the market (Art. 5-14).

The Regulation further establishes a **European Chemicals Agency** responsible to register and manage the information supplied on the chemicals in a central database, coordinate the evaluation of suspicious chemicals and build up a public database in which consumers and professionals can find hazard information.

**Waste is not a substance, preparation or article within the meaning of this Regulation (Art. 2 No 2). However, chemical products manufactured from waste are subject to the REACH Regulation if the end-of-waste status is achieved and substances or preparations are placed on the market, e.g. as a fertilising product under the new Fertilising Products Regulation.**

**Art. 2(7) (a) and (b)** grant **exemptions from the obligation to register for substances covered by Annexes IV and V** of this Regulation, as (a) sufficient information is known about these substances that they are considered to cause minimum risk because of their intrinsic properties, or (b) registration is deemed inappropriate or unnecessary for these substances and their exemption does not prejudice the objectives of this Regulation. According to Annex V Nr. 12, **biowaste compost** is explicitly excluded from REACH registration. An extension of the derogation to **digestates** was published on Oct 10, 2019 as amendment to Annex V Nr. 12 in Commission Regulation (EU) 2019/1691.

[Regulation \(EU\) No 2018/848 on Organic Production and Labelling of Organic Products, and the Implementing Regulation \(EU\) No 2021/165 authorising certain products and substances for use in organic production and establishing their list](#)  
Regulation (EU) No 2018/848 on organic production and labelling of products establishes the principles of organic production and lays down the rules concerning organic production, related certification and the use of indications referring to organic production in labelling and advertising, as well as rules on controls additional to those laid down in Regulation (EU) 2017/625 (Art. 1).

It repeals Regulation (EC) No 834/2007 and applies as of January 1, 2022 (Art. 61). Aim and scope are described in more detail in Art. 1 and 2, in order to make clear to which products this Regulation applies (see recital 10).

Art. 4 describes the general objectives of organic production, including among others

- The protection of the environment and climate
- Maintaining the long-term fertility of soils and
- Contributing to a non-toxic environment.

Among the overall principles described in Art. 5, the **restriction of the use of external inputs** is listed. Where necessary, such external inputs shall be limited to

- Inputs from organic production
- Naturally or naturally-derived substances
- Low solubility mineral fertilisers

Art. 24 No 5 **limits chemically synthesised inputs to exceptional cases** where the use of external inputs as specified above contributes to unacceptable environmental impacts.

Art. 6 lists **specific principles** applicable to organic farming, among them

- The **minimisation of the use of non-renewable resources** and off-farm/external inputs
- The **recycling of wastes and by-products of plant and animal origin** as input in plant and livestock production.

**Art. 12** defines **plant production rules**. It refers to Annex II of the Regulation, where plant production rules are described in more detail (adopting some of the specific rules already defined in Art. 3 of Regulation (EC) 889/2008). As specified in **Annex II** Part 1 No 1.9.2, the fertility of the soil shall be maintained and increased mainly by multiannual crop rotation and the application of – preferably composted – **livestock manure and organic material from organic production**. Annex II Part 1 No 1.9.3 requires that **additional fertiliser and soil conditioners may only be used if they have been authorised for use in organic production** under **Art. 24** (stipulating a **restrictive list** of the products and substances authorised by the European Commission). Annex II Part 1 No 1.9.8 (new) **prohibits the use of mineral nitrogen fertilisers**.

Annex II Part 1 No 1.9.4 of Regulation (EU) No 2018/848 explicitly mentions that the **total amount of livestock manure**, as defined in **Directive 91/676/EEC**, used in the in-conversion and organic production units **shall not exceed 170 kg N/ha and year of agricultural area used**. That limit shall only apply to the use of farmyard manure (fresh and dried), dehydrated poultry manure, composted animal excrement (including poultry manure), composted farmyard manure and liquid animal excrement.

Annex II Part 1 No 1.9.6 and 1.9.7 of Regulation (EU) No 2018/848 allows the use of **preparations of micro-organisms** to improve the overall condition of the soil or the availability of nutrients in the soil or in the crops, and for compost activation.

**Art. 24 No 3** defines the following general and specific criteria that must be met by a product to be eligible for placement onto the **list of permitted substances** after approval by the Commission:

- They are essential for sustained production and for the use for which they are intended
- All products and substances shall be of plant, algal, animal, microbial or mineral origin except where products or substances from such sources are not available in sufficient quantities or qualities or if alternatives are not available
- Their use is essential for obtaining or maintaining the fertility of the soil or to fulfil specific nutritional requirements of crops, or specific soil-conditioning purposes

The list of permitted fertilisers and soil conditioners can be found as **Annex II to Regulation (EU) No 2021/1165 authorising certain products and substances for use in organic production and establishing their lists**. Pursuant to Art. 24 No 7 of the Regulation on Organic Production, this **list can be amended as necessary upon request by Member States**. According to Art. 24 No 8 of Regulation (EU) 2018/848, the Commission shall regularly review all lists of permitted products of substances.

An **expert group (EGTOP)** has reviewed several fertilising products proposed for use in organic farming (Final Report on Fertilisers I (2011), II (2016) and III (2018) ([https://ec.europa.eu/info/food-farming-fisheries/farming/organic-farming/co-operation-and-expert-advice/egtop-reports\\_en](https://ec.europa.eu/info/food-farming-fisheries/farming/organic-farming/co-operation-and-expert-advice/egtop-reports_en), last accessed January 7, 2020) and, for instance, **recommended struvite and calcined phosphates from sewage sludge ash to be included** and ammonium sulfate to be excluded, among others for solubility criteria.

The recommendation to include struvite has recently been taken up by the Commission: On 17 January 2023, the Commission Implementing Regulation (EU) 2023/121 amending and correcting Implementing Regulation Reg (EU) 2021/1165 was adopted. With this Regulation, struvite was included into the new Annex II of Regulation (EU) 2021/1165.

*Please note: Art. 21 section 2 of Regulation (EC) No 2018/848 states that **Member States may implement, within their territory, production rules in organic farming in the absence of detailed production rules for products not falling within the categories regulated at EU level, provided they follow the objectives and principles laid down in this Regulation. From the wording in this article, it is clear that it is not allowed for MS to set national rules for product categories that ARE already regulated at EU level, such as fertilisers and soil conditioners used in plant production (see Art. 12 Rules for plant production). This is also explicitly clarified by Annex II Part I Section 1.9.3 of Reg. (EU) 2018/848). Consequently, lists defining products and substances allowed for fertilisation in organic farming at national level must be in accordance with the EU positive list now established by Annex II to Reg (EU) No 2021/1165 and may not go beyond it.***

Submitted (not yet approved by the EC)



## 2. Waste management

### Waste Framework Directive 2008/98/EC

last amended by Directive (EU) 2018/851

This Directive lays down measures to protect the environment and human health by **preventing or reducing the generation of waste**, the adverse impacts of the generation and management of waste and by reducing overall impacts of resource use and improving the efficiency of such use, which are crucial for the transition to a **circular economy** and for guaranteeing the Union's long-term competitiveness (Art. 1). It sets the **basic concepts related to waste management**, which must be transposed into national law by the Member States.

**Waste waters and animal by-products** (except those which are destined for incineration, landfilling or use in a biogas or composting plant) **are explicitly excluded from its scope** to the extent that they are covered by other Community legislation (Art. 2).

According to Art. 3 No 1, **waste** means any substance or object which the holder discards or intends or is required to discard. Art. 3 No 2b defines **municipal waste** as mixed waste and separately collected waste from households, [...], and other sources where such waste is similar in nature and composition to wastes from households. Municipal waste excludes waste from production, agriculture, forestry, fishing, septic tanks and sewage network and treatment, including sewage sludge. Art. 3 No. 4 and 4a include **biowaste** and **food waste** into the scope of the Directive.

Art. 4 establishes a **waste hierarchy** that shall apply as a priority order in waste prevention and management, legislation and policy:

- (a) Prevention
- (b) Preparing for re-use
- (c) Recycling
- (d) Other recovery, e.g. energy recovery; and
- (e) Disposal.

According to the definitions in Art. 3, **'re-use'** means any operation by which products or components that are not waste are used again for the same purpose for which they were conceived. **'Recovery'** is any operation the principal result of which is waste serving a useful purpose by replacing other materials necessary to fulfil a particular function or by preparing the waste in way to fulfil that function. **'Recycling'** means any recovery operation by which waste materials are reprocessed into products, materials or substances either for their original or for other purposes; it includes the reprocessing of organic materials, but does not include energetic recovery and the reprocessing into materials that are to be used as fuels or for backfilling operations. **'Disposal'** means any operation which is not recovery even where the operation has as a secondary consequence the reclamation of substances or energy.

**Annexes I and II** set out **non-exhaustive lists of disposal and recovery operations**.

The **list of recovery operations in Annex II** explicitly mentions **direct land application for agricultural use or ecological improvement (R10)**. Other options relevant with regard to the production of biobased fertilisers from nutrient-rich sidestreams (wastes) are **recycling and recovery**

**of organic substances (including composting and other biological transformation processes (R3) and recycling and recovery of inorganic substances (R5).** Another option is R1 Use principally as a fuel or other means to generate energy combined with R11: Use of waste obtained from any of the operations numbered R1 to R10) when the monoincineration ash of sewage sludge is subsequently used for the production of fertilisers. R1 may also cover the digestion of organic residues in biogas plants and subsequent use of the digestate for fertilisation.

In contrast to waste, Art. 5 No 1 defines a **by product** as a substance or object resulting from a production process the primary aim of which is not the production of that substance or object, and which meets the following conditions:

- (a) Further use of the substance or object is certain;
- (b) The substance or object can be used directly without any further processing other than normal industrial practice;
- (c) The substance or object is produced as an integral part of a production process; and
- (d) Further use is lawful, i.e. the substance or object fulfils all relevant product, environmental and health protection requirements for the specific use and will not lead to overall adverse environmental or human health impacts.

Art. 6 No 1 stipulates that Member States shall take appropriate measures to ensure that waste which has undergone a recycling or other recovery operation is considered to have ceased to be waste (i.e. is granted **end-of-waste status**) if it complies with the following conditions:

- (a) The substance or object is to be used for specific purposes;
- (b) A market or demand exists for such a substance or object;
- (c) The substance or object fulfils the technical requirements for the specific purposes and meets the existing legislation and standards applicable to products; and
- (d) The use of the substance or object will not lead to overall adverse environmental or human health impacts.

In order to facilitate the prudent and rational utilisation of natural resources and ensure a high level of protection of the environment and human health at the same time, the Commission shall **monitor the development of national end-of-waste criteria** and is entitled to **develop Union-wide criteria** for certain types of waste if needed (Art. 6 No 2).

For example, **union-wide end-of-waste (EoW) criteria** were **proposed** by JRC (2014) for **biodegradable waste**. With the new **Fertilising Products Regulation, union-wide end-of-waste criteria** were defined for **fertilisers (Art. 19 of Regulation 2019/1009/EU**, see chapter on that Regulation for details). This is the first time the European Commission made use of the entitlement given in Art. 6 of Directive 2008/98/EC.

After reviewing its waste policy in 2014 (see chapter on Landfill Directive), the Commission adopted a proposal for a revised Directive on waste amending Directive 2008/98/EC in 2015 (COM/2015/0595 final), setting new targets for the reduction of waste and establishing a long-term path for waste management and recycling. So far, no final decision has been made on this matter.

As part of the European Green Deal, a **new Circular Economy Action Plan** was adopted by the European Commission on **11 March 2020**. This plan **announces another review of the Waste Framework Directive 2008/98/EC**. In this context, a broader set of measures on waste prevention



shall be developed, including the definition of waste reduction targets for specific waste streams and a proposal to harmonise separate waste collection systems. Planned activities of the Commission within the frame of the new Circular Economy Action Plan also include

- Assessment of the scope to develop further EU-wide end-of-waste criteria for certain waste streams based on
- Monitoring Member States' application of the revised rules on end-of-waste status and by-products and
- Support cross-border initiatives for cooperation to harmonise national end-of waste and by-product criteria.

See [https://ec.europa.eu/environment/circular-economy/pdf/new\\_circular\\_economy\\_action\\_plan.pdf](https://ec.europa.eu/environment/circular-economy/pdf/new_circular_economy_action_plan.pdf) for details.

ESPP eNews no. 53 (April 2021): The European Commission is currently defining a list of secondary material streams for “scoping of development of EU End-of-Waste and By-Product criteria”, as specified in the EU [Circular Economy Action Plan](#) (11<sup>th</sup> March 2020, ESPP [eNews n°42](#)). This Action Plan cites “Food, water and nutrients” as one of seven identified Key Product Value Chains.

#### Waste Shipment Regulation 1013/2006/EC

As long as a NRSS or BBF has not reached end-of-waste status, i.e. is not compliant with the new Fertilising Products Regulation and not ‘CE’ marked) it has to comply with the Waste Shipment Regulation when transported across borders between Member States, i.e. mutual notification between departing and receiving state is required. This may cause considerable delays in transportation (Hermann et al., 2019).

#### Landfill Directive 1999/31/EC of April 26, 1999

As specified in the waste prevention and management hierarchy described in the Waste Framework Directive, disposal of waste by landfilling is the least desirable of the available options.

According to its Art. 1, the aim of this Directive is to provide stringent operational and technical requirements on landfilling of waste in order to prevent or reduce as far as possible negative effects on the environment. Member States were obliged to transpose this Directive into national law until July 16, 2001 (Art. 18).

Art. 5 of this Directive required Member States to set up a **national strategy for the reduction of biodegradable waste going into landfills**. This strategy should include measures to achieve this target by means of in particular recycling, composting, biogas production or materials/energy recovery. **According to Art. 5(2)(a-c), biodegradable municipal waste going to landfills must be reduced to 75, 50 and 35% of the total amount (by weight) produced in 1995 not later than 7, 10 and 17 years after the entry into force of this Directive.** Art. 5(2) also obliged the Commission to report on the practical experience gained by Member States in the pursuance of these targets 15 years after entry into force of this Directive (i.e. in 2014) and, if appropriate, to present a proposal

with a view to confirming or amending these targets in order to ensure a high level of environmental protection.

Accordingly, on **July 2, 2014**, the EC presented a **legislative proposal to review waste-related targets in the Landfill Directive as well as recycling and other waste-related targets in Directive 2008/98/EC** on waste and Directive 94/62/EC on packaging and packaging waste. This proposal aimed at phasing out landfilling by 2025 for recyclable waste in non-hazardous waste landfills, including among others biowaste. It was withdrawn in **December 2014** and replaced in 2015 by a **revised legislative proposal including new Directives on waste, packaging waste and landfill of waste**, and setting clear targets for the reduction of waste and establishing an ambitious long-term path for waste management and recycling, including the following key elements (see [https://ec.europa.eu/environment/waste/target\\_review.htm](https://ec.europa.eu/environment/waste/target_review.htm), last access Dec 5, 2019, for further information):

- A common **EU target for recycling 65% of municipal waste** and 75% of packaging waste by 2030
- A **binding landfill target to reduce landfill to maximum of 10% of municipal waste** by 2030
- A **ban on landfilling of separately collected waste**
- Promotion of economic instruments to discourage landfilling
- Simplified and improved definitions and harmonised calculation methods for recycling rates throughout the EU
- Concrete measures to promote re-use and stimulate industrial symbiosis – turning one industry's by-product into another industry's raw material
- Economic incentives for producers to put greener products on the market and support recovery and recycling schemes

[Animal By-Products Regulation 1069/2009/EC and related Regulation 142/2011 for its implementation](#)  
(repealing 1774/2002/EC)

This Regulation lays down **public health and animal health rules for animal by-products and derived products**, in order to prevent and minimise risks to public and animal health arising from those products, and in particular to protect the safety of the food and feed chain (Art. 1). According to Art. 2, it applies to

- (a) Animal by-products and derived products which are excluded from human consumption under Community legislation; and
- (b) The following products which, pursuant to an irreversible decision by an operator, are destined for purposes other than human consumption:
  - (i) products of animal origin which may be destined for human consumption under Community legislation;
  - (ii) raw materials for the production of products of animal origin.

According to the **definitions** in Art. 3, **„animal by-products“** means entire bodies or parts of animals, products of animal origin or other products obtained from animals, which are not intended for human consumption, including oocytes, embryos and semen. **„Derived products“** means products

obtained from one or more treatments, transformations or steps of processing of animal by-products.

**Art. 5** defines an **end point in the manufacturing chain for derived products**, beyond which they are **no longer subject to the requirements of this Regulation**, implying that those derived products may subsequently be placed on the market without restrictions under this Regulation and shall no longer be subject to official controls in accordance with this Regulation. **Art. 5(2) states that such an end point may be determined for derived products which no longer pose any significant risk to public or animal health**, and that such determinations will be adopted as supplements to Regulation (EC) 1069/2009. **Regulation (EU) 142/2011** for the implementation of 1069/2009/EC lists derived products for which an end point in the manufacturing chain has been determined, among them

- Processed pet food
- Hides and skins of ungulates
- Wool and hair
- Feathers and down

given that they fulfil the specific requirements defined for them in Annex XIII of that Regulation.

In Section 1 (Art. 7-10) of 1069/2009/EC, a **categorisation of animal by-products and derived products** is established. The three defined categories reflect the **level of risk to public and animal health** arising from the respective products (Art. 7). Section 2 (Art. 11-15) contains provisions for the **disposal and use of materials according to their category**. Table A4 shows materials belonging to the respective categories and options for their disposal and use according to the Regulation:

Table A4: Options for disposal and use of animal-by products (ABP) according to the categories defined in Regulation (EC) No 1069/2009

Material / category	Options for disposal and use
<p>Category 1 (Art. 8):</p> <ul style="list-style-type: none"> <li>• Entire bodies and all body parts, including hides and skins, of (i+ii) farmed animals killed in the context of transmissible spongiform encephalopathy (TSE) (iii) pet, zoo and circus animals (iv) animals used for experiments (v) wild animals when suspected of being infected with diseases communicable to humans or animals</li> <li>• Specified risk material and animal bodies or parts containing specific risk material at the time of disposal</li> <li>• ABP derived from animals which have been submitted to illegal treatment</li> <li>• ABP containing residues of other substances and environmental contaminants</li> </ul>	<p>(a) Disposal of waste by incineration (in some cases only after prior processing) (b) Recovery or disposal by co-incineration, if the Cat. 1 material is waste (in some cases only after prior processing) (c) Disposal by burial in an authorised landfill (in some cases only after prior processing) (d) Use as a fuel for combustion (e) Use for manufacture of derived products* (Art. 33, 34 and 36)</p> <p>*Derived products that may be placed on the market are listed in Art. 33 (cosmetic products, several medical devices, veterinary medicinal products and medicinal products). Art. 34 regulates the import, collection and movement of ABP used for the manufacture of derived products. <b>Art. 36 defines safety criteria that</b></p>

<ul style="list-style-type: none"> <li>• ABP collected during the treatment of waste water from plants treating Cat. 1 material</li> <li>• Catering wastes from means of transport operating internationally</li> <li>• Mixtures of Cat. 1 material with Cat. 2 and/or Cat. 2 material</li> </ul>	<p><b>other derived products must meet if they shall be placed on the market.</b></p>
<p>Category 2 (Art. 9):</p> <ul style="list-style-type: none"> <li>• Manure, non-mineralised guano and digestive tract content</li> <li>• ABP collected during treatment of waste water from plants processing Cat. 2 material</li> <li>• ABP containing residues of authorised substances or contaminants exceeding the permitted levels</li> <li>• Products of animal origin unfit for human consumption due to the presence of foreign bodies in them</li> <li>• Products of animal origin (other than Cat. 1 material) imported from or dispatched to a member state and failing to comply with Community veterinary legislation</li> <li>• Foetuses, oocytes, embryos, semen or dead-in shell poultry not belonging to Cat. 1 or Cat. 3</li> <li>• Mixtures of Cat.2 and Cat. 3 material</li> <li>• ABP other than Cat. 1 or Cat. 3 material</li> </ul>	<ul style="list-style-type: none"> <li>(a) Disposal as waste by incineration (in some cases only after prior processing)</li> <li>(b) Recovery or disposal by co-incineration, if the cat. 2 material is waste (in some cases only after prior processing)</li> <li>(c) Disposal in authorised landfill (in some cases only after prior processing)</li> <li>(d) Use for manufacturing of organic fertiliser or soil improvers</li> <li>(e) Composting or transformation into biogas</li> <li>(f) Application to land without processing, in the case of manure, digestive tract content separated from the digestive tract, milk, milk-based products and colostrum which the competent authority does not consider to present a risk for the spread of any serious transmissible disease</li> <li>(g) For material from aquatic animals: Ensilage, composting or transformation into biogas</li> <li>(h) Use as a fuel for combustion</li> <li>(i) Use for the manufacture of derived products (Art. 33, 34 and 36)</li> </ul>
<p>Category 3 (Art. 10):</p> <ul style="list-style-type: none"> <li>• Carcasses and parts of slaughtered/killed animals fit for human consumption but not intended for human consumption for commercial reasons</li> <li>• Carcasses and parts originating either from animals considered fit for slaughter for human consumption or from game killed for human consumption, including poultry heads; hides and skins, horns and feet of animals other than ruminants requiring TSE testing, or ruminants which have been tested with a negative result; pig bristles; feathers</li> </ul>	<ul style="list-style-type: none"> <li>(a) Disposal as waste by incineration</li> <li>(b) Recovery or disposal by co-incineration, if the Cat.3 material is waste</li> <li>(c) Disposal in an authorised landfill</li> <li>(d) Processing and use <ul style="list-style-type: none"> <li>(i) for the manufacturing of feed for farmed animals other than fur animals (with some exceptions!)</li> <li>(ii) for the manufacturing of feed for fur animals</li> <li>(iii) for the manufacturing of pet food</li> <li>(iv) for the manufacturing of organic fertilisers or soil improvers</li> </ul> </li> <li>(e) Use for the production of raw pet food</li> <li>(f) Composting or transformation into biogas</li> </ul>

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| <ul style="list-style-type: none"> <li>• ABP from poultry and lagomorphs slaughtered on the farm, which did not show any signs of disease communicable to humans or animals</li> <li>• Blood of animals which did not show any signs of disease communicable through blood to humans or animals obtained from slaughtered animals after having been considered fit for slaughter (only animals other than ruminants requiring TSE testing and ruminants which have been tested with a negative result)</li> <li>• ABP arising from the production of products intended for human consumption, including degreased bones, greaves and centrifuge or separator sludge from milk processing</li> <li>• Products of animal origin, or foodstuffs containing them, which are no longer intended for human consumption for commercial reasons or defects from which no risk to public or animal health arises</li> <li>• Petfood and feedingstuffs of animal origin, or feedingstuffs containing ABP or derived products, which are no longer intended for feeding for commercial reasons or due to defects from which no risk to public or animal health arises</li> <li>• Blood, placenta, wool, feathers, hair, horns, hoof cuts and raw milk originating from live animals that did not show any signs of disease communicable through that product to humans or animals</li> <li>• Aquatic animals and parts of such animals, except sea mammals, which did not show any signs of disease communicable to humans or animals</li> <li>• ABP from aquatic animals originating from plants manufacturing products for human consumption</li> <li>• Shells from shellfish, hatchery by-products, eggs, egg by-products and day old chicks killed for commercial reasons, if these materials originate from animals not</li> </ul> | <ul style="list-style-type: none"> <li>(g) For material originating from aquatic animals: ensilage, composting or transformation into biogas</li> <li>(h) For shells from shellfish and egg shells: use under conditions which prevent risks arising to public and animal health</li> <li>(i) Use as a fuel for combustion</li> <li>(j) Use for manufacture of derived products (Art. 33, 34 and 36)</li> <li>(k) For catering waste: processing by pressure sterilisation or composting or transformation into biogas</li> <li>(l) Application to land without processing, in the case of raw milk, colostrum and products derived therefrom, if they do not present a risk of any disease communicable through those products to humans or animals</li> </ul> |
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<p>showing any signs of disease communicable through that material to humans or animals</p> <ul style="list-style-type: none"> <li>• Aquatic and terrestrial invertebrates other than species pathogenic to humans or animals</li> <li>• Animals and animal parts of Rodentia and Lagomorpha except Cat.1 and Cat. 2 material</li> <li>• Hides, skins, hooves, feathers, wool, horns, hair and fur originating from dead animals that did not show any signs of disease communicable through that product to humans or animals</li> <li>• Adipose tissue from slaughtered animals which did not show any signs of disease communicable through that material, which were considered fit for slaughter for human consumption</li> <li>• Catering waste other than as referred to in Art. 8 (cat. 1)</li> </ul>	
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According to **Art. 32, organic fertilisers and soil improvers may be placed on the market and used provided:**

- (a) They are derived from Cat. 2 or Cat. 3 material;
- (b) They have been produced in accordance with the conditions for pressure sterilisation or with other conditions to prevent risk arising to public and animal health, in accordance with the requirements laid down pursuant to Art. 15 (laying down implementing measures for the section on disposal and use of materials);
- (c) They come from approved or registered establishments or plants, as applicable; and
- (d) In the case of meat-and-bone meal derived from Cat. 2 material and processed animal proteins intended to be used as or in organic fertilisers and soil improvers, they have been mixed with a component to exclude the subsequent use of the mixture for feeding purposes (and marked when required).

Art. 32 also explicitly allows the placing on the market and use of **digestion residues from transformation into biogas or compost** as organic fertilisers or soil improvers.

Member States are granted to adopt or maintain **national rules imposing additional conditions for or restricting the use of organic fertilisers and soil improvers** if they are justified on grounds of the protection of public and animal health.

According to Art. 32 No 3, specific measures for the implementation of this Article may be laid down and will be adopted as supplements to this Regulation. This was done in **Art. 22 of Regulation (EU) 142/2011**, which lays out **specific requirements for the placing on the market and use of organic fertilisers and soil improvers** (see **Annex XI** of that Regulation for details, including requirements for



the trade of unprocessed and processed manure and derived products from processed manure, as well as conditions for the production, storage and transport of certain organic fertilisers and soil improvers other than manure).

As mentioned above, Art. 36 contains provisions for the placement on the market of derived products other than those referred to in Art. 31, 32, 33 and 35. It stipulates that operators must ensure the control of risks to public and animal health by

- Safe sourcing in accordance with Art. 37
- Safe treatment in accordance with Art. 38, where safe sourcing does not ensure sufficient control; or
- Verifying that the products are only used for safe end users in accordance with Art. 39 where safe treatment does not ensure sufficient control.

According to Art. 37 No. 1 (a), safe sourcing shall include the use of material from which no unacceptable risks to public and animal health arise.

This legal definition of safe sourcing should for example exclude the use of ashes from Cat. 1 materials as component material for fertilisers, since Cat. 1 materials pose an unacceptable risk within the meaning of this definition – at least, this is the clearly voiced position of the European Commission. Accordingly, the Fertilising Products Regulation allows the production of fertilising materials from Category 2 and 3 animal by-products, but not from Category 1 material. However, the position of European Commission is not accepted unequivocally by all Member States. For example, in the UK, a fertiliser made from Cat. 1 ash was licensed for sale based on the argument that with the incineration, it had reached an endpoint in the manufacturing chain. Similarly, Switzerland (not EU Member) allows the use of incinerated Cat. 1 material for fertiliser production.

#### [Sewage Sludge Directive 86/278/EEC](#)

The 'EU Directive 86/278/EEC on the protection of the environment, and in particular of the soil, when sewage sludge is used in agriculture' was **designed in the 1980s to encourage the controlled and efficient reuse of sewage sludge by land application in agriculture, while regulating it in a way that should prevent adverse effects on soil, water, vegetation and animals** (Art. 1). To this end, **limit values for heavy metal concentrations in sludges and soils** were defined (Art. 4, Annex I) and it was specified that **only treated sludge**, i.e. sludge that had undergone biological, chemical or heat treatment, long-term storage or any other appropriate process so as to significantly reduce its fermentability and the health hazards resulting from its use (Art. 2), was to be used in agriculture (Art. 6). Further restrictions for the use of sludge on agricultural lands were defined (Art. 7) and it was stipulated that the sludge should be used in such a way that account was taken of the **nutrient needs of the plants** and that the **quality of the soil and of the surface and ground water** was not impaired (Art. 8). The directive also specified **rules for the sampling and analysis of sludges and soils** (Art. 9, Annex II).

Member States were obliged to transpose this Directive into national law, which was done by national sewage sludge acts or ordinances, such as the German Waste Sewage Sludge Ordinance (Abfallklärslammverordnung, AbfKlärV).



**Some Member States implemented much stricter limit values or other restrictions on the direct use of sewage sludge as a fertiliser on agricultural land**, including a total ban of that way of reuse in some countries (see chapter on National legislation).

*Submitted (not yet approved by the EC)*

### 3. Ground and surface water quality, air quality and climate/renewable energy

#### Water Framework Directive 2000/60/EC and related legislation for the protection of water

##### Water Framework Directive 2000/60/EC

Last amended by Commission Directive 2014/101/EU of 30 October 2014, establishing a framework for Community action in the field of water policy.

As can be seen from its title, this Directive was created with the **aim to establish a single piece of framework legislation introducing a more global approach to water policy**, which was until then mostly focused on separate areas of interest addressed by several specific directives (e.g. protection of wetlands, drinking water, or bathing water) or individual types or sources of pollution (e.g. urban waste water, nitrates from agriculture). To this end, the **scope of water protection was expanded to all waters, surface waters and groundwater** (Art. 1), which should be protected by introducing the system of **river basin management** (Art. 3) – with the river basin being the natural geographical and hydrological unit irrespective of national borders. In Art. 4, environmental objectives were defined for surface and ground water bodies as well as for particular protected areas. A general requirement for ecological protection, and a general minimum of chemical standard, were introduced for **surface waters**. **'Good ecological status'** was defined in **Annex V** of the Directive in terms of the quality of the biological community, the hydrological characteristics – referenced to a status with minimal anthropogenic impact – and the chemical characteristics. **'Good chemical status'** was defined based on compliance with quality standards already laid down in **existing European legislation (including Annex IX of this Regulation)**. In addition, a mechanism was provided for renewing these standards and establishing new ones by establishing a **priority list of hazardous chemicals (Annex X)**, which has been updated by Directive 2008/105/EC, see chapter below). For **groundwater**, a requirement to **monitor chemical status** and to **reverse any anthropogenically induced upward pollution trend** was laid down (Art. 4), and **'good groundwater chemical status'** as well as **'good quantitative status'** were defined in Annex V.

In order to allow a co-ordination of measures, an evaluation procedure regarding the fulfilment of the objectives of the Directive for each body of water was established, including the obligation for Member States to design whatever additional measures (supplementing existing legislation) were needed to fulfil these objectives – the **river basin management plan** (Art. 13).

The European Commission published a 'Fitness Check' of the EU Water Framework Directive (with the Environmental Quality Standards, Groundwater and Floods Directives) on Dec 10, 2019 (SWD (2019) 439 and SWD (2019) 440). The Commission's conclusions maintain and confirm the Water Framework Directive's objectives, in particular the 2027 deadline, by which finally (after the previous 2015 deadline was missed) all European surface water – lakes, rivers, transitional and coastal water, and groundwater – should reach "good status". These conclusions have been welcomed by NGOs and scientists, who had feared that the WFD deadlines might be delayed, and are coherent with the ambitious objectives of the new European Commission's 'Green Deal'. The Commission underlines that no substantial progress has been made over recent years in water bodies' overall quality status,

and that only half of water bodies had achieved good quality by 2015. The Commission notes that achieving quality objectives will require reducing pressures, restoration (e.g. morphological), and full implementation of the Nitrates Directive and the Urban Waste Water Treatment Directive, as well as better integration of action in agriculture and transport. Diffuse pollution of nutrients (phosphorus, nitrogen) from agriculture are identified as a major challenge: “Around 38% of the EU’s surface water bodies are under pressure from diffuse pollution (of which agricultural production is a major source (25%))”. Failure to achieve the WFD’s objectives is considered to be due to insufficient funding, slow Member State implementation and insufficient integration of environment into other sectoral policies. Actions to address these should include working on best practices for cost-recovery, reduction of pollutants at source and green infrastructure (ESPP eNews No. 39, January 2020).

Further information on the Water Framework Directive and related EU legislation can be found under [https://ec.europa.eu/environment/water/water-framework/info/intro\\_en.htm](https://ec.europa.eu/environment/water/water-framework/info/intro_en.htm) (last access: Nov 28, 2019).

[Directive 2008/105/EC on Environmental Quality Standards \(Priority Substances Directive\) Amending Directive 2000/60/EC by replacing its Annex X \(First list of priority substances based on Art. 16 of the Water Framework Directive\) with a new list of 33 priority substances and 8 other pollutants, for which limits on concentration were established \(Annexes I and II of Directive 2008/105/EC.](#)

This Directive introduced an obligation to review the list of priority substances by January 13, 2011. Following this obligation, a new Directive amending the Water Framework Directive and the Environmental Quality Standards Directive was proposed (COM (2011)876). As yet, no decision has been reached on this proposal.

[Groundwater Directive 2006/118/EC](#)

Another Directive directly related to the Water Framework Directive is the Groundwater Directive 2006/118/EC, which was developed in response to the requirements of Art. 17 of the Water Framework Directive. It laid down additional technical specifications to protect groundwater against pollution and deterioration, including criteria and procedures for assessing groundwater chemical status (Art. 3 and 4), identification of significant and sustained upwards trends (Art. 5) and measures to prevent or limit inputs of pollutants into groundwater (Art. 6).

[Drinking Water Directive 98/83/EC \(last amended October 6, 2015\)](#)

This Directive concerns the quality of water intended for human consumption, aiming to protect human health from the adverse effects of any contamination of water intended for human consumption by ensuring that it is wholesome and clean (Art. 1). It defines minimum requirements and quality standards for drinking water (Art. 4 and 5, Annex I), including its being free from any micro-organisms and parasites, as well as limit values for certain contaminants/pollutants. In addition, an obligation for monitoring and remedial actions and restrictions is established for the Member States (Art. 7 and 8). The Annexes must be reviewed regularly in order to account for scientific and technical progress (Art. 11).

This directive has been under revision since February 2018. A revised version that has been amended several times was approved by the EU parliaments’ ENVI Committee on February 18, 2020. The next step was accomplished on 23 October 2020 when the European Council adopted it as a first reading

position, after which it will go into a second reading for announcement at the European Parliament (EP) Plenary, vote at the Environment Committee and then, as a final step, vote by the EP Plenary. In accordance with the letter of 18 February 2020 sent by the Chair of the European Parliament's Committee on the Environment, Public Health and Food Safety to the Chair of the Committee of Permanent Representatives, the European Parliament should, at second reading, approve the Council's position at first reading without amendment.

The main aim of the new proposal is to further improve water quality and safety by adding new and emerging substances (such as legionella and chlorate) to the list of criteria determining water safety and hygiene, and by tightening existing or introducing new maximum limits for certain pollutants (e.g. PFAS, endocrine disruptors Bisphenol A and Beta-estradiol). It also addresses the obligation for Member States to improve access to water for all people. In addition, monitoring of microplastics levels is introduced, and it is stipulated that consumption of tap water instead of bottled water shall be encouraged by improving information about the quality of drinking water, aiming to reduce plastic waste. See <https://www.europarl.europa.eu/legislative-train/theme-environment-public-health-and-food-safety-envi/file-revision-of-the-drinking-water-directive> for further information.

#### Bathing Water Directive 2006/7/EC (last amended December 28, 2013)

This Directive concerns the management of bathing water quality and lays down provisions for its monitoring and classification as well as for information to the public. Its purpose is to preserve, protect and improve the quality of the environment and to protect human health by complementing Directive 2000/60/EC (Art. 1). Quality criteria based on microbial pollution with pathogenic organisms are set out in Annexes I and II.

Member States are obliged to transpose these Directives into national law, which was done e.g. by setting standards for the discharge of waters into natural water bodies, including threshold / limit values for nitrates, pesticides and other contaminants. While legislation regarding the protection of waters does not relate to fertiliser production and quality in a direct way, the water quality standards set by such legislation will have an impact on fertilisation practice and its legal regulation. A good example for this is the Nitrates Directive and related legislation (see chapters on Nitrates Directive and related national legislation). The definition of priority substances and the setting of legal limit values for such substances in surface and ground water bodies may not only have an effect on the definition of good fertilising practices, but also on the introduction (or tightening) of limit values for the respective substances in fertilisers.

#### Urban Waste Water Treatment Directive 91/271/EEC

This Directive concerns the collection, treatment and discharge of urban waste water and the treatment and discharge of waste water from certain industrial sectors. Its objective is to protect the environment from the adverse effects of the abovementioned waste water discharges (Art. 1).

The Urban Waste Water Treatment Directive sets **compulsory standards for the collection, treatment and discharge of waste waters** (Annex I), including requirements for primary and

secondary (biological) treatment and the designation of sensitive areas according to criteria laid down in Annex II, where more stringent rules for treatment and discharge apply. These rules include maximum concentration values for (bio)chemical oxygen demand (BOD) and total suspended solids, as well as N and P concentrations of the discharges from urban waste water treatment plants.

The Directive stipulates that **treated waste water as well as sludge arising from waste water treatment shall be reused whenever appropriate** (Art. 12 and 14), while making sure that disposal routes shall **minimize the adverse effects on the environment**.

Member States were obliged to transpose this directive into national law, which they did by implementing national acts and ordinances such as German Ordinance on the Discharge of Waste Water (AbwV).

On December 13, 2019, the European Commission has published conclusions of an assessment of the Urban Waste Water Treatment Directive (UWWTD), based on an in-depth JRC and OECD study and specific public consultations (SWD (2019) 700 final). The UWWTD assessment concludes that the Directive has been effective, that benefits outweigh costs, that administrative costs are negligible compared to costs and benefits, that it is coherent with other water policy and that there is widespread recognition that the Directive is still needed and that withdrawing it would have negative impacts. The Directive is assumed to have been successful in reducing pollution, with wastewater BOD (biochemical oxygen demand), nitrogen and phosphorus reduced by 61%, 32% and 44% from 1990 to 2014. However, full compliance still has not been achieved in a number of Member States: full compliance for phosphorus would reduce current total emissions to surface waters by over 13.5%. A further 250 billion € need to be spent in the EU until 2030 to maintain and achieve full UWWTD compliance. Nonetheless, the Directive is assessed to be cost effective, with total EU annual capital and operating costs at 18 billion €/year compared to benefits of nearly 30 billion €/year. Challenges which should be assessed are identified as: improving cost-recovery (water tariffs), better collection and treatment of stormwater overflows and urban runoff, emerging contaminants (pharmaceuticals, microplastics), more coherent definition of eutrophication, the definition of 'Sensitive Areas' by Member States, Circular Economy potentials (control at source of pollutants to facilitate agricultural use of sludge and water reuse) and improving treatment of waste water from smaller agglomerations and non-connected households (these place significant pressure on over 10% of Europe's water bodies). The assessment concludes that the Directive has led to innovation so that today eight of the world's top fifteen water businesses are EU-based (ESPP eNews No. 39, January 2020).

#### [Nitrates Directive 91/676/EEC and the SAFEMANURE project](#)

The objective of the Nitrates Directive is to **reduce water pollution caused or induced by nitrates from agricultural sources and to prevent further such pollution** (Art. 1). Member States are obliged to **monitor nitrate concentrations** in their ground and surface waters and to designate territories draining into waters that are or could be affected by high nitrate levels as **vulnerable zones** (Art. 3). Annex I of the Directive defines criteria for the evaluation of waters according to Art. 3. Alternatively, countries can designate their whole national territory as vulnerable zone. This approach was chosen by Germany as well as by Austria, Denmark, Finland, Ireland, Lithuania, Luxembourg, Malta, the Netherlands and Slovenia. All Member States had to establish **codes of good agricultural practice**

(topics defined in Annex II) and establish and apply **action programmes** (measures defined in Annex III) aiming to reduce existing and prevent future nitrate pollution from agricultural sources for their nitrate vulnerable zones (Art. 4 and 5). The Nitrates Directive was transposed into national law by the Member States by issuing national rules for fertilisation, such as the German Fertiliser Application Ordinance (DüV), see chapter on National legislation.

According to Annex III Nr. 2 of the Nitrates Directive, all National Action Programmes had to include a **limit of 170 kg nitrogen (N) per hectare and year from livestock manure**. Member States were allowed to get derogations to go beyond that limit, however, only under strict conditions laid out in this Annex. Some countries were granted such derogations, typically up to a limit of 230-250 kg N/ha and year. Germany had a derogation in the past (until 2014), but is currently not allowed to exceed the 170 kg limit (see National legislation – Fertiliser Application Ordinance).

According to the legal definition in Art.2 letter g, for the purpose of the Nitrates Directive, **'livestock manure'** means waste products excreted by livestock or a mixture of litter and waste products excreted by livestock, **even in processed form**. This implies that **fertilisers based on livestock manure remain manure and as such may only be used in accordance with the 170 kg N limit**, even if they bear no resemblance to animal manure in their physico-chemical characteristics anymore. This is seen critically by many producers and researchers nowadays, who point out that there are manure derived fertilisers that in fact bear the same characteristics like mineral fertilisers (see for example ESNI 2019 presentation by de Leeuw on fertiliser made from poultry litter ash in the Netherlands (ReNu2Farm)) – according to de Leeuw, poultry litter ash is in fact a mineral PK fertiliser, but has not been acknowledged as such by the EU authorities under Regulation (EC) No 2003/2003 on mineral fertilisers (see there) until now. A similar line of reasoning is brought forward by Hermann et al. (2019) who emphasize that 'when the Nitrates Directive was enforced in 1991, technologies for processing manure did not encompass producing products with distinctively different characteristics in terms of chemical composition, physical state and crop nutrient performance.' In the meantime, however, it has been demonstrated many times (e.g. by the EU project SYSTEMIC) that products can be produced from manure (and manure-based digestates) which fully correspond to specifications of mineral fertilisers from fossil resources, e.g. ammonium sulphate, ammonium nitrate, struvite and other mineral concentrates. Consequently, there are **efforts to develop harmonised criteria that could allow to grant N fertilisers partially or entirely derived from manure a status as 'chemical fertiliser' as defined in the Nitrates Directive** ('chemical fertiliser' according to Art. 2 letter f Nitrates Directive means any fertiliser which is manufactured by an industrial process). To this end, a proposal was worked out by the European Commission Joint Research Centre (JRC) under the title **'SAFEMANURE – Developing criteria for safe use of processed manure in Nitrates Vulnerable Zones above the threshold established by the Nitrates Directive'**. An interim report containing the first draft proposal for so-called RENURE criteria (**Recovered Nitrogen from manure**) was presented by Huygens et al. in September 2019.

Main objectives of the proposed criteria for RENURE materials were

- To ensure a similar agronomic efficiency and a similar N leaching potential like Haber-Bosch derived chemical fertilisers when applied under good management practices



- Not to exacerbate risks related to sustainability dimensions, environment and human health beyond those directly targeted in the Nitrates Directive (mainly regarding contaminants of emerging concern and metals, NH<sub>3</sub>-losses and odour nuisances).

RENURE was defined by Huygens et al. (2019) as ‘any nitrogen containing substance fully or partially derived from livestock manure through processing under controlled conditions that can be used in areas with water pollution by nitrogen following the same provisions applied to nitrogen containing chemical fertilisers as defined in the Nitrates Directive (91/676/EEC), while providing adequate agronomic benefits to enhance plant growth.’

A combination of product specific and use specific parameters was proposed in the RENURE compliance scheme, comprising

- A Total Organic Carbon (TOC): Total N (TN) ratio  $\leq 3$  or a mineral N:TN ratio  $\geq 90\%$  for RENURE materials
- Limit values for Cu (300 mg/kg DM), Hg (1 mg/kg DM) and Zn (800 mg/kg DM) (no limit values were proposed for veterinary drugs since it was concluded that more information was still needed to understand and evaluate their environmental risks)
- The provision of best management practices for timing and mode of application by Member States (application must be synchronized with plant nutrient requirements, and - when appropriate – cover/catch crops shall be used to prevent nutrient leaching and run-off losses from RENURE application on fallow land)
- Provisions by Member States necessary to prevent and minimise NH<sub>3</sub>-emissions during RENURE application on the field (especially if RENURE N fertilisers have  $<40\%$  of their TN present as NO<sub>3</sub>-N, or if they are applied on soils with pH $>5$ )
- Provisions by Member States necessary to prevent and minimise emissions to air resulting from storage, through enforcing appropriate storage conditions.

So far, **the proposal does NOT suggest to use RENURE criteria for defining the end point in the manufacturing chain.** As stated by Huygens et al. (2019, SAFEMANURE interim report page 2 and page 6), given the animal origin of RENURE materials, legal requirements relating to manure as an animal by-product, in particular Regulations (EC) No 1069/2009 and (EU) No 142/2011, should continue to apply until the end point in the manufacturing chain, as defined in these Regulations, is reached. Consequently, **it is NOT proposed to list the materials identified as RENURE materials under CMC 10** (Derived products within the meaning of Regulation (EC) No 1069/2009 having reached the end point in the manufacturing chain) **of the the new European Fertiliser Products Regulation No 2019/1009.** On 19 September 2020 the final report “*Technical proposals for the safe use of processed manure above the threshold established for Nitrate Vulnerable Zones by the Nitrates Directive (91/676/EEC)*” was published essentially confirming the criteria defined in the intermediate report and discussed by the expert group in a meeting at JRC Sevilla in January 2020: processed manure characterised by a ratio of total organic carbon to total N  $\leq 3$  or a mineral N to total N ratio  $\geq 90\%$  may have a similar N leaching potential and agronomic efficiency to Haber-Bosch derived and equivalent chemical N fertilisers. Nitrogen-rich processed manure materials, such as scrubbing salts, mineral concentrates, and liquid digestates obtained through centrifugation and/or advanced solids removal might be able to meet these requirements. To comply with the objectives of environmental protection, it is, however, necessary to combine the use of RENURE with good management practices, including the use of living plant covers or equivalent measures, low NH<sub>3</sub> emission



application techniques and good RENURE storage conditions. Altogether, this report proposes a set of material and use requirements to enable the safe use of RENURE in areas with water pollution by nitrogen, in amounts above the threshold established by the Nitrates Directive (91/676/EEC). The RENURE criteria are expected to be adopted by the European Commission in a first step and may be enforced in the course of 2021.

The full report is accessible under <https://ec.europa.eu/jrc/en/publication/eur-scientific-and-technical-research-reports/technical-proposals-safe-use-processed-manure-above-threshold-established-nitrate-vulnerable>

### National Emissions Ceilings (NEC) Directive 2016/2284/EU

This Directive is part of the so-called **Clean Air Policy Package** adopted by the European Commission in 2013, which included a **Clean Air Programme for Europe** setting objectives for 2020 and 2030, and accompanying legislative measures ([https://ec.europa.eu/environment/air/clean\\_air/index.htm](https://ec.europa.eu/environment/air/clean_air/index.htm), last access Dec 5, 2019).

It sets national emissions reduction commitments for Member States and the EU for five important air pollutants. It establishes reporting requirements for Member States, who are obliged to submit **National Air Pollution Control Programmes** including emission inventories as well as strategies and measures for their reduction at regular intervals.

One of the pollutants addressed by the Directive is  $\text{NH}_4$ , which originates from agriculture to a very large extent. The Directive stipulates a reduction of ammonia emissions by 29% in 2030 compared to the level of 2005.

Transposing this goal into national law required further action from the Member States regarding the implementation of emission reduction measures related to fertilisation practices. For example, Germany adapted its Fertiliser Application Ordinance regulating best management practices in fertilisation accordingly, specifically with regard to the application of liquid organic fertilisers such as animal manure or slurry.

Such requirements need to be kept in mind when evaluating the quality of BBFs from an environmental point of view.

### Renewable Energy Directive 2018/2001/EU and related legislation

A large and growing NRSS forming the basis for a number of unprocessed as well as processed biobased fertilisers are digestates resulting from the production of biogas from biomass (energy crops and organic wastes) as a renewable energy source. In addition, organic residues that may be suitable input materials for BBFs occur from the production of other biofuels based on biomass, both liquid (e.g. bioethanol, biodiesel) and solid. Policies and legislation related to renewable energy targets may have a considerable influence on the quantitative development of these sidestreams. In particular, legislation resulting from the targets set by the **Energy Union Strategy** published in 2015 (COM/2015/80 final) is relevant in this regard. The Energy Union Strategy is currently being implemented by the so-called **Clean Energy for All Europeans Package**, consisting of a total of eight

legislative acts (<https://ec.europa.eu/energy/en/topics/energy-strategy-and-energy-union/clean-energy-all-europeans>, last access Dec 5, 2019). With view to biomasses, the following legislative acts are most relevant:

Directive (EU) 2018/2001 on the promotion of the use of energy from renewable sources (recast of Directive 2009/28/EC)

The Revised Renewable Energy Directive (RED II) entered into force in December 2018. As a recast of Directive 2009/28/EC, it updated the renewable energy targets set in that Directive for 2020 for the next decade.

As stated in Art. 1, this Directive establishes a common framework for the promotion of energy from renewable sources. It sets a **binding Union target for the overall share of energy from renewable sources in the Union's gross final consumption of energy in 2030 of at least 32%** (with the option for possible upwards revision by 2023, Art. 3 of this Directive). It also lays down **rules on**

- **financial support for electricity from renewable sources,**
- self-consumption of such electricity,
- **the use of energy from renewable sources in the heating and cooling sector and in the transport sector,**
- regional cooperation between Member States and between Member States and third countries,
- guarantees of origin,
- administrative procedures and
- information and training.

It also establishes **greenhouse gas emissions saving criteria for biofuels, bioliquids and biomass fuels** (see following paragraphs).

As can be seen from the definition of 'energy from renewable sources' or 'renewable energy' in Art. 2(1), biomass (energy crops) is just one out of many renewable non-fossil sources that may be used to reach the 2030 renewable energy target. This particular source, however, may be associated with a considerable drawback: As has been observed in some Member States since the introduction of support schemes for biomass energy through EU policy, so-called **indirect land use change (ILUC)** may occur as a result of pasture or agricultural land previously destined for food and feed markets being diverted to the production of energy crops. This happens because in order to keep up food and feed production, agricultural land may be extended into areas with high carbon stock, such as forests, wetlands or peatlands. This land use change may be **associated with considerable release of greenhouse gas emissions**, i.e. emission of CO<sub>2</sub> that was previously stored in trees and soil and is therefore **unwanted**. ILUC is therefore explicitly addressed in the recast Renewable Energy Directive in several ways:

In Art. 26, **specific rules are defined for biofuels, bioliquids and biomass fuels produced from food and feed crops:**

- As stated in Art. 26(1), for the calculation of a Member State's gross final consumption of energy from renewable sources (Art. 7) and the minimum share of renewable energy in the transport sector (Art. 25(1)), the share of biofuels and bioliquids, as well as of biomass fuels consumed in transport, where produced from food and feed crops, shall be no more than 1%

point higher than the share of such fuels in the final consumption of energy in the road and rail transport sectors in 2020 in that Member State (with a maximum of 7%).

- Member States may set a lower limit and may distinguish between different biofuels, bioliquids and biomass fuels produced from food and feed crops, taking into account best available evidence on indirect land-use change impact.
- According to Art. 26(2), the share of **high-indirect land-use change risk biofuels, bioliquids or biomass fuels** produced from food and feed crops for which a significant expansion of the production area into land with high-carbon stock is observed shall not exceed the level of consumption of such fuels in that Member State in 2019, unless they are certified to be low indirect land-use change-risk fuels. From Dec 31, 2023 until Dec 31, 2030 at the latest, that limit shall gradually decrease to 0%.
- **low indirect land-use change-risk biofuels, bioliquids and biomass fuels** are defined in Art. 2(37) of this directive as fuels the feedstock of which was produced within schemes which avoid displacement effects of food and feed-crop based fuels through improved agricultural practices as well as through the cultivation of crops on areas which were previously not used for cultivation of crops, and which were produced in accordance with the sustainability criteria for biofuels, bioliquids and biomass fuels laid down in Art. 29.
- By Feb 1, 2019, the Commission was obliged to adopt a delegated act to supplement Directive (EU) 2018/2001, setting out criteria for certification of low indirect land-use change-risk biofuels, bioliquids and biomass fuels and for determining the high indirect land-use change-risk feedstock for which a significant expansion of the production area into land with high-carbon stock is observed. Following this obligation, the Commission adopted the Delegated Regulation on Biofuels and Indirect Land Use Change on March 13, 2019 (see below).

In Art. 29, **sustainability and greenhouse gas emissions criteria are defined for biofuels, bioliquids and biomass fuels**. According to Art. 29(1), energy from these fuels shall only be taken into account as contributing towards the defined renewable energy targets and for the eligibility for financial support, if they fulfil the following criteria:

Table A5: Sustainability and greenhouse gas emissions criteria for biofuels, bioliquids and biomass fuels

Type of biomass (Article/paragraph)	Sustainability/Greenhouse gas emissions criteria
Waste and residues derived not from forestry but from agricultural land (Art. 29(2))	Operators/national authorities must have monitoring or management plans in place addressing the impacts on soil quality and soil carbon
Agricultural biomass (Art. 29(3))	No raw material obtained from land with a high biodiversity value (further specified in this paragraph)
Agricultural biomass (Art. 29(4))	No raw material obtained from land with high-carbon stock (i.e. wetlands, forests or land with high trees)
Agricultural biomass (Art. 29(5))	No raw material obtained from land that was peatland in January 2008, unless evidence is provided that the cultivation and harvesting of that raw material does not involve drainage of previously undrained soil

Forest biomass (Art. 29(6))	National or subnational laws applicable in the area of harvest as well as monitoring and enforcement systems in place, or alternatively, management systems in place ensuring sustainable production (further specified in this paragraph)
Forest biomass (Art. 29(7))	Land-use, land-use change and forestry criteria further specified in this paragraph must be met, ensuring that carbon stocks and sinks levels in the forest are maintained or strengthened over the long term
All biomasses (Art. 29(10))	Greenhouse gas emission savings from the use of the respective fuel shall be: <ul style="list-style-type: none"> <li>(a) At least 50% for fuels produced in installations in operation on or before Oct 5, 2015</li> <li>(b) At least 60% for fuels produced in installations starting operation from Oct 6, 2015 until Dec 31, 2020</li> <li>(c) At least 65% for fuels produced in installations starting operation from Jan 1, 2021</li> <li>(d) At least 70% for electricity, heating and cooling production from biomass fuels used in installations starting operation from Jan 1, 2021 until Dec 31, 2025, and 80% for installations starting operation from Jan 1, 2026.</li> </ul>

Regulation (EU) No 2018/1999 on the Governance of the Energy Union and Climate Action According to **Regulation (EU) 2018/1999**, Member States had to set up **10-year National Energy & Climate Plans for 2021-2030** (NECPs) outlining how they were going to meet the 2030 targets set by the Revised Renewable Energy Directive, including a longer-term view towards 2050. The drafts submitted to the Commission in early 2019 were reviewed by the Commission and are currently being finalised by the Member States.

Delegated Regulation on Biofuels and Indirect Land Use Change of March 13, 2019, supplementing Directive (EU) 2018/2001

As stated in its Art. 1, this Regulation specifies criteria for **determining high indirect land-use change-risk feedstock** for which a significant expansion of the production area into land with high carbon stock is observed, and for **certifying low indirect land-use change-risk biofuels, bioliquids and biomass fuels**.

According to Art. 3, cumulative criteria for high ILUC-risk feedstock are

- (a) The average annual expansion of the global production area of the feedstock since 2008 is higher than 1% and affects more than 100,000 hectares, and
- (b) The share of such expansion into land with high-carbon stock is higher than 10%.

The Regulation is accompanied by an Annex containing the relevant information needed to apply the above criteria.

According to Art. 4 low ILUC-risk biofuels, bioliquids and biomass fuels must

- (a) comply with the sustainability and greenhouse gas emissions saving criteria set out in Art. 29 of Directive (EU) 2018/2001, and
- (b) have been produced from additional feedstock obtained through additionality measures according to Art. 5 of this Regulation. 'Additional feedstock' is defined in Art. 2 as additional amount compared to the average yield, while 'additionality measure' means any improvement of agricultural practices leading, in a sustainable manner, to an increase in yields; and any action that enables the cultivation of crops on unused or abandoned land.

According to Art. 26(2) of Directive (EU) 2018/2001, **this Regulation shall be reviewed by the Commission by Sept 1, 2023** and amended where appropriate. In addition, by that time, a trajectory shall be included to **gradually decrease the contribution of high ILUC biofuels, bioliquids and biomass fuels** produced from feedstock for which a significant expansion of the production into land with high-carbon stock is observed.

***Most of the other elements of Directive 2018/2001/EU must be transposed into national law by Member States by June 30, 2021.***

Submitted (not yet approved by the EU)

## 4. Common Agricultural Policy (CAP) and related legislation

The CAP provides a policy framework for European Agriculture, aiming to

- support EU farmers and improve agricultural productivity, ensuring a stable supply of affordable food
- safeguard EU farmers to make a reasonable living
- help tackle climate change and the sustainable management of natural resources
- maintain rural areas and landscapes across the EU
- keep the rural economy alive by promoting jobs in farming, agri-foods industries and associated sectors

([https://ec.europa.eu/info/food-farming-fisheries/key-policies/common-agricultural-policy/cap-glance\\_en](https://ec.europa.eu/info/food-farming-fisheries/key-policies/common-agricultural-policy/cap-glance_en), last access: Dec 4, 2019).

CAP is based on two pillars:

- 1) **Direct payments** (income support, remunerating farmers for environmentally friendly farming and delivering public goods not normally paid for by the markets, e.g. taking care of the countryside) and **market measures** (to deal with difficult market situations such as a sudden drop in demand or a fall in prices), financed by the European Agricultural Guarantee Fund (EAGF)
- 2) **Rural development measures** with national and regional programmes, financed by the European Agricultural Fund for Rural Development (EAFRD)

By designing their direct payments programmes and targeting their market and development measures accordingly, both pillars allow to considerably influence the use of NRSS for the production of BBFs.

The following regulations contain rules for the CAP for the period 2014-2020:

### Rural Development Regulation (EU) 1305/2013

This Regulation sets rules for the financial support for rural development, defining six Union priorities to which national and regional rural development programmes (designed by Member States) must relate in order to receive funding from the EAFRD (Art. 5):

- (1) Fostering knowledge transfer and innovation in agriculture, forestry and rural areas
- (2) Enhancing farm viability and competitiveness of all types of agriculture in all regions and promoting innovative farm technologies and sustainable forest management
- (3) Promoting food chain organisation, including processing and marketing of agricultural products, animal welfare and risk management in agriculture
- (4) **Restoring, preserving and enhancing ecosystems** related to agriculture and forestry
- (5) **Promoting resource efficiency** and supporting the **shift toward a low-carbon and climate resilient economy** in the agriculture, food and forestry sectors
- (6) Promoting social inclusion, poverty reduction and economic development in rural areas

Of particular relevance with regard to NRSS/BBFs are priorities 4 and 5 which explicitly mention the option for programmes to focus on

4b) improving water management, including **fertiliser** and pesticide **management**

or on

5c) facilitating the supply and **use of renewable sources** of energy, of by-products, wastes and residues and of other non-food raw material, for the purposes of the bio-economy

5d) reducing greenhouse gas and **ammonia emissions** from agriculture

5e) fostering **carbon conservation** and sequestration in agriculture and forestry

### Horizontal CAP Issues Regulation (EU) 1306/2013 on the financing, management and monitoring of the common agricultural policy

As specified in Art. 1, this Regulation lays down rules on

- (a) Financing of expenditure under the CAP
- (b) The farm advisory system
- (c) The management and control systems to be put in place by the Member States
- (d) The cross-compliance system
- (e) Clearance of accounts

The **cross-compliance (CC) system** attaches the financial support of farmers through the CAP to so-called cross-compliance rules that must be respected by farmers regarding the following areas (Art. 93 and Annex II of this Regulation):

- (a) Environment, climate change and good agricultural condition of land
- (b) Public, animal and plant health
- (c) Animal welfare.

As stated in Art. 92 of this Regulation, **CC rules apply to beneficiaries receiving direct payments** under Regulation (EU) No 1307/2012, payments under Art. 46 and 47 of Regulation (EU) No 1308/2013 **and the annual premia** under points (a) and (b) of Art. 21(1), Art. 28-31, 33 and 34 of Regulation (EU) No 1305/2013.

CC rules include **statutory management requirements** as well as **standards for good agricultural and environmental condition of land** (see Annex II), and can be established on EU as well as on national level by legal acts. **Examples listed in Annex II relating to NRSS/BBFs** are

- The **Nitrates Directive 91/676/EEC** concerning the protection of waters against pollution caused by nitrates from agricultural sources and related national legislation (see chapters on Nitrates Directive and national legislation)
- The **protection of ground water** against pollution (see Groundwater Directive)
- The **maintenance of soil organic matter level** through appropriate practices

### Direct Payments to Farmers Regulation (EU) 1307/2013

As specified in Art. 1, this Regulation establishes common rules on payments granted directly to farmers under the support schemes listed in its Annex I as well as rules for specific payments. Among the list of specific payments is a payment for farmers observing agricultural practices beneficial for the climate and the environment (letter b, No iv), including crop diversification, maintaining existing permanent grassland and having ecological focus area on the agricultural area (Art. 43) as well as a number of so-called equivalent practices listed in Annex IX of this Regulation. So far, none of the listed practices is related to the use of NRSS/BBFs.



## Common Market Organisation Regulation (EU) 1308/2013 establishing a common organisation of the markets in agricultural products

In addition to setting rules for market intervention and providing sector-specific aid schemes and support programmes, this Regulation contains rules concerning marketing and producer organisations, including marketing standards for agricultural products. Finally, it provides rules for trade with third countries and competition rules.

A more comprehensive description of the CAP Regulations can be found in Hermann et al. (2019).

## The post 2020 CAP period

After evaluating the achievements of the first CAP period (2014-2020), the European Commission presented **legislative proposals on the future of the CAP** for the new period in June 2018.

[https://ec.europa.eu/info/food-farming-fisheries/key-policies/common-agricultural-policy/future-cap\\_en](https://ec.europa.eu/info/food-farming-fisheries/key-policies/common-agricultural-policy/future-cap_en), last access Dec 4, 2019

Among other **provisions for the new CAP period (2021-2027, start postponed to 2022)**, the Commission proposed the introduction of an obligatory **nutrient management tool** (named **Farm Sustainability Tool for Nutrients, FaST**) to **improve water quality and reduce ammonia and nitrous oxide levels**. This management tool shall be part of the standards for Good Agricultural and Environmental Conditions (GAECs) defining rules for cross compliance (CC). The FaST tool includes the development of a smart phone tool, made available to farmers free of charge, which will provide information on applicable regulations and enable entry of nutrient data, field by field, as well as enabling coherent data reporting. Member States and farmers will also be able to use other existing tools to enter their nutrient balance, subject to reporting compatibility. (see [https://ec.europa.eu/info/news/new-tool-increase-sustainable-use-nutrients-across-eu-2019-feb-19\\_en](https://ec.europa.eu/info/news/new-tool-increase-sustainable-use-nutrients-across-eu-2019-feb-19_en), last access Feb 25, 2020, for more information).

Another focus of the post 2020 CAP period is the **preservation of carbon-rich soils** through protection of wetlands and peatlands. Speakers at the EU Agricultural Outlook Conference, 10<sup>th</sup>-11<sup>th</sup> December 2019, including the new Commissioner for Agriculture Janusz Wojciechowski and the new Commissioner for Health and Food Safety, emphasized the pursuit of sustainability in agriculture including **carbon neutrality or even carbon sequestration by soils as well as agricultural and forestry activities** ([https://ec.europa.eu/info/events/2019-eu-agricultural-outlook-conference-2019-dec-10\\_en](https://ec.europa.eu/info/events/2019-eu-agricultural-outlook-conference-2019-dec-10_en), accessed January 5, 2020). In a recent study, the International Institute for Applied Systems Analysis (IIASA) outlined 'A roadmap to make the land sector carbon neutral by 2040'. If countries were to implement the roadmap, the land sector could become carbon neutral by 2040 and a net carbon sink by 2050. The land sector currently emits about 11 Gt CO<sub>2</sub>e per year (about 25% of global emissions). With this roadmap, it will be a net carbon sink of about three Gt CO<sub>2</sub> per year by 2050. Together, these actions would mitigate 15 Gt CO<sub>2</sub> per year – about 50% from reducing emissions and 50% from additional carbon uptake by land (Roe et al., 2019).

For the post 2020 period, the European Commission proposes a **new way of working**, which shall streamline administrative processes, make environmental protection easier and simplify support to young farmers. This includes the **submission of national strategic plans by Member States**, in which

the countries outline how they intend to use the CAP instruments (direct payments, rural development and sectorial strategies) to meet the 9 EU-wide objectives of the CAP:

- To ensure a fair income to farmers
- To increase competitiveness
- To rebalance the power in the food chain
- Climate change action
- Environmental care /foster sustainable development and efficient management of natural resources such as water, soil and air
- To preserve landscapes and biodiversity
- To support generational renewal
- Vibrant rural areas
- To protect food and health quality.

For further information see [https://ec.europa.eu/info/sites/info/files/food-farming-fisheries/key\\_policies/documents/cap-post-2020-enviro-benefits-simplification\\_en.pdf](https://ec.europa.eu/info/sites/info/files/food-farming-fisheries/key_policies/documents/cap-post-2020-enviro-benefits-simplification_en.pdf) (last access Feb 25, 2020).

On May 20, 2020, the European Commission published the **'Farm to Fork' Strategy** as part of the EU **'Green Deal'** (COM(2020)381 final plus Annex). Aiming to achieve a more sustainable food production, this strategy explicitly addresses the **excess of nutrients** (especially nitrogen and phosphorus) as a major challenge. Two objectives are stated which should considerably influence the post 2020 CAP period with regard to nutrient recycling: The Commission will act to **reduce nutrient losses by at least 50% by 2030**, while ensuring no deterioration on soil fertility. This shall in turn **reduce the use of fertilisers by at least 20% by 2030**. To this end, the **EU "Integrated Nutrient Management Plan" (INMAP)**, which was already proposed as part of the **new Circular Economy Action Plan in March 2020**, will be developed together with Member States (a stakeholder consultation was held until end of June 2020). The aim of the INMAP is to ensure a more sustainable application of nutrients and to stimulate the markets for recovered nutrients. The **recycling of organic waste into renewable fertilisers** is explicitly mentioned as a **key measure to be included into Member States' CAP Strategic Plans**.

The Draft Action Plan for the Farm to Fork Strategy contains two additional actions which may be relevant in terms of using NRSS for the production of BBFs, namely (indicative timetable in brackets)

- The EU **carbon farming initiative** (Q3, 2021)
- A proposal for **EU-level targets for food waste reduction** (2023)

On 21 October 2020, the **European Council** agreed its **negotiating position (general approach) on the post-2020 common agricultural policy (CAP) reform package**. This agreed position puts forward some strong commitments from Member States for **higher environmental ambition** with instruments like **mandatory eco-schemes** (a novelty compared to the current policy) and **enhanced conditionality**. At the same time, the agreed position allows Member States to have the necessary flexibility in how they would reach environmental goals. For instance, there would be a two-year pilot phase for eco-schemes and Member States would enjoy flexibility on how to allocate funds under different green practices. The **European Parliament** voted by a large majority its **key points for the CAP reform: 10% of money available for measures enhancing biodiversity, 35% for environmental and climate related measures and direct payments for eco-schemes**.

Environmentalists and Green MEPs still complain that the proposal does not go far enough and indeed, the CAP proposals and the Farm2Fork Strategy do not seem to be fully coherent. The vision, mission and strategy statements related to the Green Deal, the Farm2Form Strategy and the „Caring for Soil is Caring for Life“ Mission are apparently not sufficiently reflected in the ongoing CAP discussions.

*Submitted (not yet approved by the EC)*

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Submitted (not yet approved by the EC)

## PART B: LEGAL FRAMEWORK GOVERNING THE USE OF NUTRIENT-RICH SIDESTREAMS (NRSS) AS BIOBASED FERTILISERS (BBFs) – NATIONAL EXAMPLES

### AUTHOR'S NOTE

**Part B** provides examples of the national legal framework governing the use of NRSS as BBFs in a number of EU Member States / European countries. Reports were supplied by members of the project consortium or worked out together with research colleagues from other related projects covering the following countries: Austria, Belgium, Denmark, Finland, Germany, Italy, Norway, Poland, Slovenia, Spain, Switzerland and the UK.

The structure of the national examples follows a guideline that was provided to partners by the task leader of task 1.2, Julius Kühn-Institut (JKI).

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## GUIDELINE WITH TEMPLATE FOR MINIMUM CONTENTS

**Compiled by Sylvia Kratz (JKI)**

When preparing your description of national regulations governing the use of NRSS as BBFs, please use the same structure as presented in Part A – European Legislation (you may also use the national example for Germany as a template, the document is available to you on TIIMERI in the WP1 folder), i.e.

- arrange your example into 4 main chapters (see below)
- use the titles of the legislative texts you are describing as headers (including date of entry into force / last revision date)
- try to be as accurate as possible by citing the respective paragraphs /annexes of a regulation when describing the rules
- answer the following questions in your description, thereby keeping your focus on how these rules may affect the use of NRSS/BBFs:

### 1. Fertilising products and fertilisation

What type of legislation is in place in your country that regulates the production, making available on the market and usage/application of fertilisers? In which way are European regulations regarding fertilisers and fertilisation transposed in your country?

Your description of legal texts should comprise at least:

- Legislation on fertilisers/fertilising products (regarding composition/formulation of fertilisers and limit values for unwanted components)
- National rules transposing the Nitrates Directive 91/676/EEC
- Any additional rules for fertiliser application
- Specific rules for manure(-based) fertilisers
- Specific rules for organic farming

## 2. Waste management

How is the use of waste streams / nutrient rich side streams as starting materials for fertilisers regulated in your country? In which way are European regulations regarding waste management transposed in your country? (e.g. any limit values and/or rules for application of specific materials as fertilisers on agricultural land, any definitions regarding end-of-waste status for particular materials/products)

Your description of legal texts should comprise at least regulations on

- Management of biowaste/biowaste compost
- Management of sewage sludge
- Management of animal by-products

## 3. Ground and surface water quality, soil protection, air quality and climate/renewable energy

How does national legislation designed for environmental protection (water, air, soil, climate/energy) affect the production and usage of BBFs made from NRSS?

Your description should comprise at least the following:

- Rules for the management of nutrient rich waste waters
- Soil-related limit values / limits for contaminant loads and/or application rules for materials as specified by soil protection legislation
- Rules for immission protection, as far as they may affect the generation of air filtering wastes that may qualify as starting material for BBFs
- Rules on the use of biomass for energy production
- Goals/measures defined in your National Energy and Climate Plan 2021-2030, as far as they relate to NRSS/BBFs

## 4. Common Agricultural Policy (CAP) and related legislation

How do national provisions for the implementation of the CAP affect the production and usage of BBFs made from NRSS? Your description should at least answer the following questions:

- Are there any programmes strengthening or limiting the utilisation of particular materials?
- Are there goals/measures defined in your National Strategic Plan for the post 2020 CAP period relating to NRSS/BBFs?



## NATIONAL LEGISLATION: AUSTRIA

Compiled by Julia Tanzer and Ludwig Hermann (PROMAN)

Last updated: 20 Jan 2023

### 1. Fertilising products and fertilisation

Fertiliser Act (Düngemittelgesetz [DMG]) of June 4, 2021 (effective as of October 1, 2021)

The Fertiliser Act regulates the placing on the market of mineral and organic fertilisers, including animal by-products (referred to as “Wirtschaftsdünger”, i.e. livestock manure and crop residues), soil additives, plant additives and growing media. Wastes according to the Waste Act 2002 (see below) and the agricultural utilisation of wastewater, sewage sludge, composted waste and the like are not covered by the Fertiliser Act.

With the exemption of “Wirtschaftsdünger” the materials listed above can only be placed on the market, if they

- Conform to a type approved of in the Fertilising Ordinance, are permitted by means of an official decision, or comply with the provisions of the Regulation (EU) 2019/1009
- At appropriate use do not put soil fertility, health of humans and pets, or the ecosystem at risk
- Are appropriately packaged and labelled
- Do not contain municipal sewage sludge or sewage sludge compost

“Wirtschaftsdünger” are exempted from labelling requirements if they are directly supplied from the farm producing them to the farm using them or to shared storage facilities within the region.

The Fertilising Ordinance must define minimum requirements in accordance with the state of science and technology for each approved type ensuring that it

- Complies with the points listed above
- Is suitable to maintain or improve soil health, support soil fertility, stimulate the growth of plants adequately, improve the quality of the fertilised plants, or increase the yield on the fertilised area

Furthermore, if necessary, the ordinance must specify for each type composition, type of production, input raw materials, technical characteristics, minimum content, form and solubilities of value-determining nutrients, contents of minor constituents and requirements for the effect or application

Contaminants that must not be traceable in fertilisers, soil additives, plant additives and growing media as well as maximum contents of other contaminants have to be specified.

The Minister of Agriculture, Regions and Tourism is in charge of issuing the respective ordinances and decisions, while the Federal Office for Food Safety (bound by instructions of the Minister of Agriculture, Regions and Tourism) is responsible for the monitoring of compliance.

Contrary to the placing on the market of fertilisers, their application falls under the competence of the federal states in is therefore not covered by the Fertiliser Act. Some states have regulated this issue in Soil Protection Acts (see below). However, with the Advisory Committee for Soil Fertility and Soil Protection an important interface between the state and the federal level has been created in 1986. Among others, this committee issues the Directive for proper fertilisation (Richtlinien für die Sachgerechte Düngung, see below), which, according to the Fertiliser Act, have to be consulted for the approval and placing on the market of fertilisers, soil additives, plant additives and growing media.

Fertiliser Ordinance (Düngemittelverordnung) of February 2, 2004 (effective as of February 1, 2004), last amended April 13, 2022

Products (including fertilisers, soil additives, plant additives and growing media) must either be placed on the market as “EG-fertilisers” complying with regulation EC 2003/2003, be granted approval by an official decision (see above) or comply with one of the following types:

1. Mineral nitrogen fertiliser
2. Mineral phosphate fertiliser
3. Mineral potassium fertiliser
4. Mineral lime and magnesium fertiliser
5. Mineral calcium, magnesium, and sulphur fertiliser
6. Mineral micronutrient fertiliser
7. Mineral compound fertiliser
8. Organic fertiliser
9. Biogas manure
10. Organo-mineral fertilisers
11. Growing media
12. Soil additives
13. Plant additives

For each type, minimum nutrient requirements, type-defining components, forms and solubility of nutrients, permitted raw materials, and special requirements are defined in Annex 1 of the ordinance. Below, an example for organic fertilisers is shown:

#### 8. Organic fertiliser

- |  |   |
|--|---|
| <ol style="list-style-type: none"><li>1. Minimum nutrient requirements</li><li>2. Type-defining components, forms and solubility</li></ol> | <ul style="list-style-type: none"><li>• 20% organic substance in the dry matter and one of the following:<ul style="list-style-type: none"><li>○ 1% N</li><li>○ 1% P<sub>2</sub>O<sub>5</sub></li><li>○ 1% K<sub>2</sub>O</li></ul></li><li>• Organic substance</li><li>• Total nitrogen or organically bound nitrogen<ul style="list-style-type: none"><li>○ 85% of nitrogen must be in the form of organic nitrogen</li></ul></li><li>• Total phosphate</li></ul> |
|--|---|

- Total potassium oxide or water-soluble potassium oxide
3. Permitted raw materials One or more of the following:
- Of animal origin
    - Dicalcium phosphate and tricalcium phosphate of animal origin
    - Fish meal
    - Seabird guano
    - Bat guano
    - Hoof meal
    - Horn meal
    - Hydrolysed protein of animal by-products
    - Wool
    - Fulling hair
    - Hair meal
    - Hair
    - Bristles
    - (pelletized or differently treated) poultry-, horse-, pig- or cattle waste
    - Worm compost
    - Quality compost according to the compost ordinance for application in private gardening
    - Biogas manure
    - Other raw material of animal origin derived from category 3 material according to Article 10, EC 1069/2009 laying down health rules as regards animal by-products and derived products not intended for human consumption
  - Of plant origin
    - Press and extraction residues of oil seeds (castor, soy, rape, mustard, sunflower, pumpkin)
    - Vinasse
    - Molasse
    - Pulp from fruit processing
    - Brewers grains
    - Beer- and fruit filtration residues
    - Potato fruit water
    - Stillage from alcohol production
    - Fresh wood fibres (physically treated)
    - Algae
    - Peat
    - Plant residues from agricultural production
    - Rice husks
    - Dedusting waste from cereal processing

- Coconut waste
  - Cocoa husks
  - Roast coffee waste
  - Bark and composted bark
  - Quality compost according to the compost ordinance for application in private gardening
  - Biogas manure
  - Humic acid
  - Castor cake, provided it was sufficiently heated and permanently dust-bound
4. Special requirements
- The product must not contain more than three viable seeds and parts of plants capable of sprouting per litre, unless they are specific to the product
  - The appropriate storage for durability and possible safety regulations must be pointed out
  - Organic fertiliser can only be called organic composite fertiliser if it contains at least 1% N, 1% P<sub>2</sub>O<sub>5</sub> and 1% K<sub>2</sub>O
  - Production, packaging and labelling of fertilisers containing materials of animal origin must meet the requirements of regulation EC 1069/2009 and regulation EU 142/2011 of 26.02.2011. In particular, fertilisers must not lead to confusion with feed and must contain information regarding their correct application. Requirements regarding the admixture of by-products and defined restrictions on use must be met. Producers need a registration or authorization according to the animal material act (BGB. I Nr. 141/2003).

Annex 2 regulates the maximum content of contaminants. For heavy metals both maximum contents in the product and maximum loads to agricultural land are regulated, whereas for organic pollutants, radioactive substances, hygienic parameters and impurities only threshold values in the product exist:

Table B1: Maximum loads of heavy metals to agricultural land

Heavy metal	Maximum loads	
	g/ha within a period of two years	g/ha within a period of one year
Pb	400	200
Cd	10	5
Cr	600	300
Cu*	700	350
Ni	400	200
Hg	10	5
Zn*	3000	1500

\* Except mineral micronutrient fertilisers. If copper and zinc loads applied with the recommended application quantities of fertilisers, soil- or plant additives, are explicitly stated in the label, the maximum permissible amounts in the list can be doubled.

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Table B2: Threshold values of heavy metals, organic pollutants, radioactive substances, organic pollutants and impurities

Threshold values in the product	Fertiliser / soil additives / plant additives	Growing media
<b>Heavy metals</b>		
Pb (mg/kg DM)	100	50
Cd (mg/kg DM)	3*	1
Cr VI (mg/kg DM)	2	2
Ni (mg/kg DM)	100	70
Hg (mg/kg DM)	1	0.5
V (mg/kg DM)	**	-
As (mg/kg DM)	40	40
<b>Organic pollutants and radioactive substances</b>		
16 PAK: Naphthalene, Acenaphthylene, Acenaphthene, Fluorene, Phenanthrene, Anthracene, Fluoranthene, Pyrene, Benzo[a]anthracene, Chrysene, Benzo[b]fluoranthene, Benzo[k]fluoranthene, Benzo[a]pyrene, Indeno[1,2,3-cd]pyrene, Dibenzo[a,h]anthracene and Benzo[ghi]perylene (mg/kg DM)	6	
Organochlor- pesticides: sum of Aldrine, Dieldrine, Endrine, Heptachlorine, Heptachlorepoide, Sum of Hexachlorhexane (alpha-, beta-, gamma-, delta-HCH), DDT, DDE, Chlordane and Hexachlorbenzole (mg/kg product)	0.5	
Polychlorinated biphenyls: sum of congeners 28, 52, 101, 138, 153 and 180 (mg/kg DM)	0.2	
Polychlorinated dibenzodioxin/dibenzofuran toxicity equivalent 2-,3-,7-,8-TCDD (ng TE/kg DM)	20	
Activity of the sum of Cs-134 and Cs-137 (Bq/g product)	0.5	
AOX (adsorbable organically bound halogens) (mg/kg DM)	500	
perfluorised tensides (PFT) as sum of perfluorooctane acid (PFOA) and perfluorooctanesulphonate (PFOS) (mg/kg DM)	0.1	
<b>Hygienic parameters</b>		
Escherichia coli O157:H7 (EHEC), Salmonella sp., Campylobacter sp. and Listeria monocytogenes	not detectable in a 50 g sample	
<b>Impurities</b>		
Sum of glass, metal and plastic > 2 mm	0.4% mass	
Glass > 2 mm	0.2% mass	
Metal > 2mm	0.2% mass	
Plastics > 2 mm	0.1% mass	

\* Mineral fertilisers with > 5% P<sub>2</sub>O<sub>5</sub>: 75 mg/kg P<sub>2</sub>O<sub>5</sub>

\*\* Mineral fertilisers with > 5% P<sub>2</sub>O<sub>5</sub>: 1500 mg/kg DM

In addition, products containing chloride, boron or molybdenum must be specifically labelled, depending on the concentration and product.

Substances that must not be present include the following:

- Substances falling under the hazard categories germ cell mutagenicity, carcinogenicity, or reproductive toxicity (1A, 1B and 2) according to regulation EC 1272/2008 on classification, labelling and packaging of substances and mixtures
- Category 1 material according to regulation EC 1069/2009 laying down health rules as regards animal by-products and derived products not intended for human consumption
- Chemically treated wood

Directive for proper fertilisation on arable land and grassland (Richtlinien für die Sachgerechte Düngung im Ackerbau und Grünland), 8th edition 2022

The directive for proper fertilisation describes the standardized procedure for taking soil samples on agricultural land, as well as their analysis and subsequent soil classification according to soil type, texture, content of humus and carbonate, pH, water condition, coarse fraction, soil structure, plant-available nutrients (nitrogen, phosphorus, potassium, magnesium, trace elements), potassium fixation and exchangeable cations.

Depending on the soil classification, the cultivated species (arable crops and grassland), and the expected yield the directive then provides recommendations for fertiliser amounts of nitrogen, phosphorus, potassium, magnesium, lime, sulphur and micronutrients (B, Cu, Zn, Mn, Fe, and Mo). For instance, for wheat with high yield expectation grown on deep and heavy soil with low N-mineralization rates up to 175 kg N/ha may be suitable, whereas for sunflower with low yield expectations grown on a shallow, light and dry soil with a large coarse fraction and high N-mineralization rate 18-27 kg N/ha are considered sufficient. P<sub>2</sub>O<sub>5</sub> and K<sub>2</sub>O should only be added with fertiliser if the respective concentrations in the soil are below 112-174 mg/kg (P, arable crops, unless the clay content exceeds 15%), 69-174 mg/kg (P, grassland, unless the clay content exceeds 15%), 179-374 mg/kg (K, arable crops) and 171-332 mg/kg (K, grassland). However, on grassland a return of fertiliser with manure and plant residues, is possible even if these concentrations are exceeded.

Furthermore, the directive contains provisions for the preparation of a fertilisation plan, with respects to the timing of fertilisation, requirements according to the "Action programme nitrate" (see below) and the proper accounting for manure, harvest residues and previous crops. An online tool supports the preparation of fertilisation plans.

The directive recommends conducting soil analyses every four to six years and adapting the fertiliser management accordingly.

Derogation of Article 5 of Regulation EC 2003/2003

With the "Commission Decision of 3<sup>rd</sup> January 2006 on the national provisions notified by the Republic of Austria under Article 95(4) of the EC Treaty concerning the maximum admissible content of cadmium in fertilisers", Austria was granted a derogation of Article 5 of Regulation EC 2003/2003. Phosphorus mineral fertilisers marketed with the "EC fertiliser" label are thus be prohibited on the Austrian market if they do not meet the national cadmium limit of 75 mg/kg P<sub>2</sub>O<sub>5</sub>. The derogation



was granted under Article 95(4) of the EC Treaty for Directive 76/116/EEC on 15 May 2002 and will be in force until harmonised limit values for Cd are applicable at Union level which are equal to or lower than the national limits.

*Submitted (not yet approved by the EC)*

## 2. Waste management

Waste Management Act (Abfallwirtschaftsgesetz [AWG]) of July 16, 2002 (effective as of July 1, 2002), last amended December 10, 2021)

The Waste Management Act transposes the Waste Framework Directive 2008/98/EC into national law and therefore closely resembles it in structure.

Like in German law, animal by-products within the meaning of Regulation EC 1069/2009, carcasses of animals that have died other than by being slaughtered, and animals killed to eradicate epizootic diseases are exempt from the waste definition, except in cases, where they are intended for specific waste treatment such as incineration, co-incineration, biogas, or composting plants (§3(1.5)).

Furthermore, several exemptions apply to agricultural waste:

- Collection, storage, transport, and treatment of manure and organic compostable material stemming from agricultural or forestry holding is not necessary if they are subjected to an approved recovery directly on the holding (§2(3)).
- Agricultural and forestry holdings not required to maintain accounts are largely exempt from record keeping requirements for holders of waste (§17(2.2), §20(2.2))
- Land treatment with non-hazardous waste for the benefits of agriculture or ecology does not require approval by the respective Governor of the Federal Province (§24a(2.6)).

§5 is dedicated to end-of-waste criteria as described in Directive 2008/98/EC and enables the Minister of Agriculture, Forestry, Environment and Water Management to define end-of-waste criteria for specific wastes in ordinances. The minister is also responsible for issuing an ordinance setting the criteria for placing on the market of waste-derived compost and soil (§23(2)).

§8 sets regulations for the development of a waste management plan, at least every six years (the latest version dating from 2017, a new version is currently in consultation phase). The plan should contain an analysis and evaluation of the current situation of waste streams, collection systems and treatment infrastructure, as well as concrete provisions on how the aims of the Waste Framework Directive can be met, littering prevented and remediated and indicators and targets regarding amount and treatment of waste. It may also contain the waste prevention programme, which also has to be compiled every six years and must include a specific programme on the prevention of food waste (§9a). The Governors of Federal Provinces also have to develop waste management plans for their regions.

Ordinance on Quality Requirements from Composts made from Wastes (Verordnung über die Qualitätsanforderungen an Komposte aus Abfällen [Kompostverordnung]) of August 14, 2001 (effective as of September 1, 2001)

The compost ordinance regulates the quality criteria, type and origin of source materials, packaging and labelling requirements, as well as quality surveillance and documentation obligations for the placing on the market of composts made from waste. If the requirements of the ordinance are met, composts reach end-of-waste status for the intended use.

Composts are divided in three quality classes based on their source materials, as shown in the following table B3:

Table B3: Composts and their source materials

Quality compost	Compost and quality sewage sludge compost	Waste compost
Organic waste from households and similar institutions	Municipal sewage sludge*	Residual waste
Forage and foliage	Low contaminated sludge from the food and feed industry*	municipal, commercial, and industrial sewage sludge*
Fruit and vegetable waste, flowers	Low contaminated residues from press filter-, extraction- and oil seed residues	Organic waste exempted from the obligation of separate collection
Bark	Gelatine residues of the food and feed industry	
Wood	Bleaching earth	
Harvest- and processing residues	Vinasse	
Vegetable food waste	Solid and liquid manure	
Egg shells	Cocoa shells	
Animal-derived food waste	Flotation sludge and press filter residues from fattening farms and slaughterhouses	
Press and filter residues of the food industry	chemically modified packaging material	
Spoilt seeds	Digestate from anaerobic treatment	
Animal horn, hair, and feather waste		
Ruminal contents		
Solid and liquid manure applicable in organic farming		
Aquatic plants		
Cemetery waste		
Mycelium		
Biodegradable packaging		
Paper		
Digestate from anaerobic treatment		
Processed waste of the above categories		

\* Limits for concentration of certain heavy metals are defined in Annex 2, Table 2b and 2c of the ordinance

In addition, quality classes based on the end product are defined as shown in table B4:

Table B4: Quality classes of composts

mg/kg DM	B	A	A+
Cd	3.0	1.0	0.7
Cr	250.0	70.0	70.0
Hg	3.0	0.7	0.4
Ni	100.0	60.0	25.0
Pb	200.0	120.0	45.0
Cu	500.0	150.0	70.0
Zn	1 800.0	500.0	200.0

Furthermore, permitted aggregates, physical requirements (e.g. content of organic substance, grain size, impurities, etc.) and requirements regarding epidemic-hygienic safety are defined, depending on the intended use.

Compost intended for agricultural use must be produced from source material of the category “Quality compost” or “Compost and quality sewage compost” and must meet at least the requirements of quality class A. If in line with federal regulation, compost meeting requirements of quality class B can be used for own consumption or direct sales.

[Animal by-product Ordinance \(Tiermaterialien-Verordnung\) of December 19, 2008 \(effective as of January 1, 2009\), last amended on May 21, 2010](#)

The animal by-product ordinance regulates storage, transport, and documentation and control obligations for animal by-products and contains provisions for the treatment of certain types of animal by-products. Beyond Regulation (EC) No 1069/2009 the animal by-product ordinance regulates the use and disposal of by-products of game, which should be classified in analogous application of Regulation (EC) No 1069/2009, as well as raw milk and colostrum.

The feeding of former food of animal origin to livestock is prohibited by §10 of the ordinance with the exemption of processed former food containing milk, eggs and their products, as well as feeding milk, whey and milk products in accordance with Regulation (EC) No 79/2005. Raw milk and colostrum of animals treated with veterinary drugs cannot be used for feeding but has to be treated as category 2 material within the meaning of Regulation (EC) No 1069/2009.

Processed former food of animal origin, manure, digestive tract content, milk and colostrum can be put into biogas or composting plants without pre-treatment. Annex IV of the ordinance lays down requirements for hygienisation deviating from Regulation (EC) No 1069/2009.

Manure, digestive tract content, milk and colostrum can furthermore be applied on agricultural area without pre-treatment if not prohibited by other regulations.

### 3. Ground and surface water quality, soil protection, air quality and climate/renewable energy

Water Act (Wasserrechtsgesetz [WRG]) of October 16, 1959, last amended November 22, 2018

The Water Act is a comprehensive law regulating the use of water bodies, the protection and prevention of pollution of water bodies, and protection from water-related hazards. It contains the Austrian implementation of the EU Directives 2000/60/EC (Water Framework Directive), 2008/105/EC (Priority Substances Directive), 2006/118/EC (Groundwater Directive), 91/271/EEC (Urban Waste Water Treatment Directive), and 91/676/EEC (Nitrates Directive).

Relevant in the context of NRSS are particularly the passages regulating use restrictions on agricultural activities:

- §32 regulates impacts on waters subject to approval. In general, agricultural and forestry activities in accordance with existing laws do not require permits under the Water Act. However, fertilisation exceeding 175 kg N/ha/a on agricultural areas without vegetation cover and 210 kg N/ha/a on areas with vegetation cover (including permanent pastures and N consuming crop rotations) need to be approved by the respective authorities.
- §33f enables the Minister of Agriculture, Forestry, Environment and Water Management and the Governors of Federal Provinces to enact use restrictions in certain areas via ordinances in order to reach the targets for groundwater quality.
- Water protection areas, where certain uses are prohibited or restricted, can also be designated around water supply facilities, water resources to ensure future demands can be met, medicinal water sources and curative peat batheries (§34, 35, 37).
- According to §48 Governors of Federal Provinces can enact ordinances regulating or prohibiting pasturing on embankments and dams and the use of certain types of fertiliser along particular water channels or groundwater areas if necessary for the maintenance of water bodies, or prevention of pollution and water damage.

Quality Objective Ordinance “Chemistry Groundwater” (Qualitätszielverordnung Chemie Grundwasser [QZV Chemie GW]) of March 29, 2010, last amended August 21, 2019

The quality objective ordinance “chemistry groundwater” defines criteria for the good chemical status and for a ban on deterioration for groundwater in accordance with the European Directives 2000/60/EC and 2006/118/EC. The threshold values for good chemical status are set at 45 mg/l for nitrate and 0.3 mg/l orthophosphate.

Activities involving a direct or indirect discharge of pollutants to the groundwater should only be granted a permit under the water act (§32) if they do not lead to contamination of the groundwater body. For the substances for which threshold values are defined in the ordinance, discharges that do not lead to an exceedance of the threshold values are not considered as contamination.

Furthermore, potential restrictions under §33f of the Water Act are elaborated. Although failure of good chemical status is only reached if more than 50% of measurement sites exceed the threshold value for a parameter (unless quality objectives for surface waters or terrestrial ecosystems are

impaired) observation and preliminary measure areas are designated if groundwater characteristics are considered at risk at more than 30% of measurement sites and if groundwater characteristics are considered at risk at 50% of measurement sites or a significant and sustained upward trend for a parameter is observed, respectively. Measures set in such areas may, among others, include prohibition of application of N containing fertiliser except for fertilisers used in organic farming, extended temporal prohibitions for the application of N containing fertilisers, sewage sludge and sewage sludge compost on cropland, reduction of maximum permissible fertilisation amounts, and plot-based fertilising plans for N and N balances.

Quality Objective Ordinance “Ecology Surface Water” (Qualitätszielverordnung Ökologie Oberflächengewässer [QZV Ökologie OG]) of March 29, 2010, last amended May 23, 2019  
The quality objective ordinance “ecology surface water” defines criteria for the good ecological status and for a ban on deterioration for surface water in accordance with the European Directive 2000/60/EC. Relevant quality components should be considered when issuing water permits under the water act (§32).

Depending on the type of water body, the threshold values for good ecological status are 0.015-0.1 mg PO<sub>4</sub>-P/l and 3-7 mg NO<sub>3</sub>-N/l in running waters and 10-92 µg TP/l in lakes.

General Wastewater Discharge Ordinance (Allgemeine Abwasseremissionsverordnung [AAEV] of April 19, 1996, last amended September 9, 2021, and sector-specific wastewater discharge ordinances

The general wastewater discharge ordinance lays down the principles of wastewater treatment requirements, general limits for wastewater emissions for physical, biological, inorganic, and organic parameters and regulations for the surveillance of emission limits.

According to §3(8) liquid industrial waste (e.g. from intensive animal farming, milk- and meat industry, and vineries) should not be discharged into public sewers. Exemptions in accordance with the Water Act can be granted if it not impairing appropriate sewage sludge management.

Emission limits are defined both for the discharge into water bodies and into public sewers. However, for numerous municipal and industrial wastewater sources separate ordinances with branch-specific discharge parameters have been issued. With regard to the potential use of nutrient-rich waste waters for the production of BBFs the following ordinances may be of relevance:

- 1. Wastewater Discharge Ordinance for Municipal Wastewater (1. AEV für kommunales Abwasser) of May 7, 1996, last amended May 23, 2019
- Wastewater Discharge Ordinance Rendering (AEV Tierkörperverwertung) of December 29, 1995, last amended May 23, 2019
- Wastewater Discharge Ordinance Aquaculture (AEV Aquakultur) of October 20, 2004, last amended May 23, 2019
- Wastewater Discharge Ordinance Intensive Livestock Farming (AEV Massentierhaltung) of November 28, 1997, last amended May 23, 2019

- Wastewater Discharge Ordinance Meat Industry (AEV Fleischwirtschaft) of January 12, 1999, last amended May 23, 2019
- Wastewater Discharge Ordinance Milk Industry (AEV Milchwirtschaft) of January 12, 1999, last amended May 23, 2019
- Wastewater Discharge Ordinance Potato Processing (AEV Kartoffelverarbeitung) of December 29, 1995, last amended May 23, 2019
- Ordinance on the Limitation of Wastewater Emissions of Sugar and Starch Production (Verordnung über die Begrenzung von Abwasseremissionen aus der Zucker- und Stärkeerzeugung) of December 30, 1994, last amended May 23, 2019
- Ordinance on the Limitation of Wastewater Emissions of Breweries and Malthouses (Verordnung über die Begrenzung von Abwasseremissionen aus Brauereien und Mälzereien) of December 30, 1994, last amended May 23, 2019
- Ordinance on the Limitation of Wastewater Emissions of Plants for the Manufacture of Fish Products (Verordnung über die Begrenzung von Abwasseremissionen aus Anlagen zur Erzeugung von Fischprodukten [Fischproduktionsanlagen]) of December 30, 1994, last amended May 23, 2019
- Ordinance on the Limitation of Wastewater Emissions of Alcohol Production for Drinking Purposes and of Alcoholic Beverages (Verordnung über die Begrenzung von Abwasseremissionen aus der Herstellung von Alkohol für Trinkzwecke und von alkoholischen Getränken) of December 30, 1994, last amended May 23, 2019
- Ordinance on the Limitation of Waste Water Emissions of Production of Refreshment Beverages and Bottling of Beverages (Verordnung über die Begrenzung von Abwasseremissionen aus der Herstellung von Erfrischungsgetränken und Getränkeabfüllung) of December 30, 1994, last amended May 23, 2019
- Ordinance on the Limitation of Waste Water Emissions of Fruit and Vegetable Processing as well as Production of Frozen Food and Ice Cream (Verordnung über die Begrenzung von Abwasseremissionen aus der Obst- und Gemüseveredelung sowie aus der Tiefkühlkost- und Speiseeiserzeugung) of December 30, 1994, last amended May 23, 2019
- Ordinance on the Limitation of Waste Water Emissions of Production of Vegetal or Animal Oil or Fat including Cooking Oil and Cooking Fat Production (Verordnung über die Begrenzung von Abwasseremissionen aus der Erzeugung pflanzlicher oder tierischer Öle oder Fette einschließlich Speiseöl- und Speisefetterzeugung) of December 30, 1994, last amended May 23, 2019
- Ordinance on the Limitation of Waste Water Emissions of Yeast, Spirit, and Citric Acid Production (Verordnung über die Begrenzung von Abwasseremissionen aus der Hefe-, Spiritus- und Zitronensäureerzeugung) of December 30, 1994, last amended May 23, 2019
- Ordinance on the Limitation of Waste Water Emissions of Pickle Production (Verordnung über die Begrenzung von Abwasseremissionen aus der Herstellung von Sauergemüse) of December 30, 1994, last amended May 23, 2019
- Wastewater Discharge Ordinance Hide Glue (AEV Hautleim) of December 29, 1995, last amended May 23, 2019
- Wastewater Discharge Ordinance Feed Production (AEV Futtermittelherstellung) of December 29, 1995, last amended May 23, 2019



- Wastewater Discharge Ordinance Pulp and Paper (AEV Zellstoff und Papier) of April 6, 2018, last amended May 23, 2019
- Wastewater Discharge Ordinance Tannery (AEV Gerberei) of January 12, 1999, last amended May 23, 2019

*Submitted (not yet approved by the EC)*

## Nitrate Action Programme Ordinance (Nitrat-Aktionsprogramm-Verordnung [NAPV]) of December 27, 2022 (effective as of January 1, 2023)

The Austrian Nitrate Action Programme includes

- temporal prohibitions
    - between the harvest of the main crop and and February 15<sup>th</sup> of the following year for easily soluble fertilisers and between November 30<sup>th</sup> and February 15<sup>th</sup> of the following year for slow-release fertilisers (derogations may apply)
    - between November 30<sup>th</sup> and February 15<sup>th</sup> of the following year on permanent pastures and gras leys and between October 15<sup>th</sup> and February 15<sup>th</sup> of the following year on all other cultivated areas
    - between October 30<sup>th</sup> and February 15<sup>th</sup> of the following year for easily soluble fertilisers and between November 30<sup>th</sup> and February 15<sup>th</sup> of the following year for slow-release fertilisers on other agricultural areas
  - local prohibitions (on water-saturated, frozen, flooded or snow-covered plots and in the vicinity of water channels)
  - quantitative restrictions (depending on crop type, fertiliser type and yield situation; maximum 170 kg N/ha/a stemming from manure (animal by-products and crop residues); more stringent restrictions apply in the vicinity of surface waters)
  - provisions for the manner of fertiliser application
  - provisions to maintain a year-round cover with living plants in the vicinity of surface waters
  - provisions for the type and capacity of manure storage facilities (generally six months in liquid-tight containers or on technically tight areas with controlled drainage; more stringent regulations for areas with additional measures) and restrictions for the storage of manure as in-field stacks
  - documentation requirements
- for the application of N-containing fertiliser (including manure, sewage sludge and compost).

## Federal State Acts on Soil Protection and Sewage Sludge Land Application and respective Ordinances

Soil protection and land application of fertilisers is within the competence of the federal states. Most federal states have adopted soil protection laws aiming at protecting the soil from input of pollutants, soil compaction, and erosion and laying down provisions for soil analyses, restrictions on the application of sewage sludge and other organic fertilisers, as well as action to be taken on soils for which soil analysis shows impaired soil health:

- Soil Protection Act Burgenland (Bgl. Bodenschutzgesetz) of June 18, 1990, last amended October 17, 2019
- Soil Protection Act Lower Austria (NÖ Bodenschutzgesetz), last amended March 21, 2019
- Soil Protection Act Upper Austria (OÖ Bodenschutzgesetz) of July 3, 1991, last amended December 20, 2022
- Soil Protection Act Salzburg (Bodenschutzgesetz Salzburg) of July 4, 2001, last amended March 24, 2009

- Styrian Agricultural Soil Protection Act (Steirisches landwirtschaftliches Bodenschutzgesetz) of June 2, 1987, last amended March 10, 2004
- Tyrolian Field Protection Act (Tiroler Feldschutzgesetz) of July 5, 2000, last amended February 1, 2017
- Soil Quality Protection Act Vorarlberg (Gesetz zum Schutz der Bodenqualität Vorarlberg [BSchG]) of June 14, 2018, last amended January 18, 2022

Carinthia regulates the land application of sewage sludge and compost from biowaste and green waste as well as soil analysis in the Waste Management Act (Kärntner Abfallwirtschaftsordnung) of April 23, 2004, last amended October 8, 2020. Regulations concerning the land application of sewage sludge are specified in ordinances, except for Vienna, which does not dispose of a Soil Protection Act, but has passed the Act on Prohibition of Sewage Sludge Land Application (Gesetz über das Verbot der Ausbringung von Klärschlamm) of March 3, 2000, last amended May 19, 2014. Tables B5 and B6 provide an overview of the contaminant limits in sewage sludge and soil in the different federal states:

Table B5: Limit values of different contaminants in sewage sludge (products) applied on agricultural land in different Austrian federal states

[mg/kg DM]	B	C <sup>1</sup>	LA	SB <sup>2</sup>	ST	T <sup>3</sup>	UA	VB <sup>2</sup>	VI <sup>2</sup>
Cd	4	2.5	2	(1)	2	x	5	(1.5)	(1)
Cr	150	100	70	(70)	70	x	400	(100)	(70)
Cu	400	300	300	(150)	300	x	400	(250)	(150)
Hg	4	2.5	2	(0.7)	2	x	7	(1)	(0.7)
Ni	100	80	60	(60)	60	x	80	(60)	(60)
Pb	500	150	100	(120)	100	x	400	(120)	(120)
Zn	1000	1800	1500	(500)	1200	x	1600	(700)	(500)
AOX		500	500		500 <sup>4</sup>	x	500		
PAK (16 EPA-guide substances)		6			6 <sup>4</sup>	x			
PCB		1				x			
Dioxin		50				x			

B: Burgenland, C: Carinthia, LA: Lower Austria, SB: Salzburg, ST: Styria, T: Tyrol, UA: Upper Austria, VB: Vorarlberg, VI: Vienna

<sup>1</sup> For all organic waste applied on agricultural land

<sup>2</sup> Direct application of sewage sludge prohibited; values for sewage sludge compost (SB, VI: limit values of the federal compost ordinance apply, VB: separate limit values)

<sup>3</sup> Prohibition of land application of sewage sludge and products containing sewage sludge

<sup>4</sup> For sewage sludge from wastewater treatment plants > 30 000 PE

Table B6: Limit values of different contaminants in soil in Austrian federal states. Salzburg, Tyrol, and Vienna do not allow direct application of sewage sludge and have not defined soil limits.

[mg/kg DM]	Limits for application of sewage sludge					Soil precautionary (prec.) limits and test/threshold value (tv) <sup>3</sup>			
	B	C	LA	ST <sup>2</sup>	UA <sup>2</sup>	UA <sup>2</sup> (prec.)	UA <sup>2</sup> (tv)	VB (prec.)	VB (tv)
Cd	2	0.5-1.5 <sup>1</sup>	1-1.5 <sup>1</sup>	0.5	0.5	0.5	1	0.5	1
Cr	100	50-100 <sup>1</sup>	100	100	100	100	200	100	200
Cu	100	40-100 <sup>1</sup>	60	60	60	60	100	60	120
Hg	1.5	0.2-1 <sup>1</sup>	1	0.5	0.5	0.5	1	0.5	1
Ni	60	30-70 <sup>1</sup>	50	60	60	60	100	60	120
Pb	100	50-100 <sup>1</sup>	100	100	100	100	200	100	200
Zn	300	100-200 <sup>1</sup>	200	150	150	150	300	150	300
PCB7								0.1	
PCDD/PCDF [ng I-TEQ/kg DM]								10	
PAK16								2	
Hydrocarbon index								200	

B: Burgenland, C: Carinthia, LA: Lower Austria, SB: Salzburg, ST: Styria, T: Tyrol, UA: Upper Austria, VB: Vorarlberg, VI: Vienna

<sup>1</sup> Depending on soil pH

<sup>2</sup> For air-dried soil

<sup>3</sup> Precautionary limits: Exceedance leads to restrictions on further application of material to the soil; test/threshold value: Exceedance may lead to restrictions on use or obligations for measures to restore soil health

In addition, federal states limit total annual loads of sewage sludge applied on agricultural land and have regulated contaminant limits for other forms of organic waste, e.g. Burgenland for waste compost and Carinthia as well as Vorarlberg for all forms of organic waste.

#### Air Emission Act (Emissionsgesetz - Luft [EG-L] of November 22, 2018

The air emission act transposes the National Emissions Ceilings Directive into national law and prescribes emission reductions for NH<sub>3</sub> of 1% by 2020 and 12% by 2030 compared to 2005. The respective obligations for NO<sub>x</sub> are 37% and 69%, however, emissions from fertiliser management and agricultural soil are exempt from this category.

The National Air Pollution Control Programme (Nationales Luftreinhalteprogramm 2019) devised pursuant to §6 of the air emission act contains no concrete measures to achieve the targets for NH<sub>3</sub> but refers to the upcoming period 2021-2027 and the Austrian Agri-Environmental Programme ÖPUL. However, §7(7) of the air emission act contains prohibits the use of fertilisers based on ammonium carbonate. In addition, low-emission feeding of livestock, farming methods, manure storage (including promotion of biogas production) and manure application, as well as reductions in the application of urea-based fertiliser are considered suitable measures to reach the NH<sub>3</sub> emission targets in the national air pollution control programme.

#### Renewable Energy Development Act (Erneuerbaren-Ausbau-Gesetz [EAG]), of July 27, 2021, last amended December 30, 2022

The Renewable Energy Development Act transposes Directives 2018/2001/EU and 2019/944/EU into national law and aims at extending the share of renewables in total energy consumption in the national balance to 100% by 2030. This means annual renewable energy generation should be increased by 27 TWh by 2030. For this purpose the Renewable Energy Development Act regulates subsidising of energy production from renewable sources (including electricity, gas and hydrogen), organisation and functioning of Renewable Energy Communities, guarantees of origin of energy from renewable sources and green gas and the preparation of an integrated Austrian grid infrastructure plan.

Regarding biomass and biogas, the act contains targets of an increase of 1 TWh annual energy generation by biomass and a share of 5 TWh of nationally produced renewable gas in Austrian gas sales by 2030. Subsidies are granted in the form of market premiums, compensating the difference between production costs and the average market price of electricity, and of investment grants for the construction and conversion of plants for production and upgrade of renewable gas.

Both existing biomass and biogas plants eligible for subsidies under the previous Green Energy Act 2012 and new or repowered biomass and biogas plants are eligible for market premium, if they meet the following requirements

Biomass plants:

- Fuel efficiency of at least 60%
- Not processing meat and bone meal, waste lye or sewage sludge
- State of the art measures to prevent emissions of particulate matter
- State of the art heat meter
- Concept for material supply for at least the first (following) five years
- Only the first 5 MW<sub>el</sub> are subsidized for new and repowered plants with a bottleneck capacity above 5 MW<sub>el</sub>

New biogas plants:

- Fuel efficiency of at least 65%
- Only processing biologically degradable waste and residues of which at least 30% are manure and a maximum of 30% is catch crops and residual grassland
- More than 10 km distance from the next connection point to the gas grid
- State of the art heat meter
- Concept for material supply for at least the first five years
- Bottleneck capacity up to 250 kW<sub>el</sub>

Existing biogas plants eligible for subsidies under the previous Green Energy Act 2012

- Fuel efficiency of at least 60%
- Maximum 60% of fuels based on cereals and maize
- More than 10 km distance from the next connection point to the gas grid
- State of the art heat meter
- Concept for material supply for at least the following five years
- Bottleneck capacity up to 250 kW<sub>el</sub>

In addition, plants have to be connected to the Austrian public electricity grid, can be controlled remotely, are equipped with a load profile meter (or intelligent metering device for small plants) and comply with criteria for promoting higher social and labour protection standards and increasing regional value creation that are to be defined by ordinance by June 30, 2023.

The maximum prices under which each technology is eligible for support via market premium are regulated via ordinance. However, for biomass plants, maximum prices must be set at a level preventing that biomass is withdrawn from material use or food and feed from its original intention. The annual voluminal awarded to new and repowered plants have to comprise 15 000 kW for biomass plants (7 500 kW via tender and 7 500 kW on application) and 1 500 kW for biogas plants (on application). Market premia are granted for 20 years. Existing plants eligible for subsidies under the previous Green Energy Act 2012 can apply for succession premia up to the 30<sup>th</sup> year of operation in case of biomass plants and for 36 months in case of biogas plants.

Conditions for investment grants are also regulated via ordinance. Investment grants shall amount to at least 4 million euro annually for the construction and expansion of biomass plants, 15 million euro for the conversion of an existing biogas plant for the production and upgrading of renewable gas and 25 million euro for the construction of renewable gas production plants. A maximum 30% of the investment volume directly required for the construction or expansion (excluding land costs) is subsidised in case of biomass plants and renewable gas production plants. Upgrading of existing biogas plants is subsidised with a maximum of 45% of the direct costs for the construction of the gas treatment plant. The following eligibility criteria apply:

For biomass plants

- Same conditions as for market premia

For upgraded biomass plants

- Maximum 50% of fuel based on cereals and maize (will be tightened to a maximum of 30% and 15% from 2025 and 2027, respectively, of cereals and other crops with high starch content, sugar crops and oil seeds)
- Concept for material supply and use of digestate for at least the first five years

For renewable gas production plants

- Maximum 25% of fuel based on cereals and maize (will be tightened to an exclusive use of biodegradable wastes and/or residue materials from 2025)
- Concept for material supply and use of digestate for at least the first five years

In parallel with the renewable energy development act, an amendment of the Natural Gas Act 2011 (Gaswirtschaftsgesetz 2011 of November 21, 2011, last amended July 26, 2017) is planned, emphasising the role of renewable gas.

Fuel Ordinance 2012 (Kraftstoffverordnung) of December 3, 2012, last amended December 12, 2022

The fuel ordinance regulates the technical requirements for fuel as well as substitution and sustainability requirements for biofuels and biomethane.

It aims for a share of 3.4% based on the energy content of biofuels compared to petrol placed on the market and of 6.3% compared to diesel fuel placed on the market. In addition, from January 1, 2023 a share of 0.2% based on the energy content of fossil liquid or gaseous fuels placed on the market have to be substituted by advanced biofuels (defined in the meaning of Directive (EU) 2015/1515, Annex A, part A, a-q) annually. This share will be increased to 1% 2025 and 3.5% in 2030. From the year 2023, life cycle greenhouse gas emissions of fuels have to be reduced by 6% compared to the basis value of 94.1 g CO<sub>2</sub>eq/MJ. This value will also be successively increased to 13% by 2030.

- Biofuels can be credited for the above purposes, if they meet the following requirements:
  - Minimum content of bioethanol of 65% v/v for bioethanol containing products
  - Biofuel materials do not stem from materials with high risk for causing indirect land use change at the expense of areas with high carbon stocks according to Regulation (EU) 2019/807
  - Agricultural raw materials meet the requirements of the sustainable agricultural raw material ordinance (see below); forestry raw material meet the requirements of the respective regulations for forestry raw material
  - Waste derived biofuels do not compromise the provisions regarding the waste hierarchy and destination according to the life cycle concept of the Waste Management Act
  - Biofuels based on cereals, other crops high in starch, sugar or oil and crops cultivated as main crop primarily for energy production on agricultural area must not exceed 7% of the final energy consumption in the transport sector. Advanced biofuels are exempt from this requirement.
  - Life cycle greenhouse gas emission reductions compared to the base value of 94 g CO<sub>2</sub>eq/MJ of
    - 50% for biofuel and biomethane produced in plants commissioned before or on October 5, 2015



- 60% for biofuel and biomethane produced in plants commissioned after October 5, 2015
- 65% for biofuel and biomethane produced in plants commissioned after January 1, 2021

Sustainable Agricultural Raw Material Ordinance (Nachhaltige landwirtschaftliche Ausgangsstoff-Verordnung) of June 12, 2018

The sustainable agricultural raw material ordinance regulates the use of agricultural material for the production of sustainable biofuel and transposes Directive 2009/28/EC into national law. It largely bans the use of agricultural material from areas with high value regarding biodiversity, areas with high carbon stock, and peat bogs for the production of biofuels.

Submitted (not yet approved by the EC)

#### 4. Common Agricultural Policy in the national law

Agriculture Act 1992 (Landwirtschaftsgesetz 1992) of June 30, 1992 (effective as of July 1, 1992), last amended June 6, 2022

The agricultural act sets targets for agricultural policy in accordance with the Common Agricultural Policy and regulates the financing of government subsidy.

It contains provisions for additional grants for mountain farms and holdings in other disadvantaged regions and for granting private commercial agreements in the context of measures within the special directive for the Austrian Agri-Environmental Programme (Sonderrichtlinie für das Österreichische Programm zur Förderung einer umweltgerechten, extensiven und den natürlichen Lebensraum schützenden Landwirtschaft).

Market Organisation Act 2021 (Marktorganisationsgesetz 2021 [MOG]) of July 31, 2007 (effective as of January 1 2005 / July 1, 2007), last amended June 6, 2022 and CAP Strategic Plan Application Ordinance (GAP-Strategieplan-Anwendungsverordnung) of October 28, 2022,

The market organisation act sets the rules for the implementation and processing of the common market organisation and the rules for the CAP strategic plan. It establishes the “Agrarmarkt Austria” AMA as agency for market regulation, intervention and payment. The CAP Strategic Plan Application Ordinance further specifies the general provisions for all support measures and lays down detailed requirements for direct payments and fruit/vegetable and wine sector measures. Furthermore, the ordinance defines the criteria for maintenance of good agricultural and environmental state (GAES). In addition to the standards set in Regulation (EU) 2021/2115, this includes provisions to adhere to the Directive for proper fertilisation on arable land and grassland (see above) regarding P fertilisation.

Austrian Agri-Environmental Programme (Sonderrichtlinie für das Österreichische Programm zur Förderung einer umweltgerechten, extensiven und den natürlichen Lebensraum schützenden Landwirtschaft (ÖPUL) 2023 (Draft)

The ÖPUL programme 2015 offers subsidies for the promotion of an environmentally friendly, extensive agriculture protecting the natural living space.

Regarding NRSS and BBF measure 2 “Limitation of yield-increasing inputs” and measure 16 “Preventive groundwater protection – arable land” are of particular importance.

The obligations under which subsidies are granted under the measure “Limitation of yield-increasing inputs” include refrainment of the application of N fertiliser, with the exception of manure, compost admitted by regulation (EU) 2018/848 and biogas digestate stemming from manure produced on the farm. Nitrogen input from animal husbandry must not exceed 170 kg N/ha (after deduction of stall and storage losses) in relation to the total agriculturally used area of the farm.. Cropland and

permanent crops are entitled to grants of 60 €/ha, while for grasslands and pastures of livestock farms 60-70 €/ha, depending on the livestock density, are granted.

Only xxx areas are eligible for the measure "Preventive groundwater protection – arable land". Participants must comply with the reporting provisions of the Nitrate-Action-Programme, participate in greening measures and reduce fertilisation by 60-80% of the N surplus of the precedent crop. The basis premium for this measure is 50 €/ha with top-ups of 20-500 €/ha granted for additional measures such as participation in educational activities, renunciation of pesticides, N-reduced feeding of pigs and regional measures such as erosion protection and humus formation in Vienna or renunciation of use of easily soluble N fertilisers in Upper Austria.

Limitations on fertiliser use and temporal restrictions on the use of N fertiliser, sewage sludge and sewage sludge compost are also funded under the measures "organic farming" (measure 1B), "cultivation of mowed mountain grassland" (measure 4), "greening of arable land – intermediate crops" (measure 6), "greening of arable land – system evergreen" (measure 7), "alpine pasture management" (measure 14), "nature conservation" (measure 18), "Natura 2000 and other protected areas – agriculture" (measure 23) and "water framework directive – agriculture" (measure 24).

Furthermore, application of liquid manure and biogas digestate directly on or in the soil as well as the solid-liquid separation of cattle manure are subsidised with 1-1.6 €/m<sup>3</sup> (measure 9).

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## NATIONAL LEGISLATION: BELGIUM

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### Introduction

Belgium is since 1991 a federal state with a quite particular institutional setting. Next to the federal government, there are three regions (Flemish Region, Walloon Region, and Brussels Capital Region) who are responsible for territorial competences (for example environment and transport) and three communities (Flemish Community, French speaking Community, and German speaking Community) who have powers related to individuals (for example education and health).

This implies for instance that both the Flemish Community and the French speaking community are responsible for organising education (in their respective language) in the Brussels Capital Region. Both the French and the German speaking community organise education in the Walloon Region. The Walloon region organises the waste management of the German speaking community and a large part, but not all, of the French speaking community.

There is no hierarchy between governments. Its main component authorities (the federal state and the federate identities – the regions and the communities) are on an equal footing. This means that no authority (for example, the federal state) has precedence over another, and no authority can impose requirements (including regulatory requirements) on another. Legislative texts issued by each authority are on an equal footing.

Competences are exclusive to the different authorities. Competences are distributed across the federal state and federated entities with no overlap competences, **at least in principle**. In the case of fertiliser products agencies at national and regional level have a specific say in the matter, which might complicate the administrative process of approval. On most of the issues regarding product regulations, there seems to be a smooth collaboration at the moment. Each authority has its own legislative and executive powers for its field of competences, and its own parliament and government to exercise these powers. Flanders has, however, opted for combining the parliament and government of both the Flemish Region and the Flemish Community into a single parliament and a single government. Beyond this, there are no shared government or parliamentary structures.

Environmental policies are mostly the competence of regions (Flemish Region, Walloon Region, and Brussels Capital Region). The implementation of the nitrates directive is therefore done at regional level (excluding Brussels as there is barely agriculture present).

Health is mostly regulated and managed at federal level and therefore health issues linked with food safety or product safety is done at Belgium level. The implementation of the fertiliser regulations is thus done by the Belgian food and product safety authority.

Agriculture is a regional competence. The implementation of the CAP is therefore different in the Walloon and Flemish region.

Administrative follow-up and fines can be implemented by the respective competent governments.

Legal prosecution of any violation of the above rules is done through the justice system that is supervised by a national ministry of Justice.

Belgium government	Walloon and Flemish region
<ul style="list-style-type: none"> <li>• Legislation on fertilisers/fertilising products (regarding composition/formulation of fertilisers and limit values for unwanted components)</li> </ul>	<ul style="list-style-type: none"> <li>• National rules transposing the Nitrates Directive 91/676/EEC</li> <li>• Any additional rules for fertiliser application</li> <li>• Specific rules for manure(-based) fertilisers</li> <li>• Specific rules beyond the EU organic farming regulations or organic farming certification and subsidies</li> </ul>

Submitted (not yet approved by the EC)

## 1. Fertilising products and fertilisation

### Competent administrations

Following administrations are involved in fertilising products and fertilisation.

At the federal level:

- the FOD (Federale Openbare Dienst) health, safety of the food supply chain and environment, the office of crop protection and fertilisation products (<http://www.health.belgium.be/>)=> FOD VVVL
- the Federal Agency for the safety of the food supply chain (FAVV) (<http://ww.favv.be>)

At the regional level following administrations are responsible for waste management:

- Flemish region: Openbare Vlaamse Afvalstoffenmaatschappij=> OVAM (<http://www.ovam.be/>)
- Walloon region: Service Public de Wallonie - Département du Sol et des Déchets => DSD ([https://sol.environnement.wallonie.be/fr\\_BE/home/sols/matieres.html](https://sol.environnement.wallonie.be/fr_BE/home/sols/matieres.html))
- Brussel Capital Region: Brussels Instituut voor Milieubeheer => BIM (<http://www.ibgebim.be/>)

FOD VVVL is responsible for the product standards of fertilisers, soil improvers, cultivation substrates, sludge and related products. The FOD VVVL evaluates both the safety for humans, plants and animals and the agricultural effectiveness of the products. FOD VVVL also represents Belgium at EU level in related discussions.

FAVV is responsible to the administrative follow-up and the enforcement of the above rules and the accreditation of laboratories for testing.

Waste products and sludge can be used to produce fertilizers, soil improvers and cultivation substrates. The products based on waste also need to follow the waste management rules that are the authorities of the regional administrations (OVAM, DSD and BIM). So to bring such products on the markets and to use them, an approval of the regional authorities is necessary based on a positive list of a specific approval certificate.

Regional authorities can also put additional limitations in their implementation of the nitrates directive.

### Relevant legal texts for product regulation

The text below is based on or partly translated from the official website of the federal government that provides information and is responsible for the approval procedure of products (<https://fytoweb.be/nl/bemestingsproducten/wetgeving>).

All products are approved on a case by case basis strongly guided by the legal documents below.

As most of the approvals for products is strongly guided by EU regulations (which are directly applicable and stand above national legislation), the differences of the above rules with other EU member states is quite limited.

FOD VVVL has made an online database where all approvals and disapprovals of products can be found with the name of the product, the companies producing and marketing it, date of decision, duration of approval and a link to the background documents. Access to the database is in English. The background documents are mostly Dutch and French.

<https://apps.health.belgium.be/panamaPublicSearch/pages/public/fytoFertSearch.xhtml?dswid=-6576#b>

The list of current approved products show that most products are composts or products based on processed sludge from wastewater treatment in the food industry.

Each of the products can be authorised in Belgium if it follows the EU regulation (EU) 2019/1009 (from 16/7/2022) or the EU regulation 2003/2003 (until 15/7/2022) or based on the national legislation for approval of fertilisers, soil improvers and substrates: Koninklijk besluit van 28 januari 2013.

*EU regulation 2003/2003 (until 15/7/2022)*

At EU level, the provisions of Regulation (EC) No 2003/2003 on fertilizers apply (until 15/07/2022). This regulation only regulates the trade in mineral fertilizers that may be marketed with the designation “EC fertilizer”. Any fertilizer belonging to a type listed in Annex I to this Regulation and meeting the specified conditions may be designated as “EC fertiliser”.

Note the importance of the word “may”. The manufacturer is free to choose whether to market the fertilizer as an EC fertilizer or as a national fertilizer. If he opts for an EC fertilizer, he must state this on the label and he can trade the fertilizer freely within the European Union. The fertilizer must, however, meet the conditions laid down in the regulation.

If he chooses to trade the fertilizer as a national fertilizer, the fertilizer is subject to national legislation.

*EU regulation (EU) 2019/1009 (from 16/7/2022)*

Regulation (EU) 2019/1009 harmonises the European market for fertilising products and replaces Regulation (EC) No 2003/2003 on fertilisers and will enter into force on 16 July 2022

However, national legislation will continue to exist alongside Regulation (EU) 2019/1009. All products currently authorized in accordance with the Royal Decree of 28 January 2013 on the marketing and use of fertilisers, soil improvers and cultivation substrates can continue to be marketed under the conditions of that Decree.

Regulation (EU) 2019/1009 is optional. This means that the producer can choose whether to follow national or EU regulations. In some cases it will only be possible to place a product on the market under national legislation.



After 16 July 2022, the products may be placed on the market in accordance with Regulation (EU) 2019/1009.

The annexes to the regulation consist of 5 parts:

#### 1. Product Function Categories (PFCs)

All products placed on the market are classified in a "product function category (PFC)". The products must be marketed under this name.

PFC 1: Organic, organo-mineral and inorganic fertilizer

PFC 2: lime fertilizer

PFC 3: soil improver

PFC 4: growth medium

PFC 5: inhibitor

PFC 6: biostimulant for plants

PFC 7: fertilizer blend

#### 2. Component Material Categories (CMCs)

The raw materials used for the manufacture of PFCs must meet the requirements for one or more of the "Component Categories (CMCs)". 11 CMCs are currently included in the Regulation. 3 CMCs are expected to be added in the near future. Other CMCs will complete the regulation over time.

CMC 1: Substances and mixtures as primary material

CMC 2: plants, plant parts or plant extracts

CMC 3: compost

CMC 4: digestate from fresh crops

CMC 5: digestate other than digestate from fresh crops

CMC 6: by-products from the food industry

CMC 7: microorganisms

CMC 8: Nutrient Polymers

CMC 9: polymers other than nutrient polymers

CMC 10: Derivatives within the meaning of Regulation (EC) No 1069/2009

CMC 11: by-products within the meaning of Directive 2008/98/EC

Publication in progress for:

CMC 12: Precipitated Phosphate Salts and Derivatives

CMC 13: Thermal Oxidizing Materials and Derivatives

CMC 14: materials from pyrolysis and gasification

It should be noted that CMC 10 and CMC 11 still need to be adapted by adding the conformity criteria. As long as these criteria are missing, no conformity assessment is possible.

### 3. Labeling Regulations and Tolerances

The information that must or may be stated on the label of a product is included in Annex III. The CE marking must be affixed to the label to indicate that it is an EU fertilising product. The European Commission has published a guide to labelling.

The tolerances are given in Annex III, Part III. What is new is that the tolerance margins for the indicated parameters in this section are negative and positive values. The actual content of a constituent of an EU fertilising product, for which a minimum or maximum content is laid down in Annex I or Annex II, shall never be less than the minimum content or higher than the maximum content.

**In Belgium, labels and leaflets must at least be drawn up in the language or languages of the language area where the product is offered on the market.**

### 4. Conformity Assessment

The conformity assessment can be done in 4 ways:

Internal production control (module A)

EU-type examination by a third party (module B), followed by internal production control (module C)

Quality assurance of the production process with assessment and supervision by a third party (module D1)

Internal production control with third party supervised product testing (module A1)

Annex IV of Regulation (EU) 2019/1009 contains a detailed description of the steps to be taken for each module. The nature of the evaluation is determined by the PFC or CMC of the product.

In module A, the follow-up consists of an internal evaluation of the production (or self-evaluation).

Manufacturers of fertilising products have to rely on a notified body when their products have to be certified according to module A1, module B + C and module D1. Third party certification must be done through a notified conformity assessment body (notified body).

The certification can be done through a notified body established in the European Union. The notified body must be listed on the website.

*National legislation for approval of fertilisers, soil improvers and substrates: Koninklijk besluit van 28 januari 2013*

The national legal provisions are included in the Royal Decree of 28 January 2013 on the marketing and use of fertilisers, soil improvers and cultivation substrates and annexes. This Decree applies to

the marketing and use of fertilisers, soil improvers, cultivation substrates, sewage sludge and to any product to which a specific effect to promote plant production is attributed (referred to as "products" in this Royal Decree).

Annex I of this Royal Decree lists the products that may be traded in Belgium.

The Minister may allow the marketing of products not listed in Annex I (in accordance with Article 5) by granting an exemption for these products.

Sewage sludge from purification plants for domestic, urban or industrial wastewater can also be valorised in agriculture under certain conditions. Companies that wish to sell sewage sludge in agriculture must apply for a permit in advance. An analysis of the list of approved products show that sludge based products are approved in Belgium but there are none on the market based on municipal household wastewater treatment. Sludge based products from waste water treatment for the food industry are very common.

The above-mentioned Royal Decree lays down the rules for the labeling of the products to which it applies. An overview of the labeling requirements can be found in the document 'Labeling fertilizers' at the bottom.

The Royal Decree of 28 January 2013 replaces the Royal Decree of 7 January 1998.

Operators active in the sector of fertilisers, soil improvers, cultivation substrates, sewage sludge and related products are subject to the Royal Decree of 16 January 2006 laying down the detailed rules for the approvals, authorizations and prior registrations issued by the Federal Agency for the Safety of the Food Chain (FAVV).

At least a registration is required with the FAVV (Annex I of the above-mentioned Royal Decree). A recognition (Annex II of the above-mentioned Royal Decree) or authorization (Annex III of the above-mentioned Royal Decree) from the FAVV is respectively required for manufacturers or importers of the following products:

- compound fertilizers
- fertilizers containing multiple trace elements
- mixtures of fertilizers for the preparation of nutrient solutions for hydroponics and hydroponics
- products composed wholly or partly from by-products of animal origin
- mixed organic soil improvers

For the other activities (manufacturing or import of products other than those mentioned above, trading, packaging, storage,...) a registration with the FAVV in accordance with Annex I of the above-mentioned Royal Decree is sufficient.

The Federal Agency for the Safety of the Food Chain (FAVV) accredits the laboratories for performing analyzes on fertilizers, soil improvers, cultivation substrates, sewage sludge and related products. The list of accredited laboratories and accredited analyzes can be found on the website of the FAVV.

#### *Organic farming the regulation EU 889/2008*

The European Regulation (EC) No. 889/2008 laying down provisions for the implementation of EC Regulation 834/2007 on organic production and labeling of organic products, with regard to organic production, labeling and control, provides under Annex I a list of products that may be used in organic cultivation. This Regulation also stipulates that the doses of fertilizers must be limited to what is strictly necessary (art 3).

#### *Implementation of the nitrates directive*

As stated above, the implementation of the nitrates directive is different in the Flemish and Walloon region. The document here will focus on the Flemish region because it is the most elaborate. The implementation of the nitrates directive is since 1995 called Manure Action Plan (Mest Actie Plan) and been followed with updates indicated with a number. Currently the Manure Action Plan number 6 is implemented and it will be revised in Manure Action Plan 7 by the end of 2022.

The key policy instruments of the Manure action plans are listed below.

#### *Fertilisation standards*

Fertilisation standards apply with a variation in crops, soil types, regions and the possible participation in derogation. The fertilisation standards apply for N and P and a differentiation is made between synthetic fertilizer (for N), manure based and other fertilisers (compost or digestate not based on manure).

The follow-up of the fertilisation standards is strict and happens at farm level, not at field level. This means that in practice it is possible that farms over fertilise some field at the expense of others.

In order to prevent oversupply of manure fertilizer, the amount of manure and the nutrients in it are calculated based on fixed excretion coefficients per animal type corrected for some feeding systems and milk production and the number of animals. This number of animals is tracked using the animal and food safety registration systems. This means that cheating is very difficult for farms.

The follow up of the use of synthetic fertilization standards was until 2020 not accurate with clear evidence of not correct reporting of farms which probably overused this type of fertilizer by up to 40% on average in Flanders.

The P fertilization standards are set lower than crop requirements in order to decrease the amount of P saturated soils.

#### *Manure storage and application*

Manure can not be spread on land between 1<sup>st</sup> of September and 14<sup>nd</sup> of February. Farms need to have therefore sufficient storage, which is preferably covered. Manure or digestate spreading has to be done in a way to avoid ammonia losses. This means that either injection needs to be used or the manure needs to be incorporated in the soil directly after application.

### *Manure transport*

Farms can transport surplus nutrients (in manure, digestate or scrubber water) to other farms but have to do so within a strict legal framework. This has been made in order to be able to trace and enforce the rules of the fertilization standards. Long distance transport can only be done by an accredited transport company with GPS tracing systems in their trucks.

Transport outside Flanders is only possible if the EU regulation is followed which means that for instance manure needs to be pasteurized before crossing a country border. Flanders and The Netherlands made a protocol with an exception for manure transported to Zeeuws-Vlaanderen, which area with mostly arable farming cut-off from the rest of The Netherlands by the river Scheldt.

Transport of raw manure from Flanders to the Walloon region is not possible except for farms that fertilise own land across the regional border.

### *Nutrient Production Rights*

As a policy instrument to stop the further increase in the livestock number, the Flemish region has introduced a quota system on holding livestock in Belgium in 2000 and significantly reformed in 2006.

The amount of nutrients coming from animals did however further increase between the amount of quota rights for a suckler cow is the same as for a dairy cows, while the latter produces much more nitrogen in manure. As a result of a shift from suckler cows to dairy cows, the amount of N in manure from cattle has increased significantly in Flanders over the last decade.

On top of that, livestock of which the manure is processed is exempted from the quota system. This has made this policy instrument completely ineffective to date. An upcoming drastic reform might improve the effectiveness.

### *Manure processing*

As the result of the imbalance between nutrient production and manure disposal space within the boundaries set by the nitrate directive, the Flemish region has chosen to stimulate manure processing as a way to deal with surplus nutrients.

Manure processing is supported through investment subsidies, has been obliged for the largest livestock operations, and livestock of which the manure is processed is exempted from the nutrient production rights system.

Flanders is unique in the EU with a widespread application of nitrification-denitrification on the liquid fractions of manure or digestate to remove excess reactive nitrogen. The solid fraction of the manure or digestate is mostly dried or composted and exported to France or other nutrient deficit regions.

### *Derogation*

The Flemish region has applied for and received a derogation for higher than 170 kg/ha fertilization standard for N in nutrient vulnerable zones for crops with high N demands (grassland or grass- maize combinations). The Flemish region is unique in the sense that farms can ask for derogation based on satisfying criteria at parcel level while for all other derogation in the EU are granted based on criteria that apply to the farm level.

This results in a potential higher level of participation in the Flemish region compared to other regions that apply derogations to the nitrates directive.

#### *Nitrate residue sampling*

The Flemish region is also quite unique within the EU to support their nitrate policies with widespread obliged sampling of nitrate residues in the 90 cm top soil at the end of the growing season. The aim is to have a control mechanism on the field on the compliance of the farms with the fertilization regulations. In case of exceedance of the residual nitrate residue, farms need to follow additional rules which increase the cost for their business.

This policy instrument is potentially very effective but it suffers from the very high variability and very low reliability of the measurements of the residual nitrate.

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## 2. Waste management

### Competent administrations

Waste management is fully a competence of the regions.

Therefore following administrations are responsible for waste management:

- Flemish region: Openbare Vlaamse Afvalstoffenmaatschappij => OVAM (<http://www.ovam.be/>)
- Walloon region: Service Public de Wallonie - Département du Sol et des Déchets => DSD ([https://sol.environnement.wallonie.be/fr\\_BE/home/sols/matieres.html](https://sol.environnement.wallonie.be/fr_BE/home/sols/matieres.html))
- Brussel Capital Region: Brussels Instituut voor Milieubeheer => BIM (<http://www.ibgebim.be/>)

Waste products and sludge can be used to produce fertilizers, soil improvers and cultivation substrates. The products based on waste also need to follow the waste management rules that are the authorities of the regional administrations (OVAM, DSD and BIM). So to bring such products on the markets and to use them, an approval of the regional authorities is necessary based on a positive list of a specific approval certificate.

Waste management regulation for companies are competence of the regions. The waste management of households is mostly managed by the local government (municipalities). Municipalities offer waste collection and management as a service and decide how this service is organized and at which costs. The regions oversee the municipalities and whether they contribute sufficiently with their efforts to the waste management target set at regional level.

Interestingly, there is a huge variation in waste management between municipalities and even within municipalities, both in terms over service, cost and processing technology. This difference is most pronounce with respect to organic biological waste and is partly explained by the possibilities of household to store or process organic waste. In a densely populated urban area, it is assumed the households in smaller living units in apartment blocks have little options to store organic waste. In rural areas more households have the option and are stimulated to compost organic waste. Some municipalities have set up own joint ventures with other and have invested in own anaerobic digestion capacity. Others have chosen to send most of the organic waste at a gate fee to the private composting industry.

### Relevant legal frameworks for organic waste management

*The EU regulations on animal byproducts (EU) Nr 1069/2009 and 142/2011.*

Fertilizers, soil improvers and growing substrates containing animal by-products must comply with the provisions of Regulation (EC) No 1069/2009 of the European Parliament and of the Council of 21 October 2009 laying down health rules as regards animal by-products not intended for human consumption and derived products and repealing Regulation (EC) No 1774/2002 and the provisions of Commission Regulation (EU) No 142/2011 of 25 February 2011 implementing Regulation (EC) No 1069/2009.

Specific guidelines for approval of producers in Belgium are outlined in following document which is updated in March 2022:

[https://www.favv-afsca.be/plantaardigeproductie/omzendbrieven/ documents/20220318\\_clean\\_OmzdOFSI\\_NL\\_V6.0.pdf](https://www.favv-afsca.be/plantaardigeproductie/omzendbrieven/ documents/20220318_clean_OmzdOFSI_NL_V6.0.pdf)

Products consisting exclusively or partly of meat-and-bone meal derived from Category 2 material and/or Processed Animal Proteins must, in accordance with the above-mentioned Regulations, be mixed with a substance sufficient to make the mixture for animal feed to exclude. However, the regulations allow that in some cases the substance is not added.

#### *Waste Framework Directive*

A significant part of the household waste is organic-biological: kitchen waste and food scraps and green garden waste. The European Waste Framework Directive, obliges member states to collect organic waste as selectively as possible by the end of 2023. Therefore the Flemish region is strongly committed to promoting home composting and green waste collection through recycling parks.

The Flemish region obliges, in addition, bigger companies and organisations to sort kitchen waste and food leftovers from 2021. From 2024 onwards this applies to all companies and households.

A significant increase in the supply of organic waste is to be expected.

### 3. Ground and surface water quality, soil protection, air quality and climate/renewable energy

#### Competent administrations

Environmental policies (water quality, soil protection, air quality, renewable energy) are regional competences while part of the energy policy remains with the federal government. The federal government decides on nuclear power licenses, nuclear power rent, north sea policies (important for off shore wind power).

In the case energy policy there are a couple of absurd conflicts between the different levels of policy making in Belgium that need to be resolved.

The federal government wants to shut down (part of) the nuclear power generation by ending the licenses to produce. It made a plan to replace it with emergency capacity from gas turbines. However, gas turbines emits nitrogen oxides and potential ammonia losses from the denox filter. The licensing of such a plant is a competence of the regional government. The Flemish government denied recently permits for such gas turbines while the federal government has decided already to end most of the nuclear power generation. The combination will lead to a risk of shortage of electricity.

The Belgian government licensed an area at the Belgian cost for off-shore wind turbines. The turbines are being build while at the same time an environmental permit is asked for the high voltage



power cables that should bring the electricity towards the on-shore power grid. The on-shore power grid needs environmental permits from the Flemish government. Legal procedures in this permitting procedure might make the development of these cable networks on land in the short run not possible.

The example above illustrated that the distribution of competences to different decision level has led to complicated and ineffective decisions and policies.

#### Relevant legal frameworks for organic waste management

##### *Energy policy: anaerobic digestion and list of approved products*

Anaerobic digestion is only a small portion of the total energy mix in Belgium. There are support mechanisms for electricity production from anaerobic digestion and sustainable heat certificates if a Combined Heat and Power mechanism is being used. So far, the use of heat from a combined heat and power system for the drying of digestate is considered as a sustainable use of heat and allows the operator to receive heat certificates. Indirectly this is a very important support mechanism to produce dried biobased fertilizer products such as a dried solid fraction of digestate or manure.

The environmental permit of these installations requires air scrubbing to prevent ambient air pollution with ammonia. The residual heat causes a significant ammonia volatilization but the scrubbing creates another interesting biobased fertilizer product that indirectly also benefits from the renewable energy support: ammonium sulfate.

There is a national list of approved products for anaerobic digestion and the use of digestate in agriculture.

[https://fytoweb.be/sites/default/files/legislation/attachments/digestaat\\_toegelaten\\_inputstromen\\_v2.1.pdf](https://fytoweb.be/sites/default/files/legislation/attachments/digestaat_toegelaten_inputstromen_v2.1.pdf)

##### *Biodiversity strategy*

A variety of directives (birds and habitats directive) and EU strategies (EU green deal, Farm to Fork) focus on stopping the loss of biodiversity. Natura 2000 areas have been identified and member states are expected to take measures to protect endangered species in these areas. One of the main obstacles for plant biodiversity is the enrichment of natural areas with reactive nitrogen. In Belgium, critical loads of nitrogen have been defined for different areas. Any dry or wet deposition of reactive nitrogen in the form of nitrogen oxides or ammonia above these targets increases the risk of loss of plant biodiversity.

There are cases of juridical rulings against permits for industrial projects or livestock production on the basis of a lacking or insufficient action plan against this nitrogen deposition in Flanders.

Therefore, the Flemish government decided on an action plan to reduce nitrogen emissions in february 2022. This plan lays out the step to be taken to reduces the nitrogen emissions. The translations of this political agreement into ministerial decree or laws is planned in the first half of 2023.

It is to be expected that in the near future all livestock housing systems have taken additional measures against ammonia losses. The number of stables equipped with air scrubbers will increase resulting in an increase of supply of ammonium sulfate generated from a circular recovery process.

Biobased fertiliser production plants will also be subjected to more strict environmental permitting with respect to reactive nitrogen emissions.

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#### 4. Common Agricultural Policy (CAP) and related legislation

##### Competent administrations

The implementation of the CAP and is decided at regional level: the Walloon and the Flemish region make slightly different choices. The Flemish region tends to put more emphasis on the competitiveness of the agricultural sector while the Walloon region has more attention for the maintenance of agricultural landscapes (<https://vilt.be/nl/nieuws/groene-ambities-in-wallonie-4000-kilometer-haag> ).

##### *Choices relevant to biobased fertilizers*

The new CAP 2023-2027 has introduced the 'eco-schemes' as a policy instrument to distribute means of income support towards farms. Eco-schemes can be considered as light versions of the agri-environmental measures that exists already longer within the second pillar of the CAP.

The Flemish region has introduced pre-ecoschemes in 2022 to build experience with the participation and the interest of farmers. (<https://lv.vlaanderen.be/subsidies/perceelsgebonden/pre-ecoregelingen> )

One ecoscheme is of particular relevance for biobased fertilizers. This particular ecoscheme offers farms a payment for doing efforts to increase the organic carbon. Farmers fertilising with compost can apply for a payment of 130 euro per ha. The Flemish region expects that 10000 ha might apply for such a compensation. There are also compensations for less processed biobased fertilizers or soil improvers: 60 euro/ha for manure mixed with straw and 462 euro/ha for wood snippets.

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## NATIONAL LEGISLATION: DENMARK

Compiled by Lars Stoumann Jensen (UCPH)

Last updated: 1 Dec 2022

### Introduction

This report describes the national regulations related to fertiliser use and recycling of nutrient rich residuals and sidestreams, whether raw or processed, to agricultural in Denmark. It has been written by Lars Stoumann Jensen, professor at University of Copenhagen (UCPH) as a part of the LEX4BIO project, task under Work Package 1 - Assessment of Nutrient Rich Side Streams in the EU and their use as Bio-based Fertilisers (BBF).

The report covers the Danish legal framework and guidelines connected to use of conventional mineral and bio-based fertilisers in agriculture. Information is also provided on regulations related to waste management, water and air quality guidelines, where they may be of relevance to the former.

### Background on the development of Danish regulations on nutrient use in agriculture

The expansion of agricultural Nitrogen (N) inputs in Danish agriculture after World War II has gradually led to a parallel increase in agricultural N surpluses, and significantly increased N leaching to groundwater. With more than 60% of the land farmed and a geography with 7500 km of coastline with shallow estuaries and coastal waters, this resulted in severe environmental problems during the late 1970ies and the 1980ies, such as eutrofication, anoxia and depletion of marine life in many near-coastal areas. Media attention to these problems during the mid 1980ies forced Danish politicians to act and resulted in the parliament passing the first Action Plan on Nitrogen, Phosphorus and Organic Matter Discharge in 1985 (the NPo-plan, Table 1).

Furthermore, increasing groundwater nitrate concentrations exacerbated the problems since the drinking water supply in Denmark is almost 100% based on unpurified groundwater. When the EU Nitrate Directive was implemented, Denmark therefore designated the whole territory as nitrate vulnerable, and subsequently, approximately 15% of the land was designated as nitrate vulnerable abstraction areas in 2005 (Hansen and Thorling 2008).

From 1985 and onwards the following series of political action plans to mitigate losses of N and other nutrients were implemented, several of them implementing EU directives related to environment and agriculture (Table B7). This resulted in the Danish agricultural industry being subject very early on to one of the strictest regulatory regimes in Europe, if not the world (Dalgaard et al., 2014; Sommer and Knudsen, 2021)

Table B7: Overview of the Danish regulation for the reduction in leaching of nitrogen (modified from Dalgaard et al 2014; Knudsen 2016)

Year	Action plan	Elements in the plan	Target
1985	Action Plan on Nitrogen, Phosphorus and organic matter (NPO)	Ban on sewage discharge without treatment. Ban on the direct leakage of manure to drain and streams. Ban on manure spreading on frozen soils, minimum spreading area of manure per animal unit (harmony rule).	General reduction of pollution of ground and surface waters.
1987	Action Plan for the Aquatic Environment I (AP-I)	Demand for storage capacity for animal manure, ban on autumn and winter spreading on bare soils, requirement for a minimum coverage of soil with autumn and winter crops, mandatory fertilizer plans.	50% reduction of N leaching from agriculture relative to leaching in the 1980s.
1991, updated in 1996	Action Plan for Sustainable Agriculture, implementing the EU Nitrates Directive	Maximum N quotas (econ. optimal N rates), minimum requirements for utilisation of N in animal manure, mandatory fertilizer accounts.	Same as above
1998, updated in 2000	Action Plan for the Aquatic Environment II (AP-II)	10% reduction in N quotas from optimal levels, mandatory minimum area with catch crops, wetlands, afforestation.	Same as above; target achieved in 2003
2001	Ammonia Action Plan	Reduction of ammonia emission through mitigation measures in animal houses, manure storages (mandatory covers), ban on broadspreading of slurry, requirement for rapid soil incorporation (6h),	12% reduction of NH <sub>3</sub> loss relative to 1999
2004	Action Plan for the Aquatic Environment III (AP-III)	Increasing demand for mandatory catch crops, volunteer buffer strips.	13% reduction in N leaching relative to the leaching in 2003.
2009	Green Growth Plan	Ban on soil tillage in autumn before spring sown crops, 50,000 ha mandatory buffer strips, 140,000 hectare extra cover crops in catchments to vulnerable fjords.	Reduction of loss of N with 30% relative to the outlet 2004-2008.
2011 – 2015	River Basin Management Planning (RBMPs) initiated, implementing the EU Water Framework Directive (WFD)	Change from focus on general reduction of N leaching to the aquatic environment, to a targeted regulation to achieve good ecological quality of fresh- and marine waters. Geographically targeted regulations to achieve a certain reduction in N loading to particular recipients.	Achieving good ecological status of all streams, rivers, lakes and sea. This will necessitate 22% reduction in N loss to the aquatic environment, relative 2010-2014.

2016	Food and agricultural Plan	Increasing quotas of N to the econ. optimal level with effect from 2017. Mandatory buffer strips abolished and cancellation of the 140,000 hectares of extra cover crops. Wetlands, constructed wetlands, afforestation, 100,000 hectare extra voluntary catch crops in 2017 and 2018. Targeted regulation of catchment to vulnerable fjords 2018-2021 (part of RBMP). Introduction of max. P application limits (manure+fertilizer) in 2017	Reduction of the loss of N by 13% until 2021 related to the loss 2010-2014 and further 9% in the period 2021-2027.
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As a result of this series of action plans and regulations to reduce nutrient losses from Danish agriculture to the aquatic environment, the N surplus has been reduced from its mid 1980ies level by around 50% and N-leaching from the root zone has accordingly been approximately halved (Dalgaard et al 2014; Sommer and Knusen, 2021). A large analysis of almost three decades of monitoring data from a number of permanent monitoring sites throughout Denmark (Petersen et al. 2021) found that the most effective and significant mitigation measures for nitrate-N loads to streams were found to be i) increased storage capacity and improved spreading techniques for animal manures (facilitating higher utilization efficiency of N in manures and concurrent substitution of mineral fertilizer application) and ii) growing of catch crops following the main crops as well as banning soil tillage in autumn prior to spring sown crops (reducing soil N mineralisation and leaving volunteers and weeds to grow over autumn/winter, reducing the risk for nitrate leaching).

However, further reductions are required, especially to comply with the EU Water Framework Directive, and a change of paradigm is therefore being implemented now, with a spatially differentiated approach, involving more severe restrictions placed on applications to land vulnerable to nitrate leaching to the aquatic environment and a potential easing of restrictions in other areas.

In Denmark, the legislative body (the Parliament) issues laws or legal acts (in Danish = love, lovbestemmelser), e.g. the *Danish Law on Use of Fertilisers*. With this, it authorises the executive bodies (e.g. the Government or individual Ministries such as the Ministry of Agriculture and Fisheries) to issue decrees, ordinances or orders (e.g. the Danish Fertiliser Ordinance, Danish = *Gødningsbekendtgørelsen*). These ordinances serve to define more detailed how the goals and principles stipulated in European directives and/or national legal acts shall be implemented and achieved.

The following legal acts and ordinances relate to the use of nutrient-rich residual side streams (NRSS) as biobased fertilisers (BBF) and are described here with respect to their key contents.

## 1. Fertilising products and fertilisation

The Danish regulations related to fertilising products and fertilization includes several different laws and ordinances. These address both conventional fertilizing products (*Gødningsbekendtgørelsen*), as well as manures and other residues from livestock production (*Husdyrgødningsbekendtgørelsen*).

### Law and Ordinance on Animal Husbandry and Management of Manure

Regulation of the storage, management and utilization of manure and organic fertilizers is compiled in the Danish Law on Animal Husbandry and Management of Manure (*Husdyrbrugloven*) and the Manure Decree (*Husdyrgødningsbekendtgørelsen*). The decree is updated annually by The Ministry of Environment of Denmark.

The decree is founded on the following EU regulations for environmental protection: the EU Nitrates Directive, the EU fertilizer legislation, the EU water frame directive, and the decree of NEC. The decree also compiles national environmental action plans implemented in the period from 1985 till today aiming to reduce the environmental impact of livestock production.

Danish Law on Animal Husbandry and Handling of Manure (***Husdyrbrugloven: Bekendtgørelse af lov om husdyrbrug og anvendelse af gødning m.v*** LBK nr 520 af 01/05/2019) available in Danish here: <https://www.retsinformation.dk/eli/lt/2019/520>.

The Manure Decree (***Husdyrgødningsbekendtgørelsen: Bekendtgørelse om miljøregulering af dyrehold og om opbevaring af gødning*** BEK nr 2243 af 29/11/2021), available in Danish here: <https://www.retsinformation.dk/eli/lt/2021/2243>.

The decree covers several aspects related to design and maintenance of animal housing and in particular manure storages.

The storage capacity for manure must be sufficient to allow between six and nine months storage, depending on livestock and the crop system. The storage capacity must be high enough to allow that manure only is land applied outside the closed periods, and that a sufficient high utilization of nitrogen in the manure can be reached. Documentation for sufficient storage capacity has to be provided by fertilization accounts.

All liquid manure storage facilities must be covered by a solid cover (tent, concrete lid, or floating tarpaulin lid), if the manure surface is not covered by an artificial or natural floating crust. If the storage facility is without a solid cover, the owner has to provide a logbook note each month. The logbook note has to ensure that the floating crust has an adequate thickness and spreading to abate odour and ammonia emission. If the floating crust is not adequate, the farmer has to ensure that, for instance by supplying chopped straw.

Solid manure storage facilities without a daily addition of new material must be covered by airtight material. Only deep litter with a dry matter content higher than 30 per cent can be stored in field heaps. All other types of solid manure have to be stored at concreted areas with collection of manure leakage.

### Law and Ordinance on Use of Fertilisers in Agriculture and Minimising Nutrient Losses

The regulations on use of both synthetic fertiliser products and manures as fertilising products are covered by the Danish Law on Use of Fertilisers in Agriculture and Minimising Nutrient Losses

**(Gødskningsloven: Lov om jordbrugets anvendelse af gødning og om næringsstofreducerende tiltag**, LOV nr 338 af 02/04/2019), available in Danish here:

<https://www.retsinformation.dk/eli/lt/2019/338>

and two ordinances, the Danish Fertilisation Ordinance (**Gødningsanvendelsesbekendtgørelsen: Bekendtgørelse om anvendelse af gødning**, BEK nr 1551 af 02/07/2021), available in Danish here:

<https://www.retsinformation.dk/eli/lt/2021/1551>

and the Danish Fertiliser Use Ordinance (**Gødskningsbekendtgørelsen for 2021/22: Bekendtgørelse om jordbrugets anvendelse af gødning i 2021/22**, BEK nr 1601 af 14/07/2021), available in Danish here: <https://www.retsinformation.dk/eli/lt/2021/1601>

The first ordinance includes rules for handling and use of all fertilizers used in agriculture. Here it is stated that in most cases a maximum of the equivalent of 170 kg total N/ha in organic fertilizer may be used on average on the farm. It also states how much phosphorus may be used. The phosphorus limit indicates how much phosphorus may be used on average per hectares on the farm - this depends on the type of use. In addition, there are a number of rules for when the individual types of fertilizer can be used - the so-called "closing periods" - as well as rules for application in case of frost, snow cover, etc. All fertilizer must be stated in a fertilizer account, which must be prepared annually and submitted to the Danish Agency for Agriculture.

The second ordinance includes rules and prescriptions for planning and registration of all trade and use of N or P containing mineral and organic fertilisers (manures and other NRSS), including statutory maximum N norms for individual crops and soils conditions. The ordinance covers not only farmers, but also all dealers and traders of fertilisers and fertilising materials, incl. middle-men for manure exchange, biogas and composting plants etc.

#### Application rates:

Statutory maximum N application rates are defined for all agricultural and horticultural crops and land uses (cropland, grasslands, permanent pastures etc.), and depend also on soil types and preceding crop or catch crop (N deduction depending on prehistory). These statutory N norms are generally based on economically optimal N application rates (in mineral fertiliser), derived from 10 years of annual data from a number of national field trials as the basis; the N norms are revised every third year.

A farm quota of maximum allowed available N is then estimated from the area proportion of individual crops on each farm, and this sets the maximum limit for use of mineral fertiliser and manure N on the farm. Manure and other organic N sources are only accounted on their available N, estimated with statutory mineral fertiliser replacement values set for each manure type.

#### Application time:

The application of liquid manure and liquid organic waste is not allowed between harvest and 1<sup>st</sup> of February. Due to the differences in harvest time, this means that the open window for manure application depends on the type of crop. Winter cereals and crops established in spring can only have manure applied in the spring period from 1<sup>st</sup> of February till the crop is too developed or mature to be able to utilize the nutrients applied. Winter rape may additionally have manure applied in the period between crop establishment in the autumn and 1<sup>st</sup> of October. Crops with a long growing



season (sugar beets, grass, and maize) can have manure applied from 1st February until harvest, but not later than 1<sup>st</sup> of October.

Solid manure and solid organic waste are allowed to be applied from 1<sup>st</sup> of February till 15<sup>th</sup> of November, given that the area is established with a winter crop. In areas without a winter grown crop, solid manure and solid waste are only allowed to be applied from 1<sup>st</sup> of February till harvest and from 20<sup>th</sup> of October till 15<sup>th</sup> of November.

#### Application areas:

Livestock manure and organic waste must not be applied to areas that may cause risk of nutrient runoff to streams, lakes bigger than 100 m<sup>2</sup>, and coastal waters. Application of manure is not allowed in hilly areas (more than 6°) closer than 20 m to the aforementioned water types, unless the manure is injected. Application of manure is not allowed in hilly areas (more than 12°) closer than 20 m to the aforementioned water types.

Livestock manure must not be applied to soils that are frozen, covered by snow, or saturated by water.

#### Application technologies:

Liquid manure and liquid organic wastes applied to uncropped soil and fodder grass have to be injected. The only exception is if the slurry is treated by a verified technology (for example, acidification) proven to give the same ammonia reduction as injection. If applied to other established crops, liquid manure must be applied by trailing hoses or trailing shoe systems. Application by broad spreading and irrigation technologies is not allowed.

Solid manure and solid organic waste applied to uncropped soil must be incorporated within 4 hours after the application.

#### Manure data used for fertilizing purposes

Reduction of nitrogen and phosphorus input to agricultural land has an important role in the Danish regulation system. To ensure that farmers do not use too much nitrogen and phosphorus, each farmer must submit a fertilizer account to the ministry each year.

The fertilizer account has to document that the total amount of nutrients applied is below the nitrogen and phosphorus ceilings for the specific farm, taking into account the farm specific soil type, livestock number and production systems, and the crop systems for the coming season. The fertilization accounts also involve the calculation of the total nitrogen and phosphorus production in animal manure at the farm, and the given requirements for the minimum utilization of the nitrogen content of the animal manure.

The total farm specific production of nitrogen and phosphorus is calculated by the total number of livestock animals in different categories, and the use of standard table values for the ex-storage nutrient production (normative values). The normative values are calculated by Aarhus University annually for the different livestock types, categories, and housing and manure systems. It is a mass balance system based on the difference between the nutrient input in feed measured on a large number of farms, the nutrient output in livestock products (milk, meat, eggs and fetus), and ammonia loss from the housing system for the specific animal category.

When making the fertilizer account, the farmer has the opportunity to use the normative values as they are given, or to calculate farm specific normative values depending on the farm specific input of nutrients in feedstuff and farm specific farm production output levels (Type 2 corrections).

The farmers can use manure analyses of their manure to optimize their fertilization plans to the actual nutrient content of their manure. However, only the normative values are allowed for the calculation of the fertilization accounts submitted to the authorities, for the maximal nutrient application rates, and for the total production of manure nutrients at the farm.

Maximum allowable fertilization rates for manure N and P:

Nitrogen: The total application of nitrogen in livestock manure and organic fertilizers must not exceed 170 kg nitrogen per ha per year. There is only one exception to this limit, for cattle derogation farms if they fulfil the specific requirement of minimum 80% of the cropped area grown with forage crops (long growing season and high nutrient uptake) they are allowed to apply up to 230 kg N per ha per year in manure.

Phosphorus: The maximal phosphorus application rate to agricultural land depends on the fertilizer source and whether the application takes place in areas situated above water catchment areas for environmentally sensitive waters. The max allowed application rates are decreasing and are for the coming growing season 2019/2020 between 30 and 39 kg P/ha/year, depending on livestock type (Table B8). If the fertilization takes place in areas above water catchment areas leading to environmental sensitive waters, the max phosphorus levels are reduced to 35 kg P at derogation cattle farms, and 30 kg P per ha for all other types of livestock farms. The total area of the environmental sensitive areas makes up about 22 per cent of the total Danish agricultural area.

Table B8: Overview of the maximum application of nitrogen and phosphorus to agricultural land in Denmark.

Type of manure or fertilizer	N-ceiling (kg total N ha <sup>-1</sup> )	P-ceiling (kg P in all ha <sup>-1</sup> )	Environmentally sensitive areas
Cattle	170	30	30
Cattle – derogation	230	35	30
Slaughter pigs	170	35	30
Sows + piglets	170	35	30
Poultry and fur	170	35	30
Other livestock	170	30	30
Organic waste	170	30	30
Mineral fertilizer	-	30	30

## Organic farming certification and operational rules

In addition to the above general rules for all farming activities in Denmark, certified organic farming practices are regulated by the Danish Law on Organic Farming (**Bekendtgørelse af økologiloven**, LBK nr 152 af 29/01/2021), available in Danish here: <https://www.retsinformation.dk/eli/lt/2021/152>) and in the Ordinance for Organic Farming Practices (**Økologibekendtgørelsen: Bekendtgørelse om økologisk jordbrugsproduktion m.v.**, BEK nr 2249 af 01/12/2021), available in Danish here: <https://www.retsinformation.dk/eli/lt/2021/2249>.

These are based on the general EU Regulation 2018/848 on organic production and labelling of organic products and ensure implementation in Danish legislation and administration over and above the general regulation of agricultural activities. They cover both certification as well as special rules regarding animal production, manure management, plant production, protection and fertilisation, approved fertilising materials, documentation etc.

## Danish Implementation of the EU Fertilising products regulation 2019/1009/EU

The implementation of the EU Fertilising products regulation 2019/1009/EU in Danish legislation is currently taking place through a recent amendment to the Law on Fertilisers and Soil Amelioration Products (**Bekendtgørelse af lov om gødning og jordforbedringsmidler m.v.** LBK nr 16 af 04/01/2017) available in Danish at <https://www.retsinformation.dk/eli/lt/2017/16>.

The recent Law Amendment on Fertilisers and Soil Amelioration Products (**Lov om ændring af lov om gødning og jordforbedringsmidler m.v.** LOV nr 416 af 05/04/2022) available at <https://www.retsinformation.dk/eli/lt/2022/416> provides adjustments to comply with the new EU FPR requirements. The law is associated with revisions to a number of the ordinances, including the Ordinance on Fertilisers and Soil Amelioration Products (**Gødningsbekendtgørelsen; Bekendtgørelse om gødning og jordforbedringsmidler m.v.** BEK nr 1135 af 09/07/2022) available in Danish here <https://www.retsinformation.dk/eli/lt/2022/1135>

The Danish Agricultural Agency ([www.lbst.dk](http://www.lbst.dk)) will serve as the notifying authority, but it has not yet made decision on notifying body. The Danish Accreditation Fund ([www.danak.dk](http://www.danak.dk)) will serve as accrediting body.

Further details and updates on the Danish implementation of the EU FÜR 2019/1009 can be followed on (in Danish) at <https://lbst.dk/virksomheder/salg-af-goedning-og-jordforbedringsmidler-mv/ny-eu-goedningsforordning-20191009-gaeldende-fra-16-juli-2022/>

## 2. Waste management

Waste management in Denmark is regulated by a number of different laws and ordinances. First of all, the Danish Law on Protection of the Environment (**Miljøbeskyttelsesloven: Bekendtgørelse af lov om miljøbeskyttelse**, LBK nr 1218 af 25/11/2019), available in Danish here:

<https://www.retsinformation.dk/eli/lt/2019/1218>. This sets the overall framework for protection soils, ground and surface waters and air as well as the general regulation of polluting industries.

The ordinance on management of waste (**Affaldsbekendtgørelsen: Bekendtgørelse om affald**, BEK nr 2512 af 10/12/2021), available in Danish here: <https://www.retsinformation.dk/eli/lt/2021/2512>, covers waste planning, disposal and utilisation of waste, as well as categories of waste according to risks (for environment and health).

Finally a number of ordinances regarding the application of various types of waste to soils, describe the specific requirements for these disposal pathways

### Waste to Soil Order

If the applied fertilizer is characterized as waste, it must also comply with the rules in the Waste to Soil Order (**Slambekendtgørelsen: Bekendtgørelse om anvendelse af affald til jordbrugsformål** BEK nr 1001 af 27/06/2018), available in Danish here: <https://www.retsinformation.dk/eli/lt/2018/1001>

Examples of this type of fertilizer are biosolids (wastewater sludge), protamylasse (potato cell water, from industrial starch extraction), abatoir waste, animal byproducts, dairy processing sludge, fish farm sludge, organic waste from households etc. (specified in a list in the ordinance). For some of these, further restricted ordinances apply, see below.

Before application, the waste must as minimum be analysed for dry matter, nitrogen, phosphorus, 7 heavy metals (Cd, Hg, Cr, Zn, Cu, Ni and Pb) and 4 organic pollutants (PAH, LAS, DEHP and NPE). If the waste complies with the strict limit values, it can be used as fertilizer. Limit values are given in Table B9 and B10.

Table B9: Maximum limits for heavy metal content in organic waste applied to soils. Either limit value (per DM or total P) applies, depending on which is most limiting

	mg per. kg DM	mg per kg total P
Cd	0.8	100
Hg	0.8	200
Pb <sup>1)</sup>	120	10 000
Ni	30	2 500
Cr	100	-
Zn	4 000	-
Cu	1 000	-

Table B10: Maximum limits for content of organic pollutants of inorganic waste applied to soils.

	mg per kg DM
LAS <sup>1)</sup>	1 300
Σ PAH <sup>2)</sup>	3
NPE <sup>3)</sup>	10
DEHP <sup>4)</sup>	50
Σ PCB <sup>5)</sup>	0.2

1) LAS: Linear alkylbenzen sulfonates

2) PAH: Polycyclic, aromatic hydrocarbons.

Σ PAH = Σ Acenaphthene, Phenanthrene, Fluorene, Fluoranthene, Pyrene, Benzfluoranthenes (b+j+k), Benz(a)pyrene, Benz(ghi)perylene, Indeno(1,2,3-cd)pyrene.

3) NPE: Nonylphenols (+ethoxylates).

4) DEHP: di(2-ethylhexyl)phthalate.

5) PCB7: PCB28, PCB52, PCB101, PCB118, PCB138, PCB153 and PCB180. Only sewage sludge, and only at indication of PCB7.

Prior to use, a contract must be entered into with the recipient, who must designate the areas where the waste is to be used. The contract, field map and a declaration (with analysis results and a description of how the waste is to be used) are sent to the recipient's municipality, which approves the use.

After application, the quantities are reported to the Danish Agency for Agriculture, so that it is automatically included in the recipient's fertilizer account.

The recipient must be aware that there is a requirement for a maximum amount of dry matter added in waste/hectare over a 10-year period.

#### The Bio-Ash Order

If bio ash (ash from wood and/or straw) is to be applied to soil, the bio ash must, in addition to the general rules, be dispensed in accordance with the rules in the Bio Ash Order (**Bioaskebekendtgørelsen: Bekendtgørelse om anvendelse af bioaske til jordbrugsformål** BEK nr 732 af 09/07/2019), available in Danish here: <https://www.retsinformation.dk/eli/ta/2019/732>

All other ash types/mixtures must be applied in accordance with the rules in the Waste to Soil Order (if they are suitable as fertilizer on agricultural soil).

The Bio Ash Order requires analysis for Phosphorus, Potassium, and 5 heavy metals (Cd, Cr, Ni, Hg and Pb, limit values Table B11). If the plant does not continuously measure for CO in the flue gas, it must also be measured for PAH. If the limit values are met, bio ash can be used as fertilizer. Prior to delivery, a contract must be entered into with the recipient. Next, it must be notified to the recipient's municipality that bio ash is applied to the farm. In connection with the notification, the contract and declaration are submitted. Waste to be used for agricultural purposes and digestate from biomass coming from livestock manure-based biogas plants or treatment plants shall, prior to its application, comply with the restrictions on the use of waste in Table B12 that are applied for sanitary reasons.

Table B11: Maximum limits for heavy metal content in bio ash applied to soils

	mg per kg DM
Cd	5/20 <sup>1)</sup>
Hg	0.8
Pb	120/250 <sup>2)</sup>
Ni	60
Cr	100
Zn	4 000
Cu	1 000
Σ PAH	12

<sup>1)</sup> 5 for straw and mixed ash, 20 for wood ash

<sup>2)</sup> 120 for woodash applied in forest

Table B12: Usage restrictions on various types of waste based on sanitary aspects, see Annex 1, after various treatments

Treatment Waste	Not treated	Stabilised	Controlled composting	Controlled sanitation
A) Sludge, etc. from vegetable production	+	+	+	+
B) Sludge from aquaculture	Not to be used for recreational areas and private gardening	+	+	+
C) Sludge from the processing of raw animal materials	Not to be used for agricultural purposes	Not to be used for agricultural purposes	Not to be used for agricultural purposes	+
D) Domestic organic waste and waste similar to domestic waste	Not to be used for agricultural purposes	Not to be used for agricultural purposes	Only after sanitation at 70 °C for at least 60 min. in a biogas plant.	+
E) Sewage sludge	Not to be used for agricultural purposes	Not for edible crops or recreational areas and private gardening. Injected or worked into the soil within 6 h of delivery.	Not for edible crops or recreational areas and private gardening.	+
G) Inactivated and lime-stabilised biomass with DM > 30 % derived from a fermentation production, as well as surplus sludge from associated industrial ww	+	+	+	+

After application, the quantities are reported to the Danish Agency for Agriculture, so that it is automatically included in the recipient's fertilizer account. The recipient must be aware that there is a requirement for a maximum amount of added dry matter and cadmium in the bio ash/hectare over a 5-year period.

#### Organic Fertilizers and Soil Improvements with Animal Derived Content

If the desired fertilizer was originally an animal by-product, the handling and application must comply with the rules in the Executive Order on Organic Fertilizers and Soil Improvements with Animal Derived Content (**Bekendtgørelse om organiske gødningsstoffer og jordforbedringsmidler med animalsk indhold** BEK nr 574 af 29/05/2018), available in Danish here:

<https://www.retsinformation.dk/eli/ta/2018/574>

The order includes prescriptions on how these animal byproducts are treated and processed before incorporation as fertilizing products, e.g. which retention time is required at different reactor temperature in an anaerobic digestion plant (biogas).

For materials under this order there is a requirement that a minimum of 21 days must elapse from the application of fertilizer until the crop is utilized. In addition, there are requirements for maximum incidence of Salmonella, Enterobacteria and Clostridium.

After application, the quantities are reported to the Danish Agency for Agriculture, so that it is automatically included in the recipient's fertilizer account.

Submitted (not yet approved by the EC)

### 3. Ground and surface water quality, soil protection, air quality and climate/renewable energy

Protection of the environment in Denmark is regulated by a number of different laws and ordinances. As listed in chapter 2, the main one is Danish Law on Protection of the Environment (**Miljøbeskyttelsesloven: Bekendtgørelse af lov om miljøbeskyttelse**, LBK nr 1218 af 25/11/2019), available in Danish here: <https://www.retsinformation.dk/eli/lta/2019/1218>. This sets the overall framework for protection soils, ground and surface waters and air as well as the general regulation of polluting industries. Further laws on specific environmental spheres are described in the following.

#### Water resources

The Law on Protection of the Marine Environment (**Havmiljøloven**, LBK nr 1165 af 25/11/2019) available in Danish here: <https://www.retsinformation.dk/eli/lta/2019/1165>

The Law on Protection of Freshwater Streams and Lakes (**Vandløbsloven** LBK nr 1217 af 25/11/2019) available in Danish here <https://www.retsinformation.dk/eli/lta/2019/1217>

The Law on Protection and Supply of Potable Water Resources (**Vandforsyningsloven** LBK nr 1450 af 05/10/2020), available in Danish here: <https://www.retsinformation.dk/eli/lta/2020/1450>

The Law on Planning of Protection of Surface and Ground Water Resources (**Vandplanlægningsloven** LBK nr 126 af 26/01/2017) available in Danish here <https://www.retsinformation.dk/eli/lta/2017/126>

The latter represents the implementation of the EU Water Framework Directive, and is associated with a range of ordinances regarding water catchments, setting of water quality goals, water management plans, water action plans and baselines (see more in Danish on this link: <https://mst.dk/natur-vand/vandmiljoe/vandomraadeplaner/vandomraadeplanerne-2021-2027/vandomraadeplanerne-2021-2027/>)

#### Soil and Natural areas

The Law on Protection of Soils from Contamination (**Jordforureningsloven** LBK nr 282 af 27/03/2017) available in Danish here <https://www.retsinformation.dk/eli/lta/2017/282>

The Law on Protection of Natural Areas (**Naturbeskyttelsesloven** LBK nr 1392 af 04/10/2022) available in Danish here <https://www.retsinformation.dk/eli/lta/2022/1392>

#### Air and Climate

The ordinance on Assessment and Control of Air Quality (**Luftkvalitetsbekendtgørelsen: Bekendtgørelse om vurdering og styring af luftkvaliteten** BEK nr 1472 af 12/12/2017), available in Danish here <https://www.retsinformation.dk/eli/lta/2017/1472>, specifies goals, indicators and control measures for air quality.. However, the ordinance contains nothing on ammonia or similar emissions from manure and other waste products – these are regulated in the regulations on approval of animal productions facilities and similar.

The political targets regarding climate have in Denmark been set in the Law on Climate (**Bekendtgørelse af lov om klima** LBK nr 2580 af 13/12/2021) available here <https://www.retsinformation.dk/eli/lta/2021/2580>, which basically implements the Paris Agreement in Danish law. However, as of yet, the agricultural sector has not been regulated based on this,



though this is part of the parliamentary negotiations regarding establishment of a new Danish government ongoing in Nov 2022.

*Submitted (not yet approved by the EC)*

#### 4. Common Agricultural Policy in the national law

Not considered

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## NATIONAL LEGISLATION: FINLAND

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Fertiliser use of manure and organic fertiliser products is governed via national legislation enacting the EU Nitrates Directive (91/676/EEC) and the EU Fertilising Product Regulation (EU 2019/1009). The Government Decree on Limiting Certain Emissions from Agriculture (1250/2014), known as 'Nitrates Decree', aims to reduce nitrogen emissions caused by the storage and use of manure and other organic fertiliser products and the use of inorganic fertiliser products. In the Decree, the whole of Finland is defined as a nitrate vulnerable zone and thus it controls nitrogen fertilisation in all farms across the country. Legislation on phosphorus fertilisation was renewed in January 2023 when The Government Decree on Use of Phosphorus Containing Fertiliser Products and Manure (205/2022) was laid down under Fertiliser Act (711/2022). It is the first stricter regulation for phosphorus fertilisation in Finland. Previously, phosphorus fertilisation had only a maximum limit in legislation (325 kg/ha/5 yr period), but it did not include manure. Otherwise, limits were then based on a voluntary agri-environmental programme. The Fertiliser Act (711/2022), the Decree of the Ministry of Agriculture and Forestry on fertiliser products (24/2011) and the Decree of the Ministry of Agriculture and Forestry on Activities Concerning Fertiliser Products and Their Control (11/2012) regulate manufacturing fertiliser products, placing them on the market, and their use, transport, import and export, and control. Additional rules may also apply via the environmental permitting of animal farms and other related legislation.

The following laws and regulations are related to the use of nutrient-rich side-streams (NRSS) as bio-based fertilisers (BBF) and are described here with respect to their key contents (please note that, where a paragraph (§) consists of several sections and reference is made to a particular section, the section number is given in brackets () following the number of the paragraph):

### 1. Fertilising products and fertilisation

Fertiliser Act 711/2022 (13.7.2022)

The Fertiliser Act (711/2022) regulates manufacturing fertiliser products, placing them on the market, and their use, storage, transport, import and export, and providing information on fertiliser use for customers and end-users. The Act also regulates manure use in fertilisation. The objectives of the Act are

- to promote the supply of safe and high-quality fertiliser products suitable for plant production,
- to ensure the safety of plant and food production, and environmental quality,
- to promote the utilisation of manure for fertilising, and
- to promote the provision of adequate information on fertiliser products to the buyers and end-users.

## Fertiliser products

Fertiliser products include fertilisers, liming materials, soil conditioners, substrates, microbial products and by-products used as fertiliser products (**§4(1)**). The Act is applicable to EU fertiliser products regulated in EU 2019/1009 (**§4(2)**). Fertiliser products must be safe, they must be suitable for the intended use and the requirements in EU Fertiliser Regulation and in this Act must be fulfilled. The products must not contain harmful substances, products, or organisms so that they could not cause any danger to human or animal health or safety, plant health or the environment, when used according to the instructions for use (**§5(1-2)**). In addition, raw materials must be safe and fulfil the quality requirements (**§7**).

When using fertiliser products or manure for phosphorus fertilisation, the amount of phosphorus must be equal to plant's need and taking the soil phosphorus status into account (**§6**).

The Finnish Food Authority approves the list of ingredients used in fertiliser product. The origin, properties and production process of each ingredient must be verified (**§8**). The labelling requirements of the products and packaging are also regulated (**§9, §11**).

## Operators

Operators are expected to have appropriate premises, facilities and implements for manufacture, storage and transport of fertiliser products and their raw materials (**§13**). Before an operator commences activity (manufacturing, importing in EU, technical processing or storing), the operations must be approved by the Finnish Food Authority (**§14**). A new approval must be applied if the operations are changed significantly (**§14**). A specific notification must be delivered beforehand to the Finnish Food Authority about new operations, essential changes, and termination of operations. This does not apply to the operators in wholesale or retail trade. The authority performs an inspection before the operations are started (**§14**). An operator must annually report the volumes of manufactured fertiliser products, their type designations and trade names, the used raw materials and their origin, the fertiliser products placed on the market, imported, and exported with their volumes and the purpose of use, if needed, to the Finnish Food Authority (**§14**). The operator is also obliged to keep records (**§16**) unless it works only in wholesale or retail trade. The manufacturer must conduct an in-house quality control plan (**§17(1)**). The plan shall cover techniques, processes and measures relating to manufacturing, quality control and quality assurance. In addition, the quality system shall cover inspections and tests carried out before, during manufacture and after manufacture, and their frequency of execution. The quality control plan shall be submitted to the Finnish Food Authority on request (**§17(2)**).

[Decree of the Ministry of Agriculture and Forestry on Activities Concerning Fertiliser Products and Their Control \(11/2012, last amended 3.11.2015\)](#)

The decree gives further provisions in more detail to operators, for example, on the obligation to notify, keep records, conduct in-house control, laboratory approval, internal trade, import of fertiliser products and approval of establishments. It also lays down the provisions on organising the control related to fertiliser products.

Decree of the Ministry of Agriculture and Forestry on Fertiliser Products (24/2011, last amendment 8.2.2016)

The Decree regulates the types of national fertiliser products, type designation groups and their requirements, and the quality, marking, packaging, transport, storage, use and other requirements related to fertiliser products and their raw materials (**§1(1)**).

National types of fertiliser products and type designation groups together with their more thorough descriptions and requirements are listed on the following link:

[https://www.ruokavirasto.fi/globalassets/yriytykset/lannoiteala/tiedostot/type\\_designation\\_1\\_2016\\_fin\\_en.pdf](https://www.ruokavirasto.fi/globalassets/yriytykset/lannoiteala/tiedostot/type_designation_1_2016_fin_en.pdf)

Concerning harmful contaminants, the Decree regulates as follows:

**Cadmium (Cd) (§5a):**

- A fertiliser product may not contain Cd more than 1.5 mg kg<sup>-1</sup> in dry matter.
- Ash fertilisers (type designation group 1A7), when used in agriculture, horticulture, green areas and landscaping, may not contain Cd more than 2.5 mg kg<sup>-1</sup> in dry matter. If an ash fertiliser is used in forests, the maximum content of Cd is 25 mg kg<sup>-1</sup> dry matter. The same applies to the raw materials used for the production of ash fertilisers.
- With the minimum phosphorus (P) content of 2.2% (5% as P<sub>2</sub>O<sub>5</sub>), a fertiliser may not contain more than 50 mg Cd kg<sup>-1</sup> P (22 mg of Cd kg<sup>-1</sup> P<sub>2</sub>O<sub>5</sub>).
- The average maximum Cd load may not exceed 1.5 g Cd ha<sup>-1</sup> yr<sup>-1</sup>. The maximum Cd load as used batches during the periods of use can be
  - in agriculture and horticulture at the maximum of 7.5 g ha<sup>-1</sup> 5 yr<sup>-1</sup>
  - in landscaping and green areas at the maximum of 15 g ha<sup>-1</sup> 10 yr<sup>-1</sup>; this does not apply to soil improvers and growing medias
  - in forestry use ash fertilisers (type designation group 1A7) at the maximum of 100 g ha<sup>-1</sup> 60 yr<sup>-1</sup>

**Arsenic (As) (§5b):**

- A fertilizer product may not contain As more than 25 mg kg<sup>-1</sup> in dry matter.
- If an ash fertiliser (type designation group 1A7) is used in forest fertilisation, the maximum content of As is 40 mg kg<sup>-1</sup> in dry matter. The same applies to the raw materials used in ash fertilisers.
- The average maximum As load from the use of ash fertilisers (type designation 1A7) in forestry may not exceed 2.65 g As ha<sup>-1</sup> yr<sup>-1</sup> and 160 g ha<sup>-1</sup> 60 yr<sup>-1</sup>.

**Selenium (Se) (§6):**

- Se can be added as selenate at 15 mg kg<sup>-1</sup> in dry matter to some fertilisers when permitted in type designation. The maximum amount allowed is 20 mg kg<sup>-1</sup> in dry matter in a solid fertiliser (not allowed to add on the surface of fertiliser grain).
- To fertilisers sold to livestock farms or farms receiving manure, Se can be added as selenate at 25 mg kg<sup>-1</sup> in dry matter similarly as described above. The maximum content of Se in a fertiliser can be 30 mg kg<sup>-1</sup> in dry matter. The aim of Se addition is supplementary fertilisation of grass or cereals for a recognised need when fertilising mainly with manure.

In addition, **Annex IV** of the Decree regulates other harmful substances, organisms and contaminants in fertiliser products. These requirements apply to all fertiliser products (unless otherwise stated). However, the requirements do not apply to soil improvers, growing media or other fertiliser products utilised in landfill sites or other closed areas or to by-products utilised as such. The maximum allowable harmful metal contents are listed in Table B13, maximum allowable amounts of pathogenic or disease indicator micro-organisms in Tables B14 and B15 and impurities in Table B16.

Table B13: Threshold values for harmful metals in fertiliser products.

Harmful metal	Maximum content (mg kg <sup>-1</sup> of dry matter)	Maximum content (mg kg <sup>-1</sup> of dry matter) in ash fertilisers or in ash used as their raw material to be used in forestry
As	25	40
Hg	1.0	1.0
Cd	1.5 <sup>1</sup>	25
Cr	300 <sup>2</sup>	300
Cu	600 <sup>3</sup>	700
Pb	100	150
Ni	100	150
Zn	1500 <sup>3</sup>	4500 <sup>3</sup>

<sup>1</sup>For ash fertilisers or ash used as their raw material to be used in agriculture and horticulture, construction of green areas and landscaping the limit is 2.5 mg Cd kg<sup>-1</sup> of dry matter.

<sup>2</sup>For steel slag (type designation 2A2/3, a by-product used as a liming material as such) the limit is 2.0 mg soluble Cr<sup>6+</sup> kg<sup>-1</sup> of dry matter.

<sup>3</sup>The limit might be exceeded if there is Cu or Zn shortage based on soil analysis. In forestry, exceeding is allowed only when using Zn in peatland forest in the case of shortage based on soil/leaf/needle analysis. In that case, the limit is 6000 mg Zn kg<sup>-1</sup> of dry matter.

Table B14: Threshold values for pathogens and indicator organisms in fertiliser products

Pathogen/Indicator	Limit
Salmonella	Not found in a sample of 25 g
<i>E. Coli</i>	Under 1000 CFU g <sup>-1</sup> and under 100 CFU g <sup>-1</sup> in growing media for commercial greenhouse production of plants in which edible plant parts are in direct contact with the growing media.
Root rot fungus (for instance, <i>Fusarium</i> ; found using a culture test)	Not found in growing media used in seedling production.

Table B15: Special requirements for plant-derived fertiliser products or accompanying topsoil fractions. In addition, pests that are referred in the Act on the Protection of Plant Health (702/2003) or under it may not be present in a fertiliser product

Pest	Limit
Golden nematode ( <i>Globodera rostochiensis</i> )	Not found in a fertiliser product manufactured from root vegetable, beet and potato raw material or from accompanying topsoil fractions.
Pale cyst nematode ( <i>Globodera pallida</i> )	
Potato ring rot ( <i>Clavibacter michiganensis</i> )	
Potato brown rot ( <i>Ralstonia solanacearum</i> )	
Potato wart disease ( <i>Synchytrium endobioticum</i> )	
Beet necrotic yellow vein virus "Rhizomania"	
Root-knot nematodes ( <i>Meloidogyne spp.</i> )	
Other quarantine pests causing plant diseases	Not found in fertiliser products manufactured from plant waste or growing media from greenhouse production.

In the **Annex IV** of the Decree are also some requirements for the treatment of plant material. By-products and waste from potato, root plant and beet industry and barking and packaging plants, and separately collected biowaste need to be treated either by 1) composting (min temperature 55 °C and moisture 40% for at least two weeks), or 2) heat treating in moist at 70°C for one hour (particle size under 12 mm), or 3) using another method that is approved by the plant protection authority. However, these treatment requirements are not required, if the above mentioned plant materials originate from a raw material from production sites where pests listed in Table B15 have not been found within no more than 5 years before the production of raw material or if pests have not been found in laboratory analyses from raw materials before their use.

Table B16: Limits for impurities in fertiliser products

Impurity	Limit
Weed seeds <ul style="list-style-type: none"> <li>• in fertilisers and liming materials</li> <li>• in packaged soil improvers and growing media</li> <li>• in soil improvers and growing media sold in bulk</li> </ul>	Not found  2 germinated in a litre  5 germinated in a litre or there need to be a description: "product contains weed seeds spread by wind"
Refuse (glass, metal, plastics, bones, rocks) <ul style="list-style-type: none"> <li>• in packaged products</li> <li>• sold in bulk</li> </ul>	0.2% of fresh weight  0.5% of fresh weight
Wild oat	Not found
Parts of plants	No live roots, rootstock or any other parts relating to vegetative propagation

Government Decree on Limiting Certain Emissions from Agriculture and Horticulture (1250/2014, last amendment 15.10.2015)

This Decree implements the Nitrates Directive (91/676/EEC), and it applies to both manure and all fertiliser products (except liming products) specified in the Fertiliser Product Act (539/2006). It also applies to processed or non-processed by-products in farms that are utilised as fertilisers. The entire area of Finland is defined as a nitrate vulnerable zone.

This Decree regulates for example:

- placement of storages for manure and organic fertiliser products, exercise areas, and feeding and watering points (**§4**)
- manure storage (**§5&8**) and their minimum capacities (**Annex 1 of the Decree**)
- storage of unpackaged organic fertiliser products (**§6**)
- constructional requirements (including e.g., storages, composting, permanent feeding points, exercise areas) (**§7**)
- fertiliser use (described later) (**§10**)
- amount of N fertiliser (described later) (**§11**)
- determination of manure nutrient content (**§12**)
  - Manure must be analysed every 5 years for soluble N, total N and total P
  - A farmer may choose to use manure analysis result or table values (Annex 2 of the Decree) as basis of fertilisation planning
- buffer zones (**§10**)



The Decree contains general provisions for fertiliser use in **§10**: Nutrient runoff into water bodies and risk for subsoil compaction must be prevented in fertiliser spreading. Fertilisers should not be applied on snow-covered, frozen, or water-saturated soil. In addition, the average crop yield, cultivation zone, crop rotation and soil type should be considered. Spreading manure and organic fertiliser products is forbidden between November 1 and March 31. However, deviation is possible until November 30 if exceptional weather conditions have prevented manure spread during growing season. After surface spreading incorporation must be done within 24 hours. On fields with vegetative cover overwinter, manure and organic fertiliser products must be injected below soil surface from September 15 onwards, except in the case of manure application in preparation for autumn sowing. Application of manure and organic fertiliser products is forbidden in plot areas where slope exceeds 15%.

The limit for total N is  $170 \text{ kg ha}^{-1} \text{ yr}^{-1}$ , when using farm animal manure and organic fertiliser products (**§11(1)**). The Decree also regulates on the annual maximum amount of soluble N ( $\text{kg ha}^{-1}$ ) for various crops in mineral and organic soil (**§11(2)**). If soluble N exceeds  $150 \text{ kg ha}^{-1}$ , N amount needs to be split into at least two applications at least two weeks in between. After September 1, the amount of soluble N in manure and organic fertiliser products spread may not exceed  $35 \text{ kg ha}^{-1}$  (**§11(3-4)**). Regarding manure, fertilisation can be planned either based on manure nutrient analysis or manure nutrient “table (standard) values” that are listed in the Decree’s **Annex 2 (§12(1))**.

#### Government Decree on Use of Phosphorus Containing Fertiliser Products and Manure (205/2022, adopted 12.1.2023)

Government Decree on Use of Phosphorus Containing Fertiliser Products and Manure (205/2022) laid down under Fertiliser Act (711/2022), is the first stricter regulation for phosphorus fertilisation in Finland. Earlier, phosphorus fertilisation had only a maximum limit in legislation ( $325 \text{ kg/ha/5 yr}$  period), but it did not include manure. Otherwise, the limits have been based on a voluntary agri-environmental support scheme. The Decree regulates the use of phosphorus fertilisation in agriculture, horticulture, green areas, and landscaping.

Fertilisation limits are calculated based on total phosphorus content in manure and fertiliser products with the exceptions; 60% of the total phosphorus in sewage sludge is taken into account, and 40% of total phosphorus in ash and biochar is taken into account (**§3**). Phosphorus fertilisation must be applied with crop-specific need and yield, and taking the soil phosphorus status into account (**§4**). Maximum level for phosphorus fertilisation is given by crop and soil phosphorus status in the Annex 1 of the Decree. Soil phosphorus status categories are given by soil type and soil organic matter content in the Annex 2 of the Decree. For green areas and landscaping, higher levels of phosphorus fertilisation (given in §10) can be applied.

To promote phosphorus recycling (and manure processing), a maximum of 5 kilograms of phosphorus per hectare can be given where (1) otherwise the fertilisation would be prohibited by high soil phosphorus status (2) phosphorus is derived from the phosphorus separation of manure or digestate; and (3) the ratio of total nitrogen to total phosphorus in the fraction generated by the phosphorus separation of manure or digestate is not less than 10 (**§5**).

### Act on Organic Production

New national Act on Organic Production is in the process of being adopted and serves to implement the European Regulation No 848/2018, which will enter into force on January 1, 2022. The Finnish Food Authority is preparing new guidelines for control and enforcement of organic production. The control will be developed towards electronic inspection methods. Current legislation is based on Regulation (EC) No 834/2007 and consists of Act on Inspection in Organic Production (294/2015) and the Decree on Organic Production (454/2015).

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## 2. Waste management

Sewage sludge: Decree of the Ministry of Agriculture and Forestry on Fertiliser Products (24/2011, last amendment 1.9.2011)

Sewage sludge-based fertiliser products belong to the type designation groups of organic soil improvers (3A2) and by-products used as soil improvers as such (3A5) (Annex I in this document). Sewage sludge derived organic soil improvers can also be used as raw materials for growing media. The limits for harmful metals (Table B13), pathogens and indicator organisms (Table B14), and impurities (Table B16) and the issues related to Cd (**§5a**) and As (**§5b**) as described above concern also sewage sludge derived products. There are no limits for organic contaminants.

The Decree includes several regulations for using sewage sludge (**§11a**) and only the main points are gathered here. To be used in agriculture, sewage sludge, septic tank sludge and dry toilet waste must be processed. By-products used as soil improvers as such (type designation 3A5) may be used only on arable land where harmful metal concentrations in soil do not exceed the limits in Table B17, soil pH is above 5.8 and the load of harmful metals does not exceed the maximum annual loads in Table B18. In addition, the processed products can only be used for cereal, sugar beet or oilseed plants or plants that are not directly consumed or the subterranean part of which is not eaten or that are not used as animal feed. The withdrawal period is 5 years for potatoes, root plants, vegetables and root or herbal spices, if not stated otherwise in type designation descriptions. However, the abovementioned regulations do not apply, if the share of sewage sludge in the raw materials of 3A5 products is less than 10% of fresh weight.

Table B17: Maximum allowable harmful metal contents in field soil where sewage sludge derived fertiliser product is used

Harmful metal	Limit mg kg <sup>-1</sup> of dry matter
Hg	0.2
Cd	0.5
Cr	200
Cu	100
Pb	60
Ni	60
Zn	150

Table B18: Maximum allowable average annual load of harmful metals in agriculture caused by the used sewage sludge derived fertiliser product

Harmful metal	Maximum load g ha <sup>-1</sup> y <sup>-1</sup>
Hg	1.0
Cd	1.5
Cr	300
Cu	600 <sup>1</sup>
Pb	100
Ni	100
Zn	1500 <sup>1</sup>

<sup>1</sup>Loads can be doubled in cases where there is a shortage of Cu and Zn. However, this cannot lead to a situation where the limits in Table 5 are exceeded.

Biowaste: Decree of the Ministry of Agriculture and Forestry on Fertiliser Products (24/2011, last amendment 1.9.2011)

In Finland, there are no specific regulations for biowaste treatment in fertiliser use except what is stated in the Decree of the Ministry of Agriculture and Forestry on Fertiliser Products (24/2011). The limits for harmful metals, pathogens and indicator organisms and impurities in biowaste-based fertiliser products are same as listed in Tables B13, B14 and B16, as are the issues related to Cd (**\$5a**) and As (**\$5b**). There are no limits for organic contaminants.

In the **Annex IV** of the Decree (24/2011) are some requirements for the treatment of plant materials. By-products and waste from potato, root plant and beet industry and barking and packaging plants, and separately collected biowaste need to be treated either by 1) composting (min temperature 55 °C and moisture 40% for at least two weeks), or 2) heat treating in moist at 70°C for one hour (particle size under 12 mm), or 3) using another method that is approved by the plant protection authority. However, these are not required, if above mentioned plant materials originate from raw material from production sites where pests listed in Table B15 have not been found within no more than 5 years before the production of the raw material or if pests have not been found in laboratory analyses from the raw materials before their use.

Animal by-products: Animal By-Product Act (517/2015, last amendment 18.6.2021) and the Decree of the Ministry of Agriculture and Forestry on animal by-products (783/2015) Regulation (EC) No 1069/2009 of the European Parliament and Council with its complementary Regulation (EU) No 142/2011 of the European Commission set rules for handling animal by-products and derived products, to prevent and minimise risks to public and animal health arising from those products, and in particular to protect the safety of the food and feed chain. In Finland, the Animal By-Product Act (517/2015) and the Decree of the Ministry of Agriculture and Forestry on animal by-products (783/2015) facilitate the implementation of EU animal by-product regulations regarding the use and disposal of animal by-products and animal-derived products. Some national privileges are given in the Act and Decree. The Act also regulates the supervisory authorities and their functions.

#### End-of-waste status for particular materials/products

At the moment, there are no criteria for end-of-waste status of organic materials except by a discretionary evaluation of the authority on a case-by-case decision. Preparations have been started to the future end-of-waste-related regulation on organic materials.

Submitted (not yet approved by the EC)

### 3. Ground and surface water quality, soil protection, air quality and climate/renewable energy

Environmental Protection Act (527/2014) and Environmental Protection Decree (713/2014, last amendment 1.12.2021)

Environmental Protection Act (527/2014) and Environmental Protection Decree (713/2014) apply to all operations that may cause environmental pollution. The act is the foundation of an integrated system for environmental permits and for a pre-approval procedure for operators. The permitting system applies also for intensive farming. Granting a permit is subject to the condition that the operations do not cause harm to health or significant environmental pollution or a risk of such pollution. Environmental permits contain regulations on emissions and their reduction, waste, and waste management, and preventing air, soil, surface water, and groundwater contamination. One important condition for permits is that emissions are limited to the levels obtainable by using Best Available Techniques (BAT). In the decision, due to the local circumstances, stricter provisions can be given than those provided in legislation. Applications for permissions are processed by either the Regional State Administrative Agencies or the local municipal authority depending on the level of activity. The Finnish Food Authority keeps a record of fertiliser product manufacturers to be listed in EU's NANDO database.

Supervision is mainly targeted to operations that involve the greatest risk of causing environmental pollution. Supervision is implemented through planned inspections, by monitoring the load on and the state of the environment, and by carrying out inspections in the event of an accident, harm, or violation.

Government Decree on Water Resources Management (1040/2006, last amendment 1.12.2020)

This Decree serves to implement EU's Water Framework Directive (2000/60/EC) and has a broader approach at reducing diffuse water pollution from agricultural sources. Implementation has been planned and executed in cooperation with national and regional stakeholders. Authorities must consider given water quality targets when environmental permitting process is considered, and for example, manure and phosphorus fertiliser spreading on fields with high soil phosphorus status can be restricted.

Act on Environmental Impact Assessment Procedure (252/2017) and Decree on Environmental Impact Assessment Procedure (277/2017, last amended 1.10.2021)

The Act implements the EU Directive 2014/52/EU and gives regulations on the environmental impact assessment procedure (EIA). EIA is required for activities including, for example, different uses of natural resources, activities affecting water bodies, chemical industry, and energy production. EIA can be required for projects which are not listed in the concerned activities for EIA but have significant impacts based on their context or intensity. EIA legislation includes an assessment of the indirect and cumulative impacts, as well as interactions of several projects.

National Energy and Climate Strategy for 2030 and Climate Act (423/2022)

The Finnish Government Programme of prime minister Sanna Marin has set the target of Finland being carbon-neutral in 2035 and carbon-negative soon after that. The aim of the Climate Act

(423/2022) is to reduce greenhouse gas emissions by at least 60% by 2030 and 80% to 2040 from the level in 1990. The Climate and Energy Strategy is currently under modification and Medium-term Climate Policy Plan was updated in summer 2022.

*Submitted (not yet approved by the EC)*

#### 4. Common Agricultural Policy in the national law

In new programme period of EU Common Agricultural Policy (CAP) 2023-2027 national actions regarding to fertilisation are proposed to promote circular economy in agriculture.

The proposed agri-environmental agreement commits farmers to perform certain fertilisation practices promoting soil productivity, carbon sequestration, water and air protection, nutrient recycling, and increase of soil organic matter content. The practices are (a) injection or incorporation of slurry manure, urine, liquid fraction of separated slurry manure or liquid bio-based fertiliser or (b) application of organic material (dry matter >20%) on fields that has origin outside of the farm. Organic material means bio-based fertilisers or soil improvers or their mixtures, solid manure or dry fraction of separated manure from another farm. The minimum amount for injected or incorporated slurry or liquid fertiliser on a field is 15 m<sup>3</sup>/ha and for organic material (dry matter >20%) 10 m<sup>3</sup>/ha. For more concentrated fraction of manure or fertiliser product with high nutrient content, the minimum amount of application is 5 m<sup>3</sup>/ha. However, the application amount can be lower if the maximum allowance of nitrogen or phosphorus fertilisation on the parcel will be achieved.

The Decree of Cross-Compliance Standards on Good Agricultural and Environmental State (4/2015, last amendment 22.12.2020)

The Decree serves the implementation of Regulation (EU) No 1306/2013 of the European Parliament and of the Council on the financing, management and monitoring of the common agricultural policy. The cross-compliance standards give the basic requirements to be followed to obtain agricultural subsidies. Regarding fertilisation, organic fertiliser products are not specified distinct from manure. The other requirements are related to public health, animal and plant health, and environmental issues.

#### References

Laakso, J. & Luostarinen, S. (eds.) 2019. Legislation and voluntary actions regulating manure fertilization in the Baltic Sea Region. Natural Resources and Bioeconomy Studies 84/2019. 69 p. Natural Resources Institute Finland, Helsinki 2019. <http://urn.fi/URN:ISBN:978-952-326-876-0>

SuMaNu. 2021. SuMaNu Policy Recommendations – The Current Status in Partnership Countries. Working paper in WP3. <https://balticsumanu.eu/about-the-project/reports/>.



## NATIONAL LEGISLATION: GERMANY

Compiled by Sylvia Kratz (JKI)

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In Germany, the legislative body (the Parliament) issues legal acts (=Gesetze), e.g. the German Fertiliser Act. With such acts, it can authorise the executive bodies (e.g. the Government or individual Ministries such as the Ministry of Food and Agriculture) to decree ordinances (e.g. the German Fertiliser Ordinance and the German Fertiliser Application Ordinance). These ordinances serve to define more detailed how the goals stipulated in European directives and/or national legal acts shall be achieved.

The following legal acts and ordinances relate to the use of NRSS as BBF and are described here with respect to their key contents (please note: where a paragraph (§) consists of several sections and reference is made to a particular section, the section number is given in brackets () following the number of the paragraph).

All national legal texts cited here can be found at

<https://www.gesetze-im-internet.de/>

More information on the European legislation governing the utilisation of NRSS and BBFs is given in Part A of this Deliverable D 1.2.

### 1. Fertilising products and fertilisation

Fertiliser Act (Düngegesetz [DüngG] of 9 Jan 2009, last amended 10 August 2021)

The Fertiliser Act regulates the placing on the market and the use of fertilisers, soil additives, plant additives and growing media. It contains authorisations to implement more detailed regulations in the form of national ordinances. The **aim of this Act** is defined in **§1 DüngG** as follows:

- To ensure the nutrition of agricultural crops
- To maintain or sustainably improve soil fertility, particularly with regard to a site- and use-specific humus content
- To prevent or avert risks for human and animal health as well as for the environment, which may arise from the production, placing on the market or application of the above mentioned materials or from other fertilisation measures
- To ensure a sustainable and resource efficient use of nutrients in agricultural production, in particular to prevent nutrient loss into the environment where possible
- To transpose or implement legal acts of the European Community regarding matters of this Act, especially the movement or application of fertilisers.

According to **§3 (1) DüngG**, the above mentioned materials may only be applied if they **conform** with one of the **fertiliser types defined in the EU Fertiliser Regulation**, or with the **German Fertiliser**

**Ordinance** which was issued as authorised by **§5 DüngG**. §5 DüngG grants the placing on the market of these materials only as far as they are suitable to

- Substantially **promote** the **growth of agricultural crops**
- Substantially **increase** their **yield**
- Substantially **improve** their **quality** or
- **maintain or sustainably improve soil fertility**, particularly with regard to a site- and use-specific **humus content**

and if they **do not harm human and animal health or put the environment at risk** when used appropriately. These requirements are further specified in the German Fertiliser Ordinance (DüMV).

If the materials are lawfully produced in another EU Member State, in Turkey, or in a State which is member of the European Free Trade Association as well as the European Economic Area, they must fulfill the same requirements for the protection from risks to human and animal health and to the environment as domestic materials.

Furthermore, according to **§3 (2) DüngG** the materials may only be applied according to **good agricultural practice**, i.e. they must serve to provide plants with necessary nutrients and to maintain and promote soil fertility in order to guarantee the supply of the population with high-quality food. As part of good agricultural practice, type, amount and time of application must be in line with plant and soil needs. The Fertiliser Act authorises the Ministry of Agriculture to issue a **Fertiliser Application Ordinance (Düngeverordnung, DüV)** defining the requirements of good agricultural practice in more detail, including regulations for the protection of natural waters from pollution, particularly with nitrate.

In addition, **§11a DüngG** stipulates that farms with more than 20 ha of agricultural land or more than 50 large animal units must calculate a mass flow balance. It also contains the authorisation to regulate details in the **Mass Flow Balance Ordinance**.

**§13a DüngG** contains regulations for quality assurance regarding farmyard manure, including an authorisation to define details in an ordinance. In part, this has been implemented in the **Manure Transfer Ordinance** (see below).

A revision of the Fertiliser Act is currently under preparation to transpose the new European Fertiliser Products Regulation (FPR; 2019/1009) into national law, and implement a monitoring programme accompanying the revised Fertiliser Application Ordinance (see below).

[Fertiliser Ordinance \(Düngemittelverordnung \[DüMV\] of 5 Dec 2012, last amended 2 Oct 2019\)](#)

The German Fertiliser Ordinance regulates the **placing on the market of fertilisers which are not marked as EC fertilisers (§2 (1) DüMV)**. It also includes **farmyard manure**, if the manure is given to other farms which do not belong to or are legally attributable to the same farmer (**§2 (3) DüMV**).

The DüMV specifies the requirements named in §5 DüngG by regulating the **production, composition and labelling of fertilisers**. It contains detailed lists of **allowed source or component materials**,

provisions for **minimum contents and effectiveness of nutrients** as well as **limit values for unwanted substances**.

According to **§3 (1) DüMV**, fertilisers may only be placed on the market if they correspond to a **fertiliser type approved by this Ordinance**.

If the fertiliser contains organic substance, the following types defined in Annex 1 Section 3 DüMV may be relevant/applicable for biobased fertilisers (BBFs):

### 3.1 Organic N-, P-, K-, NP-, NK-, PK- or NPK-fertiliser

Allowable component materials are listed in Annex 2 Tables 7.1, 7.2 and 7.4 (organic substances) (see below).

### 3.2 Organo-mineral N-, P-, K-, NP-, NK-, PK- or NPK-fertiliser

Allowable component materials are listed in Annex 2 Table 7.

Table B19: Excerpt from Annex 2 Table 7 DüMV: Substances of relevance for biobased fertilisers (BBFs)

	<b>Component material, substance group or origin</b>	<b>Limitation of allowed component materials</b>
	7.1 Plant-based materials	
7.1.1	Organic soil material	peat, peat mud, healing earth $C_{org} \geq 10\%$
7.1.2	Plant-based materials	from <ul style="list-style-type: none"> <li>• production of foods and feedstuff</li> <li>• agriculture</li> <li>• forestry</li> <li>• horticulture and landscaping, including materials from related processing industries</li> <li>• production of technical alcohols</li> <li>• energy production</li> <li>• processing of medicinal and aromatic plants</li> <li>• kitchen and canteen waste / catering waste</li> <li>• reed</li> <li>• humic acids</li> <li>• algae</li> <li>• Sphagnum</li> </ul>
7.1.3	Organic substances from filtration	Filtration residues from the production of foods and feedstuffs

	<b>Component material, substance group or origin</b>	<b>Limitation of allowed component materials</b>
7.1.4	Plant based filter materials	From biological air scrubbing
7.1.5	Castor cake	(Ricin content max. 50 mg/kg TM)
7.1.6	Vegetable floating debris and screenings	From water management and cleaning of beaches (after aerobic or anaerobic treatment)
7.1.7	Mushroom substrates	From production of edible and medicinal mushrooms
7.1.8	Fermentation residues of plant origin	From the production of enzymes and vitamins (for food and feedstuff)
7.1.9	Plant-based protein hydrolysates and plant-based amino acids	
7.1.10	Coal	Brown coal, including leonardite, xylith, and charcoal
	7.2 Animal-based materials	
7.2.1	Animal by-products	Materials allowed according to Regulation (EC) No 1069/2009: <ul style="list-style-type: none"> <li>1. Materials according to Art. 9 (category 2) <ul style="list-style-type: none"> <li>a) Farmyard manure, slurry and urine, (except guano)</li> <li>b) Digestive tract contents</li> <li>c) Substances from waste water treatment</li> <li>d) Substances from animals and animal parts</li> <li>e) Milk containing inhibitors</li> </ul> </li> <li>2. Materials according to Art. 10 (category 3)</li> </ul>
7.2.2	Animal excreta not derived from livestock	Excreta from pets
7.2.3	Fermentation residues of animal origin	From enzyme production
7.2.4	Guano	From seabirds or bats
7.2.5	Waste water from the processing of materials according to No 7.2.1 to 7.2.3	

	<b>Component material, substance group or origin</b>	<b>Limitation of allowed component materials</b>
	7.3 Mineral substances	
7.3.16	Ashes from [materials according to Tab. 7.1, 7.2 or 7.4]	Incineration of materials according to Tab. 7.1, 7.2 or 7.4, including mixtures. No flue gas ashes, except from the first filtering unit. No sludges from condensation traps.
	7.4 Other materials and organisms, including mixtures	
7.4.1	Waste water from the production of synthetic methionine	
7.4.2	Sludges, flotation tailings and liquid residues from food processing industry	From waste waters originating from <ul style="list-style-type: none"> <li>• Milk processing</li> <li>• Production of beverages</li> <li>• Production of gelatine</li> <li>• Production of vegetable foods</li> </ul>
7.4.3	Sewage sludges	Sewage sludges which are permitted for direct land application according to AbfKlärV
7.4.4	Organic wastes	Biowaste according to §2 No 1 BioAbfV from separate collection in private households or small businesses.  Catering wastes.  TierNebV and BioAbfV must be observed.
7.4.5	Living microorganisms	Bacteria, fungi
7.4.6	Dead microorganisms	Preparation derived from fireblight bacteria
7.4.7	Synthetic polymers	(special requirements regarding degradability)
7.4.8	Healing earth	
7.4.9	Polystyrene	(as component material for growing media)
7.4.10	Carbamid-Methanal-condensation product	Organic-synthetic resin foam (use as soil additive)

	<b>Component material, substance group or origin</b>	<b>Limitation of allowed component materials</b>
7.4.11	Hydrangea blue	Ammonium aluminum sulfate (use as plant additive)
7.4.12	Fishpond sludge	Fishpond sludge, fishpond sediments and filter sludges from fish production in ponds
7.4.13	Materials from air scrubbing in animal production facilities	Only water, pure sulfuric acid, pure sodium bicarbonate and nitrification inhibitors according to DüMV may be added in the scrubbing process

If **mineral N- and P-fertilisers** are produced **from organic component materials**, additional fertiliser types listed in Annex 2 may become relevant:

#### N-fertilisers

1.1.12 ammonium sulfate solution from ... (only a single component listed in Annex 2 Table 6.1)

Table 6.1 offers the following components

6.1.1 from air scrubbing (e.g. at animal production facilities, waste water treatment plants, biowaste treatment)

6.1.3 from aerobic or anaerobic treatment of organic materials according to Tables 7.1, 7.2 and 7.4

6.1.4 from municipal and industrial waste water treatment

6.1.5 from biotechnological treatment of materials according to Tables 7.1 and 7.2

6.1.9 from food production (production of sweetener, processing of sugar beets)

#### P-fertilisers

1.2.1 Dicalcium phosphate with magnesium (may be produced by precipitation of phosphoric acid originating from animal bones)

Minimum contents: 20% P<sub>2</sub>O<sub>5</sub> (soluble in alkaline ammonium citrate), 6% MgO

1.2.2 Dicalcium phosphate with tricalcium phosphate (also by precipitation of mineral phosphates)

Minimum content: 8% Total P<sub>2</sub>O<sub>5</sub> (soluble in mineral acid)

1.2.9 Phosphate fertiliser from ... (Phosphate containing component materials according to Annex 2 Table 6.2, only one component allowed)

Minimum content: 10% total P<sub>2</sub>O<sub>5</sub>, solubility requirements for type 1.2.9 according to Table 5, No 5.7:

Water soluble P<sub>2</sub>O<sub>5</sub>: min. 2.5%, P<sub>2</sub>O<sub>5</sub> soluble in neutral ammonium citrate and water: min. 5%, P<sub>2</sub>O<sub>5</sub> only soluble in mineral acid: max. 2%

Table B20: Annex 2 Table 6.2 DüMV Allowed component materials for type 1.2.9

No	Component material, substance group or origin	Limitation of allowed component materials
6.2.1	Carbonization of animal bones	Materials according to Table 7.2 No 7.2.1
6.2.2	Incineration of animal-based materials	Combustion chamber ashes of animal-based materials according to Table 7.2 pursuant to line 7.3.16
6.2.3	Incineration of sewage sludges	Ashes from sewage sludges according to Table 7.4 No 7.4.3 pursuant to line 7.3.16
6.2.4	Phosphate precipitation	<p>Precipitation of mineral phosphates with</p> <ul style="list-style-type: none"> <li>• Calcium chloride</li> <li>• Milk of lime</li> <li>• Magnesium chloride</li> <li>• Magnesium oxide or –hydroxide</li> <li>• Calciumsilicohydrate (only original production no residues or wastes)</li> </ul> <p>(as far as the material does not comply with type No 1.2.1 oder 1.2.2, i.e. DCP with Mg or DCP with TCP)</p>
6.2.5	Melt-gasification	Materials according to Table 7 (process temperature $\geq 1450^{\circ}\text{C}$ , no addition of foreign materials according to Table 8.3)

### Multinutrient fertilisers

2.1 NP-fertiliser (produced chemically, by mixing (solid) or dissolution (liquid))

2.3 PK-fertiliser (produced chemically, by mixing (solid) or dissolution (liquid) or suspension); may also be produced solely from ashes according to Annex 2 Table 7.3 line 7.3.16, i.e. from incineration of plant-based, animal-based or other materials according to Tab. 7.1, 7.2 or 7.4, e.g. thermally processed poultry faeces

2.4 NPK-fertiliser (produced chemically, by mixing (solid) or dissolution (liquid) or suspension); also by use of ashes according to Annex 2 Table 7.3 line 7.3.16, i.e. from incineration of plant-based, animal-based or other materials according to Tab. 7.1, 7.2 or 7.4

All fertilisers permitted according to §3 DüMV must comply with the **limit values for contaminants defined in Annex 2 Tab. 1.4 DüMV** and be labelled accordingly if they exceed the declaration values defined there.

Table B21: Annex 2 Tab. 1.4 DüMV: Declaration and limit values for contaminants

Contaminant	Declaration value (mg/kg DM oder other given unit)	Limit value (mg/kg DM or other given unit)
Arsenic (As)	20	40
Lead (Pb)	100	150
Cadmium (Cd)	1.0	1.5
Cd for fertilisers $\geq$ 5% P <sub>2</sub> O <sub>5</sub> (FM)	20 mg/kg P <sub>2</sub> O <sub>5</sub>	50 mg/kg P <sub>2</sub> O <sub>5</sub>
Chromium (total Cr)	300	
Hexavalent chrom (Cr VI)	1.2	
Nickel (Ni)	40	80
Mercury (Hg)	0.5	1
Thallium (Tl)	0.5	1
Perfluorinated tensides (PFT)	0.05	0.1
Sum of dioxine and dl-PCB (WHO-TEQ 2005)		30 ng (on grassland for feed production and other land used for cultivation of animal feed : 8 ng)

In addition, there are limit values for **copper (Cu) and zinc (Zn)**, which are primarily seen as micronutrients essential for plant nutrition. According to Annex 1 Section 4 DüMV they are type-defining micronutrients if they exceed a threshold of 200 mg/kg TM – in that case, limit values of 900 and 5000 mg/kg apply for Cu and Zn, respectively. For materials pursuant to AbfklärV a limit of 4000 mg/kg Zn applies (see chapter on Waste Sewage Sludge Ordinance). If biowastes are used as component materials, they must also comply with the limit values for Cu and Zn defined by BioAbfV, i.e., depending on application rate, 100 (or 70) mg/kg TM Cu and 400 (or 300) mg/kg TM Zn (see recital No 4 in Annex 2 Tab. 7 DüMV and chapter on Biowaste Ordinance).

If **farmyard manures and slurries** are not placed on the market according to §3 DüMV, **§4 (1) No 1 DüMV** stipulates that it must still be ensured that they do not harm soil fertility, human, animal and plant health, and do not put the environment at risk when used appropriately. In particular, the **declaration and limit values according to Annex 2 Table 1.4** column 4 are also binding for them (exception: limit values for dioxines and dl-PCB are not applicable for farmyard manures or digestates without biowaste as input material).

According to **§5 DüMV**, all permitted fertilisers must comply with special sanitary requirements regarding **epidemics and phytohygiene**. They must not contain any pathogens, toxins or pests which threaten the health of humans, animals or agricultural crops. In particular, they must not contain salmonella, and plant-based component materials must not be affected by resistant pathogens.



Farmyard manures are exempted from this requirement (salmonella), except if they are stored in tanks used by several farmers together (see §5 sec. 4).

It must be emphasized here that – in contrast to the provisions for EC fertilisers defined in the new Regulation (EC) No 2019/1009 – **compliance with a fertiliser type listed by DüMV or with the list of component materials in Annex 2 Tables 6 and 7 DüMV do NOT constitute an end-of-waste status for the respective product according to German law.** This can be seen by the fact that the German Fertiliser Ordinance makes reference to ordinances regarding waste such as the Waste Sewage Sludge Ordinance, the Biowaste Ordinance and the Animal By-products Disposal Ordinance several times.

However, a set of general criteria that could establish an **end-of-waste status** were defined in the **Circular Economy Act** (see below), one of them being compliance with relevant legislation (in this case the DüMV) – meanwhile, the legislative body has not made use of the option to specify these criteria by way of an ordinance for individual product types, e.g. for biowaste compost (see chapter on Circular Economy Act) yet.

Therefore, according to German law, a fertiliser producer must find an individual consensus on the interpretation of his materials as waste or as product in agreement with the competent waste and fertilising authorities.

**If a producer intends to place a new fertiliser on the market**, they must check whether the DüMV contains a type definition that fits their product, and if the product complies with the requirements defined for the respective type. If no suitable type is listed in the ordinance, the producer may lodge a request with the Ministry of Agriculture to supplement the list accordingly. If this request is considered positively by the Scientific Council for Fertilising Matters, the Ministry may decide to change the Fertilizer Ordinance accordingly. Producers should consult the Ministry for advice before lodging their request (<https://www.bmel.de/DE/ministerium/organisation/beiraete/dueng-inverkehrbringen.html> , last accessed 2 Dec 2022).

Fertiliser Application Ordinance/Ordinance redefining best practice in the application of fertiliser (Düngeverordnung [DüV] of 26 May 2017, last amended 10 August 2021) transposing the EU Nitrates Directive 91/676/EEC into national law, based on §3 Abs. 2 DüngG

This Ordinance is an essential component of the National Action Programme transposing the EU Nitrates Directive 91/676/EEC (according to Art. 5 (1) of that Directive). It specifies the requirements of **good agricultural practice in fertilisation** and contains provisions for **reducing the risks of fertilisation**, particularly of nutrient loss. It stipulates a **site specific assessment of fertiliser needs** for crops and grasslands before fertiliser application. This shall ensure a balance between expected nutrient needs of crops and actual nutrient supply. The Fertiliser Application Ordinance also transposes measures of the National Air Pollution Control Programme, which is designed to transpose the obligations of the European National Emissions Ceilings Directive (NEC), see Part A, chapter 3 of this Deliverable.

In October 2013 the European Commission initiated a contract infringement procedure against Germany, as the EU found that Germany had failed to transpose and implement the Nitrates Directive 91/676/EEC to its full extent in the national Fertiliser Application Ordinance. As a consequence, the Fertiliser Application Ordinance was thoroughly revised and a new Ordinance was issued in 2017. Since, according to the European Commission, the new Fertiliser Application Ordinance of 2017 was still not able to fully implement the changes stipulated by the decision made by the European Court of Justice in June 2018, further changes were made, and a revised **Fertiliser Application Ordinance** entered into force as of May 1, 2020 (regulations for 'red areas': January 1, 2021). This Ordinance contains:

- Detailed provisions for an **assessment of fertilising needs for N and P** (§§ 3 and 4 DüV), supplemented with crop-, yield- and site-specific obligatory guidance values and upper limits for N and P demand (Annexes 4 and 7)
- Detailed provisions for **N and P containing fertilisers** (§5 DüV), including a **ban to apply them on inundated, water-logged, frozen or snow-covered soils**, as well as **minimum 'no fertilisation' distances to water courses** (depending on slope) to be kept when applying them
- Special provisions for **organic and organo-mineral fertilisers**, including animal manures and slurries, as well as for **urea** (§ 6 DüV), in particular:
  - an **obligation to incorporate** organic and organo-mineral fertilisers with a significant N content (i.e. >1.5% N/kg TM, §2 No 11 DüV) **into the soil** within a maximum of 4 hours
  - application of **urea** allowed only in combination with a **urease inhibitor**
  - an obligation to apply **liquid organic and organo-mineral fertilisers** with a significant N content by **strip application** or to **incorporate them into the soil immediately**
  - an upper limit for **N from organic and organo-mineral fertilisers of 170 kg N/ha and year, per farm unit**, - in contrast to the Nitrates Directive, the German Fertiliser Application Ordinance extends this limit from animal manure to digestates from biogas plants, compost and sewage sludge,
- a **ban for the application of fertilisers with a significant N content** (i.e. >1.5% N/kg TM, §2 No 11 DüV) during the following **restriction periods** (§6 sections 8 and 9 DüV):

- from harvest of last main crop until January 31 on cropland (with exceptions for catch crops, winter rape, winter barley following a cereal crop and field forage under defined conditions)
- from Nov 1-Jan 31 on grassland
- solid manure and compost: Dec 1 to Jan 15
- a **restriction period for fertilisation with P containing fertilisers** (banned from Dec 1 – Jan 15, § 6 section 8 DüV)
- an obligation for farmers to **document the assessment of fertilising needs** according to §§ 3 and 4 as well as the **actual fertilisation** per plot (§10 DüV and Annex 5)
- an obligation for farmers to use **application equipment** for fertilisation that is in accordance with **recognised rules of technology** (§ 11 DüV)
- an obligation for farmers to provide **minimum storage capacity and duration for their organic fertilisers** (liquid and solid manure, digestates and compost) (§12 DüV)
- an obligation for **Federal Provinces to designate areas with high nitrate pollution and/or P eutrophication** and to issue additional measures for their protection by way of an ordinance (§ 13a DüV), eligible measures are listed in a catalogue in §13a DüV

In regions designated as areas with high nitrate pollution ('red areas') and/or high phosphorus eutrophication ('grey areas'), the following rules apply (§13a section 2 DüV):

- Reduction of calculated N fertilisation demand by 20% (average over total agricultural land that is cropped by the farmer in 'red areas'), exceptions for farmers who already practice a water-protecting cultivation
- Upper N limit of 170 kg N/ha and year for organic and organo-mineral fertilisation shall no longer be calculated as farm unit average, but relate to the fertiliser amounts applied to individual plots; exceptions for farmers who already practice a water-protecting cultivation
- No application of fertilisers with a significant N content from October 1 until January 31
- No application of solid manure from ungulates and of composts from Nov 1 until January 31
- No autumn N fertilisation for winter rape, winter barley and catch crops that are not used for feeding
- A limit of autumn fertilisation with liquid organic and liquid organo-mineral N fertilisers (including liquid manure) of 60 kg N/ha on grassland and areas used for cultivation of animal feed crops
- A ban of N fertilisation before summer crops except where the seeding of the summer crop is preceded by cultivation of a catch crop

*The ongoing tightening of the requirements of good agricultural practice in the Fertiliser Application Ordinance increasingly limit the use of unprocessed organic residues such as animal manure, municipal sewage sludge, biogas digestates and biowaste composts as fertilisers, aiming at a better environmental protection. Therefore, alternative strategies for the reuse of organic wastes in processed form gain more importance. This will probably a major driving force for the future development of biobased fertilisers which have clearly defined properties and are safe to use.*

*However, a prerequisite for a broader acceptance of such BBFs is the clarification of their legal status. In particular, with regard to the upper N limit of 170 kg for organic and organo-mineral fertilisers, it must be clarified if BBFs indeed keep their status as organic fertilisers independent of their real  $C_{org}$  content, or under which circumstances they can be classified as mineral equivalent. This question is*

currently tackled at EU level for animal manure derived products, which according to **Art. 2 letter g of the EU Nitrates Directive** remain 'animal manure' even if they have been processed into mineral fertilisers. The SAFEMANURE project has developed criteria that shall allow manure derived products to be exempted from the 170 kg N threshold under well defined circumstances (see Part A, chapter 3, subchapter on EU Nitrates Directive and the project SAFEMANURE).

Mass Flow Balance Ordinance (Stoffstrombilanzverordnung [StoffBiV] of 14 Dec, 2017, last amended 10 August 2021)

based on § 11a DüngG

This ordinance is based on the principle of a sustainable and resource-efficient use of nutrients at farm level, aiming to prevent nutrient loss into the environment as far as possible (§3 StoffBiV). The goal is to depict nutrient flows at farm level in a transparent and controllable way. Farmers must balance the amounts of nitrogen and phosphorus imported into and exported from their farm, based on the database of orientation values published as Annex to the Fertiliser Application Ordinance and supplementary data provided by the federal provinces' advisory services.

The ordinance is in force since January 1, 2018 and applies for

1. Farms with more than 50 LAU (large animal units) per farm unit or with more than 30 ha agricultural land and an animal density over 2.5 LAU/ha (from January 1, 2023: farm units with more than 20 ha agricultural land or more than 50 LAU per farm)
2. Animal production units staying below the threshold values in No 1, if they receive animal manure from outside their own operation
3. Farms operating a biogas plant if they receive animal manure generated outside their own operation

The N balance must be evaluated. As evaluation criterion, an allowed gross balance of 175 kg N/ha (calculated as 3-year-average) is defined, alternatively, an individual upper limit value can be defined for the farm. If the actual balance exceeds the defined limit by more than 10%, the farmer is obliged to seek advice from official advisory services regarding the sustainable and resource-efficient use of nutrients on his farm.

Manure Transfer Ordinance (Wirtschaftsdüngerverbringeverordnung [WDüngV] of July 21, 2010, last amended 2020)

based on §§ 4 und 15 DüngG

This ordinance on the placing on the market and transport of farmyard manures regulates obligations for documentation, notification and reporting of the placing on the market of manures, including the mediation, transport and acquisition of manure as well as materials containing or made of manure. These obligations apply both for inland exchange and exchange with other countries (§1 WDüngV). According to §3, the following data must be documented

- Name and address of seller, shipper and recipient
- Date of sale, shipment and reception

- Amount in tonnes fresh matter and type of manure/material
- Contents of total N and P<sub>2</sub>O<sub>5</sub> in kg/t FM and amount of N from manure of animal origin in kg

Transport across borders must be reported to the competent authority by the recipient. The federal provinces operate databases for this purpose. Before the first professional placing on the market of the above materials the seller must notify the competent authorities. This also applies for distributors who bring materials into the country for fertilising purposes.

According to §1 the obligations defined in WDüngV are not applicable

- For transports within an operational unit or within units belonging to the same owner, if the distance to the unit of origin is below 50 km
- For farms who are not obliged to calculate a nutrient balance according to the Fertiliser Application Ordinance and whose sum of nutrients generated on-farm and nutrients imported to the farm does not exceed 500 kg N/year
- If the farm exports, transports or receives less than 200 t FM per year
- For delivery to non-professional endusers in packing units of <50 kg

Based on the authorisation in §6, some of the federal provinces have issued more detailed regulations (§6).

Organic Farming Act (Öko-Landbaugesetz [ÖLG] of Dec 7, 2008, last amended 10 August 2021)

The Organic Farming Act serves to implement the Regulation (EU) No 2018/848 (repealing Reg. (EC) 834/2007 as of 1 Jan 2022) on organic production and labelling of organic products at national level. This implementation also covers all European legal acts that are based on or implementing Regulation (EU) No 2018/848, including the **restricted positive list of permitted fertilisers and soil conditioners in Annex II to the Implementing Regulation (EU) No 2021/1165** (authorising certain products and substances for use in organic production and establishing their lists). In particular, it lays down a uniform procedure for the approval of inspection bodies which are established to control the lawfulness and quality of organic production. It also defines the tasks and modes of action of the inspection bodies. In addition, it contains a range of sentences for potential infringements of the EU Regulation and its associated legal acts. The Organic Farming Act further empowers the Ministry of Agriculture to issue a set of ordinances aiding the implementation of the EU Regulation.

*Please note: Art. 21 section 2 of Regulation (EC) No 2018/848 states that **Member States may implement, within their territory, production rules in organic farming in the absence of detailed production rules for products not falling within the categories regulated at EU level, provided they follow the objectives and principles laid down in this Regulation. From the wording in this article, it is clear that it is not allowed for MS to set national rules for product categories that ARE already regulated at EU level, such as fertilisers and soil conditioners used in plant production (see Art. 12 Rules for plant production). This is also explicitly clarified by Annex II Part I Section 1.9.3 of Reg. (EU) 2018/848). Consequently, lists defining products and substances allowed for fertilisation in organic farming at national level must be in accordance with the EU positive list now established by Annex II to Reg (EU) No 2021/1165 and may not go beyond it.***

## 2. Waste management

Circular Economy Act (Kreislaufwirtschaftsgesetz [KrWG] of Feb 24, 2012, last amended 10 August 2021)

The Circular Economy Act transposes the EU Waste Framework Directive 2008/98/EC into national law. Accordingly, it contains **definitions of waste (§3) and by-products (§4)**, as well as criteria that need to be met by substances in order to reach **end-of-waste status (§5)**, which are based on the definitions and criteria of that Directive (see Part A chapter 2 on EU legislation).

According to §1, the aim of the Circular Economy Act (KrWG) is to promote circular economy for the protection of natural resources and to guarantee the protection of man and environment in the production and management of wastes. §3 (19) defines '**circular economy**' within the meaning of this Act as the **prevention and recovery of wastes**. §3 implements the definitions for '**waste**' (any substance or object which the holder discards or intends or is required to discard), '**recovery**', '**recycling**' and '**disposal**' provided by EU Directive 2008/98 (see there). **Wastes for recovery** are wastes that will be recovered; wastes that are not recovered are **wastes for disposal**. §3 (2) stipulates that **discarding** is assumed if the owner takes substances or things to be recovered according to **Annex 2 (non-exhaustive list of recovery operations)** or to be disposed of according to **Annex 1 (non-exhaustive list of disposal operations)**, or if he releases his actual power of possession including any further determined purpose of the substance or thing.

The lists of recovery and disposal operations are similar to those in EU Directive 2008/98/EC.

**Animal by-products are exempt from this Act** according to §2 (2) No 2 KrWG. They are separately regulated by **Regulation (EC) No 1069/2009** at EU level, as well as by the German Animal By-Products Disposal Act (**TierNebG**) and the Ordinance based on this Act (**TierNebV**) on national level. This also applies for other wastes of animal-origin which underly Regulation (EC) No 1069/2009. An **exception** are **animal by-products destined for incineration, deposition as landfill, or use in a biogas or composting plant**.

According to **§§11 and 12 KrWG**, **sewage sludges** and **biowastes** are explicitly within the scope of this Act.

§3 (7) defines **biowastes** as biologically degradable materials of animal or plant origin or from fungal material consisting of

1. Gardening and park wastes
2. Landscaping wastes
3. Food and kitchen wastes from private households, restaurants and catering, or from retail and comparable wastes from the food processing industry
4. Wastes of other origin which are comparable to those in No 1-3 regarding their type, quality or material properties.

§11 KrWG contains **authorisations to regulate details** and special requirements regarding the collection, treatment and recycling of **biowastes and sewage sludges** in separate ordinances. This was done by implementing the Biowaste Ordinance (**BioAbfV**) and the Waste Sewage Sludge Ordinance (**AbfKlärV**) (see respective chapters below).

**§5 KrWG** defines **end-of-waste status** according to Art. 6 of EU Directive 2008/98/EC. It contains an **authorisation to define end-of-waste criteria in more detail for particular substances and objects** (§5 (2) KrWG). However, the **legislator has not**



*made use of this authorisation as yet. This is noted with regret by Bundesgütegemeinschaft Kompost (BGK), who was hoping that end-of-waste status would be defined for composts and digestates from biowaste in the Biowaste Ordinance e.g. based on the quality assurance systems regulated by this Ordinance (Luyten-Naujoks, BGK, personal communication).*

In §§ 23ff., KrWG specifies a general responsibility of manufacturers of all types of products to contribute to the goal of circular economy in their production. Accordingly, products shall be designed in a way that generation of wastes during their production and usage is reduced, and manufacturers shall ensure that generated wastes will be recovered or disposed of in an environmentally friendly way. This concept is termed '**product responsibility**'.

The main aim of the **2020 revision of KrWG** was to transpose the changes of the European Waste Framework Directive of 2018 into national law, thereby further strengthening circular economy. In line with this, the **concept of product responsibility laid out in § 23 was further specified** by the 2020 revision: In particular, §23 Section 2 No. 2, stating that product responsibility comprises the **preferential use of recyclable wastes or secondary raw materials when manufacturing products** was further specified by **emphasizing the use of recycling materials in particular**. §3 No. 7b now defines recycling materials as 'secondary raw materials which are recovered from wastes or occur when disposing of wastes, and which are suitable for the manufacture of products'. In addition, § 23 Section 2 No. 3 no explicitly stipulates an **economical usage of critical raw materials**. Since phosphate rock and P were placed on the EU list of critical raw materials in 2014 and 2017, respectively (European Commission, 2014 and 2017), this should provide a strong incentive for an increased use of recycling materials for manufacturing P containing fertilisers. As was already the case in the previous version of KrWG, specific obligations for manufactures regarding their product responsibility must be legally defined by the government by way of ordinances (§23 Section 4). **To our knowledge, no such ordinance is being prepared with regard to the use of recycling materials for fertiliser production at the time of this writing.**

Waste Sewage Sludge Ordinance (Abfallklärschlammverordnung [AbfklärV] of Sept 27, 2017, last amended 19 June 2020)

Issued with Ordinance on the Reorganisation of Sewage Sludge Utilisation of Sept 27, 2017 (Bundesgesetzblatt 2017 Teil I Nr. 65, S. 3465 vom 2. Oktober 2017)

based on §§ 8, 10, 11, 12 and 67 KrWG

According to §1 (1) No 1, this Ordinance regulates the **application or incorporation of sewage sludge, sewage sludge mixtures** (i.e. mixtures of sewage sludge with other materials according to Annex 2 Tables 7+8 DüMV, see §2 (7) AbfklärV) and **sewage sludge compost** for the purpose of **utilisation/recovery onto or into a soil**

- a) Under agricultural use
- b) For landscaping measures
- c) Under forestry use and
- d) Under use as a house or kitchen garden or allotment garden.

Furthermore, it regulates the **delivery/distribution and treatment** (i.e. measures for biological, chemical and physical stabilisation, §2 (9)) of the above mentioned materials and contains **obligations for their analysis and limit values for contaminants** in these materials as well as in the

soils they are applied to. In addition, provisions for **quality assurance** of these materials are laid down here.

According to §1 (4), this Ordinance does not apply to waste water sludges pursuant to the Biowaste Ordinance (BioAbfV), as far as the treated waste water has not been mixed with domestic or municipal waste water and the waste water sludges comply with the provisions of the Biowaste Ordinance.

Legal regulations regarding fertilisers and fertilisation remain unaffected by the Waste Sewage Sludge Ordinance (i.e. if sewage sludge is used as a component material for fertilisers, the limit values defined in the Fertiliser Ordinance apply for these products).

§2 (2) AbfKlärV defines **sewage sludge** as a **waste resulting from the treatment of waste water in a closed treatment facility**, consisting of water, organic and inorganic substances, excluding screening, sieving and sand trap residues, including waste that was dewatered, dried, treated in herbal beds or treated otherwise. **A material is no longer a sewage sludge if it was changed by treatment in a way that it has lost those characteristics which are typical for sewage sludge.** This implies that precipitation products like struvite are no longer to be seen as sewage sludge. However, they are still waste, once they have been separated from the waste water stream, as long as they do not fulfil the end-of waste criteria of §5 KrWG.

According to §2 (3) **raw sludge** is a non-stabilised or partly stabilised sludge taken out of a waste water treatment facility before the completion of the treatment. As stated in §15 (1), the application or incorporation of raw sludge onto or into the soil is not permitted.

**Waste water** is defined according to §2 (4) as

1. Domestic or municipal waste water within the scope of Annex 1 to the Waste Water Ordinance
2. Waste water that was treated inside an operational waste water treatment plant and that resembles waste water defined in No 1 in its chemical composition.

For **soil-related contamination limit values** applying to the application or incorporation of sewage sludge onto or into the soil, **§7 (1) AbfKlärV** refers to the **precaution values** for metals, PCB and Benzo(a)pyrene according to Annex 2 No 4.1 and 4.2 **Soil Protection Ordinance (BBodSchV)**, i.e. application or incorporation is only permitted as long as the precaution values defined there are not exceeded (see chapter on BBodSchV).

In **§8 AbfKlärV**, **sewage sludge-related contamination limit values** are defined. Section 1 refers to the limit values according to Annex 2 Table 1.4 of the **Fertiliser Ordinance (DüMV)** (see there) and **additional limit values in Annex 1 AbfKlärV** (see Table B22 below). For copper (Cu) §8 (1) AbfKlärV refers to Annex 1 Section 4.1 No 4.1.1 DüMV, defining 900 mg/kg TM Cu as upper limit.



Table B22: Additional contamination limit values for sewage sludge, sewage sludge mixtures and sewage sludge compost according to Annex 1 AbfKlärV

Substance	Limit value (mg/kg TM)
Zinc (Zn)	4000
Sum of adsorbable organically bound halogens (AOX)	400
Benzo(a)pyrene (B(a)P)	1
Polychlorinated Biphenyles (PCB), for each congener 28, 52, 101, 138, 153, 180	0.1

As pointed out in §8 (2) AbfKlärV, when producing a mixture or compost, the limit values defined in section 1 apply both for the sewage sludge before mixing as well as for the mixture or compost.

The **allowed amount of application** is limited according to §14 (1) sentence 1 AbfKlärV to 5 tonnes DM sewage sludge per hectare within 3 calendar years. Pursuant to section 2, the share of sewage sludge within mixtures and composts may also not exceed 5t DM sewage sludge per hectare within 3 calendar years.

§15 AbfKlärV contains **limitations for the soil-related utilisation of sewage sludge**:

§15 (4): Ban of soil-related use in agriculture for sewage sludge from waste water coming from the potato processing industry

§15 (5): Ban of soil-related use for

1. Grassland (temporary and permanent),
2. Areas used for feed cropping,
3. Areas for maize cultivation, except corn maize and maize produced for biogas production, if sewage sludge has not been incorporated into the soil before seeding
4. Areas for sugar beet cultivation, if the greens are to be used as animal feed and if sewage sludge was not applied or incorporated before seeding in the year of cultivation,
5. Areas for cultivation of vegetables, fruit or hops,
6. House or kitchen gardens or allotment gardens
7. Forestry.

§15 (6): Ban of soil-related use in water conservation areas, nature conservation areas, national parks, (national) natural monuments, protected landscape components and legally protected biotopes.

**§3 AbfKlärV** stipulates a **recovery of sewage sludge of the highest quality** that is technically possible and economically reasonable. It clarifies that the **recovery of phosphorus** and the **recycling** of phosphorus or phosphorus-containing sewage sludge incineration ash **into the economic cycle shall be aimed for**.

Art. 4 to 6 of the **Ordinance for the Restructuring of the Waste Sewage Sludge Ordinance of Sept 27, 2017** contain **more detailed regulations to be included into §3 AbfKlärV from January 1, 2029 on**, regarding the obligations for recovery of P from sewage sludge and sewage sludge ash, as well as the related definitions in §2:

According to Art. 5 of the Restructuring Ordinance, from January 1, 2029 on, **P recovery** will be **defined in §2 (4a) AbfKlärV** as any recovery procedure by which phosphorus is recovered from sewage sludge (No 1) or from sewage sludge ash made of sewage sludge by mono- or co-incineration or of a carbon-containing residue (No 2). A **carbon-containing residue** is **defined in §2 (11d)** as the carbon- und phosphorus-containing material after thermal pre-processing of sewage sludge in a facility applying gasification, partial incineration or thermal processing with indirect heating of the reactor.

The recovery obligations resulting from §§3 ff. AbfKlärV starting in 2029 (or 2032) can be summed up as follows:

Large waste water treatment plants, i.e. $\geq 100.000$ population equivalents (from 2029 on) or $\geq 50.000$ population equivalents (from 2032 on):		Smaller waste water treatment plants
Sewage sludge with P content < 2% P (TM)	Sewage sludge with P content $\geq 2\%$ P (TM):	
<ul style="list-style-type: none"> <li>• Soil-related recovery limited (only up to a maximum size of 100.000 (from 2032 on: 50.000) population equivalents)</li> </ul>	<ul style="list-style-type: none"> <li>• Recovery of at least 50% P from the sludge or</li> <li>• Reduction of P content to &lt;2%</li> </ul>	<ul style="list-style-type: none"> <li>• Soil-related recovery still allowed</li> </ul>
<ul style="list-style-type: none"> <li>• Optional: Mono- or co-incineration</li> </ul>	<ul style="list-style-type: none"> <li>• Alternatively: Mono- or co-incineration</li> </ul>	<ul style="list-style-type: none"> <li>• Alternatively: Mono- or co-incineration</li> </ul>
<p>For sewage sludge incineration ashes and carbon-containing residues from sewage sludge, the recovery procedure applied must recover at least 80% of P content of the ash or residue (from 2029 on). That way, co-incineration in cement kilns is effectively excluded, since this route does not allow the option of P recovery.</p>		

All waste water treatment plants are obliged to submit a P recovery plan by the end of the year 2023 (Art. 4 of the Restructuring Ordinance).

Biowaste Ordinance (Bioabfallverordnung [BioAbfV] of Sept 21, 1998, new version of 4 April 2013, last amended 28 April 2022)  
based on §§ 11 and 12 KrWG

§1 BioAbfV defines the scope of this Ordinance as follows:

1. **Untreated and treated biowastes and mixtures** that are destined to be **applied to agricultural, forestry or garden soils for recovery as fertilisers**, or are distributed with that purpose, and
2. The **treatment and analysis** of these biowastes and mixtures.

According to §1 sections 3 and 3a, the BioAbfV does not apply in as far as the AbfKlärV applies, and not for animal by-products, which are regulated by the European Regulation (EU) No 1069/2009.

Pursuant to §1 (4), the legal regulations regarding fertilisers remain unaffected by BioAbfV. (This means for example that biowastes, if they are used as component materials for fertilisers, must also comply with the additional contamination limit values of the Fertiliser Ordinance for As and Tl.)

If biowastes and animal by-products are subjected to a joint treatment, both regulations (BioAbfV and EU-Regulation 1069/2009 and its related national ordinances) apply beside each other.

**§2 No 1 BioAbfV defines biowastes** as wastes of animal or plant origin or from fungal material destined for recovery, which can be decomposed by microorganisms, soil organisms or enzymes, including wastes for recovery with a high share of organic substance of animal or plant origin or from fungal material. Annex 2 No 1 of this Ordinance contains a list of biowastes including further specifications. Particular biowastes (No 1b) may only be applied by permission of the competent authority or on farmland cultivated by the producer/ owner of that waste (§9a BioAbfV). Annex 2 No 2 lists other wastes including biologically degradable materials and mineral substances that are suitable for a joint treatment together with biowastes and for the production of mixtures (among them for example ashes from the incineration of plant and animal materials, rock flour, clay, lime sludges a.s.o.).

Plant residues originating from agricultural land or forestry and remaining on that land are not biowaste.

According to §3 BioAbfV biowastes must undergo a **sanitary treatment** before application, which shall guarantee their **sanitary safety** in terms of epidemics and phytohygiene. Annex 2 contains further specifications for treatments and proof of sanitary safety of treated biowastes, listing the following treatment options:

- Pasteurisation
- Thermophilic composting (aerobic)
- Thermophilic digestion (anaerobic)
- For other types of treatment, proof of their equivalent efficacy must be given.

In addition, pursuant to §3a, **biowastes must be stabilised biologically** before land application in order to prevent adverse effects on the general well-being of people by decomposition processes and odour nuisance.

§3b contains special provisions for preventive hygiene with regard to the treatment of biowastes of animal origin on livestock farming units.

The following **heavy metal limit values** are defined for the application of treated biowastes on land (§4 (3) and §6 BioAbfV):

Table B23: Heavy metal limit values for treated biowastes and mixtures destined for land application (in mg/kg DM of applied material) pursuant to §4 (3) BioAbfV

Heavy metal (mg/kg DM)	Max. amount of application 20t DM/ha in 3 years (§6 (2) sentence 1)	Max. amount of application 30t DM/ha in 3 years (§6 (2) sentence 2)
Lead (Pb)	150	100
Cadmium (Cd)	1.5	1
Chromium (Cr)	100	70
Copper (Cu)	100	70
Nickel (Ni)	50	35
Mercury (Hg)	1	0.7
Zinc (Zn)	400	300

§ 4 BioAbfV also regulates **obligations for analysis and documentation.**

Maximum permitted content of **macroscopic impurities and stones** (§4 (4)):

Macroscopic impurities (glass, plastics, metal) > 2mm: 0,5% DM; stones >10mm: 5% DM

§8 BioAbfV prohibits the **application of biowastes and sewage sludge on the same plot** within a time period of 3 years (time period as defined in §6 (1)).

According to §9(2) BioAbfV, **soil tests for heavy metals and soil-pH** must be carried out prior to the first application of biowastes or mixtures. If there is evidence that the **precaution values defined by the Soil Protection Ordinance** will be exceeded, a renewed application must be prohibited.

**Art. 1 of the new “Ordinance changing waste related regulations/ordinances of 28 April 2022 (BGBl. I S. 700)”** introduces a number of changes to the Biowaste Ordinance that will apply in different steps, starting from 1 May 2023. In addition to extending its scope from agricultural, forest and garden soils to all soils, its **main aim is to keep macroscopic impurities, plastics in particular, from biowaste treatment processes such as digesting and composting.** To this end, a new Annex 5 is introduced defining labelling requirements (applying from 1 Nov 2023), and stricter requirements for cleaning treatment, as well as control and limit values for input materials and products are defined, introducing the new limit values of DüMV into BioAbfV (see new §2a applying from 1 May 2025).

Animal By-products Disposal Act (Tierische Nebenprodukte-Beseitigungsgesetz [TierNebG] of January 25, 2004, last amended 10 August 2021) and Animal By-products Disposal Ordinance (Tierische Nebenprodukte-Beseitigungsverordnung [TierNebV] of July 27, 2006, last amended December 4, 2018)

As stated in its §1, the Animal By-products Disposal Act (TierNebG) serves to transpose and implement Regulation (EC) No 1069/2009 on animal by-products and its related EU regulations (see Part A chapter 2 on EU legislation).

§13 TierNebG authorises the legislator to regulate details in additional ordinances. Based on this as well as on authorisations contained in other legislation in the field of waste, fertilisers and animal hygiene, the TierNebV was issued.

The **Animal By-Products Disposal Ordinance (TierNebV)** contains special provisions for food and canteen wastes and for livestock farming operations, obligations regarding the **storage, transport and placing on the market of animal by-products (including farmyard manure)** as well as obligations for **documentation**, and provisions for the **processing, treatment and disposal** of animal by-products, **insofar as they are not already regulated by Regulation (EC) No 1069/2009.**

**§23 (1) TierNebV** stipulates that digestates and composts containing animal by-products may only be **applied to soils** used for agriculture, forestry or gardening if the animal by-products are listed in Annex 4 of this Ordinance. **Annex 4** lists the following materials:

1. **Category 2 materials** within the meaning of Regulation (EC) No 1774/2002 (replaced by No 1069/2009):
  - a) manure
  - b) digestive tract and ruminal contents
  - c) milk and colostrum
  - d) other cat. 2 material that has been treated according to method 1 of the EU Regulation
2. **Category 3 materials** within the meaning of Regulation (EC) No 1774/2002 (replaced by No 1069/2009)

Submitted (not yet approved by the EC)

### 3. Ground and surface water quality, soil protection, air quality and climate/renewable energy

Federal Water Act (Wasserhaushaltsgesetz [WHG] of 31 July 2009, last amended 20 July 2022)

The Federal Water Act is the **central legal act governing German water protection**. It aims at protecting water bodies (including ground, surface and coastal waters) as integral parts of nature, as livelihood for man, as natural habitat for animals and plants and as a serviceable commodity by defining aims and principles for their sustainable management (§1 WHG). The aims and principles defined here are based on those defined by the **European Water Framework Directive**, which the WHG serves to transpose into national law. § 23 WHG authorises the government to regulate details of water management by way of ordinances.

**With regard to fertilisers and fertilisation practices, §§51 and 52 WHG may be relevant, because they contain the option to establish water protection areas** by way of an ordinance. For these water protection areas, **specific management rules** can be defined which serve to protect the water body from adverse impacts.

Groundwater Ordinance (Grundwasserverordnung [GrwV] of 9 November 2010, last amended 12 Oct 2022)

Serves to transpose the **European Groundwater Directive**, the **European Water Framework Directive** and other related European legal acts.

Defines **criteria for the evaluation of chemical status of groundwater bodies** (Annex 2 defines limit values for good/bad chemical status), with a **limit value for nitrate of 50 mg/L** (in accordance with the Groundwater Directive 2006/118/EC).

Surface Water Ordinance (Oberflächengewässerverordnung [OGewV] of 20 June 2016, last amended 9 December 2020)

Serves to transpose the **European Water Framework Directive** and other related European legal acts, replaces OGewV from 20 July 2011.

Defines **general physico-chemical quality parameters** as a basis to categorize the **ecological status of surface waters (Annex 7)**. With regard to **identifying waters affected by eutrophication** as mentioned in the Fertiliser Application Ordinance, the **limit values** for good ecological status with regard to **ortho-phosphate (PO<sub>4</sub>-P) and total P concentrations** are important:

For slowly running surface waters: Ortho-P according to Annex 7 No 2.1.2, must be below an annual average ranging between  $\leq 0.05$  mg/L and 0.2 mg/L PO<sub>4</sub>-P (depending on type of water body) to fit the category ‚good ecological status‘.

For lakes: Total P according to Annex 7 No 2.2, must be below a seasonal average ranging between 9-45 µg/L P (depending on type of water body) to fit the category ‚good ecological status‘.

Waste Water Ordinance (Abwasserverordnung [AbwV] of March 21, 1997, new version of 17 June 2004, last amended 20 January 2022)

This Ordinance defines **minimum requirements for the discharge of waste waters** (of origins defined in its annexes) **into open waters**, as well as requirements for the installation, operation and use of **waste water treatment plants**. It contains obligations for operators and limit values for emissions that dischargers must comply with, having regard to extended requirements for discharge permits from the side of water legislation (§1 AbwV). It thereby transposes the provisions given by the **Urban Waste Water Treatment Directive 91/271/EEC** into national law.

Limit values include biochemical and chemical oxygen demand (BOD and COD) the concentrations of filterable substances and the concentrations of nitrogen and phosphorus in waste water at the site of discharge. Depending on the type of waste water, further limit values for organic and inorganic substances as well as ecotoxicological parameters are defined.

With regard to the potential use of nutrient-rich waste waters (in addition to those of domestic and municipal origin) for the production of BBFs, the following origins regulated in this Ordinance may be of relevance:

- Dairy processing
- Fruit and vegetable processing
- Production and bottling of beverages
- Fish processing
- Potato processing
- Meat processing
- Breweries
- Production of alcohol and alcoholic beverages
- Drying of vegetable products for feed production
- Production of hide glue, gelatine and bone glue
- Sugar production
- Pulp production
- Processing of animal by-products
- Malting plants
- Operations for biological treatment of waste waters
- Leather production, pelt refineries, production of leather fibres
- Production of paper, cardboard and paperboard

Soil Protection Act (Bundesbodenschutzgesetz [BBodSchG] of March 17, 1998, last amended 25 February 2021) and Soil Protection Ordinance (Bundesbodenschutzverordnung [BBodSchV] of July 12, 1999, last amended 19 June 2020)

The objective of the **Soil Protection Act (BBodSchG)** is to **safeguard or restore the soil functions** in a sustainable way. To this aim, **adverse soil alterations must be repelled**, [...] and precautions must be taken against negative impacts on the soil (§1). The **obligation for precaution** is further defined in §7,

which specifically refers to **agricultural soil use**. This case is regulated in detail in § 17 sections 1 and 2 (see below).

§8 (2) contains an authorisation to issue an ordinance defining soil values that indicate a potential adverse soil alteration (**precaution values**). This ordinance shall also define **acceptable additional loads** for heavy metals as well as requirements for the prevention or reduction of inputs of unwanted substances. This was done by issuing the **Soil Protection Ordinance (BBodSchV)** (see Tables B 24-26 below).

Table B24: Precaution values of BBodSchV (Annex 2, No 4.1 and 4.3) for metals in mg/kg DM

Soil texture	Cd	Pb	Cr	Cu	Hg	Ni	Zn
Clay <sup>1</sup>	1.5	100	100	60	1	70	200
Loam/silt <sup>2</sup>	1	70	60	40	0.5	50	150
Sand	0.4	40	30	20	0.1	15	60
Soils with increased background values	No precaution values apply as long as no adverse effects on soil functions are to be expected by release or additional inputs of contaminants						
<sup>1</sup> if soil pH <6.0, values for loam/silt are valid for Cd, Ni and Zn							
<sup>2</sup> if soil pH <6.0, values for sand are valid for Cd, Ni and Zn							
<sup>3</sup> if soil pH <5.0, values for lead shall be tightened similarly to footnote 1 and 2							
Precaution values are not applicable for soils with an organic matter content >8%.							

Table B25: Precaution values of BBodSchV (Annex 2, No 4.2) for organic contaminants in mg/kg DM

Organic matter content of soil...	PCB (6)	Benzo(a)pyren	PAK (16)
> 8%	0.1	1	10
≤ 8%	0.05	0.3	3



Table B26: Acceptable additional contaminant loads per year across all input pathways (Annex 2 No 5 BBodSchV)

Element	Load (g/ha*year)
Lead (Pb)	400
Cadmium (Cd)	6
Chromium (Cr)	300
Copper (Cu)	360
Nickel (Ni)	100
Mercury (Hg)	1.5
Zinc (Zn)	1200

**§17 (1) BBodSchG** states that **in the case of agricultural soil use, the obligation for precaution** pursuant to §7 is **fulfilled by Good Agricultural Practice**. The main principle of Good Agricultural Practice according to §17 (1) is to safeguard soil fertility and natural soil productivity in a sustainable way. As stated in §17 (3), **compliance with the legal regulations listed in section 1 (including the Circular Economy Act and Ordinances concerning the recovery of waste for fertilising purposes, as well as Ordinances concerning fertilisers and fertilisation)** may also be interpreted as **fulfilling the obligation for precaution, however, only insofar as these legal regulations contain provisions for hazard prevention** – apart from that, the regulations of the Soil Protection Act and Soil Protection Ordinance apply. Similarly, there is a reference to the precaution values of the BBodSchV in waste legislation (AbfKlärV and BioAbfV) with regard to the recovery of waste as fertiliser. *Considering the fact that the Fertiliser Ordinance does not define soil-related limit values, it would appear logical to interpret this statement in §17 (3) such that it implies that the precaution values are also relevant for soil application of all fertilisers (not only those made of sewage sludge or biowaste), at least if adverse soil alterations could be expected. However, no legal clarification was found about this by the author of the present text on German legal regulations.*

Also relevant with regard to the recovery of wastes for fertilisation is **§12 BBodSchV**, defining **specific requirements for the application onto or incorporation into the soil**. In particular, this refers to soil materials, dredged materials and mixtures of soil materials with wastes (§12 (1)).

Immission Protection Act (Bundesimmissionsschutzgesetz [BlmSchG] of May 17, 2013, last amended 19 October 2022) and Immission Protection Ordinance (4.

Bundesimmissionsschutzverordnung [4. BlmSchV] of May 2, 2013, last amended 12 October 2022)

The Immission Protection Act aims to protect man, animals, plants, soils, water, the atmosphere and other cultural goods and commodities from adverse environmental effects (§1). It determines that **installations or plants which are prone to generate adverse environmental effects must undergo an immission control approval procedure** (§4). §4 also authorises the government to issue an ordinance

to specify which types of plants are concerned here. This was done with the 4. Immission Protection Ordinance (4. BImSchV). §1 / Annex 1 Nr. 7 of the 4. BImSchV specifies which **large animal production units must go through such an an immission control approval procedure**. §5 BImSchG defines obligations for plant operators. **Operators must install and run their plants in a way that guarantees a high level of protection for the environment** and prevents adverse environmental effects, particularly by taking measures and **installing technology in accordance with the current state of the art**.

The current state of the art for the construction and operation of large animal units includes the **installation of air filtering or washing units in order to prevent or reduce the emission of dust/bioaerosols, ammoniak and odours**. Some federal counties including North Rhine Westphalia and Lower Saxony have further specified the requirements of the immission control procedures in so-called **“Filter Decrees”**.

*Depending on the type of air filters required, different types of residues or wastes result from the air filtering or washing procedure, some of which may be used as starting materials for the production of biobased fertilisers. The specific design and formulation of Filter Decrees issued by the Federal Counties may therefore have an impact on the type and amount of materials wich are generated during the air filtering/air washing process.*

Renewable Energy Act (Erneuerbare Energien Gesetz [EEG 2023] of 21 July 2014, last amended 8 October 2022)

This act transposes the European Renewable Energy Directive into national law. According to §1 EEG, its aim is to increase the share of electricity from renewable energies in the gross energy consumption to 65% in the year 2030.

§4 specifies the share of different types of renewable energy that shall be installed in order to reach the defined goal. No 4 states that biomass energy plants shall generate an output of 8400 Megawatt in the year 2030.

§§ 8 and 11 define an obligation for network operators to favor producers of renewable energy in connecting them to their power supply network, and to purchase and distribute the energy generated by the renewable energy plants.

§9 (5) contains technical requirements for the construction of biomass energy plants.

§§ 39 to 39h contain special provisions for calls concerning funding (market premium, feed-in tariffs) for the installation of biomass energy plants. §§ 42 to 44 define the tariffs to be paid for biomass energy per kWh, which depend on the type of biomass used to produce the energy, and on the size of the energy plant (maximum 20 Megawatt per year). **Biogas produced from anaerobic digestion of separately collected bio wastes and farmyard manures are financially privileged over biomasses from energy crops which are produced with the aim to generate biomass energy** and are therefore in direct competition with food and feed crops (see Part A, chapter 3, subchapter on European Renewable Energy Legislation).

Biomass Ordinance (Verordnung über die Erzeugung von Strom aus Biomasse [BiomasseV] of 21 June 2001, last amended 13 Oct 2016)

As authorised in §2 of the Renewable Energy Act [EEG] and stated in §1 BiomasseV, the Biomass Ordinance defines which materials are biomasses in the sense of EEG (see §§ 2 and 3), and specifies viable technical processes (§4) and environmental requirements (§ 5) that must be respected when producing electricity from biomass.

§ 2 defines biomass as energy carrier consisting of phyto- and zoomass, including derived and by-products, residues and wastes that contain energy from phyto- and zoomass. The following materials are listed here:

- Plants and plant parts and energy carriers made of them
- Wastes and by-products of plant and animal origin from agriculture, forestry and fishery
- Bio wastes according to §2 (1) BioAbfV
- Gas and related products generated from biomass by gasification or pyrolysis
- Alcohol and related products generated from biomass
- Flotsam from the maintenance of water bodies and shores
- Biogas from anaerobic digestion of biomass (with less than 10% by mass sewage sludge in the substrate)

§3 lists materials which do not comply with the definition of biomass given in §2:

- Fossil fuels and derived and by-products
- Peat
- Unsorted municipal wastes from private households
- Waste wood (except from industry)
- Paper and cardboard
- Sewage sludge
- Harbor sludges and other sludges and sediments from water bodies
- Textiles
- Animal by-products of category 1
- Animal by-products of category 2 except animal manure, separated contents of stomachs and intestines, or colostrum
- Animal by-products of category 3 which have been disposed of as waste by incineration, except hides, skins, hooves, feathers, wool, horns, hair and pelts
- Animal by-products of category 3 which have been processed in units that also process cat. 1 and cat. 2 materials
- Landfill gas
  - Gas from purification plants
  - Waste liquors from pulp production.

While §5 on environmental requirements simply states that current legislation related to the use of the listed materials and technical processes must be obeyed, the Biomass Electricity Sustainability Ordinance sets more specific rules (see following chapter).

Biomass Electricity Sustainability Ordinance (Biomassestrom-Nachhaltigkeitsverordnung [BioSt-NachV] of 2 December 2021, last amended 14 June 2022)

This ordinance specifies (§ 3) that electricity produced from biomass is only eligible for financial funding if

- It complies with the requirements for the protection of natural habitats and for sustainable cultivation of land (§§4-5 BioSt-NachV) – this is to protect land with a high nature conservation value as well as areas with a high carbon pool, such as natural forests, wetlands and peat bogs, and to guarantee a good agricultural and ecological state of the land used for biomass production
- It exhibits a greenhouse gas reduction potential as defined in §6 BioSt-NachV (i.e. at least 50-65% depending on the time of installation of the biogas plant)
- The operator has registered the plant and provided the required documentation.

Biofuels Sustainability Ordinance (Biokraftstoff-Nachhaltigkeitsverordnung [Biokraft-NachV] of 2 Dec 2021

Similar to the Biomass Electricity Sustainability Ordinance, this Ordinance specifies sustainability criteria to make sure that biofuels receiving financial support and counting towards the renewable energy goals stipulated in the EU Renewable Energy Directive and related National Energy and Climate Plan are produced in an environmentally safe way. §§ 4-6 resemble the requirements laid down in the BioSt-NachV.

National Energy and Climate Plan (NECP) for 2021-2030

According to **Regulation (EU) 2018/1999**, Member States had to set up **10-year National Energy and Climate Plans for 2021-2030** (NECPs) outlining how they were going to meet the 2030 targets set by the Revised Renewable Energy Directive, including a longer-term view towards 2050. The Federal Ministry for Economic Affairs and Energy (BMWi) published the final NECP for Germany in June 2020:

[https://www.bmwk.de/Redaktion/DE/Downloads/I/integrierter-nationaler-energie-klimaplan.pdf?\\_\\_blob=publicationFile&v=6](https://www.bmwk.de/Redaktion/DE/Downloads/I/integrierter-nationaler-energie-klimaplan.pdf?__blob=publicationFile&v=6)

Measures that may affect the amount and quality of NRSS generated and/or the use of biobased fertilisers are described in chapter 3.1 (decarbonisation, subchapter agriculture) and include the aim to set up a funding programme for nutrient management as well as instruments to promote the use of farmyard manures and agricultural residues for energy generation in biogas plants.

#### 4. Common Agricultural Policy in the national law

##### National Strategic Plan for the implementation of the CAP objectives

For the post 2020 CAP period, Member States are for the first time obliged to submit a National Strategic Plan outlining how the country intends to meet the 9 EU-wide CAP objectives while responding to the specific needs of their farmers and rural communities (**Regulation (EU) 2021/2115**, see also Part A of this Deliverable).

The **German National Strategic Plan** was finally approved by the EU on 21 November 2022 after a number of required amendments and is now valid from 2023-2027.

In the light of the Russian invasion in Ukraine, the revised version takes particular account of the need to strengthen the resilience of the agricultural sector and reduce its dependence on plant protection products, mineral fertilisers and fossil fuels.

The complete Plan can be found at:

<https://www.bmel.de/SharedDocs/Downloads/DE/Landwirtschaft/EU-Agrarpolitik-Foerderung/gap-strategieplan-version-1-2.pdf?blob=publicationFile&v=3>

A description of the specific interventions is found at:

<https://www.bmel.de/SharedDocs/Downloads/DE/Landwirtschaft/EU-Agrarpolitik-Foerderung/gap-strategieplan-interventionssteckbriefe.pdf?blob=publicationFile&v=3>

##### First pillar:

In addition to 5 interventions aiming at basic income security, 7 of the 12 direct payment interventions are defined as so-called eco schemes, describing specific voluntary measures taken by farmers to protect the environment, biodiversity and climate.

None of the interventions of the first pillar shows a direct relation to the production of NRSS or the utilisation of BBFs.

##### Second pillar:

The second pillar contains 11 so called ELER (European Agricultural Fund for Rural Development) interventions, i.e. interventions based on area related management and cultivation obligations serving the protection of the agricultural environment and climate (in German: Agrarumwelt- und Klimamaßnahmen, AUKM).

While some of these interventions are related to fertiliser management (stopping or reducing fertiliser use), none of them are explicitly related to the production of NRSS or the utilisation of BBFs.

GAP Direct Payments Law (GAP-Direktzahlungen-Gesetz [GAPDZG] of 16 July 2021) and GAP Direct Payments Ordinance (GAP-Direktzahlungen-Verordnung [GAPDZV] of 24 January 2022) In addition to the European Regulations on GAP Payments (see Part A of D 1.2), GAP direct payments (first pillar) are regulated in the GAP Direct Payments Law. The Ordinance on GAP Direct Payments

(GAPDZV) contains further details. Both legal texts will start to apply the day after the the European Commission has made the implementing decision for the German National Strategic Plan.

Payments related to the second pillar (AUKM) are regulated by the federal counties.

*Submitted (not yet approved by the EC)*

## NATIONAL LEGISLATION: ITALY

Compiled by Julia Tanzer and Ludwig Hermann (PROMAN)

Last updated: 23 Nov 2020

### 1. Fertilising products and fertilisation

Legislative Decree of 29 April 2010, n. 75, "Reorganization and revision of the regulations on fertilizers, pursuant to article 13 of the law of 7 July 2009, n. 88. (Riordino e revisione della disciplina in materia di fertilizzanti, a norma dell'articolo 13 della legge 7 luglio 2009, n. 88.)"

Contains the Italian fertiliser regulations.

### 2. Waste management

Legislative Decree of 3 April 2006, n. 152 "Environmental regulations (Norme in materia ambientale)"

Article 208 of the decree transposes the EU directive 2008/98/CE into national law.

Furthermore, all wastewaters collected and discharged to the public sewer must comply with the quality criteria required by the decree.

Legislative Decree of 27 January, n. 99, "Implementation of directive no. 86/278 / EEC concerning the protection of the environment, especially the soil, in the use of sewage sludge in agriculture (Attuazione della direttiva n. 86/278/CEE concernente la protezione dell'ambiente, in particolare del suolo, nell'utilizzazione dei fanghi di depurazione in agricoltura)"

The decree transposes directive 86/278/CEE into national law and aims to regulate the use of sewage sludge in agriculture to avoid harmful effects to soil, vegetation, animals and humans, and to encourage, at the same time, its correct use. It rules:

Type of sewage sludges treatment (e.g.: thermal, biological, etc.)

Conditions of sewage sludges agronomic use (e.g.: maximum dose/ha criteria, sewage sludges analyses, soil analyses, etc.)

Prohibitions of sewage sludges agronomic use

Administrative procedure to be applied to use sewage sludges in agriculture.

### 3. Ground and surface water quality, soil protection, air quality and climate/renewable energy

Legislative Decree of 3 April 2006, n. 152 “Environmental regulations (Norme in materia ambientale)”, amended by Legislative Decree of 29 June 2010, n. 128

The decree transposes the directives 2000/60/CE and 2010/75/EU into national law. Article 92 and 112 are closely related to the nitrate problem.

Article 92 establishes the criteria for:

- the identification of the Nitrates Vulnerable Zones;
- the guidelines of the Action Programs to be drafted and approved by the Regions;
- the information and the training for farmers on the programs themselves and on the Good Agricultural Practices, to be done by the Regions.

Article 112 regulates the general criteria for the agronomic use of livestock manure (detailed in D.M. of the 7<sup>th</sup> of April 2006). This one was updated by the current Decree of the 25th of February 2016 (see below).

Decree of 25 February 2016 “Criteria and general technical rules for the regional regulation of the agronomic use of livestock manure and waste water, as well as for the production and agronomic use of digestate (Criteri e norme tecniche generali per la disciplina regionale dell'utilizzazione agronomica degli effluenti di allevamento e delle acque reflue, nonché per la produzione e l'utilizzazione agronomica del digestato)”

The Decree disciplines the entire agronomic use cycle of livestock effluents and all others organic fertilisers: production, storage, treatment, transport and distribution, both in Vulnerable and Non-Vulnerable Zones. It provides for specific rules on the use of nitrogen, which concern in particular distribution methods (period, doses) and relative territorial restrictions (e.g. distance from ditches, rivers, lakes, etc.).

Legislative Decree of 29 December 2003, n. 387, “Implementation of Directive 2001/77 / EC on the promotion of electricity produced from renewable energy sources in the internal electricity market (Attuazione della direttiva 2001/77/CE relativa alla promozione dell'energia elettrica prodotta da fonti energetiche rinnovabili nel mercato interno dell'elettricità)”

Transposes directive 2001/77/EC into national law.



Ministerial Decree of 04 July 2019 (following similar Decrees of 06 July 2012 and 23 June 2016) “Incentive for production of electric energy from facilities using renewable feedstock different from PV (Incentivazione della produzione di energia elettrica da impianti a fonti rinnovabili diversi dai fotovoltaici)”

For biogas plants of 1-5 MW installed capacity, the decree determines a feed-in premium. The regulation discerns between different types of technology and feedstock from different origin.

Eligible biomass in general is defined as “agricultural products” listed in tabella 1b and distinguished from industrial bio-waste (sottoprodotti acc. to tabella 1a) and the organic fraction from municipal solid waste (tabella 1c). Sewage sludge must not be used as a feedstock to receive the feed-in premium. Biogas from sewage sludge is considered under the own category “Gas residuati dai processi di depurazione”.

The guaranteed feed-in premium range is € 80-110/MWh for biomass digesters depending on type of feedstock: the lower value is for agricultural products, the higher for biological waste products which are not separately collected.

Applicants for the feed-in premiums have to register in a register serviced by Gestore Servizi Energetici (GSE). Registration is subject to tenders (up to three times per year) opening registration up to a cap. The 2021 cap (3 tenders) will be 455 MW. The feed-in premium is guaranteed for 20 years, without degression.

The Ministerial Decree of 02 March 2018 for the promotion of use of biomethane and other advanced bio-fuels in the transport sector (Il Decreto interministeriale del 2 marzo 2018 per la promozione dell’uso del biometano e degli altri biocarburanti avanzati nel settore dei trasporti) provides an incentive of € 375 / CIC (Certificati di Immissione in Consumo).

## NATIONAL LEGISLATION: NORWAY

**Compiled by Gøril Aasen Slinde and Gerard Cornelissen (NGI)**

**Last updated: 1 July 2020**

### Introduction

This report is prepared by the Norwegian Geotechnical Institute (NGI) as a part of the LEX4BIO project. The theme of the report is the Norwegian legal framework and guidelines connected to use of (bio-based) fertilizers in agriculture. Information is also provided on waste management, water and air quality guidelines, as well as common agricultural policy. Both current and future regulations are described.

### Norwegian Laws and Regulations

The Norwegian Parliament adopts, changes and repeals Norwegian laws.

Regulations are rules regarding the citizens' rights and duties. The regulations are established by Norwegian public authorities (the state or counties), and are founded in the laws.

In the legal framework regarding fertilizers used in agriculture, the rules to follow are given by regulations. In the following, the most important regulations are summarized. For each regulation, the law(s) in which the regulation is founded is stated, and the authority responsible for the regulation is given.

The legal framework in relation to fertilizers is threefold:

Regulation on fertilizers with organic origin (Forskrift 4. juli 2003 nr. 951 gjødselvarer mv. av organisk opphav)

Regulation regarding trade with fertilizers and liming agents (Forskrift 4. juli 2003 nr. 1063 om handel med gjødsel og kalkingsmidler)

Regulation on fertilizers marketed as EF-fertilizers (Forskrift 4. november 2003 nr. 1331 om gjødsel som markedsføres som EF-gjødsel)

There are also adjacent regulations to the mentioned, also briefly mentioned in the following. The report also discloses some information of Norwegian regulations regarding waste and water, and the interface between the different regulations.

**It is important to note that the Norwegian regulations on fertilizers are under revision.** In the following sections, the current and probable future regulations are therefore summarized.

## 1. Fertilising products and fertilisation

In Norway, the following nutrient rich side streams (NRSS) are currently allowed to be utilized as fertilizer or soil improvement (given in annex 4 to Regulation on fertilizers with organic origin):

- Waste from slaughterhouses
- Waste from food industry: Waste from industry that processes products from agriculture, both plant based and animal based
- Waste from preservation industry, preserving vegetables, fruits and berries
- Waste from potato industry: potato peeling, potato water, soil and soil waste. The waste cannot be spread on areas where potatoes are grown or areas where it is planned to grow potatoes in the next 20 years
- Manure: Faeces or urine from livestock, with or without sprinkle
- Other agricultural waste: Stubble, grass, feed scraps, potatoes, vegetables etc.
- Food waste from hotels, canteens, institutions etc.
- Household-waste: The organic and compostable fraction of household waste
- Waste from fish farming: waste from slaughter, sludge, leftover feed
- Waste from fishery: trimmings, fish heads, guts, leftover from shellfish etc.
- Waste from wood processing: waste from paper- and cellulose industry and other wood processing industry
- Other industrial sludge or waste
- Waste from parks
- Sludge from waste water treatment plants
- Sludge from water works
- Mixed waste: mixes of waste from two or more of the earlier mentioned fractions

Production, sale and usage are bound by regulations, summarized in the following sections.

Current regulation

Regulation on fertilizers with organic origin

Norwegian name: Forskrift om gjødselvarer mv. av organisk opphav	
English translation of name: Regulation on fertilizers with organic origin	
Announced: 2003-07-18	Founded in: Act on soil, act on pollution, act on public health, act on food
Responsible authorities: Ministry of Agriculture and Food, Ministry of Climate and Environment and Ministry of Health and Care Services	

Regulation on demands of fertilizer products and use of fertilizers with organic origin: The purpose (§1) of the regulation is to secure satisfactory quality of products that are comprised by the regulation, prevent disadvantages to health and hygiene from production, storage and utilization of fertilizers and to facilitate that the products can be used as a resource. The regulation shall further also contribute to an environmentally friendly management of the soil, and safeguard biodiversity.

Producers of organic fertilizers have the duty to introduce and implement internal control. Sampling and analysis must be done in accordance to guidelines given by the food safety authorities (§7).

#### **Requirements of minimum content of secondary and micronutrients in organic fertilizers**

The values in the table indicate the absolute minimum content for a nutrient (weight percentage) to be declared. The declared value must therefore always be higher than the minimum content (annex 3).

Table B27: Minimum content of micronutrients in organic fertilizer (weight percentage)

<b>Nutrient</b>	<b><i>For use on field and meadow</i></b>	<b><i>For use in horticulture</i></b>
Ca	0.6	0.6
Mg	0.8	0.8
Na	2.2	2.2
S	0.8	0.8
B	0.016	0.016
Co	0.002	–
Cu	0.01	0.002
Fe	0.5	0.02
Mn	0,1	0.01
Mo	0.001	0.001
Zn	0.01	0.002

For comparison the minimum nutrient contents for mineral fertilizers can be seen in Table B30.

### Requirements of maximum content of heavy metals in organic fertilizers

The regulation set demands on the maximum content of heavy metals allowed, in relation to the area use where fertilizers are applied (§10).

Table B28: Maximum permitted concentrations (in mg/kg d.w.) of heavy metals within defined quality classes

Quality class	0	I	II	III
Cd	0.4	0.8	2	5
Pb	40	60	80	200
Hg	0.2	0.6	3	5
Ni	20	30	50	80
Zn	150	400	800	1500
Cu	50	150	650	1000
Cr	50	60	100	150

Definition of quality classes (§27):

0: Fertilizers can be used at agricultural land, private gardens, parks, greenery etc. The quantity of fertilizers is limited by the plants' need of nutrients.

I: Fertilizers within quality class I can be used:

- a) At agricultural land, private gardens and parks, at a maximum rate of 4 tonnes of the fertilizer (dry weight) applied per 1000 m<sup>2</sup> per decade (i.e., 40 tons per ha per 10 years, or 16 tons per acre per 10 years).
- b) In areas without production of crop intended for consumption, the fertilizer can be applied at a maximum 5 cm layer and mixed with local soil

II: Fertilizers within quality class II can be used:

- a) At agricultural land, private gardens and parks, at a maximum 2 tonnes of the fertilizer (dry weight) applied per 1000 m<sup>2</sup> per decade (i.e., 20 tons per ha per 10 years, or 8 tons per acre per 10 years)
- b) In areas without production of crop intended for consumption, the fertilizer can be applied at a maximum 5 cm layer and mixed with local soil

III: Fertilizers within quality class III can be used:

- a) In areas without production of crop intended for consumption, the fertilizer can be applied at a maximum 5 cm layer and mixed with local soil
- b) As top layer on waste deposit sites, at a maximum thickness of 15 cm

For amendment of fertilizers in classes I and II to soil, the soil cannot have heavy metal contents above the values mentioned below (§26):

Table B29: Maximum content of heavy metals in agricultural soil (in mg/kg dw).

<b><i>Metal</i></b>	<b><i>Maximum content in agricultural soil (mg/kg dw)</i></b>
Cd	1
Pb	50
Hg	1
Ni	30
Zn	150
Cu	50
Cr	100

#### **Other requirements**

There are no demands as to the content of organic pollutants. Producers or users of fertilizers should show diligence and take precautions to prevent spreading of organic pollutants, pesticides, antibiotics/chemotherapeutics or other environmental hazardous organic pollutants in quantities that can do harm to health or environment (§10-2).

The content of plastic, glass or metal pieces larger than 4 mm shall not amount to more than 0.5 weight percent of total dry weight (§10-6).

Use of organic fertilizers shall not lead to transfer of disease to human, animals or plants. Therefore, the products shall not contain salmonella bacteria or infective eggs of parasites. The content of

thermo-tolerant coliform bacteria shall be less than 2500 bacteria per gram fertilizer (dry weight) (§10-3).

The products must be stabilized to prevent smell or other environmental disadvantages, both in storage and when utilizing the fertilizer to soil (§10-4).

#### Regulation regarding trade with mineral fertilizers and liming agents

Norwegian name: Forskrift om handel med gjødsel og kalkingsmidler mv.	
English translation of name: Regulation regarding trade with fertilizers and liming agents	
Announced: 2003-08-22	Founded in: Act on fire, explosion and accidents with dangerous substances, act on food
Responsible authorities: Ministry of Agriculture and Food	

The aim of the regulation is to ensure the quality of mineral fertilizers, liming agents and other mineral products applied as fertilizer or soil improvement. The products regulated shall have lowest possible risk for harming humans, animal and the environment, and the turnover shall proceed openly and honestly (§1). Mineral fertilizers, composting agents, growth inducers and liming agents are regulated for usage on agricultural land, nurseries, parks or private gardens (§2).

The regulation provides decision on registration of products, duty of reporting, product demands and requirements for branding. The fertilizers shall be divided into different types based on content. There are demands regarding the lowest possible nutrient content (Table ) and demands for effect when applying liming agent.

The minimum nutrient contents for mineral fertilizers are given below (Annex 3):

Table B30: Minimum content of micronutrients in mineral fertilizer (weight percentage)

Nutrient	Mixtures of micronutrients		Fertilizer containing macro and micronutrients		
	1	2	3	4	5
	Nutrient in inorganic form	Nutrient as chelate	For use on field and meadow	For use in horticulture	Leaf fertilizer
Ca	–	–	0.6	0.6	0.6
Mg	–	–	0.8	0.8	0.8
Na	–	–	2.2	2.2	2.2
S	–	–	0.8	0.8	0.8
B	0.2	0.2	0.01	0.01	0.01
Co	0.02	0.02	0.002	–	0.002
Cu	0,5	0.1	0.01	0.002	0.02
Fe	2	0.3	0.5	0.02	0.02
Mn	0,5	0.1	0.1	0.01	0.01
Mo	0.02	–	0.001	0.001	0.001
Zn	0,5	0.1	0.01	0.002	0.002

The regulation only stipulates requirements regarding production and turnover, not regarding use of the fertilizers. However, every user of fertilizer shall make a plan for fertilization, though there is no demand to document or report actual utilization of the products.

#### Regulation on fertilizers marketed as EF-fertilizers

Norwegian name: Forskrift om gjødsel som markedsføres som EF-gjødsel	
English translation of name: Regulation on fertilizers marketed as EF-fertilizers	
Announced: 2005-11-09	Founded in: Act on fire, explosion and accidents with dangerous substances, act on food
Responsible authorities: Ministry of Agriculture and Food	



The regulation is the Norwegian implementation of the European regulation number 2003/2003. The regulation stipulates requirements regarding production and turnover of mineral fertilizer and lime. Only the fertilizers that meet the requirements can be marketed as EF-fertilizers.

The regulation requires products to be put in different types of designation, and different requirements are to be met within different designations, f.i. minimum content of some nutrients. There are also detailed requirements for sampling and analysis of fertilizers.

The producers of fertilizers can freely choose whether to meet the European or the Norwegian regulations, and most producers choose the national regulation.

#### Regulation regarding planned use of fertilizers

Norwegian name: Forskrift om gjødslingsplanlegging	
English translation of name: Regulation regarding planned use of fertilizers	
Announced: 1999-07-01	Founded in: Act on soil
Responsible authorities: Ministry of Agriculture and Food	

The regulation aims to provide a basis for good quality crops while limiting runoff and/or vaporization of nutrients from agricultural land. Planned use of fertilizer shall ensure exploitation of nutrients from the soil itself, and from added mineral fertilizer, animal fertilizer, sludge and/or other organic or inorganic fertilizer (§1).

The regulation states that a fertilization plan is to be prepared before every crop season (§3-1), though smaller farms can have less strict demands. Soil should be sampled for analysis (minimum pH, phosphorus, potassium, LOI and organic content) every 4 to 8 years (§3-3). Farms spreading bio based fertilizers shall do an estimation of the acceptable consumption in the coming crop season.

The need for fertilizer shall be adjusted according to the results of analysis, local growth and fertilization norms, size of previous crops and the state of the soil after last year's crop (§3-6).

Each county oversees that the regulation is followed (§4).

## Regulation on animal by-products, not intended for consumption

Norwegian name: Forskrift om animalske biprodukter som ikke er beregnet på konsum	
English translation of name: Regulation on animal by-products, not intended for consumption	
Announced: 2016-09-16	Founded in: Act on food
Responsible authorities: Ministry of Agriculture and Food, Ministry of Trade, Industry and Fisheries	

Animal by-products are whole bodies or parts of animals that are not intended for consumption. By-products could be a risk for public and animal health, but can also be a resource when exploited safely. Those who handle products within the category, have a duty to ensure that their handling complies with the regulation (§1).

Use of organic fertilizer or soil improvement at farms without livestock is not part of the regulation (§3).

The regulation states rules on how different categories of animal by-products can be processed and used. Most animal by-products shall be sanitized before further use, and the regulation states standard methods for this.

Untreated manure (except for manure from fur production or slaughterhouses) can be spread on fields within the same county where it was produced, or outside with permission from the national food authorities. If untreated manure is spread on fields, forage crops for livestock can be harvested after 21 days and livestock can graze at the field after six weeks, both at the earliest (§12).

## Regulation on plants and measures against plant pests

Norwegian name: Forskrift om planter og tiltak mot planteskadegjørere	
English translation of name: Regulation on plants and measures against plant pests	
Announced: 2016-03-01	Founded in: Act on food
Responsible authorities: Ministry of Agriculture and Food	

The regulation is set to hinder introduction and spreading of plant pests in Norway, to battle or exterminate outbreaks of plant pests, as well as to ensure production and sale of plants with best possible health and satisfactory quality (§1).

The regulation restricts trade with plants or other infectious substances if there is a risk of quarantine pests following the trade. When importing organic fertilizers or soil improvement agents, a phytosanitary certificate must follow the shipment (§20). Importers of organic fertilizers or soil improvement agents must be registered by the national food safety authorities.

### Future regulation

The Ministry of Agriculture and Food is responsible for an extensive revision of the current Norwegian regulations on fertilizers. The present outline is that the three current regulations will be replaced by two new regulations; one regarding the production, sale and import of fertilizers, while the other regulates the use and storage of fertilizers and plant nutrition. Both will include organic and inorganic fertilizers. A goal for the revision, is that the regulations should advocate increased utilization of organic fertilizers, and at the same time safeguard the environment.

For the regulation on production, sale and import, the planned changes considered most relevant for this report, are summarized below:

- All regulated products, including mineral fertilizers, will have requirements regarding maximum content of heavy metals.
- The allowed heavy metal content in phosphorus rich products will be based on the ratio between heavy metals and phosphorus. This is especially intended to facilitate the utilization of the organic residue derived from biogas production.
- To reduce the risk of pollution of close-by recipients, the new regulations will set demands for maximum content of phosphorous and in some cases also nitrogen.
- To ensure that limit values are similar between different regulations, the limit values for heavy metals in soil derived from construction sites will be revised.
- Measures are being taken to facilitate easier turnover and use of some products based on sludge from waste water treatment plants.
- Demands regarding the sanitizing and stabilization of bio based fertilizers are clarified.
- Demands regarding storage of fertilizing products will be clarified, to ensure that the products are not impaired during storage.
- E.coli will substitute TKB as indicator organism of microbial quality.
- Additives to fertilizers shall be evaluated regarding their effect on health and environment.
- The documentation requirement to show that raw materials and products have a net positive effect will be clarified.
- Biostimulants will be more clearly separated from pesticides.

The regulations regarding usage of fertilizer will be revised towards a more sustainable use of fertilizer in agriculture. Investigations have shown that nutrients (mainly phosphorous and nitrogen) and organic matter are not fully exploited in the current practice. The new regulation will stimulate innovation to a greater extent, and the principles of circular economy will open for more nutrient rich side streams being utilized as fertilizers in the future. An example is that organic residue from biogas plants can be brought back to agricultural land as a fertilizer, instead of being disposed of at a landfill.

The amount of fertilizer used should be balanced with the actual need of fertilizer. The future regulation for instance will demand more documentation to avoid excess fertilizing.

Nitrogen is more volatile than phosphorus. To minimize loss of nitrogen, demands regarding storage, time of spreading, method of spreading and amount of fertilizer used will be included in the proposed regulation.

All in all, future changes in regulation of fertilizer seem to aim at facilitating and stimulating the use of bio-based fertilizers in Norwegian agriculture, reducing the country's dependence on mineral fertilizers.

## 2. Waste Management

### Circular Economy

Worldwide, nature's resources are put under increasing pressure due to anthropogenic exploitation. Hence, the climate, nature and environment are dependent on more efficient use of the given resources, to limit the need for further exploitation. A transition from a linear to a circular economy will to some extent help in this matter, as products to a larger degree will be repaired, upgraded and reused. Conversion from linear to circular economy is a necessary part of becoming a low emission society, as well as of reaching UNs sustainable development goals.

The Norwegian Government states that Norway should be a pioneer in developing a green and circular economy that uses already exploited natural resources to a greater extent. A national strategy is to be developed, and is expected during 2020 (Miljødirektoratet: <https://www.miljodirektoratet.no/ansvarsomrader/avfall/sirkular-okonomi/>). It is expected that Norway will be implementing many of the points from EUs action plan connected to launching of the European Green Deal.

## Regulation on Recycling and Treatment of Waste

Norwegian name: Forskrift om gjenvinning og behandling av avfall (avfallsforskriften)	
English translation of name: Regulation on recycling and treatment of waste	
Announced: 2004-06-24	Founded in: Act on control of products and consumer services, Act on pollution
Responsible authorities: Ministry of Justice and Public Security, Ministry of Climate and Environment	

Regulation on recycling and treatment of waste is the most important regulation regarding waste management in Norway. In the context of this report, the relevant chapters of the regulation are chapter 9 (Deposition of waste) and chapter 10 (Incineration of waste).

The purpose of chapter 9 (deposition of waste) is to ensure that deposition/landfilling of waste happens properly and controlled, to limit harm to the environment and people's health. In accordance to the regulation (§9-3), depositing of biodegradable waste is prohibited. Biodegradable waste contains valuable resources that should be exploited, not put in landfills.

If needed, depositing waste is nonetheless allowed if the content of total organic carbon (TOC) does not exceed 10 % or the LOI does not exceed 20 %. In addition, deposition of the following waste types is still allowed:

- Street sweepings
- Contaminated soil and sediment
- Waste from grates in waste water treatment plants
- Sludge from waste water treatment plants that cannot be used as fertilizer because it exceeds the quality classes

The authorities can in special cases allow other biodegradable wastes to be deposited (§9-4).

The regulation presents three landfill categories (§9-5)

- a) Category 1: Landfills for hazardous waste
- b) Category 2: Landfills for ordinary waste
- c) Category 3: Landfills for inert waste

When testing waste for categorizing into landfill categories, the criteria are based on leaching tests (both "first flush" (L/S = 0,1) and long term leaching (L/S = 10)). In the following, the criteria for the landfill categories are given (all tables are given in annex 2 to chapter 9 in the regulation).

Table B31: Criteria for accepting waste into a landfill for inert waste (category 3)

Parameter	Leaching test L/S = 10 done by shaking and particle size < 4 mm (mg/kg dw)	C <sub>0</sub> (L/S = 0,1) with column test (mg/L)
Arsenic (As)	0.5	0.06
Barium (Ba)	20	4
Cadmium (Cd)	0.04	0.02
Chromium, total (Cr)	0.5	0.1
Copper (Cu)	2	0.6
Mercury (Hg)	0.01	0.002
Molybdenum (Mo)	0.5	0.2
Nickel (Ni)	0.4	0.12
Lead (Pb)	0.5	0.15
Antimony (Sb)	0.06	0.1
Selene (Se)	0.1	0,04
Zinc (Zn)	4	1.2
Chloride	800	460
Fluoride	10	2.5
Sulphate	1000*	1500
Phenol index	1	0.3
Dissolved organic carbon (DOC)**	500	160
Total suspended solids (TSS)***	4000	-

\* Even though the waste exceeds the limit value for sulphate, the criteria can still be seen as fulfilled if the leaching does not exceed the following values: 1500 mg/L as C<sub>0</sub> at L/S = 0,1 and 6000 mg/kg at L/S = 10

\*\* If the waste exceeds the limit value for DOC at its natural pH, it is also possible to test L/S = 10 at a pH between 7,5 and 8. If the DOC-concentration does not exceed 500 mg/L, the limit value is fulfilled

\*\*\* The TSS value can be used as an alternative for the sulphate and chloride values

In addition to the limit values given in Table, there are also limit values for total concentrations of organic parameters for acceptance of waste into an inert landfill (Table B32:).

Table B32: Limit values for content of organic substances for waste to be deposited on inert landfills

Parameter	Value
Total organic carbon (TOC)	3 %*
Benzene, toluene, ethylbenzene and xylenes	6 mg/kg
Polychlorinated biphenyls (7 congeners of PCB)	1 mg/kg
Mineral oil (C10 to C40)	500 mg/kg
Polyaromatic hydrocarbon ( $\Sigma$ PAH 16)	20 mg/kg
Benzo(a)pyrene	2 mg/kg

\* If the waste is a soil, a higher content of TOC can be allowed, as long as the leaching criteria of 500 mg/kg DOC is maintained, either at the waste's natural pH or at a pH between 7,5 and 8

Waste which exceeds the leaching values and/or content of organic parameters and are not classified as hazardous according to the European Waste Liste (EAL), can be put in a landfill for ordinary waste (category 2).

In addition, stable hazardous waste where the leaching will not aggravate in the long term, can be deposited together with ordinary waste as long as the leaching criteria given in Table B33 are not exceeded.

Table B33: Limit values for leaching from stable hazardous waste to be deposited in a landfill for ordinary waste (category 2)

Parameter	Leaching test L/S = 10 done by shaking and particle size < 4 mm (mg/kg dw)	C <sub>0</sub> (L/S = 0,1) with column test (mg/L)
Arsenic (As)	2	0,3
Barium (Ba)	100	20
Cadmium (Cd)	1	0,3
Chromium, total (Cr)	10	2.5
Copper (Cu)	50	30
Mercury (Hg)	0.2	0,03
Molybdenum (Mo)	10	3.5
Nickel (Ni)	10	3
Lead (Pb)	10	3
Antimony (Sb)	0.7	0,15

Selene (Se)	0.5	0,2
Zinc (Zn)	50	15
Chloride	15000	8500
Fluoride	150	40
Sulphate	20000	7000
Dissolved organic carbon (DOC)*	800	250
Total suspended solids (TSS)**	60000	

\* If the waste exceeds the limit value for DOC at its natural pH, it is also possible to test L/S = 10 at a pH between 7,5 and 8. If the DOC-concentration does not exceed 800 mg/L, the limit value is fulfilled

\*\* The TSS value can be used as an alternative for the sulphate and chloride values

Also, the TOC content cannot exceed 5 %, and the pH in the waste shall be at least pH 6.

Hazardous waste to be put in a land fill for hazardous waste (category 1), cannot exceed the criteria given in table B34.

Table B34: Limit values for leaching from hazardous waste to be deposited in a landfill for hazardous waste (category 1)

Parameter	Leaching test L/S = 10 done by shaking and particle size < 4 mm (mg/kg dw)	C <sub>0</sub> (L/S = 0,1) with column test (mg/L)
Arsenic (As)	25	3
Barium (Ba)	300	60
Cadmium (Cd)	5	1.7
Chromium, total (Cr)	70	15
Copper (Cu)	100	60
Mercury (Hg)	2	0.3
Molybdenum (Mo)	30	10
Nickel (Ni)	40	12
Lead (Pb)	50	15
Antimony (Sb)	5	1
Selene (Se)	7	3
Zinc (Zn)	50	60



Chloride	25000	15000
Fluoride	500	120
Sulphate	50000	17000
Dissolved organic carbon (DOC)*	1000	320
Total suspended solids (TSS)**	100000	

\* If the waste exceeds the limit value for DOC at its natural pH, it is also possible to test L/S = 10 at a pH between 7,5 and 8. If the DOC-concentration does not exceed 1000 mg/L, the limit value is fulfilled

\*\* The TSS value can be used as an alternative for the sulphate and chloride values

For permission to deposit hazardous waste into a landfill category 1, the LOI cannot exceed 10 % nor the total organic carbon content 6 %.

In Norway, biodegradable waste is either composted or treated in a biogas facility. Biogas facilities convert biodegradable waste into energy and a bioresidue. The bioresidue is further utilized at agricultural areas. Compost is mainly used in soil mixtures or other fertilizing products. Both methods ensure that nutrients are recycled from the waste back into the environment.

Approximately 30 % of Norwegian waste is annually incinerated ([www.miljostatus.no](http://www.miljostatus.no)). The incineration will give energy as heat, which in most cases is further utilized for instance as district heating. Incineration of waste is regulated by chapter 10 in the regulation on recycling and treatment of waste. Plants that burn biodegradable waste are generally not included in the regulation, as long as waste products generated in the process are not classified as hazardous waste.

### 3. Ground and surface water quality

#### Water Framework Directive

Norwegian name: Forskrift om rammer for vannforvaltningen (vannforskriften)	
English translation of name: Regulation on a Framework for Water Management	
Announced: 2006-12-19	Founded in: Act on pollution, Act on watercourses and groundwater, Act on planning and building permits, Act on management of nature diversity
Responsible authorities: Ministry of Climate and Environment, Ministry of Petroleum and Energy	

Through the EEA agreement, Norway is committed to implement the European Water Framework Directive. Norway has also actively participated in the European strategy, "Common Implementation Strategy" (CIS) since the start up in 2001.

Norwegian waters are divided into groundwater, coastal water, rivers and lakes. Further, each of the water body types are regionally divided into water occurrences and water areas (larger than occurrence). Norway is divided into 15 water regions, where 10 are international including water bodies in Sweden and/or Finland. Further, the water regions are divided into 105 water areas, which again consists of almost 30 000 water occurrences.

The directive assumes cooperation between all that uses and influences the water. The collaboration includes the government at all levels, businesses, NGOs, educational institutions, scientists and local industry. Management of the waters is based on knowledge and collaboration between the sectors, and this enables finding cost efficient and accurate measures for all waters. The work is done under the banner "Sammen for vannet" (= together for the water), with a goal to reach good quality for all waters within 2021, both for biological and chemical quality indicators. Each water region has its own group that has made a plan for management and achievement of good quality in the water occurrences within the region. There is also a reference group within each of the regions, ensuring that all interest are heard.

Even though only 3 % of Norway's surface area is cultivated land, eutrophication is one of the three largest impact factors to Norwegian waters. The main reason for the elevated concentration of nutrients, organic matter and particles, are point sources of waste water and runoff from agricultural land.

Definition of what is good quality with regards to the content of nutrients (phosphorus and nitrogen) is not defined by the regulation itself, but is given in a guidance document (Direktoratsgruppen vanndirektivet, 2018). The guidance document is demanded by annex V to the regulation, stating that Norway shall prepare a document classifying ecological state into five classes (very good to very bad) and chemical state into two states (good or not good). Using the guidance document, all water occurrences shall be classified ecologically and chemically. The limit values defining what is "good quality" also varies with other factors than the concentration of nutrient itself, for instance if the water occurrence is in the mountains, the lowland or forest, the content of humus and lime etc.

An example of the classification system is given for some parameters in B35 below. Here, only a few parameters are shown for classification of fresh water, but there are numerous more parameters for fresh water and also classes defined for sea water and sediments. All table can be found in Direktoratgruppen Vanndirektivet (2018). Class I defines background level for the substances. Substances that do not have a natural prevalence in nature (most organic substances), will not have a background level defined. The upper limit value for class II is defined by AA-EQS, which is the limit value for chronic effects after long time exposure. The upper limit to class III is the MAC-EQS, which is the limit values for acute toxic effects after short time exposure. Both AA-EQS and MAC-EQS are given by the Water Framework Directive. The upper limit for class IV is based on acute toxicity after short term exposure.

Table B35: Example of classification into classes of some substances in fresh water. Concentrations are given in µg/L

Substance name	Class I	Class II	Class III	Class IV	Class V
Lead	0-0,02	0,02-1,2	1,2-14	14-57	> 57
Nickel	0-0,5	0,5-4	4-34	34-67	> 67
Mercury	0-0,01	0,001-0,047	0,047-0,07	0,07-0,14	> 0,14
TBT		0-0002	0,0002-0,0015	0,0015-0,003	>0,003
Naphtalene	0,00066	0,00066-2	2-130	130-650	> 650
PFOS		0-00065	0,00065-36		

To reduce the negative impact of fertilization in connection to agricultural land, a number of guidance documents have been prepared by the Norwegian Institute of Bioeconomic Research (NIBIO), giving measures to reduce pollution of water related to runoff from agricultural land (reports

in Norwegian can be found here: <https://www.nibio.no/tema/miljo/tiltaksveileder-for-landbruket/tiltak-mot-vannforurensning-fra-landbruket/tiltak-mot-vannforurensning-fra-landbruket>).

Ground water can be classified in accordance to the threshold and turning point values given for the use of the ground water as drinking water (Table , found in annex IX to the regulation). The threshold value is the limit value which defines the boundary between good and bad quality. The turning point value gives a value for when measures should be introduced.

Table B36: Limit values determining the quality of ground water as drinking water

<b>Parameter</b>	<b>Threshold value</b>	<b>Turning point value</b>
Nitrate, mg/L	50	37.5
Pesticides, µg/L	0.5	0.4
Chloride, mg/L	200	150
Sulphate, mg/L	100	75
Ammonium, mg/L N	0.5	0.4
Arsenic, µg/L	10	7.5
Cadmium, µg/L	5	3.75
Lead, µg/L	10	7.5
Mercury, µg/L	0.5	0.4
Trichloroethene and Tetrachloroethene, µg/L	10	7.5

## Air Quality

Norwegian name: Forskrift om begrensning av forurensning (forurensningsforskriften)	
English translation of name: Regulation on limiting pollution	
Announced: 2006-12-19	Founded in: Act on ship security, Act on leisure boats, Act on pollution, Act on municipal water and wastewater, Act on control of products and consumer services
Responsible authorities: Ministry of Climate and Environment	

Pollution in general is regulated by the Norwegian regulation on limiting pollution, where air pollution is specifically mentioned in part 3 of the regulation. The provisions in the chapter aim to

promote people's health and wellbeing, as well as protect vegetation and ecosystems. This is met by setting minimum demands and limit values for air quality and ensure that these are met (§7-1).

Air pollution with regards to agriculture and use of fertilizers will be connected to evaporation of nitrogen compounds or airborne particulate matter. Limit values as set by §7-6 are shown below. If limit values are exceeded, measures will be made. Measures must not lead to exceedance of limit values in other areas. Measures shall secure that the limit values will be met at least 3 years after measures have been made (§7-6).

Table B37: Concentrations representing limit values for outdoor air (excerpt)

<i>Component</i>	<i>Averaging period</i>	<i>Limit value</i>	<i>Number of allowed exceedances</i>
<b>Nitrogen dioxide and nitrogen oxides</b>			
Hourly limit value for protection of health	1 hour	200 µg/m <sup>3</sup> NO <sub>2</sub>	The limit value shall not be exceeded more than 18 times per year
Yearly limit value for protection of health	1 year	40 µg/m <sup>3</sup> NO <sub>2</sub>	
Limit value for protection of vegetation	1 year	30 µg/m <sup>3</sup> NO <sub>x</sub>	
<b>Airborne particulate matter (PM<sub>10</sub>)</b>			
24 h limit value for protection of health	24 hours	50 µg/m <sup>3</sup>	The limit value shall not be exceeded more than 30 times per year
Yearly limit value for protection of health	1 year	25 µg/m <sup>3</sup>	
<b>Airborne particulate matter (PM<sub>2,5</sub>)</b>			
Yearly limit value for protection of health	1 year	15 µg/m <sup>3</sup>	

#### 4. Common Agricultural Policy (CAP) and related policies

The EEA-agreement does not include EUs common agricultural policy (CAP), nor the common market for agricultural products. Trade with processed agricultural products is included in protocol 3 to the EEA-agreement, while trade with basis agricultural products is included in protocol 19.

The objectives of agricultural policy in Norway are to secure the food supply, preserve the cultural landscape and to preserve the biological diversity. Every tenth year, overarching guidelines regarding agriculture in Norway are set by the Government. Every two years, there are negotiations between the government and the agricultural organisations, to set an agricultural agreement between the government and the organisations. The agreement regulates maximum prices for agricultural commodities, as well as regulating other methods for the farmers to gain an income.

## References

Chapters III, IV and V were based on the current regulations on fertilizers in Norway, found through the Norwegian website lovdata: [www.lovdata.no](http://www.lovdata.no)

For the subchapter regarding the future regulation, the source of information is the Norwegian Agricultural Agency's information about the proposed new regulations being sent to the Ministry of Agriculture and Food. There are numerous background reports (mostly in Norwegian) attached to the submission. The information can be found at this website:

<https://www.landbruksdirektoratet.no/no/miljo-og-okologisk/jordbruk-og-miljo/gjodsling/regelverk/forslag-til-nye-forskrifter-levert-gjodsel-storre-ressurs-mindre-ulempe>

Norwegian guidance document for classification of waters:

Direktoratsgruppen vanddirektivet (2018). Veileder 2:2018 Klassifisering. Downloaded from:

[http://www.vannportalen.no/globalassets/nasjonalt/dokumenter/tema-a-a/klassifisering/klassifiseringssystemet-veileder/klassifiseringsveileder\\_print\\_02.2018.pdf](http://www.vannportalen.no/globalassets/nasjonalt/dokumenter/tema-a-a/klassifisering/klassifiseringssystemet-veileder/klassifiseringsveileder_print_02.2018.pdf)

## NATIONAL LEGISLATION: POLAND

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### Scope of the report

The report presents an analysis of the possibility in the usage of nutrient rich side streams (NRSS) in the production of fertilisers with strong emphasis on the bio-based fertilisers (BBFs), which are the main objective of the project LEX4BIO. The analysis include inventory of the legal regulations in Poland which relate to waste management, fertilization, general directions and strategies for the management of waste rich in nutrients. The most important documents are Polish acts, ordinances, national strategies and plans. The short descriptions of the analysed legal regulations are provided below.

1. Act on fertilisers and fertilisation (Journal of Laws 2007 No. 147 item 1033)

The Act sets out the conditions and procedure for placing fertilisers on the market, soil conditioners, tasks and the competence of bodies and organizational units in the field of placing fertilisers on the market. It regulates the use of fertilisers and products supporting the cultivation of plants in agriculture, agrochemical service of agriculture and prevention of threats to human and animal health, as well as the environment, which may arise as a result of transport, storage and use of fertilisers and soil conditioners

2. Fertilisation Ordinance (Journal of Laws 2008 No. 119 item 765)

The Ordinance defines organizational units authorized to conduct fertiliser and soil conditioner testing, the scope of these tests, the scope of documentation regarding fertilisers and soil conditioners, the requirements to be met by the instructions for use and storage of fertilisers and soil conditioners, acceptable types present in pollution fertilisers and minimum quality requirements to be met by fertilisers.

3. Programme of measures to reduce water pollution by nitrates from agricultural sources and to prevent further pollution (Journal of Laws 2020 item 243)

The Ordinance defines measures aimed at reducing water pollution by nitrates from agricultural sources and preventing further pollution, including limiting the agricultural use of fertilisers, fertilisation periods, storage conditions for natural fertilisers and leachate treatment, doses and methods of nitrogen fertilisation, the method of documenting the implementation of the Programme and material and time schedule of funds implementation.

4. Act on waste (Journal of Laws 2013 item 21)

The Waste Act is the primary legislative tool in the Polish waste management system. The Act sets out measures to protect the environment, human life and health that prevent and reduce the negative impact on the environment and human health arising from the production and management of waste, and limit the overall effects of resource use and improve the efficiency of such use.

5. Municipal Sewage Sludge Ordinance (Journal of Laws 2015 item 257)

The Ordinance sets detailed conditions for the use of municipal sewage sludge, including the doses of the sludge that can be used on land. It regulates the scope, frequency and reference methods for testing municipal sewage sludge and land on which the sludge is going to be used.

6. Wastewater Ordinance (Journal of Laws 2019 item 1311)

The Wastewater Ordinance indicates the substances particularly harmful to the aquatic environment, causing water pollution to be eliminated and substances particularly harmful to the aquatic environment, causing water pollution to be reduced. It also sets the conditions for introducing wastewater into water or soil, in particular domestic wastewater, urban wastewater and industrial wastewater, including the maximum permissible values for polluting substances, and conditions for the agricultural use of wastewater, as well as the place, method and the minimum frequency of wastewater sampling, reference methodologies for analysis and how to assess whether the wastewater meets the required conditions.

7. Strategy for Municipal Sewage Sludge Management for 2019 -2022

The subject of the Strategy is to create conditions and create mechanisms conducive to solving the growing problem of municipal waste sludge management in Poland. The Strategy recommends the best methods for sewage sludge processing including their land application, composting, usage for the biogas production, incineration and phosphorus (P) recovery from the sewage sludge ashes.

8. National Waste Management Plan 2022 (Polish Monitor 2016 item 784)

The National Waste Management Plan 2022 is a document that defines waste management tasks. The development of a National Waste Management Plan results from the EU (European Union) regulations, and more specifically from the hierarchy of waste management methods set out in a Directive 2008/98/EC of the European Parliament and of the Council of 19 November 2008 on waste and repealing certain directives.



## 1. Agriculture and fertilisation policy

### Act on Fertilisers and Fertilisation

**Name (Eng):** Act on Fertilisers and Fertilisation

**Full name (Pol):** Ustawa z dnia 10 lipca 2007 r. o nawozach i nawożeniu

**Release date:** 10.07.2007

**ID:** Dz.U. 2007 nr 147 poz. 1033

(Journal of Laws 2007 No. 147 item 1033)

**Competent authority:** Parliament

**In text as (abbreviation):** Act on Fertilisation

According to the Act on Fertilisers and Fertilisation, the term "fertiliser" means products intended to provide plants with nutrient components or to increase soil fertility or to increase the fertility of fish ponds, which are mineral, natural, organic and organo-mineral fertilisers. The description of individual fertilisers types are presented in Figure 1.

Mineral fertiliser	Natural fertiliser	Organic fertiliser	Organo-mineral fertiliser
<ul style="list-style-type: none"><li>• inorganic fertilisers, produced by chemical or physical changes or processing of mineral raw materials, including fertilising lime, which includes magnesium-containing fertiliser lime, as well as some organic fertilisers</li></ul>	<ul style="list-style-type: none"><li>• manure, liquid manure, derived</li><li>• from farm animals, within the meaning of the regulations on organization of breeding and reproduction of farm animals, excrements, from exceptional excrements of bees, without the addition of other substances,<ul style="list-style-type: none"><li>• guano (intended for agricultural use)</li></ul></li></ul>	<ul style="list-style-type: none"><li>• fertilisers made from organic matter or from mixtures of organic substances, including composts, as well as composts made using earthworms (vermicomposting)</li></ul>	<ul style="list-style-type: none"><li>• mixtures of organic and mineral fertilisers</li></ul>

Figure 1: Definitions of fertiliser types

Fertilisers that contain ammonium nitrate ( $\text{NH}_4\text{NO}_3$ ) in an amount of more than 28% in terms of total nitrogen, imported from third countries, should be provided with a valid certificate that confirms their resistance to detonation, issued by an accredited body in this respect on the territory of the EU Member States.

Fertilisers and soil conditioners are marketed on the basis of a permit issued by the Ministry competent for agriculture. [Fertilisation Ordinance](#)

**Name (Eng):** Ordinance on the implementation of certain provisions of the Act on fertilisers and fertilisation

**Full name (Pol):** Rozporządzenie Ministra Rolnictwa i Rozwoju Wsi z dnia 18 czerwca 2008 r. w sprawie wykonywania niektórych przepisów ustawy o nawozach i nawożeniu

**Release date:** 18.06.2008

**ID:** Dz.U. 2008 nr 119 poz. 765

(Journal of Laws 2008 No. 119 item 765)

**Competent authority:** Ministry of Agriculture and Rural Development

**In text as (abbreviation):** Fertilisation Ordinance

The Fertilisation Ordinance plays a key role in shaping the legal framework for the use of NRSS as BBFs in Poland. The main regulations limiting the maximum allowable pollutant levels and the minimum nutrient contents in fertilisation products are shown in Table B38-B40.

Table B38: Maximum allowable value of impurities in organic, organic-mineral fertilisers as well as organic and organic-mineral fertilisers

Element	Maximum value	Unit
Chrome (Cr)	100	mg/kgDM*
Cadmium (Cd)	5	mg/kgDM
Nickel (Ni)	60	mg/kgDM
Lead (Pb)	140	mg/kgDM
Mercury (Hg)	2	mg/kgDM

\*DM - dry matter

Table B39: Maximum allowable value of impurities in mineral fertilisers and agents supporting the cultivation of plants of mineral origin

In calcium fertiliser	Cadmium (Cd)	8	mg/kg CaO
	Lead (Pb)	200	mg/kg CaO
in fertiliser calcium containing magnesium	Cadmium (Cd)	15	mg/kg CaO+MgO
	Lead (Pb)	600	mg/kg CaO+MgO
in other mineral fertilisers and soil conditioners	Arsenic (As)	50	mg/kgDM
	Cadmium (Cd)	50	mg/kgDM
	Lead (Pb)	140	mg/kgDM
	Mercury (Hg)	2	mg/kgDM

In fertilisers, the nitrogen, phosphorus and potassium content or their sum is declared, the content of these components may not be less than that given in the B40.

Table B40: The content of fertiliser components in fertilisers

	Mineral fertilisers in solid form	Mineral fertilisers in liquid form	Organo-mineral fertilisers in solid form (they should contain at least 20% organic matter on a dry basis)	Organo-mineral fertilisers in liquid form	Organic fertilisers in solid form (they should contain at least 30% organic matter on a dry basis)	Organic fertilisers in liquid form
N [%]	≥2	≥1	≥1	≥0.5	≥0.3	≥0.08
P <sub>2</sub> O <sub>5</sub> [%]	≥2	≥1	≥0.5	≥0.2	≥0.2	≥0.05
K <sub>2</sub> O [%]	≥2	≥1	≥1	≥0.5	≥0.2	≥0.12

Programme of measures to reduce water pollution by nitrates from agricultural sources and to prevent further pollution

**Name (Eng):** Ordinance on the adoption of the "Programme of measures to reduce water pollution by nitrates from agricultural sources and to prevent further pollution"

**Full name (Pol):** Rozporządzenie Rady Ministrów z dnia 12 lutego 2020 r. w sprawie przyjęcia „Programu działań mających na celu zmniejszenie zanieczyszczenia wód azotanami pochodzącymi ze źródeł rolniczych oraz zapobieganie dalszemu zanieczyszczeniu”

**Release date:** 14.02.2020

**ID:** Dz.U. 2020 poz. 243

(Journal of Laws 2020 item 243)

**Competent authority:** the Council of Ministers

**In text as (abbreviation):** Programme for nitrates pollution reduction

The Programme of measures to reduce water pollution by nitrates from agricultural sources and to prevent further pollution was developed in Poland in order to set the legal framework and detail the existing legal regulations in terms of using fertilisers on areas where a significant threat of eutrophication have been identified. These areas such as water reservoirs, natural watercourses, ditches and channels have been included on the list of areas where the use of fertilisers is regulated by this Programme. The list of detailed limits regarding the types of applied fertilisers is shown in Table B41.

Table B41: Distances at which fertilisers are not used near surface waters

On arable land from the shore				
Type of fertiliser	lakes and water reservoirs up to 50 ha	natural watercourses	ditches, excluding ditches up to 5 m wide calculated on the upper edge of the ditch's edge	channels
Fertilisers, excluding manure	5 m	5 m	5 m	5 m
Slurry	10 m	10 m	10 m	10 m
On arable land from:				
Type of fertiliser	shore of lakes and water reservoirs with an area of over 50 ha	water intakes, if no protection zone has been established on the basis of the provisions of the Act of 20 July 2017 - Water Law (Journal of Laws of 2018, item 2268)	coastal riparian areas	
All types of fertilisers	20 m	20 m	20 m	

Submitted (not yet approved by the EC)

## 2. Waste management

### Act on waste

**Name (Eng):** Act on waste

**Full name (Pol):** Ustawa z dnia 14 grudnia 2012 r. o odpadach

**Release date:** 14.12.2012

**ID:** Dz.U. 2013 poz. 21 (Journal of Laws 2013 item 21)

**Competent authority:** Parliament

**In text as (abbreviation):** Act on waste

The Polish Act on waste is the most important act regarding waste management in Poland. In terms of using BBFs the Act on waste sets a legal framework the land application of sewage sludge.

The Act on waste includes the following rules and obligations:

- 1) The municipal sewage sludge can be handled for use to the land owner only by the producer of this sludge.
- 2) Responsibility for the proper use of municipal sewage sludge rests with the producer of the sludge.
- 3) The use of municipal sewage sludge is possible if they are stabilized and prepared according to the purpose and manner of their use, in particular by subjecting them to biological, chemical or thermal treatment or another process that reduces the susceptibility of municipal sewage sludge to kneading and eliminating the threat to the environment or human life and health.
- 4) Irrigation of previously dehumidified municipal sewage sludge is prohibited.
- 5) A producer of municipal sewage sludge notifies in writing the competent Regional Environmental Protection Inspectorate about the intention to transfer the sludge to the land owner, on which this sludge is going to be used at least 7 days before the transfer.
- 6) The use of municipal sewage sludge is prohibited in:
  - a) in the areas of national parks and nature reserves;
  - b) in intermediate protection areas of water intake protection zones;
  - c) in a 50 m wide strip of land directly adjacent to the banks of lakes and watercourses;
  - d) in areas of particular flood risk and in temporarily flooded and swampy areas;
  - e) in areas temporarily frozen and covered with snow;
  - f) on soils with high permeability, in particular loose and loamy sands and light loamy sands, if the groundwater level is less than 1.5 m below the ground surface;
  - g) on agricultural land with a decrease exceeding 10%;
  - h) in inland water protection areas according to the Water Act;
  - i) in areas covered by other forms of nature protection not mentioned in point 1, if sewage sludge was generated outside these areas;
  - j) in areas less than 100 m from the water supply source, the households or food production plant;
  - k) on land where fruit plants and vegetables grow, except for fruit trees;

- l) on land intended for the cultivation of berry plants and vegetables, the edible parts of which are in direct contact with the ground and are consumed raw - during the 18 months preceding harvest and during harvest;
- m) on land used as pasture and meadow;
- n) on land used for cultivation under cover.

The ministry competent for climate matters, in consultation with the ministry competent for agriculture matters, shall determine, by an Ordinance, the detailed conditions for the use of municipal sewage sludge, including the doses of this sludge that can be used on land, as well as the scope, frequency and reference methods of municipal sewage sludge testing and land on which the sludge are to be used in accordance with the principles of environmental protection and the protection of agricultural land. The above conditions are included in the Municipal Sewage Sludge Ordinance (Dz.U. 2015 poz. 257).

Submitted (not yet approved by the EC)

### 3. Water and wastewater legislation

#### Municipal Sewage Sludge Ordinance

**Name (Eng):** Municipal Sewage Sludge Ordinance

**Full name (Pol):** Rozporządzenie Ministra Środowiska z dnia 6 lutego 2015 r. w sprawie komunalnych osadów ściekowych

**Release date:** 6.02.2015

**ID:** Dz.U. 2015 poz. 257

(Journal of Laws 2015 item 257)

**Competent authority:** Ministry of Environment

**In text as (abbreviation):** n/a

The Polish Municipal Sewage Sludge Ordinance set the specific conditions for municipal sewage sludge, including their dosing for land application in agriculture. Moreover, the Ordinance sets the scope, frequency and reference methods for testing municipal sewage sludge and land on which these sludge are to be applied. Therefore, municipal sewage sludge can be used on soils if the following conditions are met:

- 1) The heavy metal content in the sludge dry matter does not exceed the amounts specified in Attachment 1 to the Ordinance (Table B42)

Table B42: Permissible content of heavy metals in sewage sludge used in agriculture

Heavy metal	Permissible content of heavy metals in mg/kg DM		
	In agriculture and for land reclamation for agricultural needs	for land reclamation for non-agricultural needs	when adapting land to specific needs resulting from waste management plans, for growing crops for compost, for growing non-intended plants for the consumption and production of feed
Cd	20	25	50
Cu	1000	1200	2000
Ni	300	400	500
Pb	750	1000	1500
Zn	2500	3500	5000
Hg	16	20	25
Cr	500	1000	2500

- 2) In the case of using sewage sludge in agriculture and for land reclamation for agricultural purposes - bacteria cannot be isolated from the genus Salmonella in a representative sample of 100 g of sludge obtained in accordance with the following assumptions:

A sample of municipal sewage sludge, intended for the tests is obtained by combining and thoroughly mixing samples taken at the same time from different places intended for testing by reference methods, the number of these samples is at least:

- a) 10 – if the sewage sludge volume is  $<50 \text{ m}^3$  ;
  - b) 15 – if the sewage sludge volume is from 50 to  $100 \text{ m}^3$
  - c) 30 – if the sewage sludge volume is  $>100 \text{ m}^3$  .
- 3) Total number of live eggs of intestinal parasites Ascaris sp., Trichuris sp., Toxocara sp. in 1 kg of dry matter of sludge intended for :
- a) agricultural use and land reclamation for agricultural needs - is 0;
  - b) land reclamation - is  $<300$ ;
  - c) adapting land to specific needs arising from waste management plans, spatial development plans or decisions on building and land development conditions - is  $<300$ ;
  - d) for growing plants for the production of compost - is  $<300$ ;
  - e) for growing plants not intended for consumption and for the production of feed - is  $<300$ .
- 4) The amount of heavy metals in the top soil layer 0-25 cm deep on which the sludge are to be used, does not exceed the limit values set out in Attachment 2 and 3 to the Ordinance (Table B43 and B44 respectively)



Table B43: Permissible heavy metal content in top soil layer (0-25 cm) on which the sewage sludge is applied for agriculture needs

Heavy metal type	Permissible heavy metal content in top soil layer (0-25 cm) on which the sewage sludge is applied for agriculture needs in mg/kgDM		
	light	medium	heavy
Cd	1	2	3
Cu	25	50	75
Ni	20	35	50
Pb	40	60	80
Zn	80	120	180
Hg	0.8	1.2	1.5
Cr	50	75	100

Table B44: Permissible heavy metal content in top soil layer (0-25 cm) on which the sewage sludge is applied for adapting land to specific needs resulting from waste management plans, for growing crops for compost, for growing non-intended plants for the consumption and production of feed

Heavy metal type	Permissible heavy metal content in top soil layer (0-25 cm) on which the sewage sludge is applied for adapting land to specific needs resulting from waste management plans, for growing crops for compost, for growing non-intended plants for the consumption and production of feed in mg/kgDM		
	light	medium	heavy
Cd	3	4	5
Cu	50	75	100
Ni	30	45	60
Pb	50	75	100
Zn	150	220	300
Hg	1	1.5	2
Cr	100	150	200

- a) the soil pH value in agricultural land where the sludge is to be applied is not less than 5.6;
- b) the use of the sludge does not degrade the quality of soil, surface and groundwater;

- c) the sludge is used outside the period of growth and development of plants intended for direct consumption by people understood as the time from sowing or planting to harvest.
- 5) The permissible doses of municipal sewage sludge that can be used during the year per unit of land surface, provided that the permissible heavy metal content in municipal sewage sludge specified in Attachment 1 to the Ordinance (Table 5) is not exceeding:
- a) in agriculture and for land reclamation for agricultural purposes - 3 MgDM/ha/year;
  - b) for land reclamation for non-agricultural purposes and for adapting land to specific arising needs from waste management plans, spatial development plans or decisions on building and land development conditions, for growing plants intended for the production of compost, for growing non-intended plants for consumption and for the production of feed - 15 MgDM/ha/year.
  - c) with the use of municipal sewage sludge up to once in two or three years in agriculture and land reclamation for agricultural purposes the permissible dose of municipal sewage sludge can be accumulated and not may exceed 6 MgDM/ha/2 years and 9 MgDM/ha/3 years;
  - d) with the use of municipal sewage sludge for one time in two or three years for land reclamation for non-agricultural purposes and for adapting land to specific needs resulting from waste management plans, spatial development plans or decisions on building and land development conditions for plant cultivation intended for the production of compost and plants not intended for consumption and for the production of feed the acceptable dose of municipal sewage sludge may be accumulated and may not exceed 30 MgDM/ha/2 years and 45 MgDM/ha/3 years.
- 6) Municipal sewage sludge is used in liquid, greasy or earthy form.
- 7) A condition for using municipal sewage sludge in liquid form is its introduction into the soil by the injection method or spraying method, including hydroseeding.
- 8) The condition for the use of municipal sewage sludge in a greasy and earthy form is their even distribution on the ground surface and introduction into the ground.
- 9) The reference methods for testing municipal sewage sludge are carried out with a frequency depending on load of wastewater treatment plant expressed as population equivalent (PE) at least:
- a) once per 6 months if the PE is <10 000;
  - b) once per 4 months if the PE is from 10 000 to 100 000;
  - c) once per 2 months if the PE is >100 000.
- 10) Soil testing with reference methods on which municipal sewage sludge is to be used includes determining:
- a) pH values;

- b) plant bioavailable phosphorus content calculated as P<sub>2</sub>O<sub>5</sub> (phosphorus pentoxide) if the sludge will be used in agriculture - expressed in mg/100g soil;
- c) content of heavy metals: lead, cadmium, mercury, nickel, zinc, copper and chromium - expressed in mg/kgDM

## Wastewater Ordinance

**Name (Eng):** Ordinance on the particularly harmful substances to the aquatic environment and conditions wastewater introduction to waters or into the ground, as well as when discharging rainwater or snowmelt to waters or water facilities

**Full name (Pol):** Rozporządzenie Ministra Gospodarki Morskiej i Żeglugi Śródlądowej z dnia 12 lipca 2019 r. w sprawie substancji szczególnie szkodliwych dla środowiska wodnego oraz warunków, jakie należy spełnić przy wprowadzaniu do wód lub do ziemi ścieków, a także przy odprowadzaniu wód opadowych lub roztopowych do wód lub do urządzeń wodnych

**Release date:** 12.07.2019

**ID:** Dz.U. 2019 poz. 1311

(Journal of Laws 2019 item 1311)

**Competent authority:** Ministry of Maritime Economy and Inland Navigation

**In text as (abbreviation):** Wastewater Ordinance

- 1) The Polish Wastewater Ordinance concerns about setting the limits for discharged wastewater (municipal and industrial) in terms of harmful substances for water receivers. Besides the discharge limits it regulates the conditions for applying wastewater in agriculture by introducing the following conditions:
  - a) the BOD<sub>5</sub> is reduced by at least 20% and the TSS content by at least 50%;
  - b) comply with the sanitary conditions specified in Attachment 9 to the Ordinance (Table B45);

Table B45: Sanitary conditions for wastewater intended for agricultural use

No.	Indicator	Limit
1	Salmonella pathogenic bacteria	undetectable in 1 dm <sup>3</sup>
2	The presence of live eggs of parasites (Ascaris sp., Trichuris, Toxocara sp.)	absent in 1 dm <sup>3</sup>

- c) they do not pose a threat to the quality of ground and surface waters, and in particular will not cause pollution of these waters with substances particularly harmful to the aquatic environment;
- d) they do not contain polluting substances in amounts exceeding the maximum permissible values for polluting substances set in Attachment 4 of the Wastewater Ordinance (Table B46)

Table B46: Maximum permissible values for polluting substances

Pollutant name or symbol	Max. daily average (mg/l)	Max. monthly average
Hg	0.1 (0.2 for the electrolysis of alkali metal chlorides, 0.06 for not mentioned activities)	0.05 (0.03 for not mentioned activities)
Cd	0.4 (0.1 for glass industry, 0.05 for heating industry, 0.07 for ceramic industry)	0.2
As	0.1 (0.3 for glass industry)	n/a
Ba	2.0 (3.0 for glass industry)	n/a
Be	1.0	n/a
B	1.0	n/a
Zn	2.0	n/a
Sn	2.0 (1.0 for production of coating paints and varnish resins)	n/a
Cr <sup>+6</sup>	0.1 (0.5 for heating industry, 0.05 for tanning industry)	n/a
Cr (Total)	0.5 (1.0 for tanning industry)	n/a
Co	1.0 (0.1 for ceramic industry)	n/a
Cu	0.5 (0.1 for ceramic industry)	n/a
Mo	1.0	n/a
Ni	0.5 (0.1 for ceramic industry)	n/a
Pb	0.5 (0.1 for heating industry)	n/a
Se	1.0	n/a
Ag	0.1	n/a
Tl	1.0	n/a
Ti	1.0	n/a
V	2.0	n/a
Cl <sub>2</sub> (free)	0.2	n/a
Cl <sub>2</sub> (total)	0.4	n/a
Free cyanides	0.1	n/a
Bound cyanides	5.0	n/a
F	25	n/a
Thiocyanate	10	n/a
S	0.2	n/a

Table B46: Maximum permissible values for polluting substances (continued)

Pollutant name or symbol	Max. daily average (mg/l)	Max. monthly average
Formaldehyde	2.0	n/a
Acrylonitrile	20	n/a
Volatile phenols	0.1	n/a
Chlorinated hydrocarbons insecticides	0.0005	n/a
Organophosphorus and carbamate insecticides	0.001	n/a
Caprolactam	10	n/a
Anionic surfactants	5	n/a
Nonionic surfactants	10	n/a
The sum of anionic and nonionic surfactants	1.0	n/a
Substances susceptible to extractions with petroleum ether	50	n/a
Petroleum hydrocarbons	15 (5.0 for oil processing industry)	n/a
Volatile aromatic hydrocarbons	0.1	n/a
Adsorbable organochlorine compounds	1.0 (5.0 for the production of bleached pulp, sulphate and sulphite)	n/a

2) Moreover, the Wastewater Ordinance set a limit for the permissible content of heavy metals in soils, in the 0-25 cm layer, in areas where agricultural utilization of wastewater can be used. The limits are set out in Attachment 10 to the Ordinance Table B47.

Table B47: Permissible content of heavy metals in soils, in the 0-25 cm layer, in areas where agricultural utilization of wastewater can be used

Heavy metal type	Content (mg/kgDM) in soils			
	very light	light	medium	heavy
Pb	20	40	60	80
Cd	0.5	1.0	2.0	3.0
Hg	0.7	0.8	1.2	1.5
Ni	10	20	35	50
Zn	60	80	120	180
Cu	20	25	50	75
Cr	30	50	75	100

- 3) Microbiological and parasitological tests as well as tests on the condition and composition of wastewater intended for agricultural use shall be carried out at least once every two months.
- 4) Tests for the content of heavy metals in soils in areas where agricultural utilization of wastewater can be used are carried out every 5 years.
- 5) Agricultural utilization of wastewater can be used outside of shallow areas of crevice rocks not insulated from the surface with an impermeable layer.
- 6) The location of land on which agricultural use of wastewater can be used, and the location of equipment and installations intended for storage and preparation of wastewater for agricultural use should comply with the conditions set out in Attachment 11 to the Ordinance (Table B48).

Submitted (not yet approved by the EC)

Table B48: Applicable distance conditions regarding the use of wastewater for agricultural needs

Land location	Minimum distance
1) from facilities intended for people, at wastewater distribution:	
using a gravity system	100 m
using a sprinkler system	200 m
2) from public roads and railways at wastewater distribution:	
using a gravity system	20 m
using a sprinkler system	70 m
3) from the shoreline of flowing waters when the terrain slopes:	
< 2%	30 m
2% - 10%	50 m
> 10%	70 m
4) from water reservoirs, fish ponds not intended for wastewater supply, from the shore of lakes, at land fall:	
< 2%	50 m
2% - 10%	80 m
> 10%	100 m
5) from the intake of surface or underground water, constituting a source of water supply for the population intended for consumption	250 m

Submitted (not yet approved by the EC)

#### 4. Other

##### Strategy for Municipal Sewage Sludge Management for 2019 -2022

**Name (Eng):** National Strategy for Municipal Sewage Sludge Management for 2019 -2022

**Full name (Pol):** Strategia postępowania z komunalnymi osadami ściekowymi na lata 2019-2022

**Release date:** 18.11.2018

**ID:** n/a

**Competent authority:** Ministry of  
Environment

**In text as (abbreviation):** n/a

The National Strategy for Municipal Sewage Sludge Management for 2019 -2022 was developed for the analysis of the possibilities of improving the sewage sludge management in Poland. The strategy includes the most important data analysis about the quantity of sewage sludge produced and processed in 2015-2016. The set of data are shown in Table B49.

Table B49: The amount of municipal sewage sludge generated and the their processing method in 2015-2016

	2015	2016
	thousands MgDM per year	
<b>Total production</b>	<b>590.2</b>	<b>605.3</b>
Used in agriculture	122.8	119.7
Used in land reclamation, including lands for agricultural needs	17.6	16.4
Used for growing crops for compost production	37.4	20.2
Incinerated	83.7	108.9
Disposed	77.2	62.2
Other processing methods	251.4	277.8

The Strategy corresponds with the other legal regulations concerning using sewage sludge in agriculture, including land application of sewage sludge. However, it seems that it is the only official document, which currently provides recommendations for the P recovery from sewage sludge ashes (SSA).



## **Land application**

According to the Strategy the only waste type approved for this type of recovery are "stabilized municipal sewage sludge" (waste code: 19 08 05), with additional conditions resulting from waste regulations. Properties that allow the use of municipal sewage sludge in the process of recovery on the land surface should be achieved at the stage of treatment of municipal sewage sludge.

The strategy underlines that the purpose of municipal sewage sludge recovery by using them on the earth surface is to use valuable agronomic properties and fertilising potential of municipal sewage sludge, i.e. the organic matter and nutrients content for plants, such as N, P and microelements. However, the introduction of these components into the soil along with the sludge should be in line with the general fertilisation rules while respecting the principles of environmental protection, including soil and water protection. Determining the dose and carrying out tests determining the quality of the sludge are extremely important for meeting and maintaining the purpose of using municipal sewage sludge for soils.

An indispensable factor enabling the use of sewage sludge on the earth surface is finding willing recipients - those who control the lands. The land-ruler should declare the cultivation of plants on which fertilisation with municipal sewage sludge is allowed, have the appropriate equipment to spread and mix the sludge with the soil based on the code of good agricultural practice.

## **Sewage sludge ashes**

Fertiliser granules obtained from ashes from the combustion of biomass and municipal sewage sludge have not been used for agricultural purposes in Poland. According to the Strategy for Municipal Sewage Sludge Management for 2019-2022 it can be considered that this substance is "unknown in fertilisation".

It was underlined that the chemical composition of SSA is variable and further research are needed to clarify the recommendations for their use and determine the dose. Furthermore, it was assumed that the ashes are an important source of P, but the form and its bioavailability for plants of the element derived from this source is unknown. There is also a risk that SSA may have an increased content of some heavy metals and others impurities (depending on the source of sludge origin). Due to the lack of information in this area, it is also appropriate to conduct agricultural research to assess the bioavailability of nutrients and the impact of fertilisers obtained from ashes on soil properties and crop yielding. Therefore, it is not justified to allow uncontrolled introduction into agriculture of fertilisers obtained from SSA.

However, fertilisers produced from SSA can be placed on the market, within the meaning of the Fertilisation Act (Dz.U. 2007 nr 147 poz. 1033), after prior examination of their chemical properties, i.e. in accordance with the applicable procedure for mineral fertilisers and soil conditioners and after obtaining the permission of the ministry competent for agriculture. According to legal regulations in this are an entity authorized to conduct physical examinations, physicochemical and chemical fertilisers and soil conditioners us the Institute of New Chemical Syntheses in Puławy, Poland.

Moreover, the Strategy recommends the production of fertilisers as a result of the extraction of P from ashes and its use for the production of mineral fertilisers, not the usual ash granulation. It is advisable

to develop technologies in the extraction of P from ashes for the production of mineral fertilisers. The usual granulation of ashes to obtain "fertiliser" is not recommended.

## National Waste Management Plan 2022

**Name (Eng):** National Waste Management Plan 2022

**Full name (Pol):** Krajowy Plan Gospodarki Odpadami 2022

**Release date:** 1.07.2016

**ID:** M.P. 2016 poz. 784

(Polish Monitor 2016 item 784)

(Annex to the Resolution No 88 of the Council of Ministers of 1 July 2016 item 784)

**Competent authority:** the Council of Ministers

**In text as (abbreviation):** n/a

The legal basis for the development of the National Waste Management Plan 2022 is the Waste Act. Pursuant to this Act, waste management plans are updated at least every six years. The starting point for the elaboration of the National Waste Management Plan is the waste hierarchy presented in the Figure 2.

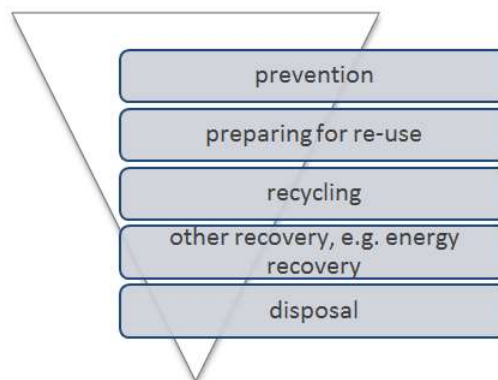


Figure 2: Waste hierarchy

As part of the National Waste Management Plan, the waste has been divided into:

- municipal waste, including food waste and other biodegradable waste,
- hazardous waste,
- other waste.

Biodegradable municipal waste includes:

- paper and cardboard,
- clothing and textiles made of natural materials (50%),
- waste from green areas,

- kitchen and garden waste,
- wood (50%),
- multi-material waste (40%),
- fine fraction <10 mm (30%).

The data indicated in the National Waste Management Plan show that the share of municipal waste that is biodegraded selectively collected and utilized in a different way than landfilling is increasing, which is consistent with both the hierarchy of waste management methods and applicable regulations on the limitation and prohibition of landfilling biodegradable municipal waste. Selectively collected bio-waste in single-family housing can be utilized in home composters.

Waste from the agri-food sector is generated mainly in slaughterhouses, meat processing plants, dairies, cold stores, agricultural and horticultural farms, sugar factories, breweries, distilleries and other food production and processing plants. From the whole mass of generated waste, 97.3% is recovered, 1.6% neutralized, and 1.1% stored. The chemical composition and properties of this waste predispose them to natural use. The dominant direction of waste recovery is the production of organic fertilisers and compost production components. In addition, some types of waste from the agri-food sector can be used as a means for the production of organic acids, etc.

Waste from wood processing and the production of paper, cardboard, pulp and furniture arise mainly in sawmills, woodworking plants, carpentry factories, and paper and cellulose factories. The main quantitative share has such waste as: shavings, cuttings, pieces of wood and chipboard, veneer as well as sawdust and waste bark and cork. The bark and cork are recoverable for energy purposes at the premises of the plants producing them or by individual customers. Waste from the production of panels and furniture, not contaminated with hazardous substances, are used in gardening and forestry as a component of peat mixtures or natural mulch in forest nurseries. However, the natural use of waste from wood processing is too low in relation to the potential possibilities.

## NATIONAL LEGISLATION: SLOVENIA

Compiled by Matjaž Glavan (University of Ljubljana, Slovenia) and Sylvia Kratz (JKI)

Last updated: 27 April 2021

### 1. Fertilising products and fertilisation

#### Mineral Fertilisers Act (Zakon o mineralnih gnojilih (ZMinG-1))

This Act **implements Regulation (EC) No 2003/2003/EC** into Slovenian national law. It states that mineral fertilisers may be placed on the market if they meet the conditions laid down in Regulation (EC) No 2003/2003. It also provides for **mineral fertilisers that do not meet the conditions laid down in Regulation (EC) No 2003/2003**. The latter may be marketed on the territory of the Republic of Slovenia if they meet the **requirements regarding minimum quality** (which are further defined in the **Rules on quality of mineral fertilisers**), are **marked** in accordance with the Mineral Fertilisers Act and **do not endanger soil fertility** when used correctly, **human and animal health and the environment**. The Mineral Fertilisers Act will be updated when the new EU Fertilising Products Regulation No 2019/1009 enters into force in 2022.

Link:

[Zakon o mineralnih gnojilih \(ZMinG-1\)](#)

#### Rules on quality of mineral fertilisers (Pravilnik o kakovosti mineralnih gnojil )

The **Rules on quality of mineral fertilisers** determine the conditions regarding the **minimum quality of mineral and organo-mineral fertilisers** that do not meet the requirements of Regulation (EC) No 2003/2003 and are in trade on the territory of the Republic of Slovenia, regarding the **minimum content of macronutrients and micronutrients**, the **maximum content of heavy metals (Cd and Pb)**, **labelling/declaration** of macronutrients, secondary nutrients and micronutrients and **tolerances for deviations from the declared contents** of nutrients.

The following limit values are set for Cd and Pb:

Table B50: Limit values for Cd and Pb

	Limit value in mineral fertilisers with more than 5% P <sub>2</sub> O <sub>5</sub> in mg/kg	Limit value in mg / kg in mineral fertilizers with less than 5% P <sub>2</sub> O <sub>5</sub> in mg / kg
Cadmium (Cd)	75 mg/kg P <sub>2</sub> O <sub>5</sub>	3
Lead (Pb)	100	100

Link:

[Pravilnik o kakovosti mineralnih gnojil](#)

Decree on the protection of waters against pollution caused by nitrates from agricultural sources (Uredba o varstvu voda pred onesnaževanjem z nitrati iz kmetijskih virov)

This Decree provides, in accordance with Council Directive 91/676/EEC concerning the protection of waters against pollution caused by nitrates from agricultural sources:

- limit values for nitrogen input to or from soil from agricultural sources, and
- measures to reduce and prevent water pollution caused by nitrates from agricultural sources.

**Agricultural sources comprise both mineral and organic fertilisers.** Organic fertilisers include **livestock manures and other fertilisers of organic origin**, such as digestate, biogas production residues, compost, vegetable waste, sewage sludge, sludge, peat and other fertilisers in accordance with the Regulation governing the use of sewage sludge in agriculture and the Regulation governing the processing of biodegradable waste and the use of compost or digestate.

Due to groundwater protection, a key source of drinking water in Slovenia, **State defined Slovenia's entire area as a vulnerable area.**

In this area, the **annual nitrogen input from livestock manure may not exceed 170 kg N/ha of the utilised agricultural area at the level of the agricultural holding.**

According to this Decree definition, livestock manure comprises stable manure, slurry, slurry, and excreta excreted by animals on pasture. Livestock manure also includes the residue from the production of biogas (digestate or biogas slurry) if stable manure, slurry or slurry were also used to produce biogas.

Every farmer carrying out **fertilisation** must implement **mandatory requirements** for the protection of waters against nitrate pollution. In particular, farmers must take into account:

- periods during which the application of certain fertilisers to or on the soil is prohibited;
- rules for fertilisation on steep lands;
- rules for fertilising soils saturated with water, flooded soils, frozen soils or soils covered with snow,
- fertilisation rules near watercourses;
- minimum storage capacity for livestock manure, which must exceed the storage needs beyond the maximum period during which the introduction of livestock manure into or on the soil is prohibited;
- measures to prevent water pollution by manure from leachate storage;
- fertilisation procedures (doses, homogeneous fertiliser spread) that will maintain nitrogen losses to water at an acceptable level and
- further restrictions on the application of fertilisers to the soil in vulnerable areas.

Link:

[Uredba o varstvu voda pred onesnaževanjem z nitrati iz kmetijskih virov](#)

### Good agricultural practice

More detailed recommendations for implementing good agricultural practice by farmers concerning fertilisation are described in the **Expert guidelines for fertilisation** [Smernicah za strokovno utemeljeno gnojenje \(Ministry for agriculture\)](#). (in Slovenian Language)

### Supervision

The Inspectorate of the Republic of Slovenia for Agriculture, Forestry, Hunting and Fisheries is responsible for the control of fertilisation and the use of mineral fertilisers. The Agricultural Institute of Slovenia is authorised to perform chemical analyses for the needs of inspection control over mineral fertilisers' trade.

Further references for chapter 1:

<https://www.gov.si teme/gnojenje-in-gnojila/>

<https://www.gov.si teme/varstvo-voda-pred-onesnazevanjem-z-nitrati-iz-kmetijskih-virov/>

<https://www.gov.si teme/vodovarstvena-obmocja/>

Submitted (not yet approved by the EC)

## 2. Waste management

The following decrees are based on the Water Act and the Environmental Protection Act (see chapter 3).

Decree on the treatment of biodegradable waste and the use of compost or digestate -  
Uredba o predelavi biološko razgradljivih odpadkov in uporabi komposta ali digestata

This Decree lays down rules of conduct and other conditions relating to the recovery of biodegradable waste and the use of compost or digestate in accordance with Directive 2008/98/EC of the European Parliament and the Council on waste and placing the compost or digestate on the market.

Annexe 1 contains a **list of materials (biodegradable waste)** to which the degree applies.

Art. 11 and Annex 2 define **mandatory instructions for composting**, including **hygiene requirements**.  
Art. 12 defines **special requirements for anaerobic digestion**.

Art. 13 and Annex 3 contain requirements for **quality control**, including measurements, analysis and testing parameters, as well as the obligation to keep a report on the quality control.

Annexe 4 defines **two quality classes** that must be assigned to every compost or digestate by the waste processor (according to Art. 15), based on **contents of heavy metals and other unwanted substances**. The use of compost or digestate that does not fulfil the requirements of either quality class according to Art. 15/Annex 4 is prohibited (see Art. 24).

**Art. 15 grants product status to class 1 materials, i.e. these materials cease to be waste.**

According to Art. 24, **only compost or digestate of quality class 1 is allowed for agricultural land use**.  
Art. 25 contains further provisions for the use of quality class 1 materials, including the **obligation for regular soil analysis** and **application limits for annual input to agricultural land**. Analytical data and soil application must be documented according to Art. 27.

Table B51: Limit values defining quality classes for compost according to Annex 4

Parameter	Unit	1 <sup>st</sup> quality class	2 <sup>nd</sup> quality class
Cadmium (Cd)	mg/kg d.m. <sup>1</sup>	1.5	3
Total chromium (Cr)	mg/kg d.m.	100	250
Copper (Cu)	mg/kg d.m.	100	500
Mercury (Hg)	mg/kg d.m.	1	3
Nickel (Ni)	mg/kg d.m.	50	100
Lead (Pb)	mg/kg d.m.	120	200
Zinc (Zn)	mg/kg d.m.	400	1800
Polycyclic aromatic hydrocarbons (PAH16)	mg/kg d.m.	6	6
Polychlorinated biphenyls (PCB7)	mg/kg d.m.	0.2	1
Organic matter	% mass d.m.	>15	>15
Biological stability (AT4) <sup>2</sup>	mg O <sub>2</sub> /g d.m.	<15	<15
Seeds and vegetative reproductive parts of weeds	pcs/L	≤2	≤2
Determining the effect of soil improvers and growth substrates on germination and plant growth	%	15% w/w or 25% v/v compost: fresh plant mass (SRM) ≥100% of control substrate, germination ≥95%, germination delay 0 days  30% w/w or 50% v/v compost: SRM ≥90% of control substrate, germination ≥90%, germination delay 0 days	/
Solid particles of glass, plastic or metals > 2mm	% mass s.s.	<0.5	<2
Mineral solid particles > 5mm	% mass s.s.	<5	<5
Salmonella	Absence in 25g fresh substance	Not found: 0	Not found: 0
Escherichia coli	CFU or NMP/1g fresh substance	1000	1000
<sup>1</sup> d.m. = dry matter <sup>2</sup> AT = respiration index at 4 days			



Table B52: Limit values defining quality classes for anaerobic digestates according to Annex 4

Parameter	Unit	1 <sup>st</sup> quality class	1 <sup>st</sup> quality class	2 <sup>nd</sup> quality class
Dry matter content	%	<20	≥20	≥20
Cadmium (Cd)	mg/kg d.m.	2.5	1.5	3
Total chromium (Cr)	mg/kg d.m.	100	100	250
Copper (Cu)	mg/kg d.m.	200	200	500
Mercury (Hg)	mg/kg d.m.	1	1	3
Nickel (Ni)	mg/kg d.m.	50	50	100
Lead (Pb)	mg/kg d.m.	120	120	200
Zinc (Zn)	mg/kg d.m.	400*	400	1800
Polycyclic aromatic hydrocarbons (PAH16)	mg/kg d.m.	6	6	6
Polychlorinated biphenyls (PCB7)	mg/kg d.m.	0.2	0.2	1
Organic matter	% mass d.m.	>15	>15	>15
Biological stability (KMK) (acetic and propionic)	mg/L	<300	<100	<300
Determining the effect of soil improvers and growth substrates on germination and plant growth	%	15% w/w or 25% v/v digestate: fresh plant mass (SRM) ≥100% of control substrate, germination ≥95%, germination delay 0 days 30% w/w or 50% v/v digestate: SRM ≥90% of control substrate, germination ≥90%, germination delay 0 days		/
Solid particles of glass, plastic or metals > 2mm	% mass d.m.	/	<2	<2
Mineral solid particles > 5mm	% mass d.m.	/	<5	<5
Seeds and vegetative reproductive parts of weeds		≤2	≤2	≤2
Salmonella	Absence in 25g fresh substance	Not found: 0	Not found: 0	Not found: 0
Escherichia coli	CFU or NMP/1g fresh substance	1000	1000	1000
*limit value for digestate from biodegradable waste with >50% pig manure or poultry manure is 600				
**KMK stands for so-called short-chain fatty acids (only acetic and propionic acid are determined)				

Annex 5 sets **limit values for the introduction of dangerous substances into the soil.**

Table B53: Limit Values for the introduction of dangerous substances into the soil

	g/ha in two years
Cadmium and its compounds (expressed as Cd)	10
Total chromium (Cr)	600
Copper and its compounds (expressed as Cu)	700
Mercury and its compounds (expressed as Hg)	10
Nickel and its compounds (expressed as Ni)	400
Lead and its compounds (expressed as Pb)	600
Zinc and its compounds (expressed as Zn)	3000

Link:

Decree: <http://www.pisrs.si/Pis.web/pregledPredpisa?id=URED6281>

Annexes 4 and 5: [Priloga 4: Kakovostni razredi komposta ali digestata](#), [Priloga 5: Mejne vrednosti vnosa nevarnih snovi v tla](#)

**Placement of these materials** as fertilisers is regulated in the Decree on the protection of waters against pollution caused by nitrates from agricultural sources (see chapter 1).

Link: [Uredba o varstvu voda pred onesnaževanjem z nitrati iz kmetijskih virov](#)

Decree on the management of sewage sludge from the urban wastewater treatment plants - [Uredba o uporabi blata iz komunalnih čistilnih naprav v kmetijstvu](#)

This Regulation was issued in accordance with Council Directive (86/278/EEC) on the protection of the environment, and in particular of the soil, when sewage sludge is used in agriculture and was last amended based on Council Regulations (EC) No 807/2003 and 1234/2007. It lays down measures and treatment of sewage sludge when used as agricultural fertiliser, prohibitions and restrictions on such use and the obligation to report to the European Commission. Annex 1 defines the limit values of heavy metals. Annex 2 specifies methods for the analysis of treated sludge.

Art. 6 sets conditions for the use of sludge in agriculture. It stipulates that sludge must have undergone aerobic or anaerobic treatment in accordance with the Decree governing the treatment of biodegradable waste (if it ensures that the treated sludge meets the requirements of quality class 1 or 2 defined there) or any other treatment that ensures equivalent stabilisation, hygiene and compliance with environmental quality requirements. Art. 6 clarifies that the preparation of sludge for its processing into fertiliser is considered to be the processing of waste.

Art. 8 defines cases where the use of treated sludge in agriculture is prohibited. Art. 9 stipulates that for the use of treated sludge in agriculture, the Decree on biodegradable waste must be applied. Art. 10 and 11 define specific requirements for annual reporting and records on the use of treated sludge in agriculture.

Table B54: Limit values for heavy metal concentrations in soil according to Annex 1 of the Decree on the management of sewage sludge

Parameter	Concentration in soil (mg/kg dry matter)
Cadmium and its compounds (expressed as Cd)	1
Chromium and its compounds (expressed as total Cr)	100
Copper and its compounds (expressed as Cu)	60
Mercury and its compounds (expressed as Hg)	0.8
Nickel and its compounds (expressed as Ni)	50
Lead and its compounds (expressed as Pb)	85
Zinc and its compounds (expressed as Zn)	200
The limit values apply to the content of heavy metals in a representative soil sample, set out in Part C of Annex 2 to this Decree, at a pH of 6 to 7 in the soil	

Table B55: Heavy metal concentration limits for sludge used in agriculture according to Annex 1 of the Decree on the management of sewage sludge

Parameter	Concentration in treated sludge (mg/kg dry matter)
Cadmium and its compounds (expressed as Cd)	1.5
Chromium and its compounds (expressed as total Cr)	200
Copper and its compounds (expressed as Cu)	300
Mercury and its compounds (expressed as Hg)	1.5
Nickel and its compounds (expressed as Ni)	75
Lead and its compounds (expressed as Pb)	250
Zinc and its compounds (expressed as Zn)	1200
The limit values apply to the concentrations of heavy metals in the treated sludge. Measured values must be converted to 30% biodegradable organic content substances in treated sludge.	

Table B56: Limit values for allowed yearly heavy metal loads to farmland, based on a 10-year average

Parameter	Maximum annual input (kg/ha)
Cadmium and its compounds (expressed as Cd)	0.015
Chromium and its compounds (expressed as total Cr)	2
Copper and its compounds (expressed as Cu)	3
Mercury and its compounds (expressed as Hg)	0.015
Nickel and its compounds (expressed as Ni)	0.75
Lead and its compounds (expressed as Pb)	2.5
Zinc and its compounds (expressed as Zn)	12

Link

Decree: <http://www.pisrs.si/Pis.web/pregledPredpisa?id=URED4880>

Annex: [Priloga 1: Mejne vrednosti težkih kovin](#)

Decree on biodegradable kitchen waste and garden waste management - Uredba o ravnanju z biološko razgradljivimi kuhinjskimi odpadki in zelenim vrtnim odpadom

This Decree lays down mandatory management of biodegradable kitchen waste generated in kitchens and in the distribution of food for the purpose of carrying out food activities (catering), kitchen waste generated in the household and green garden waste. In particular, it contains an obligation for separate collection of these types of waste by their producer. It defines several options for handing over the produced waste to a collector for further processing. No explicit reference is made to the destined use of such waste for agricultural purposes. However, if a producer or collector wants to place this type of waste on the market as a fertiliser, the Decree on the treatment of biodegradable waste applies.

Link:

Decree: <http://pisrs.si/Pis.web/pregledPredpisa?id=URED5366>

Decree on burdening of soil with waste spreading - Uredba o obremenjevanju tal z vnašanjem odpadkov

This Regulation lays down the conditions relating to the loading of soil by introducing waste and the obligatory conduct in the planning and implementation of the introduction of excavation or artificially prepared soil to improve the soil's ecological condition.

This Decree covers the following types of land:

- soil recultivation,
- backfilling of the lower layers of agricultural land under regulations governing agricultural land,
- backfilling of building land, and
- backfilling of areas of mineral resources to fill the soil after excavation.

Annexes define maximum and minimum values of parameters (Annex 1, 3) Physico-chemical properties (Annex 2, 4) used in soil recultivation and backfilling and types of mineral, mineral-organic waste and other wastes that can be used for the preparation of artificially prepared soil (annexe 5).

Link:

<http://pisrs.si/Pis.web/pregledPredpisa?id=URED4791>

Annexe:

[Priloga 1: Največje vrednosti parametrov v zemeljskem izkopu, namenjenem rekultivaciji tal, nasipavanju spodnjih plasti kmetijskih zemljišč in stavbnih zemljišč ter nasipavanju območij mineralnih surovin za zapolnitev tal po izkopu](#)

Submitted (not yet approved by the EC)

### 3. Ground and surface water quality, soil protection, air quality and climate/renewable energy

#### Water Act (Zakon o vodah (ZV-1))

In the **Water Act, transferring EU directives into Slovenian law** (Council Directive on bathing water quality (76/160 / EEC), Directive 2000/60 / EC of the European Parliament and the Council establishing a framework for Community action in the field of water policy, Directive 2006/7 / EC bathing water quality, Directive 2007/60 / EC of the European Parliament and the Council on the assessment and management of floods, Directive 2008/56 / EC of the European Parliament and the Council on Community action in the field of marine environmental policy), water protection zones are regulated.

With **water protection zones and water protection regimes** in vulnerable areas (as defined by the Decree on the protection of waters against pollution caused by nitrates from agricultural sources), drinking water that is used for public supply to the population or is intended for this public supply in the future is protected.

Due to the different level of protection, in addition to the catchment area, internal areas can be formed in the water protection area, namely:

- the narrowest water protection zone with the strictest water protection regime,
- a narrow water protection zone with a stricter water protection regime and
- a wider water protection zone with a milder water protection regime.

The narrowest water protection zone (VVO I) is the area around the water abstraction point (well). Due to the area's natural characteristics, pollutants reach the aquifer very quickly, so this area must be large enough to ensure an acceptable risk of contamination by pathogenic microbiological organisms and other pollutants.

In the narrow water protection zone (VVO II), depending on the hydrological conditions and water dynamics, a sufficiently long retention time and sufficient dilution of pollutants must be ensured, and thus an acceptable risk of water pollution in the catchment with slowly decomposing pollutants. Simultaneously, a sufficiently long period must be provided for possible action in the event of spills or releases of hazardous substances.

The wider water protection zone (VVO III) covers the water abstraction point's (well) entire catchment area. It is intended for the long-term, ensuring the health adequacy of drinking water.

#### Environmental Protection Act (Zakon o varstvu okolja)

This Act regulates the protection of the environment from pollution as a basic condition for sustainable development and in this context sets out the basic principles of environmental protection, environmental protection measures, environmental monitoring and environmental information, economic and financial instruments of environmental protection, public environmental protection services and others environmental issues. It serves as umbrella act for all other legislation regarding environmental protection by transposing 16 environment-related EU directives into national law.

## National Energy and Climate Plan - Nacionalni energetska in podnebni načrt (NEPN)

The national energy and climate plan was prepared in February 2021.

The Integrated National Energy and Climate Plan, slo. Celoviti nacionalni energetska in podnebni načrt (NEPN) is a strategic action document that sets goals, policies and measures for the period up to 2030 (with a view to 2040) in five dimensions of the Energy Union:

- decarbonisation (GHG and RES emissions from renewable energy sources (RES)),
- energy efficiency,
- energy security,
- the internal market, and
- research, innovation and competitiveness.

Link:

<https://www.gov.si/zbirke/projekti-in-programi/nacionalni-energetska-in-podnebni-nacrt/>

PORTAL

<https://www.energetika-portal.si/dokumenti/strateski-razvojni-dokumenti/nacionalni-energetska-in-podnebni-nacrt/>

English version of the NEPN:

[https://www.energetika-portal.si/fileadmin/dokumenti/publikacije/nepn/dokumenti/nepn\\_eng.pdf](https://www.energetika-portal.si/fileadmin/dokumenti/publikacije/nepn/dokumenti/nepn_eng.pdf)

### Goals of NEPN

The key goals by 2030, defined in the NEPN, are:

- reduction of total greenhouse gas emissions by 36%, of which by 20% in the non-ETS sector (which is 5 percentage points above the accepted commitment of Slovenia) (ETS = Emissions Trading System, non-ETS includes the following sectors: transport, agriculture, waste, industry outside the EU-ETS and the municipal and housing sector);
- at least 35% improvement in energy efficiency, which is higher than the target adopted at the EU level (32.5%);
- at least 27% of renewable energy sources, where Slovenia, due to relevant national circumstances, primarily environmental constraints, had to agree to a lower target than the target at EU level (32%) in an effort to increase ambition in the next NEPN update (2023 / 24),
- 3% investment in research and development, of which 1% public funds.

### Bio-Based Fertilisers (BBF) made from Nutrient-Rich Side streams (NRSS) in NEPN

Bio-Based Fertilisers (BBF) made from Nutrient-Rich Side streams (NRSS) are mentioned several times. However, never directly as BBF or NRSS.

- (1) The first time they are implicitly mentioned as an incentive from the Ministry of Agriculture, Forestry and Food to reduce nitrous oxide emissions (p. 73-74). The agriculture sector will »promote the reduction of GHG emissions in the agriculture sector and increase the efficiency of animal breeding and shares of minimum releases and the promotion of techniques for a more efficient nitrogen reduction in agriculture.«

- (2) The second time the Ministry implicitly mentions them for Environment and Spatial Planning as instruments of waste management (page 76-77). »Securing conditions for the use of compost and digestate from waste treatment - supervise the implementation of the Regulation on the Recovery of Biodegradable Waste and the Use of Compost or Digestate, the opening of the Digestate and Compost Market in the EU.«
- (3) The third time they are implicitly mentioned as biogas for electricity generation (p. 151 – English version). »Due to the relatively well-developed livestock breeding, livestock manure presents considerable potential for biogas production. The plan is to utilise biogas potential: treatment plants, industry, waste, agriculture (residues).«

On page 214, negative impacts are also discussed. »The generation of waste from hydroelectric power plants (HPP), especially large quantities of sludge, and digestate from biogas plants can be expected. Implementing the interventions foreseen in the NEPN may affect the quality of drinking water if wind power plants (WPP), HPP, steam power plants or other interventions are located in water protection areas and near water sources intended for drinking water supply. Effects on drinking water sources can also be caused by changes in groundwater amount and chemical status due to interventions foreseen in NEPN.«

Submitted (not yet approved by the EC)



#### 4. Common Agricultural Policy in the national law

Resolution on the national program on strategic directions for the development of Slovenian agriculture and food: Our food, rural areas and natural resources after 2021

The specific objectives of the resolution are a response to the proposal of nine specific objectives of the Common Agricultural Policy, which justify the European and thus Slovenian agricultural policy from 2021 and which Slovenia must address in preparing its National Strategic CAP plan.

Two specific goals are related to BBF and NRSS. However, never directly as BBF or NRSS.

The goals are:

B1. Reduction of negative impacts on water, soil and air

B2. Climate change mitigation and adaptation

Agricultural and forestry holdings and the food industry must seek to:

- the economic and sustainable use of resources and the principles of the circular economy,
- increasing water and energy efficiency,
- use and conservation of Slovenian genetic resources,
- use of renewable energy sources,
- use of by-products, waste, residues of organic origin and other non-food raw materials for bioeconomy purposes,
- reduction of emissions,
- reducing food waste,
- promoting carbon sinks in the agriculture, forestry and wood processing sectors,
- reducing the negative impacts on biodiversity,
- the use of sustainable materials in the product design process and product life cycle monitoring.

Link:

<http://www.pisrs.si/Pis.web/pregledPredpisa?id=RESO125>

National Strategic Plan of Common Agricultural Policy – Nacionalni strateški načrt skupne kmetijske politike 2023-2027 (SN SKP)

The National Strategic Plan (SN SKP) is in preparation. The first draft is not yet available. However, some documents frameworking the document are out. Basic ideas are pointed out here. The first Public Debate on the analysis of the situation, SWOT analysis and the needs of the Strategic Plan of the Common Agricultural Policy for the next programming period was held on 11 November 2020.

Link: <https://www.program-podezelja.si/sl/skupna-kmetijska-politika-po-2020/javna-razprava>

Link to the presentation about the framework of the SN SKP (in Slovenian language):

[https://www.kgzs.si/uploads/dokumenti/druga\\_gradiva/posvet/03\\_majkovic\\_-\\_strateski\\_ncrt\\_sko\\_2021\\_-2027.pdf](https://www.kgzs.si/uploads/dokumenti/druga_gradiva/posvet/03_majkovic_-_strateski_ncrt_sko_2021_-2027.pdf)

- (1) The SN SKP will contain eco-schemes for organic farming based on the list of potential eco-schemes published by the European Commission ([https://ec.europa.eu/info/news/commission-publishes-list-potential-eco-schemes-2021-jan-14\\_en](https://ec.europa.eu/info/news/commission-publishes-list-potential-eco-schemes-2021-jan-14_en)). Among others, these will also be focused on reducing nitrate emissions. Measures related to fertilisers are (a) Applying slurry into the soil or directly to the soil surface; (b) Nitrogen fertilisation only in organic form.
- (2) The SN SKP will define ten specific goals, all of which have different interventions.
  - Specific goal 4 - Contributing to climate change mitigation and adaptation, as well as to sustainable energy. This goal will also support on-farm adjustments towards the efficient use of nitrogen fertilisers and biogas.
  - Specific goal 5 - Promoting the sustainable management of natural resources such as water, soil and air. The support is not yet directly stated, but it is present in the undertone of the text.
- (3) The green architecture set new conditionalities. Statutory management requirement (SMR) 1 conditionality - Protection of waters against diffuse sources of phosphate pollution is a completely new standard. Good Agricultural and Environmental Conditions (GAEC) 5 - Compulsory use of the new Farm Sustainability Tool for Nutrients.
- (4) Agri-environmental and climate payments are not yet designed. However, this part of SN will not be concentrated on the management of fertilisers and nutrient-rich side streams from the first impressions but more on protecting water, soil, air and biodiversity.

Links:

Common agricultural policy after 2020

<https://www.gov.si/zbirke/projekti-in-programi/skupna-kmetijska-politika-po-letu-2020/>

National Strategic Plan 2021-2027

<https://www.gov.si/novice/2021-02-04-strateski-nacrt-skupne-kmetijske-politike-za-obdobje-20232027/>

Documents presenting SN SKP (in Slovenian language)

[https://www.kgzs.si/uploads/dokumenti/druga\\_gradiva/posvet/03\\_majkovic\\_-\\_strateski\\_ncrt\\_sko\\_2021\\_-2027.pdf](https://www.kgzs.si/uploads/dokumenti/druga_gradiva/posvet/03_majkovic_-_strateski_ncrt_sko_2021_-2027.pdf)

Agriculture Act (Zakon o kmetijstvu)

(Uradni list RS, št. [45/08](#), [57/12](#), [90/12](#) – ZdZPVHVVR, [26/14](#), [32/15](#), [27/17](#) in [22/18](#))

This Act is an umbrella document for all legislation dealing with agriculture. It transposes 38 EU decrees, decisions and guidelines into national law and sets out the objectives of agricultural policy, agricultural and rural development planning, agricultural policy measures, adaptation to climate change and climate change mitigation, informing the public about agricultural policy, trade in agricultural products and food products, food supply chain, food safety of non-animal origin in all

stages of production, processing and distribution, food quality at all stages of production, processing and distribution, food safety and quality in catering, institutional catering establishments and catering establishments at work, labeling of agricultural products and foodstuffs, consumer protection in the part relating to food products and agricultural services, food donation, ancillary activities on the farm, temporary or occasional work in agriculture, public services in agriculture, databases and information in the field of agriculture, procedures and bodies for the implementation of this Act, research, education and development tasks and inspections.

Submitted (not yet approved by the EC)

## NATIONAL LEGISLATION: SPAIN

Compiled by Antonio Delgado and Ramiro Recena (US)

Last updated: 16 Dec 2022

### 1. Fertilising products and fertilisation

- Legislation on fertilisers/fertilising products (regarding composition/formulation of fertilisers and limit values for unwanted components)

There is only one law in Spain for regulation of composition/formulation, types, marketing, information to users, raw materials used and limit to unwanted components. This is the law Royal Decree (RD) RD506 from 2013, which was modified to adapt contents to the European fertilizers framework in 2015, 2017, 2020, and 2022. The complete reference for this is:

**Royal Decree 506/2013 of 28 June on fertiliser products**

**Order AAA/2564/2015 of 27 November amending Annexes I, II, III, IV y VI of the above mentioned law**

**Order APA/161/2020 of 20 February amending Annexes I, III and VI of the above mentioned law**

**Orden APA/104/2022, de 11 de febrero amending Annexes I, II, III y VI of the above mentioned law**

Contents of the law RD506/2013, not modified by subsequent orders, are:

- Regulate aspects of Regulation (EC) No. 2003/2003, of Parliament European and Council, of October 13, 2003, relative to fertilizers, whose realization and development have been entrusted to the Member States.
- Define and classify fertilizer products, other than "EC fertilisers", which can be used in agriculture and gardening.

- Guarantee that the nutritional richness and other characteristics of the products fertilizers comply with the requirements of this royal decree.
- Prevent risks to health and the environment from the use of certain products.
- Regulate the Register of fertilizer products for the registration of certain products.

All this is available at: <https://www.mapa.gob.es/es/agricultura/legislacion/Legislacion-productos-fertilizantes.aspx>

Although not defined as „BBFs“, the Spanish fertilizer law includes as fertilizers „organic fertilizers“ obtained from different sources (e.g. animal wastes), and also those obtained from composting, although in this case, can be also considered as „organic amendment“, i.e., suppliers of organic matter more than nutrients

Modifications of the RD506/2013 was necessary since in the recent years have seen an increase in applications for the registration of fertiliser products in groups 2, 3 and 6 of Annex I ([https://www.mapa.gob.es/es/agricultura/legislacion/AAA-770-2014%20Formulario%20RPF\\_tcm30-72956.pdf](https://www.mapa.gob.es/es/agricultura/legislacion/AAA-770-2014%20Formulario%20RPF_tcm30-72956.pdf)) of this Royal Decree. The detailed analysis of the technical dossiers makes it convenient to clarify some aspects, such as the concept of additive, so that companies can be more confident when manufacturing their products. On the other hand, it has also been observed that many of these products contain mixtures of a wide range of raw materials included in Annex IV of the law, which makes it impossible to guarantee the traceability of the products. Furthermore, many of these mixtures involve treatments that do not make it possible to ensure the agronomic efficacy of the products obtained. For all these reasons, it has been considered appropriate to establish a series of guidelines for the correct use of these raw materials in the updates of the legislation.

- National rules transposing the Nitrates Directive 91/676/EEC

The transposition of this Community Directive 91/676/EEC of 12 December into Spanish law was carried out first by the Royal Decree 261/1996, of 16 February, on the protection of water against pollution caused by nitrates from agricultural sources. In order to achieve its purpose, the aforementioned Directive foresees that the Member States report every four years on the fulfilment of their obligations with regard to the application of the aforementioned regulation. Therefore, there is a direct report preceding this report for the four-year period 2012-2015 (MAGRAMA, 2017), which is now updated for the four-year period 2016-2019.

The RD 267/1996 was repealed by the current **RD47/2022 from 18 January** including more ambitious objectives for pollution control. This law regulates:

- Definition of vulnerable zones
- Good agricultural practices for reducing nitrate pollution, which is responsibility of Regional governments
- Action programs, which should be defined in the vulnerable zones by Regional governments; these programs should take into account scientific information considering sources of agricultural N and environmental conditions in vulnerable zones. These programs should be revised each 4 years.
- Monitoring programs for water quality, which also depends on Regional governments.
- Definition of criteria to better identify the waters affected by nitrates and determines thresholds for their designation as vulnerable areas.
- The increase of protected areas by 50%, which will require more rigorous action programs and will include limitations on the use of fertilizers.

Information on the new law on nitrates, and comments in Spanish is available at:  
<https://www.miteco.gob.es/es/prensa/ultimas-noticias/el-gobierno-aprueba-un-real->

decreto-para-reducir-la-contaminaci%C3%B3n-por-nitratos-y-reforzar-la-protecci%C3%B3n-de-las-masas-de-agua-m%C3%A1s-vulnerables/tcm:30-535231

- Any additional rules for fertiliser application

Nowadays, there is not any additional national law for regulation of the application of fertilizer products. Some limits can be established for wastes depending on the pollutant content (see points below). As agronomic recommendation, there is a draft of the future law on „Sustainable nutrition in agricultural soils“, which should establish the need of soil analysis for taking decisions on fertilizers application. At this time, only some „Integrated management rules“, which are specific for crops and are released by Regional governments, includes limits in the maximum fertilizer rate applied to crops and some indication of potential fertilizer needs. Sometimes these recommendations are not updated and recommendations are not very precise.

The purpose of this future law on sustainable nutrition in agricultural soils is to provide a framework for action that allows maintaining or increasing the productivity of agricultural soils, while reducing the environmental impact of the application of fertilizer products and other sources of nutrients or organic matter on said soils. In particular, it is intended to achieve in a special way, although not exclusively, the following objectives:

- sustainable management of crop nutrition
- sustainably increase agri-food production
- the maintenance or increase, where appropriate, of the organic matter of agricultural soils
- the reduction of greenhouse gas emissions and the fight against climate change
- the reduction of emissions of other polluting gases, especially ammonia
- avoid water pollution, in particular prevent and reduce pollution of continental surface waters, transition waters, coastal waters and groundwater, caused by nitrates and act preventively against new pollution of this kind
- preserve and improve the biological properties of agricultural soils, promoting their management as "living soils"

- prevent the accumulation of heavy metals and other pollutants in agricultural soils
- Specific rules for manure(-based) fertilisers

The use of manure and manure based fertilizers does not have an specific regulatory framework. However, there are some regulations in different laws

**Royal Decree RD 306/2020 of 11 February for regulation of pig farms**

**Law Royal Decree RD 506/2013 of 28 June on Fertilizers**

**Law RD47/2022 on nitrate pollution**

The management of manure is only regulated in the case of pig farms by the RD 306/2020. This royal decree defines the need of a manure management plan in pig farms, considering safe storing and land application. Management may involve the use as fertilizers, but taking into account other normatives for fertilizer application, in particular the law for control of nitrate pollution. The farm should have enough land for the application of these products. The RD provides indicative information on the maximum amounts of manure produced in farms.

There is not a specific law regulating the management of manure as fertilizers; this will surely developed in the future law on nutrition in agricultural soils. However, the use of manure as raw material for fertilizers is regulated by RD506/2013 on fertilizers as mentioned in points above. The use of manure as fertilizer is also affected by the environmental normative. In particular, the royal decree 47/2022 on nitrate pollution establishes restrictions for application of manures in vulnerable zones to reduce pollution risks.



## 2. Waste management

Waste management is regulated by the **Spanish Law Royal Decree RD 7/2022** of 8 April for residues, contaminated soils and circular economy. This law regulates all the aspects related to waste management. It also considers the potential use of biowastes and biocompost as fertilizers without any specific indication for management in agricultural soils.

The above mentioned law regulates the development of the National Framework Waste Management Plan (Plan Estatal Marco de Gestión de Residuos, PEMAR). This Plan for the period 2016-2022 was approved in November 6th 2015. It is subsequent to the National Integrated Waste Management Plan (Plan Nacional Integrado de Residuos), which was established in 2008, for the period 2008-2015. Additionally, the national waste prevention programme (Programa Estatal de Prevención de Residuos) was adopted in November 2013 for the period 2014-2020, complementing the above mentioned plans in prevention issues. The Plan implements the European normative, by defining different fluxes which are suitable for: reuse, recycling, other forms of valorization including energy production, and disposal in landfill.

At the regional level, most of the regions have waste management programs in force (except for the Balearic Islands, Murcia, Navarra, Ceuta and Melilla, which have outdated plans or are in the process of revising these).

- Management of biowaste/biowaste compost
- Management of sewage sludge
- Management of animal by-products

The production of biowaste and biowaste compost is regulated by the Spanish law on residues, contaminated soils and circular economy RD 7/2022 mentioned above. In particular:

- Local entities, in order to comply with the provisions of article 25, will adopt the necessary measures for the separation and recycling at source of bio-waste through domestic and community composting.

- The competent authorities will promote the use of compost and digestate in the agricultural sector, gardening or the regeneration of degraded areas to replace other organic amendments and as a contribution to saving mineral fertilizers.

The application of sewage sludge in the agricultural sector is regulated in Spain by:

- **Royal Decree RD1310/1990, of 29 October, on the use of sewage sludge in the agricultural sector.**
- **Ministerial Order AAA/1072/2013, of 7 June, on the use of sewage sludge in agriculture, which implements the previous law**
- Regional regulations

The RD1310/1990 regulates:

- The soils on which the treated sludge may be applied must have a concentration of heavy metals lower than that established in Annex 1A of this law.
- The treated sludge to be used in soils shall not exceed, in terms of heavy metal content, the limit values expressed in Annex B.
- The maximum amounts of sludge that may be added to the soil per hectare and year will be those that, according to the heavy metal content of the soil and sludge to be applied, do not exceed the limit values for the incorporation of heavy metals established in the Annex 1 C.
- The analytical and sampling techniques to be used, as well as the determinations to be carried out on sludge and soil, will be, at least, those established in annexes II A, II B and II C, of this Royal Decree.

In any case, the following prohibitions are established:

- Apply treated sludge in prairies, pastures and other uses to be used in direct grazing by livestock, less than three weeks in advance of the start date of said direct use.
- Apply treated sludge to horticultural and fruit crops during their vegetative cycle, with the exception of fruit tree crops, or within a period of less than ten months before harvesting and during harvesting itself, in the case of horticultural crops or fruit crops whose organs or vegetative parts to be marketed and consumed fresh are normally in direct contact with the ground.

The purpose of the order AAA/1072/2013 is to update the content of the National Sludge Register and the information to be provided by wastewater treatment plants, sewage sludge treatment plants and managers who apply treated sewage sludge on agricultural land.

The Ministry of Agriculture, Food and Environment (MAGRAMA) is responsible for implementing, amending and enforcing the application of the law at the national level. It is also responsible for developing a Prevention Program and National Waste Management Plans which set out the policy orientation, minimum targets, objectives and measures. Additionally, the MAGRAMA is responsible for authorizing and monitoring foreign trade of waste and for adhering to reporting requirements on the progress of waste management policies. Most of the responsibility for planning and implementation lies on Regional Governments.

There is not any specific regulation for animal by-products, by except those considered in the Law on wastes and that of pig manure.

#### **Legislative framework for waste management:**

The basic legal framework in Spain is the Spanish law RD7/2022 on wastes, contaminated soils and circular economy. However, the following Directives/provisions have been transposed by a series of legislation; we mentioned here the European directive and how these directives on wastes are implemented in Spain:

- Directives 2011/65/UE and 2012/12/EC on waste electrical and electronic equipment (WEEE): 10 Royal Decree 219/2013 of March 22nd and 110/2015 of February 20th .
- Directive 94/62/EC on packaging and packaging waste: 11 Law 11/1997 of April 24th , Royal Decree 782/1998 of April 30th , Order of April 27th 1998, Order of October 21st 1999, Order of June 12th 2001, Order of MAM/3624/2006 of November 17th, Royal Decree 252/2006 of March 3rd, and Order AAA/1783/2013 of October 1st .
- Ban on landfilling tyres as outlined in the Landfill Directive: Royal Decree 1619/2005 of December 13th .
- Directive on waste batteries and accumulators: 12 Royal Decree 106/2008 of February 1st and its subsequent modifications (Royal Decree 943/2010 of July 23rd and Royal Decree 710/2015 of July 24th)
- Directive 2000/53/EC on end-of-life vehicles: 13 Royal Decree 1383/2002 of December 20th , Order INT/624/2008 of February 26th, Order PRE/26/2014 of January 16th.

Most of the responsibilities regarding waste management have been transferred to the Regional governments. Most of them have also implemented regional legislation on waste management as outlined in the following Figures:

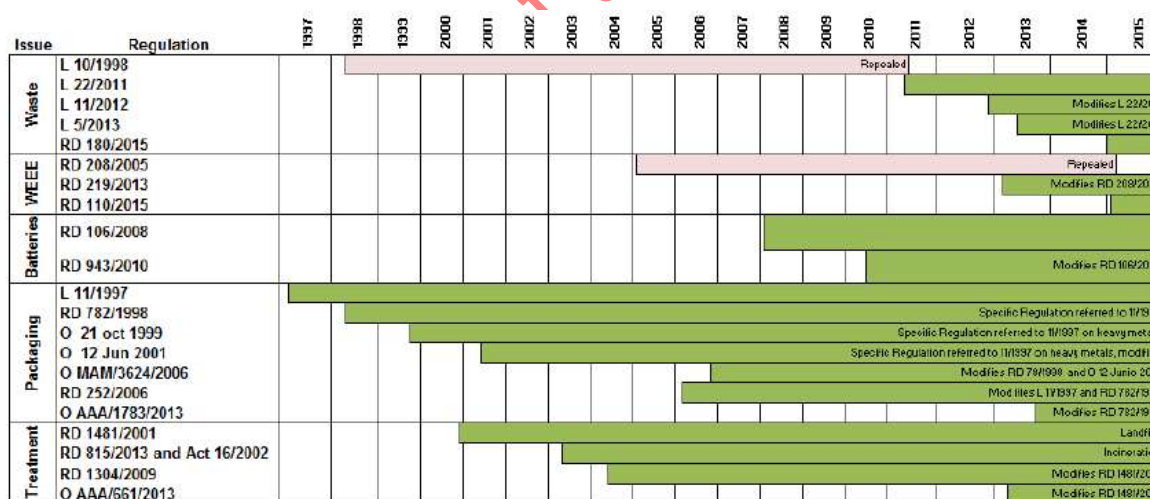


Figure 3: Implementation of regional legislation on waste management

	General Law on Waste								Others, detail
	Tires	Sanitary Waste	End-of-life Vehicles	Waste Infrastructure	Construction	Landfills	Incineration	Others	
Andalusia	D							L	Integrated Environmental Quality
Aragon	L	O+D	D						
Asturias									
Balearic Is			D						
Canary Is	L	L							
Cantabria		D			D				
C-La Mancha			D						
C Leon		D	D	L					
Catalonia	D+L	D	D	L+D	D	D	D		
Extremadura		D							
Galicia	L	D				O		D	Management of data on waste, traceability
Madrid									
Murcia									
Navarra			D		D			D	Biowaste
Basque Country		D	D		D	D			
Rioja			D						

Figure 4: Implementation of regional legislation on waste management

Source for both figures: <https://eur-lex.europa.eu/legal-content>

Submitted (not yet approved)

### 3. Ground and surface water quality, soil protection, air quality and climate/renewable energy

- Rules for the management of nutrient rich waste waters

There is not a legal framework for using waste waters in irrigation. Legislation allows the use of swage sludge or treated (regenerated) water. The legal regime for the reuse of treated waste waters is regulated by the **Royal Decree 1620/2007, of 7 December, establishing the legal regime for the reuse of treated water**

This law allows the use of regenerated waste water. To this end, the user has to make a using and management program which should include control of volume and water quality. In the case of agricultural use, locations of farm should be also specified.

The Spanish Circular Economy Strategy includes the reuse of water as an individual priority sector. It proposes the following actions:

- Regulatory adjustment for the promotion of the reuse of reclaimed wastewater
- Preparation of a guide for the implementation of the regulatory instrument at EU level
- Support for irrigation projects whose resources include the reuse of wastewater
- Actions on reuse included in the Basin Hydrological Plans
- Promotion of research work to establish the minimum quality criteria required for reused water from a health and environmental point of view.

The Spanish Circular Economy Strategy for 2030 is available (in Spanish) at:

<https://www.miteco.gob.es/es/calidad-y-evaluacion-ambiental/temas/economia-circular/estrategia/>

- Soil-related limit values / limits for contaminant loads and/or application rules for materials as specified by soil protection legislation

The limits for pollutants in fertilizer products and raw materials, such as heavy metals, is defined in the Spanish fertilizer law **RD 506/2013**. There is not a law on soil protection in Spain with regards agriculture. The **Spanish law Royal decree RD 9/2005 from 14 January** on pollutant activities for soils and contaminated soils is essentially focused on the industrial degradation/pollution of soil, with no reference to agricultural use of soils. The law describes a list of pollutants and generic limits of risk. In addition, the **RD7/2022** on waste, contaminated soils, and circular economy, also makes some references to contaminated soils, but not focused on agricultural soils as the previous law. Regulations included in RD506/2013 relating to contaminated soils include provisions relating to activities that potentially contaminate soils, the procedure for declaring contaminated soils, regional and state inventories of declarations of contaminated soils, as well as the determination of the subjects responsible for the decontamination and recovery of contaminated soils.

- Rules for emission protection, as far as they may affect the generation of air filtering wastes that may qualify as starting material for BBFs

There is not any regulation on the byproducts from the reduction of pollutant in gas emissions to the atmosphere for producing BBFs. However, the National System of gas emissions and for the elaboration of Emissions Inventories and Projections is set and ruled by the following legal framework:

- Law 34/2007, of November 15, on air quality and protection of the atmosphere, establishes in article 27.3 the Spanish Emissions Inventory and Projections System (SEI).
- Royal Decree 818/2018, of July 6, on measures for the reduction of national emissions of certain atmospheric pollutants sets in article 10 the rules of functioning of the Spanish Emissions Inventory and Projections System.
- Royal Decree 500/2020, of April 28, which develops the basic organic structure of the Ministry for the Ecological Transition and the Demographic Challenge, designates, in article 7.f), the Directorate General of Environmental Quality and Assessment as competent authority of the Spanish Emissions Inventory and Projections System.
- Emission Inventories are considered a statistic operation within the National Statistic Plans 2017-2020 and 2021-2024 (statistic operation numbers 7105 for plan 2017-2020 and 8105

for plan 2021-2024) and according to Law 12/1989, it is compulsory to provide the necessary information for its development.

- Rules on the use of biomass for energy production

The use of biomass for energy production is included in the Renewable Energy Plan (PER) 2011-2020 was approved by Agreement of the Council of Ministers of November 11, 2011, establishing objectives in accordance with Directive 2009/28/CE of the European Parliament and of the Council, of April 23, 2009, regarding the promotion of the use of energy from renewable sources, and in accordance with the mandates of Royal Decree 661/2007, which regulates the activity of electricity production under the special regime and Law 2/2011, of 4 March, Sustainable Economy.

The renewable energy sources referred to in this Plan are the following: biofuels and bioliquids, biogas, biomass, energy from the sea, wind power, geothermal energy and other environmental energy, hydroelectric power, waste (municipal, industrial and WWTP sludge) and solar (photovoltaic, thermal and thermoelectric).

Although Spain is rich in biomass resources, the technological developments in the field of biofuels and bio-energy are behind expectations and targets mentioned in the PER (Plan Energías Renovables) 2005-2010, due to high investment costs, inadequate support mechanisms and insufficient logistics. By the end of 2009, the total installed capacity for bio-energy (solid biomass) was 648 Mw, an increase of 10.4% compared to 2008. However, the target of 2.039 Mw installed capacity in 2010 (PER) was not met. In 2010, biomass and biogas contributed to 1.4 % of total electricity production in Spain.

The **Royal Decree RD661/2007** (25 May) which regulates the activity of electricity production under the special regime established a feed-in tariff regime for the electricity production for each type of biomass. This decree also considers the possibility of cogeneration with traditional fuels. Thanks to this, the traditional thermal plant has introduced solid biomass and biogas production. This way they can sell a part of their production according to the tariff from the Special Regime. The national Renewable Energy Plan proposed measures related with the subsidies for projects and actions with direct influence in the biomass sector. The thermal use of biomass has been included in the Building Thermal Installation Regulation (RITE). Renewable energy progress report: [http://ec.europa.eu/energy/renewables/reports/doc/com\\_2013\\_0175\\_res\\_en.pdf](http://ec.europa.eu/energy/renewables/reports/doc/com_2013_0175_res_en.pdf)



Controversial legislation:

- 27 January 2012: Royal Decree 1/2012, which suspended 'until further notice' for newly installed generators of renewable power (the Government decreed a moratorium on renewable energy)
- 27 December 2012: new Law to introduce 7% tax on all domestic energy production
- 1 February 2013: de-indexed from Consumer Price Index + Premium = 0 c€
- Goals/measures defined in your National Energy and Climate Plan 2021-2030, as far as they relate to NRSS/BBFs

The Integrated National Energy and Climate Plan of Spain for 2021-2030 (PNIEC, in Spanish) <https://www.miteco.gob.es/es/prensa/pniec.aspx>) was approved and sent to the European commission. The PNIEC pursues a 23% reduction in greenhouse gas (GHG) emissions compared to 1990. This reduction objective implies eliminating one out of every three tons of greenhouse gases that are currently emitted. It is an effort consistent with an increase in ambition at the European level for 2030, as well as with the Paris Agreement.

The Plan takes into account the reduction in the GHG emissions in agriculture. To this end, reduction in N fertilizers by introducing legumes and by accurate estimates of N needs of crops is recommended. In addition, control of emissions from liquid manure in pig farms is considered with a proper management. Regarding the BBFs, the recommendations considered are:

- Composting of the solid fraction for using as fertilizer.
- Composting of bioresidues

#### 4. Common Agricultural Policy (CAP) and related legislation

How do national provisions for the implementation of the CAP affect the production and usage of BBFs made from NRSS? Your description should at least answer the following questions:

- Are there any programmes strengthening or limiting the utilisation of particular materials?

There is not any particular program related to the CAP

- Are there goals/measures defined in your National Strategic Plan for the post 2020 CAP period relating to NRSS/BBFs?

The proposal of a National Strategic Plan for the post 2020 CAP period was submitted by the government to the European Commission in December 2021. This Plan includes proposal for:

- Reducing nutrient losses by 50% according to the EU 2030 target, while taking care not to impair soil fertility
- Adequate management of N that includes the optimization of the use of N from inorganic and organic fertilizers (livestock manure, crop residues, pruning remains, compost, etc.), which in the case of livestock use the best available techniques for manure management or reduction of enteric fermentation and in soils, maintain or increase soil organic carbon content.
- The plan considers that there is great potential for development linked to the valorization of agricultural resources, livestock and forestry, the development of the bioeconomy and the use of renewable energies.
- It promotes the circular economy in the agricultural sector, using the connection with bioeconomy, in particular in the treatment of livestock manure and agri-food waste for the manufacture of biofertilizers that help sequester carbon in the form of organic matter in the soil.

As a strength for achieving the objectives of the Plan, there is a great availability of forest and agricultural resources for recovery as fertilizers or for its use as an alternative energy to fossil fuels.

*Submitted (not yet approved by the EC)*

## NATIONAL LEGISLATION: SWITZERLAND

Compiled by: Else Bünemann (FiBL)

Last updated: 1 June 2022

### 1. Fertilising products and fertilisation

The following legal acts and ordinances relate to the use of NRSS as BBF in Switzerland and are described here with respect to their key contents.

please note: where an article (Art.) consists of several paragraphs and reference is made to a particular paragraph, the paragraph number is indicated at the beginning of the section with a superscripted number.

Example: **Art. 8 [DüV]**

<sup>1</sup>Fertilizer types are accepted in the fertilizer list if they (...)

Fertiliser ordinance (Dünger-Verordnung [DüV]) SR 916.171 of 10 Jan 2001, last amended Jan 1, 2019)

The approval of fertilisers in Switzerland is the responsibility of the **Federal Office of Agriculture FOAG (Bundesamt für Landwirtschaft FOAG)**. It examines the applications submitted and issues licenses to place fertilizers on the market. The fertilizer ordinance is based on several articles of other Swiss legislations like the Agriculture Act [LwG], Environmental Protection Act [USG] and so on.

#### Art. 1

<sup>1</sup>The fertilizer ordinance [DüV] regulates the approval, placing on the market, import and use of fertilizers.

<sup>2</sup>The ordinance **does not apply** to farmyard manure intended for the own farm use and fertilizers intended exclusively for export as well as fertilizers for aquatic plants in aquarium.

<sup>3</sup>Furthermore, the provisions of the Chemicals Ordinance of 5 June 2015 (**ChemV**) and Annex 2.6 of the Ordinance of 18 May 2005 on Risk Reduction related to Chemical Products (**ORRchem**) apply to the use of fertilizers.

**Art.2**

<sup>1</sup>fertilizers may be **placed on the market** only if they **comply with the relevant requirements and are authorized**.

<sup>2</sup>A fertilizer is approved when it corresponds to a fertilizer type on the fertilizer list (**Appendix 1, Fertiliser Book Ordinance, [DüBV]**) or a marketing authorization has been granted to one or more persons or firms (**Art.6, [DüV]**).

To obtain an authorization, the following requirements of **Art.3 [DüV]** must be fulfilled. A fertilizer may only be approved if it

- a. is qualified for the intended use
- b. does not cause unacceptable side effects when used as directed and does not pose a risk to the environment or indirectly to humans
- c. when used as prescribed, guarantees that the raw materials used in the production of food and commodities comply with the requirements of food legislation contains only substances which, if they are covered by Ordinance on protection against dangerous substances and preparations (ChemO, SR 813.11) have been classified, evaluated and notified in accordance with it

According to **Art. 5 [DüV]**, fertilizers are defined as **substances used for plant nutrition**

Table B57: Definitions

Fertilizer type	material	requirements
Farmyard manure	<ul style="list-style-type: none"> <li>• slurry</li> <li>• dung</li> <li>• dung waters</li> <li>• slurry separation products</li> <li>• silo juices</li> <li>• other comparable outflows of crop production or livestock farming</li> </ul>	Max. 20 % of total material with other origin than agriculture
Recycled fertilizers	Fertilisers of vegetable, animal, microbial or mineral origin or from wastewater treatment, such as:	
	1. Compost	plant, animal or microbial material that has decomposed correctly under the influence of air
	2. Digestate, solid or liquid	plant, animal or microbial material which has been fermented correctly under exclusion of air; digestate is liquid if the

Fertilizer type	material	requirements
		<b>dry matter content is not more than 20 percent</b>
	<b>3. Unrotten plant material</b>	<b>such as by-products from vegetable processing plants, distilleries and cider plants or extraction shred which is worked into the soil</b>
	<b>4. Sewage sludge</b>	<b>Sludge in treated or untreated form from municipal wastewater treatment</b>
Mineral fertilizers	1. mineral single-nutrient fertilizers	contain only one macronutrient and thereof at least 3 %, or with potassium, magnesium or sulphur as accompanying ion
	2. mineral multi-nutrient fertilizers (NPK, NP, NK, PK)	<ul style="list-style-type: none"> <li>• Contain min. 3 % of two or three primary nutrients</li> </ul> or <ul style="list-style-type: none"> <li>• contain a primary nutrient and calcium, magnesium, sulphur or sodium are not only present as accompanying-ion (at least 3 percent of these elements in total)</li> </ul>
<b>Mineral recycled fertilizers</b>	<b>Nutrients derived partly or fully from municipal wastewater, sewage sludge or sewage sludge ash treatment.</b>	
<b>Organic fertilizers</b>	<b>Products consisting mainly of carbonaceous material of plant, animal or microbial origin</b>	<ul style="list-style-type: none"> <li>• <b>min. 10 % organic matter</b></li> <li>• <b>min. 3% macronutrients</b></li> <li>• <b>at least 0.005% of two or more trace nutrients or at least 0.01% of one of these trace nutrients</b></li> </ul>
<b>Organo-mineral fertilizers</b>	<b>Mixture of organic and mineral fertilizers</b>	<ul style="list-style-type: none"> <li>• <b>min. 10 % organic matter</b></li> <li>• <b>min. 3% macronutrients</b></li> <li>• <b>at least 0.005% of two or more trace nutrients or at least 0.01% of one of these trace nutrients</b></li> </ul>
Fertilizer with trace-nutrients		<ul style="list-style-type: none"> <li>• at least 0.005% of two or more trace nutrients or at least 0.01% of one of these trace nutrients</li> </ul> or <ul style="list-style-type: none"> <li>• 3 percent of a useful nutrient</li> </ul>

Fertilizer type	material	requirements
		(sodium or silicon)
<i>other products</i>	<i>other products of plant, animal, microbial or mineral origin intended for plant nutrition which do not comply with a definition in this Regulation, such as algae products</i>	•
<i>other products</i>	<i>Cultures of microorganisms for the treatment of soil, seeds or plants: Products that promote the development of agricultural crops by providing increased nutrients or by performing symbiotic services;</i>	•
<i>other products</i>	<i>Agents for influencing biological processes in the soil: Products which modify the transformation processes of nutrients or their release by soil organisms.</i>	•
Fertilizer-additives		Products which improve the properties or effectiveness of fertilisers or ease their application
Composting agent		• Products that support the rotting of organic waste
Soil conditioner		• Products that improve the properties of the soil;
Primary nutrients	• N, P, K	
Secondary nutrients	• Mg, Ca, Na, S	
Macronutrients	• N, P, K, Mg, Ca, Na, S	
Trace-nutrients	• B, Fe, Cu, Mn, Mo, Zn	

**Art. 6 [DüV]** says that only persons and companies resident or having a place of business in Switzerland may place fertilizers on the market. Persons and companies with residence or business establishment in other countries can be granted a marketing authorization if this possibility is provided for in a state treaty.

#### **Art. 7 [DüV]**

Fertilizers of the **following fertilizer categories** are approved for placing on the market if they correspond to a fertilizer type on the fertilizer list. The **fertilizer list** is placed in the **Fertiliser Book Ordinance [DüBV, SR 916.171.1]** by the Federal Department of Economic Affairs, Education and Research (EAER).

- a. Mineral single-nutrient fertilizer
- b. Mineral multi-nutrient fertilizers
- c. Organic or organic-mineral fertilizers
- d. Fertilizers with trace-nutrients
- e. Mineral or organic soil conditioner
- f. Farmyard- and recycled fertilizers**
- g. Additives to farmyard manure
- h. Composting agents

The **fertiliser list [DüBV]** specifies the type designations and the requirements which the individual fertilisers must comply with.

#### **Art. 8 [DüV]**

<sup>1</sup>Fertilizer types are accepted in the fertilizer list if they:

- a. meet the requirements laid down in **Art. 3[DüV]**
- b. contain active substances whose efficacy and safety are known
- c. are not derived from animal by-products, except**
  - 1. catering waste not originating from cross-border traffic
  - 2. greens with food waste,
  - 3. eggs, milk, dairy products and colostrum,



- 4. beekeeping products,
- 5. untreated wool,
- 6. metabolic products, such as urine and rumen, stomach and intestinal contents;
- d. and **are not** produced from sludge from a slaughterhouse, meat cutting plant or meat processing plant

<sup>2</sup>The list of fertilisers also includes fertiliser types that are approved in Switzerland and that are approved in a country with comparable approval conditions with similar value-determining properties. In checking whether these conditions are met, the EAER relies on the information in the list of fertilizers in the country of origin; it takes further information into account as far as it is brought to its attention.

#### **Art. 10**

<sup>1</sup>The following fertilisers require a licence from the FOAG for approval:

- a. Fertilisers which do not correspond to any type of fertiliser in the list of fertilisers;
- b. Fertilisers of the following fertiliser categories:
  - 1 additions to fertilisers with the exception of farmyard manure additions,
  - 2 cultures of micro-organisms for the treatment of soil, seeds or plants,
  - 3 substances to influence biological processes in the soil,
  - 4 mineral recycled fertilisers,
  - 5 mixtures of fertilisers of the categories referred to in points 1 to 4 above with each other and with categories of fertilisers referred to in Article 7

<sup>2</sup>A marketing authorization is required in all cases for fertilizers to which micro-organisms have been added or which consist of or contain genetically modified or pathogenic organisms. This also applies to fertilizers corresponding to a type of fertilizer on the fertilizer list.

#### **Art 21.a.**

<sup>1</sup> Fertilisers may only be placed on the market if the quality requirements specified in **Annex 2.6 of the Chemical Risk Reduction Ordinance [ORRchem]** with regard to the limit values for pollutants and inert foreign substances are fulfilled.

<sup>2</sup> No plant protection products, sewage sludge, substances containing medicinal products, components of *Ricinus communis* or agents that influence biological processes in the soil may be added to fertilisers.

<sup>3</sup> On application, the FOAG may authorise the mixing of nitrification inhibitors, which are intended to be used as agents to influence biological processes in the soil, with nitrogenous mineral fertilisers. The licence is granted only if the use of such mixtures does not endanger soil fertility.

<sup>4</sup> Producers of fertilisers may only use raw materials that are suitable and do not adversely affect the end product. Only materials from non-agricultural holdings may be added to farmyard manures if the limit values for pollutants specified in paragraph 1 are complied with.

<sup>5</sup> No unwanted organisms, such as pathogenic organisms or seeds of neophytes, must be spread during the production or use of a fertilizer.

#### **Art. 23** General labelling requirements

<sup>2</sup> All packaging or labels affixed thereto, and in the case of loose deliveries on the documents accompanying the delivery, must bear at least the following information:

- a. designation of the fertiliser type in accordance with the fertiliser list or, in the case of authorised fertilisers, in accordance with the FOAG regulations;
- b. Type and content of the value-determining ingredients and additives;
- c. Trade name, if available;
- d. Name and address of the company responsible for placing on the market or importing;
- e. **Source materials in the case of recycled fertilizers or fertilizers containing recycled fertilizers;**
- f. instructions for use.

<sup>3</sup> Insofar as Swiss fertiliser recommendations are available, no dosage instructions in accordance with **Article 24a paragraph 1 letter a** are required in the instructions for use for the corresponding products or fertiliser types supplied to professional users.

#### **Art. 24** Labelling of anaerobic digestion and composting products

<sup>1</sup> In addition to the information required under Article 23, owners of composting and anaerobic digestion plants that process more than 100 tonnes of compostable or fermentable material per year and deliver compost, digestates or farmyard manure must, on delivery, issue a delivery note containing the following information

- a. the quantity delivered;
- b. dry matter and organic matter content;
- c. total nitrogen content;
- d. phosphorus, potassium, calcium and magnesium content and electrical conductivity (expressed in millisiemens per centimetre).

**Art. 24 b** Recording the distribution of farmyard and recycled fertilisers

<sup>1</sup> Anyone who delivers farmyard manure must record all deliveries in the information system in accordance with Article 165f [LwG]. Farmyard manure that is delivered in sacks is exempt from the entry.

<sup>2</sup> Anyone who dispenses recycled fertiliser must record in the information system all deliveries to purchasers who purchase recycled fertiliser with a total annual content of more than 105 kg nitrogen or 15 kg phosphorus.

<sup>3</sup> The owners of installations in accordance with Article 24 paragraph 1 who supply farmyard or recycled fertilisers in accordance with paragraphs 1 and 2 must also record the compostable or fermentable input materials in the information system. For input materials of agricultural origin, each delivery must be recorded; in the case of input materials of non-agricultural origin, the total quantity must be recorded once a year.

**Art. 24 c** Further requirements for the storage and distribution of farmyard and recycled fertilisers

<sup>1</sup> Owners of installations in accordance with Article 24 paragraph 1 may supply fertilisers to purchasers who do not use them on their own or leased land only if the purchasers prove that they have the necessary expertise for the use of the fertiliser.

<sup>2</sup> When storing and dispensing farmyard manures and recycled fertilisers, the provisions of water protection legislation must be observed.

<sup>3</sup> The owners of installations must carry out the necessary investigations in accordance with the instructions of the FOAG to ensure that the requirements in accordance with Article 21a paragraph 1 are fulfilled. They provide the results of the investigations immediately to the FOAG and the cantonal authorities.

Ordinance of the EAER<sup>1</sup> on the Placing on the Market of Fertilisers (Ordinance of the EAER on the Fertiliser Book, DüBV) SR 916.171.1, of Nov 16, 2007 as of Jan 1, 2019)

**Art.1**

The types of fertiliser approved for placing on the market in accordance with Art. 7 of the Fertiliser Ordinance of 10 January 2001 [DüV] with the corresponding type designations and the type-specific requirements are listed in Annex 1 of the [DüBV].

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<sup>1</sup> The Federal Department of Economic Affairs, Education and Research

## Art.2

<sup>2</sup> Products from anaerobic digestion and composting installations are registered if a copy of the cantonal operating licence is sent to the Federal Office for Agriculture FOAG.

## Art. 3 General requirements

In addition to the requirements mentioned in **Annex 1**, each type of fertiliser must comply with the following requirements:

- a. No nutrients of animal, plant or microbial origin may be added to single- or multi nutrient mineral fertilizers.
- b. In organic and organic-mineral fertilizers and soil improvers, the carbonaceous material of the organic substance must originate from the processing of animal, plant or microbial material. Trace nutrients such as calcium, magnesium, sodium and sulphur may also be added to organic-mineral fertilizers.

## Art. 5 Weight and volume specifications

In addition to the information required by the Fertiliser Ordinance of 10 January 2001, the following weight or volume details must be given on all packaging or labels attached thereto, or in the case of loose deliveries on the documents accompanying the delivery:

- d. for farmyard and **recycled fertilisers**, either the net weight or the brutto and tare weight in kilograms or the volume in litres or cubic metres

## Art. 6

<sup>1</sup> The contents of ingredients and additives must be stated in percentages by weight; information with one decimal place, and up to four decimal places for trace nutrients, is permitted. The following are permitted

- a. indication of the content in grams per litre or kilograms per hectolitre for liquid fertilisers;
- b. the indication in kilograms per cubic metre or in kilograms per tonne for farmyard manure and recycled fertilisers.

<sup>2</sup> Unless otherwise required, the guaranteed contents shall relate to the commercial product and not to the dry matter.

**Art. 6 Paragraph 3** as well as **Art. 7, 8, 9, 10** contain information concerning the declaration of primary-, and secondary nutrients.

**Art 11**

<sup>9</sup> For fertilisers corresponding to a type of fertiliser and advertised as additives to fertilisers or as composting agents, the type of fertiliser must be indicated.

<sup>11</sup> For recycled mineral fertilizers containing secondary phosphorus, the solubility of the phosphorus and phosphate in neutral ammonium citrate (PA) and in two-percent citric acid (PZ) must be declared and the designation must be supplemented by the words "containing secondary P".

**Art. 15 Tolerances**

1 For fertilisers with **the exception of farmyard manure, compost and digestates**, the tolerances listed in Annex 2 apply to deviations in the declared guaranteed contents and solubilities.

2 Tolerances must not be exploited according to plan.

**Annex 1 Part 6**

**Fertilisers subject to declaration**

**Farmyard and recycled fertilisers and other products**

**Requirements for the individual fertiliser types**

Table B58: Farmyard, recycled fertilisers and other products and requirements for the individual fertiliser types

Farmyard and recycled fertilisers Annex 1, Part 6						
No.	Type	Minimum content	Type-determining components, nutrient forms and solubility	Assessment ; further requirements	Composition; Method of preparation	Special provisions to be Provisions
1	2	3	4	5	6	7
2010	Farmyard manure		Total nitrogen Total phosphate Total potash organic matter Dry matter		In prepared or unprepared form	The animal species from which the farmyard manure originates shall be indicated. The form in which the farmyard manure is present (type of processing) shall be indicated.

2011	Dried dung	40 % OS	Total nitrogen Total phosphate Total potassium organic matter Dry matter content		Drying and, if necessary, granulating or pelletising of manure or animal excrement	Reference shall be made to the animal species from which the manure originates.
2020	<i>cancelled</i>					
2030	Compost		Total nitrogen Total phosphate Total potash Calcium Magnesium organic matter Dry matter electrical conductivity			
2040	Liquid or solid digestate		Total nitrogen Total phosphate Total potash Calcium Magnesium organic matter Dry matter electrical conductivity			
2060	<i>Cancelled</i>					
2070	Additives to farmyard manure				Minerals, carbonaceous material of plant, animal or microbial origin, and mixtures of these	Additives to dung and slurry
2080	Mixture of products 2010, 2011 and 2030–2070					The components and their specific provisions to be complied with shall be indicated

Ordinance on Risk Reduction related to the Use of with Certain Particularly Dangerous Substances, Preparations and Articles (Ordinance on Risk Reduction related to Chemicals, ORRchem) SR 814.81 of 18 May 2005 (as at 1 June 2021)

The **ORRchem Appendix 2.6** contains **pollutant limit values** for different fertiliser categories and regulates the **use of fertilisers**.

## Annex 2.6 Fertilisers

## 2.1 Supply of fertilisers

<sup>1</sup> Fertilisers may only be supplied if the requirements specified in Number 2.2 are met in addition to those specified in the Ordinance on Fertilisers.

<sup>2</sup> It is prohibited to supply sewage sludge.

### 2.2.1 Organic fertilisers, recycling fertilisers with the exception of mineral recycling fertilisers and farm manure

<sup>1</sup> The pollutant content of organic fertilisers, recycled fertilisers with the exception of mineral recycled fertilisers, and farm manure must not exceed the following limit values:

Table B59: Limit values of inorganic pollutants in organic fertilisers, recycled fertilisers (with the exception of mineral recycled fertilisers), and farm manure

Pollutant	Limit value in grams per ton of dry matter
Cadmium (Cd)	1
Copper (Cu)	100*
Lead (Pb)	120
Mercury (Hg))	1
Nickel (Ni)	30
Zinc (Zn)	400**
* 150 g/t dry matter if the proportion of pig excrement is more than 50% of dry matter	
** 600 g/t dry matter if the proportion of pig excrement is more than 50% of dry matter	

<sup>2</sup> compost and digestate:

- a. contaminants (metal, glass, wastepaper, cardboard, etc.) with a diameter of more than 2 mm must not exceed 0.5% of the mass of the dry matter;
- b. the content of aluminium foil and plastics must not exceed 0.1% of the mass of the dry matter;
- c. the content of stones with a diameter of more than 5 mm should be as low as possible, so that fertiliser <sup>2</sup> In addition, the following requirements for inert contaminants apply to quality is not impaired.

<sup>3</sup> The following guide values apply to compost and digestate:

Table B60: Guide values for composts and digestate

Pollutant	Guide value
Polycyclic aromatic hydrocarbons (PAHs)	4 grams per tonne of dry matter <sup>a</sup>
Dioxins (PCDDs) and furans (PCDFs)	20 nanograms I-TEQ <sup>b</sup> per kilogram of dry matter
<sup>a</sup> Sum of the following 16 PAH compounds on the EPA priority pollutants list: naphthalene, acenaphthylene, acenaphthene, fluorene, phenanthrene, anthracene, fluoranthene, pyrene, benzo[a]anthracene, chrysene, benzo[b]fluoranthene, benzo[k]fluoranthene, benzo[a]pyrene, indeno[1,2,3-cd]pyrene, dibenzo[a,h]anthracene and benzo[ghi]perylene	
<sup>b</sup> I-TEQ = International toxic equivalents	

<sup>4</sup> The provisions of paragraph 1 do not apply to farm manure intended for own farm use or supplied directly to end users by a livestock farm. This is without prejudice to the provisions specified in Article 30a paragraph 2 of the Ordinance on Fertilisers.

### 2.2.2 Mineral fertilisers and fertilisers prepared from animal by-products

The pollutant content of mineral fertilisers and fertilisers prepared from animal by-products must not exceed the following limit values:

Table B61: Pollutant content of mineral fertilisers and fertilisers prepared from animal by-products

Pollutant	Limit value in grams per tonne of Dry matter	
		Phosphorus (P)
Cadmium (Cd) in phosphorus fertilisers containing more than 1% phosphorus		50
Chromium (Cr)	2000	
Vanadium (V)	4000	

### 2.2.4 Mineral recycled fertilisers

<sup>1</sup> The inorganic pollutant content of mineral recycled fertilisers with recovered phosphorus may not exceed the following limit values:

Table B62: Inorganic pollutant content of mineral recycled fertilisers with recovered phosphorus

Pollutant	Limit value in grams per tonne of phosphorus (P)
Lead (Pb)	500



Cadmium (Cd)	25
Copper (Cu)	3000
Nickel (Ni)	500
Mercury (Hg)	2
Zinc (Zn)	10000
Arsenic (As)	100
Chromium (Cr)	1000

<sup>2</sup> The organic pollutant content of mineral recycled fertilisers with recovered phosphorus may not exceed the following limit values:

Table B63: Organic pollutant content of mineral recycled fertilisers with recovered phosphorus

Pollutant	Limit value
Polycyclic aromatic hydrocarbons (PAH)	25 grams per tonne of phosphorus (P) <sup>a</sup>
Polychlorinated biphenyls (PCB)	0.5 grams per tonne of phosphorus (P) <sup>b</sup>
Dioxins (PCDD) and furans (PCDF)	120 nanograms I-TEQ per kilogram of phosphorus (P) <sup>c</sup>
<sup>a</sup> Sum of the following 16 PAH compounds on the EPA priority pollutants list: naphthalene, acenaphthylene, acenaphthene, fluorene, phenanthrene, anthracene, fluoranthene, pyrene, benzo[a]anthracene, chrysene, benzo[b]fluoranthene, benzo[k]fluoranthene, benzo[a]pyrene, indeno[1,2,3-cd]pyrene, dibenzo[a,h]anthracene and benzo[ghi]perylene	
<sup>b</sup> Sum of the 7 congeners according to IRMM (Institute for Reference Materials and Measurements), IUPAC No 28, 52, 101, 118, 138, 153, 180	
<sup>c</sup> I-TEQ = International toxic equivalents	

<sup>3</sup> Mineral recycled fertilisers with recovered nitrogen or potassium may not exceed the limit values for recycled fertilisers under No 2.2.1.

### 3 Use

#### 3.1 Principles

<sup>1</sup> Any person who uses fertilisers must give due consideration to:

- a. the nutrients present in the soil and the nutrient requirements of plants (recommendations on fertiliser application);

- b. the site (vegetation, topography and soil conditions);
- c. meteorological conditions;
- d. limits ordered or agreed under legislation on water protection, nature and cultural heritage protection or environmental protection.

<sup>2</sup> Any person who has supplies of farm manure may only use recycling or mineral fertilisers if the farm manure is insufficient or not suitable for meeting the nutrient requirements of the plants concerned.

<sup>3</sup> Inputs of pollutants to agricultural soils must be avoided as far as possible.

## **3.2 Restrictions**

### **3.2.1 Nitrogenous fertilisers and fluid fertilisers**

<sup>1</sup> Use of nitrogenous fertilisers is only permitted during periods when plants can absorb nitrogen. If the particular crop production conditions require fertiliser treatment outside these periods, use of such fertilisers is only permitted if they pose no risk to water quality.

<sup>2</sup> Use of fluid fertilisers is only permitted if the soil has the necessary absorption capacity. In particular, they must not be used when the soil is waterlogged, frozen, snow-covered or dried-out.

### **3.2.2 Compost and digestate**

<sup>1</sup> Over a three-year period, up to 25 tonnes of compost or solid digestate (based on dry matter) may be applied as fertiliser per hectare, or 200m<sup>3</sup> liquid digestate per hectare, provided that these quantities do not exceed the nitrogen and phosphorus requirements of the plants.

<sup>2</sup> It is prohibited to use, over a ten-year period, more than 100 tonnes of organic or organic mineral soil improvement agents, compost or solid digestate per hectare, either for soil improvement, as a substrate, for erosion protection, for recultivation purposes or for artificial topsoil mixtures.

### **3.2.3 Residues from small wastewater treatment plants and from non-agricultural sealed cesspools**

<sup>1</sup> Residues from non-agricultural wastewater treatment plants with a maximum of 200 population equivalents and from non-agricultural sealed cesspools may be used on forage areas in remote or poorly accessible locations outside the groundwater protection zones if an authorisation is granted by the cantonal authority.

<sup>2</sup> Without prejudice to the provisions of Number 3.3, they must not be used on vegetable plots or added to slurry pits.

## **3.3 Prohibitions and exemptions**

### **3.3.1 Prohibitions**

<sup>1</sup> It is prohibited to use fertilisers:

- a. in areas designated as nature reserves under federal or cantonal legislation, in the absence of relevant regulations or agreements to the contrary;
- b. in reed beds and mires, where these are not already covered by provisions referred to in letter a;
- c. in hedges and copses and in a 3m-wide strip alongside hedges and copses;
- d. in surface waters and in a 3m-wide strip alongside surface waters, whereby the strip alongside watercourses for which a space for waters has been specified in accordance with Article 41a WPO<sup>3</sup> or for which a space for waters has been expressly dispensed with under 41a paragraph 5 WPO is measured from the shore line, and in the case of other watercourses and standing waters from the top edge of the bank in accordance with the buffer strip information sheet «Measuring and managing buffers strips correctly», KIP/PIOCH 2009<sup>4</sup>;
- e. in groundwater protection zone S1.

<sup>2</sup> It is prohibited to use liquid farm manure and recycling fertilisers in groundwater protection zones S2 and S<sub>h</sub>.

<sup>3</sup> With regard to the use of fertilisers in the areas of contribution Z<sub>v</sub> and Z<sub>o</sub>, the cantonal authority must specify restrictions going beyond those listed in paragraphs 1 and 2 if this is necessary to ensure water protection.

<sup>4</sup> **It is prohibited to use sewage sludge.**

<sup>5</sup> It is prohibited to use fertilisers in forests and in a 3 m strip alongside the stand of trees.

### 3.3.2 Exemptions

<sup>1</sup> Notwithstanding the prohibition specified in Number 3.3.1 paragraph 2, the cantonal authority may permit the spreading of a maximum of 20m<sup>3</sup> liquid farm manure and recycled fertilisers per hectare in groundwater protection zone S2 up to three times per growing season, at appropriate intervals, if the nature of the soil is such that no pathogenic microorganisms can enter the groundwater well or recharge facility.

<sup>2</sup> Notwithstanding the prohibition specified in Number 3.3.1 paragraph 5 and without prejudice to Number 3.3.1 paragraphs 1–4, the application of fertilisers in forests and in a 3m-wide strip alongside the stand of trees outside groundwater protection zones may be authorised (Art. 4–6) for:

- a. the use of compost, solid digestate and mineral fertilisers:
  1. in forest nurseries,
  2. during afforestation or reforestation and for sowing,
  3. to promote the development of plant cover on forestry road verges and for bioengineering,
  4. on small areas within the framework of scientific trials;

- b. the spreading of farm manure, compost, solid digestate and non-nitrogenous mineral fertilisers on wooded pastures.

Specific rules for organic farming: Guidelines for the production, processing and trade of BioSuisse products, Version of 1<sup>st</sup> of January 2020 (Publisher: BioSuisse)

## Part II: Guidelines for plant cultivation and animal husbandry in Switzerland

### 2.4 Nutrient supply

(...) **Nitrogen fertilisation is carried out exclusively with organic fertilisers.** Mineral supplementary fertilisation is carried out on the basis of site requirements, soil analyses, observations on the farm and the nutrient balance of the whole farm and is to be kept to a minimum.

#### 2.4.3 Requirements for incoming and outgoing fertilisers

**The use of synthetic chemical nitrogen compounds, easily soluble phosphates and high percentage chlorine and pure potash fertilisers is prohibited.** Fertilisers permitted in organic farming are listed in Part II, Art. 2.4.4.5, page 110 and in the FiBL list of inputs (<https://www.betriebsmittelliste.ch>, BML).

#### Reduction of plastic contamination

Bio Suisse aims to ensure that only plastic-free fertilisers are applied to certified organic areas. The following measures are intended to implement this goal step by step.

**From 1.1.2021, liquid/solid digestate, slurry, manure and compost must be listed in the Input List (BML).**

The following maximum values apply to plastics (in relation to the dry matter of the end product):

**From 1.1.2021 0.1 %; from 1.1.2024 0.05 %.** The limit values are controlled within the framework of the BML listing.

Plants that accept less than 100 tonnes of biogenic waste per year do not have to submit any plastic analyses for the BML listing.

#### 2.4.3.1 Farmyard manure

- a) Farmyard manure input: Residues and foreign substances

From 1.1.2021 onwards, anaerobically digested slurry and manure supplied must be listed in the Input List. This also applies to own nutrients processed in biogas or composting plants.

#### 2.4.3.2 Recycled fertiliser

##### a) Recycled fertiliser supply: residues and foreign substances

Where a sufficient supply of nutrients from the farm or from organic farms is not possible, a maximum of half of the nitrogen or phosphorus

Where a sufficient supply of nutrients from the farm or from organic farms is not possible, a maximum of half of the nitrogen or phosphorus requirement according to the Suisse Balance may be covered by liquid or solid digestate. Liquid recycled fertilisers used must be listed in the farm input list.

Before an organic farm applies recycled fertilisers containing farmyard manure from non-organic farms, proof must be provided that no organic farmyard manure is offered within the distance limits.

Farmyard manure added to the recycled manure must meet the quality requirements for farmyard manure according to Part II, Art. 2.4.3.1, page 103. Farmyard manure from non-organic farms shall be counted towards the non-organic farmyard manure portion according to Part II, Art. 2.4.3.1, page 103.

Liquid recycled fertiliser (liquid digestate): Liquid recycled fertilisers must comply with the heavy metal limit values of the ORRchem(17).

Supply of compost and solid recycled fertiliser (digestate): Added compost and solid recycled fertiliser must comply with the heavy metal limit values of the ORRchem, as well as the quality guidelines of the sector.

##### b) Distance limits and energy expenditure

The maximum air distance of a facility from which recycled fertiliser may be supplied or discharged, shall be:

- 80 km for bulk composts, mushroom substrates with farmyard manure
- 40 km for compost raw material, solid digestate

■ 20 km for liquid digestate

The distance limit does not apply to composts, mushroom substrates and digestate as a component of commercial fertilisers and substrates.

Mushroom substrates without farmyard manure are also exempt from the distance limit (MKA 6/2016). Worm compost may only be imported as a component in substrates. The import of pure worm compost is not permitted (MKA 6/2014).

#### 2.4.3.3 Biogas plants

Certified organic farms may operate biogas plants, be involved in plants and supply digestate as farmyard or recycled fertiliser (requirements for supply according to Part II, Art. 2.4.3.1, page 103 and according to Part II, Art. 2.4.3.2, page 106).

#### b) Supply and delivery

Before an organic farm supplies nutrients containing farmyard manure from non-organic farms, proof must be provided that that no organic farmyard manure is offered within the distance limits.

A distinction is made between solid and liquid farmyard manure, i.e. anyone who wants liquid digestate, for example, is not obliged to accept solid organic hen manure (MKA 5/2018).

#### National rules transposing the Nitrates Directive 91/676/EEC

*Information to the Directive 91/676/EEC is shown below and cited from FAOLEX Database:  
<https://www.fao.org/faolex/results/details/en/c/LEX-FAOC019065/>*

This Directive<sup>2</sup> aims to reduce water pollution from nitrates used for agricultural purposes and to prevent any further pollution.

Member States must:

- a) designate as vulnerable zones all those draining into waters which are or could be affected by high nitrate levels and eutrophication;
- b) establish mandatory action programmes for these areas, taking into account available scientific and technical data and overall environmental conditions;

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<sup>2</sup> Nitrates Directive 91/676/EEC

- c) monitor the effectiveness of the action programmes;
- d) test the nitrate concentration in fresh ground and surface water at sampling stations, at least monthly and more frequently during flooding;
- e) carry out a comprehensive monitoring programme and submit every 4 years a comprehensive report on the implementation of the Directive;
- f) draw up a code of good agricultural practice which farmers apply on a voluntary basis;
- g) provide training and information for farmers, where appropriate. The European Commission shall provide a report every four years on the basis of the national information it has received.

The directive is transposed in Switzerland mainly through the Waters Protection Act (WPA), Waters Protection Ordinance (WPO) and Ordinance on Risk Reduction related to Chemicals (ORRchem) Annex 2.6.

Remediation values for drinking and ground water are defined in the Ordinance of the FDHA on drinking water and water in publicly accessible bathrooms and shower facilities, Annex 2 and the Waters Protection Ordinance, Annex 2, respectively:

Drinking water

Nitrat	40	mg/l
Nitrit	0,1	mg/l

Groundwater:

Nr.	Parameter	Requirements
1	Stickstoffverbindungen	
	Nitrat ( $NO_3^- - N$ )	For water bodies used for drinking water production: 5,6 mg N/l (equal to 25 mg nitrate/l)

The code of good agricultural practise is described and defined in the federal act of agriculture (LwG) and the ordinance on direct payments for agriculture (DZV) based on the Federal Constitution of the Swiss Confederation and the Federal Act on the Protection of the Environment (EPA).

## 2. Waste management

Ordinance on the Avoidance and the Disposal of Waste (Waste Ordinance, Abfallverordnung, [VVEA]) of 4 December 2015 (Status as of 1 January 2022)

### **Chapter 1 Aim, Scope of Application and Definitions**

#### **Art. 1**

This Ordinance aims to:

- a. protect people, animals, plants and their biological communities, waters, the soil and the air from harmful effects or nuisances caused by waste;
- b. to limit environmental pollution by waste through precautionary measures;
- c. to encourage the sustainable use of natural raw materials through the environmentally sustainable recovery of waste.

#### **Art. 2**

This Ordinance applies to the avoidance and disposal of waste and to the construction and operation of waste disposal facilities. Special regulations on individual types of waste in other federal acts and ordinances are reserved.

#### **Art. 3 Definitions**

In this ordinance:

- a. municipal waste means waste from households and waste from businesses with fewer than 250 full-time employees the composition of which in ingredients and proportions is similar to waste from households;
- b. undertaking means a legal entity with its own identification number or such entities combined in a group with a jointly organized waste disposal system;
- c. special waste means waste designated as special waste in the list of wastes issued in Article 2 of the Ordinance of 22 June 2005<sup>3</sup> on Movements of Waste (OMW);
- d. biogenic waste means waste of plant, animal or microbial origin;
  - i. composting facility means a waste disposal facility in which biogenic waste decomposes while exposed to the air;
  - j. anaerobic digestion facility means a waste disposal facility in which biogenic waste is allowed to ferment in the absence of air;

### **Chapter 3 Avoidance, Recovery and Deposit of Waste; Section 3 Recovery of Waste**

#### **Art. 12 General recovery obligation according to the state of the art**



1 Waste must be recycled or recovered for energy provided recovery does less harm to the environment than:

1. any other form of disposal; and
2. the manufacture of new products or the acquisition of other heating fuels.

2 Recovery must be carried out according to the state of the art.

#### **Art. 13 Municipal waste and waste of similar composition**

1 The cantons shall ensure that that the recoverable parts of municipal waste such as glass, paper, cardboard, metals, garden waste and textiles are if possible collected separately and recycled.

2 They shall ensure that the following are collected and disposed of separately:

1. special waste from households;
2. non-business-specific special waste of up to 20 kg per collection from businesses with fewer than 10 full-time employment positions.

3 They shall ensure that the infrastructure required to comply with paragraphs 1 and 2 is provided, and in particular that collection points are set up. If necessary they shall also ensure that regular collections are made.

4 The proprietors of waste from businesses with 250 or more full-time employment positions must as far as possible and reasonable collect and recycle the recoverable parts of their waste that are similar in their composition to municipal waste.

#### **Art. 14 Biogenic waste**

1 Biogenic waste must be recovered solely by recycling or by anaerobic digestion, provided:

1. it is suitable for this purpose as a result of its properties, in particular its nutrient and pollutant content;
2. it has been collected separately; and
3. recovery is not prohibited by other provisions of federal law.

2 Biogenic waste that need not be recovered in accordance with paragraph 1 must as far as possible and reasonable simply be recovered for energy or incinerated in appropriate facilities. In doing so, its energy content must be used.

#### **Art. 15 Phosphorus-rich waste**

1 Phosphorus must be recovered from municipal waste water, from sewage sludge from central waste water treatment plants or from the ash produced by the incineration of such sewage sludge and then recycled.

2 Phosphorus in animal and bone meal must be recycled, unless the animal and bone meal is used as animal feedstuffs.

3 When recovering phosphorous from waste in accordance with paragraph 1 or 2, the pollutants in the waste must be removed according to the state of the art. If the phosphorous recovered is used to manufacture a fertiliser, the requirements of Annex 2.6 Number 2.2.4 ORRchem<sup>3</sup> must also be met.

#### **Chapter 4 Waste Disposal Facilities, Section 4 Composting and Anaerobic digestion Facilities**

##### **Art. 34 Operation**

1 In composting and anaerobic digestion facilities that accept more than 100 t of waste each year, biogenic waste may only be allowed to decompose or ferment if it is suitable or the relevant procedure due to its properties, and in particular its nutrient and pollutant content, and for recovery as fertiliser as defined in Article 5 of the Fertiliser Ordinance of 10 January 2001 [DüV]<sup>4</sup>. Waste that is fermented in facilities for co-digestion in waste water treatment plants is exempt from the requirement of suitability as fertiliser.

2 Packaged biogenic waste may only be allowed to decompose or ferment in composting and anaerobic digestion facilities in accordance with paragraph 1 other than waste water treatment plants if:

- a. the packaging is bio-degradable and suitable for the procedure concerned; or
- b. the packaging is as far as possible removed before or during decomposition or anaerobic digestion.

3 The regulations in the [DüV] and the [ORRchem] relating to compost and digestates also apply.

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<sup>3</sup> elaborated in document 1 Fertilising products and fertilisation

<sup>4</sup> elaborated in document 1 Fertilising products and fertilisation

## **Chapter 5 Final Provisions; Section 3 Transitional Provisions**

### **Art. 51 Phosphorus-rich waste**

The duty to recover phosphorus in accordance with Article 15 applies from 1 January 2026.

#### **Annex 1**

Table B64: Types of waste

Code	Description of the waste
	<b>Class 6: Biogenic waste</b>
6101	Problematic wood residues
6201	Cooking oils and fats excluding those from communal and other collections
6202	Waste wood
6301	Natural wood
6302	Residual wood
6303	Biogenic waste from communal and other collections
6304	Biogenic waste from agriculture, industry and commerce
	<b>Class 7: Sludges and treatment residues</b>
7101	Slag and ash
7105	Street and farmyard sludges
7106	Other sludges and industrial waste water
7301	Sewage sludge from the communal waste water treatment and faecal sludge
7302	Sludges and treatment residues not subject to OMW controls

Ordinance on animal by-products (Verordnung über tierische Nebenprodukte [VTNP]) SR 916.441.22 of 25 May 2011 (status as of 1 June 2018)

#### **Art. 1**

The purpose of this Regulation is to:

- a. ensure that animal by-products do not endanger human and animal health and the environment
- b. allow animal by-products to be recovered as far as possible;
- c. ensure that the infrastructure for the disposal of animal by-products is provided.

## Art.2

<sup>1</sup>This Ordinance regulates trade in animal by-products and their disposal.

<sup>2</sup> It does not apply to:

- a. animal by-products from waste water from slaughterhouses and cutting plants and from plants in which Category 1 or Category 2 animal by-products are disposed of after the solids have been removed in accordance with the requirements;
- b. whole carcasses or parts of wild animals which are not suspected of being infected with a disease communicable to humans or animals or which are not collected after killing in accordance with good hunting practice;
- c. Ova, embryos and semen for breeding purposes;
- d. raw milk, colostrum and products derived therefrom which are collected, stored and disposed of or used on the holding of origin;
- e. Shells of molluscs and crustaceans without soft tissue and flesh;
- f. ...
- g. Metabolic products, except where these:
  1. arise in slaughterhouses, or
  2. are intended for import or export
- h. radioactively contaminated animal by-products which are subject to radiation protection legislation;
- i. animal by-products designated as hazardous waste in the list of waste adopted pursuant to Article 2 of the Ordinance of 22 June 20057 on the movement of waste.

<sup>2bis</sup> It applies to food waste if this

- a. originate from means of transport used in cross-border traffic;
- b. Are intended for animal feed
- c. Are intended for processing into fertilizers or for use in a biogas or composting plant, unless they come from private households and are mixed with green waste in the context of the public collection of municipal waste and are disposed of in installations on whose premises there is no livestock farming

### Art. 2a Applicability to derived products

<sup>1</sup> Derived products are subject to this Ordinance if they have not yet reached the end point (Art. 3 let. e). The same provisions apply to derived products as to the animal by-products from which they were derived, unless otherwise provided.

<sup>2</sup> The derived products that have reached the end point are listed in Annex 1a.

<sup>3</sup> The endpoints do not apply to derived products that are used as or processed into fertilisers or animal feed, with the exception of pet food.

### Art. 3 Terms

The following terms mean:

- c) Disposal:** the collection, storage, transport, processing, recovery, incineration and burial of animal by-products;
- d) derived product:** product obtained from animal by-products through one or more processing steps;
- e) End point:** stage of processing in the manufacturing chain beyond which a derived product does not pose a specific risk to human and animal health and the environment;
- o) Solids:** animal by-products separated from food or waste water by grids in drains or a pre-treatment process (flotation or filtration plant);
- p) Food waste:** kitchen and catering waste originating from establishments where food containing animal components is produced for direct consumption, such as private households, restaurants, catering establishments and kitchens, including commercial and domestic kitchens;
- r) Collection centre:** place for the intermediate storage of animal by-products prior to their further processing;
- s) Plant:** facility used for the processing, recovery or incineration of animal by-products;
- t) Biogas plant:** A plant in which animal by-products are biodegraded under anaerobic conditions;
- u) Composting plant:** a commercial plant in which animal by-products are biodegraded under aerobic conditions.

**Art. 6** Animal by-products of Category 2 are

- a. carcasses or parts thereof which do not belong to Category 1, have been declared unfit for human consumption by the meat inspection service and show signs of a disease communicable to humans or animals
- b. carcasses of poultry killed rather than slaughtered for commercial reasons or for salmonella control purposes;
- c. metabolic products;
- d. animal products mixed with foreign bodies and therefore not fit for human consumption;
- e. animal by-products containing residues in concentrations exceeding the limits laid down in the Ordinance of 26 June 1995 on foreign substances and ingredients or which are excluded from the food chain on the basis of a positive inhibitor test;
- f. solids from slaughterhouses other than those referred to in Article 5(f).

## **Art.7**

Animal by-products of Category 3 are, if they do not belong to Category 1 or 2:

- a. carcasses or parts thereof from slaughterhouses or cutting plants and wild animals or parts thereof killed for meat production, which:
  1. are fit for human consumption but are not intended for use as foodstuffs, or
  2. are not fit for human consumption but do not present a health risk to humans or animals
- b. Blood, placenta, hides and skins, hooves, horns, bristles, feathers, hides and skins, fur and hair of animals not covered by point (a) and which do not show any signs of disease communicable to humans or animals
- c. day-old chicks killed for commercial reasons;
- d. animal by-products of aquatic animals and invertebrates, hatchery by-products, eggs, by-products including bird eggshells, milk, milk products, colostrum, apiculture products, provided that they do not present a health risk to humans or animals;
- e. animal by-products resulting from the production of food from edible raw material, including centrifuge and separator sludge from milk processing
- f. food and feed containing products of animal origin which, for commercial reasons or due to minor defects, are no longer intended or suitable for human or animal consumption, but which do not present a health risk to humans or animals;
- g. food waste other than those referred to in Article 5(g).

## **Art. 9 Principles**

Anyone who trades in or disposes of animal by-products must ensure that:

- a. no pathogens are spread and the environment is not endangered;
- b. the animal by-products in categories 1-3 remain identifiable and separate;
- c. they come into direct or indirect contact only with containers, premises, vehicles and equipment kept in good repair; and
- d. the containers, rooms, vehicles and equipment are of sufficient size and suitability for the intended purpose and are cleaned regularly;
- e. the flow of goods is documented in a comprehensible manner.

## **Art. 11 Licensing requirement**

<sup>1</sup> Installations and establishments in accordance with Annex 1b require a licence from the cantonal veterinarian.

<sup>2</sup> The permit shall be granted if the constructional and operational requirements in accordance with this Ordinance that are relevant to the activity in question are met. An on-site inspection must be carried out before the licence is granted.

<sup>3</sup> Other licences and inspection procedures prescribed by federal law shall remain reserved.

#### **Art. 23 Disposal of Category 2 animal by-products**

<sup>1</sup> Category 2 animal by-products must be disposed of:

- a. in accordance with the methods for Category 1 by-products referred to in Article 22;
- b. after pressure sterilisation in accordance with Annex 5 by **recycling**:
  1. in a **biogas or composting plant**
  2. the melted-out fat in **organic fertilisers** or in other technical products, except for pharmaceutical, cosmetic or medical products,
  3. the protein and bone materials in **organic fertilisers**.

<sup>2</sup> Metabolic products may be directly utilised in a biogas or composting plant or used for the manufacture of technical products. Small quantities may also be composted in the holding of origin of the slaughtered animal.

<sup>3</sup> Animal by-products containing residues or a positive inhibitor test in accordance with Article 6 letter f may also be disposed of in a public sewage treatment plant or, in the case of milk or colostrum, discharged into a manure pit. If disposal by other means is not possible, the cantonal veterinarian may permit the milk or colostrum to be applied directly to agricultural land after dilution by at least a factor of 4, provided that this does not pose an excessive health risk to humans or animals.

#### **Art. 24 Disposal of Category 3 animal by-products**

<sup>1</sup> Animal by-products of Category 3 must be disposed of:

- a. in accordance with the methods for Category 2 by-products referred to in Article 23;
- b. by recovery in a biogas or composting plant;
- c. by utilisation as animal feed or for the production of fertiliser or of technical products in accordance with Article 35.

#### **Art. 26 Disposal of incineration and anaerobic digestion residues**

The disposal or **recycling of residues from incineration, biogas and composting plants** is in accordance with environmental protection and agricultural legislation, in particular the Waste Ordinance of 4 December 2015 (VVEA), the Ordinance of 22 June 2005 on the circulation of waste, the Chemical Risk Reduction Ordinance of 18 May 2005 and the Fertiliser Ordinance of 10 January 2001.

## **Production of fertilisers and technical products**

### **Art. 34a Production of fertiliser**

The requirements of **Annex 5, paragraph 39**, shall apply to the production of fertilisers.

*Chapter 5 describes the responsibility for disposal by the holder, the canton and cost bearing and is not elaborated here*

## **Measures in the event of an epidemic**

### **Art. 42 Principle**

Animal by-products must not be moved from areas or firms to animal health restrictions due to highly contagious diseases. In such cases, they may not be used as animal feed or for the production of fertiliser or technical products. Articles 43 and 44 are reserved.

## **Annex 1b**

Installations and firms for which a permit is required:

5. biogas and composting plants;
6. firms producing organic fertilisers and soil improvers;
8. Institutions storing animal by-products; for the storage of derived products, an authorisation shall only be required if they:
  - c. are intended for the production of organic fertilisers and soil improvers;

*Annex 3 contains requirements for biogas and composting plants and is not elaborated here*

## **Annex 5**

### **Processing methods for animal by-products**

#### **1 pressure sterilization**

- 11 The particle size of the raw material must not exceed 50 mm at the start of the sterilisation process. Larger parts are to be reduced in size mechanically. The effectiveness of the comminution must be checked and recorded. If the checks reveal particles of material with an edge length of more than 50 mm, the comminution process must be stopped and the equipment repaired before resuming operation.



12. The effect of sterilisation must be equivalent to heating to a core temperature of at least 133 °C at a pressure of 3 bar for 20 minutes.

### **3 Production of animal feed, fertilisers or technical products from Category 3 material**

#### **39 Processing into fertilizer without prior anaerobic digestion or**

##### **Composting**

- 391 By-products of categories 2 and 3 must be pressure-sterilised before processing into fertiliser according to Number 1.
- 392 When processed animal protein is used, the requirements of Number 30 shall apply to its production.
- 393 Category 3 starting material other than processed animal protein must be treated by one of the methods 1-7 set out in Chapter III of Annex IV to Regulation (EU) No 142/2011.
- 394 By way of derogation from point 393, aquatic animal by-products and invertebrate by-products, food waste, hides and skins, fur, hooves, horns, bristles, feathers and hair may be subjected to a heat treatment with a core temperature of 70 °C for at least one hour before further processing.

#### **4 Utilisation in biogas and composting plants**

- 41 Category 3 material must be pressure-sterilised before or in the course of processing in a biogas or composting plant in accordance with Number 1.
- 42 Products in accordance with Article 7 letters b-g that are placed in digesters of waste water treatment plants for co-digestion and whose residues are incinerated in accordance with the requirements of environmental legislation are exempt from the obligation to pressure sterilisation.
- 43 Category 3 material is exempt from the requirement for pressure sterilisation if it is subjected to a heat treatment with a core temperature of 70 °C for at least one hour at a maximum particle size of 12 mm before or in the course of anaerobic digestion or composting.
- 44 For milk, milk products and colostrum (Art. 7 let. d), the requirement for heat treatment in accordance with Number 43 also does not apply.
- 45 For feathers, liming with 2-5 per cent slaked lime is permissible instead of the heat treatment in accordance with Number 43.

- 46 The FSVO<sup>5</sup> may authorise other methods provided that a comparable hygienic effect has been demonstrated. The proof must include a risk assessment with regard to the danger posed by the feed material, a definition of the process conditions and a validation of the process. The validation must demonstrate that the following overall risk reduction is achieved:
- a. A reduction of 5 log<sub>10</sub> of *Enterococcus faecalis* or *Salmonella Senftenberg* (775W, H2S negative);
  - b. A reduction of at least 3 log<sub>10</sub> in the infectivity titer of thermoresistant viruses such as parvovirus whenever they are identified as a relevant hazard; and
  - c. for chemical processes, an additional reduction of resistant parasites such as *Ascaris* sp. eggs by at least 99.9 % (3 log<sub>10</sub>) of viable stages.

Ordinance on the Traffic of Waste (Verordnung über den Verkehr mit Abfällen [VeVA]) SR 814.610 of 22 June 2005 (status as of 1 January 2020)

**Art. 1 Purpose and scope**

<sup>1</sup>This Ordinance is intended to ensure that waste is only transferred to suitable disposal companies.

<sup>2</sup>It regulates:

- a. the national transport of special wastes and other wastes subject to control;
- b. cross-border traffic with all wastes;
- c. the movement of special wastes between third countries, provided that it is organised by companies in Switzerland or in which such companies are involved.

<sup>3</sup>It does not apply:

- a. to the movement of hazardous waste between formations of the armed forces or buildings and installations serving national defence;
- b. to sewage that may be discharged into the sewage system;
- c. radioactive waste that is subject to radiation protection or nuclear energy legislation;
- d. for animal by-products in accordance with the Ordinance of 23 June 2004 on the disposal of animal by-products [VTNP].

<sup>4</sup>Reserved are:

- a. Federal regulations and international agreements and decisions on the transport of dangerous goods by road, rail, water and air;
- b. provisions of the Explosives Act on the traffic in explosives.

**Art. 14**

<sup>1</sup>Exports of waste under the Basel Convention are permitted only to countries that:

- a. are members of the OECD or the EU; and

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<sup>5</sup> Federal Food Safety and Veterinary Office

b. are Parties to the Basel Convention or with which there is an agreement in accordance with Article 11 of the Basel Convention.

<sup>2</sup> Imports of Basel Convention wastes are only permitted from countries that are Parties to the Basel Convention or with which there is an agreement in accordance with Article 11 of the Basel Convention.

<sup>3</sup> Wastes in accordance with the Basel Convention are defined as:

- a. Hazardous waste;
- b. other wastes subject to control
- c. Other wastes that fulfil one of the following conditions:
  1. It belongs to a group as defined in Annex I to the Basel Convention and has a hazardous characteristic as defined in Annex III to the Convention.
  2. They are wastes listed in Annex II or VIII of the Basel Convention.
  - 3 They are wastes according to the OECD Council Decision's amber list of wastes.

DETEC<sup>6</sup> Ordinance on lists for the transport of waste SR 814.610.1, 18 October 2015 (Status as of 1 January 2018)

This Ordinance includes a list of waste with specific waste declaration.

#### **Sole Article**

<sup>1</sup>This Ordinance contains

- a. in Annex 1, the list of waste referred to in Article 2 [VeVA];
- b. in Annex 2, the list of disposal operations in accordance with Articles 12(2) and 15(3) of the VeVA;
- c. in Annex 3, the quantity thresholds for special wastes in accordance with Annex 1.1 Number 22 StFV.

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<sup>6</sup> Federal Department of the Environment, Transport, Energy and Communications

## **Annex 1**

### **Chapter 02**

Wastes from agriculture, horticulture, pond management, forestry, hunting and fishing, and the production and processing of foodstuffs

### **Chapter 19**

Wastes from waste treatment plants, public sewage treatment plants and the treatment of water intended for human consumption and water intended for industrial purposes

### **Chapter 20**

Municipal, industrial and commercial wastes (household and similar commercial, industrial and institutional wastes), including separately collected fractions

## **Annex 2**

### **Part B: Disposal operations qualifying as recovery**

The following disposal operations result in recovery, recycling or direct or alternative reuse of the waste:

R10 Land application for the benefit of agriculture or ecology

Submitted (not yet approved by the EC)

### 3. Soil-, water-, air quality and protection and renewable energies

#### Soil protection

*Ordinance on soil pollution (Verordnung über Belastungen des Bodens [VBBo]) SR 814.12 of 1 July 1998 (status as of 12 April 2016)*

The Swiss Federal Council,

Having regard to Articles 29, 33(2), 35(1) and 39(1) of the Environmental Protection Act of 7 October 1983 (USG)

decreed:

#### **Art. 1 Purpose and object**

In order to maintain soil fertility in the long term, this Ordinance regulates

- a. the observation, monitoring and assessment of chemical, biological and physical soil contamination
- b. measures to prevent sustainable soil compaction and erosion;
- c. the measures to be taken when dealing with degraded soil;
- d. the cantons' more far-reaching measures in the case of polluted soils (Art. 34 USG).

#### **Art. 2 Definitions**

<sup>1</sup> Soil is considered fertile if:

- a. the biologically active biocoenosis, soil structure, soil composition and thickness are typical for its location and it has undisturbed degradability
- b. natural and human-influenced plants and plant communities can grow and develop undisturbed and their characteristic properties are not impaired;
- c. the plant products are of good quality and do not endanger human and animal health;
- d. people and animals who directly ingest it are not endangered.

<sup>2</sup> Chemical soil pollution is the pollution of the soil by natural or artificial substances (pollutants).

<sup>3</sup> Biological soil pollution is pollution of the soil, particularly by genetically modified, pathogenic or alien organisms.

<sup>4</sup> Physical soil pollution is pollution of the soil by artificial changes to the structure, composition or thickness of the soil.

<sup>5</sup> Inspection values indicate, for certain types of use, loads on the soil which, if exceeded, may, according to the state of the art in science and experience, pose a concrete risk to humans, animals

or plants. They are used to assess whether restrictions on the use of the soil in accordance with Article 34 paragraph 2 USG are necessary.

**Art. 3, Art. 4, Art. 5** contain information on the duties of the federal and cantonal authorities to **monitor, control and assess soil contamination.**

**Art. 8 Cantonal measures in the event that the guideline values are exceeded (Art. 34 para. 1 USG)**

**Art. 9 Cantonal measures in the event that the inspection values are exceeded (Art. 34 para. 2 USG)**

**Art. 10 Cantonal measures in the event that the remediation values are exceeded (Art. 34 para. 3 USG)**

**Annex 1 Guidance, inspection and remediation values for anorganic compounds**

**1 Guidance, inspection und remediation values**

**11 Guidance values**

Table B65: Guidance values

Pollutants	Amount (mg/kg DM for soil up to 15 % humus, mg/dm <sup>3</sup> for soil above % humus)	
	Total amount	Soluble amount
Chromium (Cr)	50	–
Nickel (Ni)	50	0,2
Copper (Cu)	40	0,7
Zinc (Zn)	150	0,5
Molybdenum (Mo)	5	–
Cadmium (Cd)	0,8	0,02
Mercury (Hg)	0,5	–
Lead (Pb)	50	–
Fluorine (F)	700	20
DM = dry matter		

## 12 Inspection values

Table B66: Inspection values

Uses	Concentrations (mg/kg DM for soil up to 15 % humus, mg/dm <sup>3</sup> for soil above % Humus						Sampling depth (in cm)
	lead (Pb)		Cadmium (Cd)		Copper (Cu)		
	t	l	t	l	t	l	
Food crop cultivation	200	–	2	0,02	–	–	0–20
Forage crop cultivation	200	–	2	0,02	150	0,7	0–20
Usag with possible direct soil intake	300	–	10	–	–	–	0–5
DM = dry matter	l = soluble amount		t = total amount				
<sup>1</sup> oral, by inhalation, dermal							

Submitted (not yet approved by the EC)

### 13 Remediation values

Table B67: Remediation values

Category	Amount (mg/kg DM for soil up to 15 % humus, mg/dm <sup>3</sup> for soil above % humus)						Sampling dept (in cm)	
	lead (Pb)		Cadmium (Cd)		copper (Cu)		Zinc (Zn)	
	t	l	t	l	t	l	t	
Agriculture and horticulture	2000	—	30	0,1	1000	4	2000	50–20
Private gardening	1000	—	20	0,1	1000	4	2000	50–20
Children's playgrounds	1000	—	20	—	—	—	—	0–5
DM = dry matter	l = soluble amount	t = total amount						

### 2 Determination and assessment of pollutant levels

<sup>1</sup> A guideline value is exceeded if the soluble or total content of a pollutant in a representative mixed sample from the top 20 cm exceeds this value.

<sup>2</sup> A inspection value or a remediation value is exceeded if the soluble or total content of a pollutant in a representative mixed sample from the sampling depths specified in the tables in accordance with Number 1 exceeds this value.

<sup>3</sup> In justified cases, deviations may be made from these sampling depths.

<sup>4</sup> The soil samples are dried in circulating air of 40 °C up to weight constancy and sieved onto the grain fraction of 2 mm. For the conversion of the analysis results to the dry matter, representative subsamples are dried at 105 °C to weight constancy.

<sup>5</sup> For the determination of the total and soluble pollutant contents, the following table applies:



Table B68: Determination of the total and soluble pollutant contents

Parameter	Solvent	Ratio of weighted soil sample to solvent volume (w/v)
Heavy metals (total amount)	2 M nitric acid (HNO <sub>3</sub> )	1 : 10
Heavy metals (soluble amount)	0,1 M sodium nitrate (NaNO <sub>3</sub> )	1 : 2,5
Fluorine total	NaOH-melt	0,5 : 200
Fluorine soluble	Water extract	1 : 50

*w = weight, v = volume*

<sup>6</sup> For the conversion of the pollutant contents in soils with a humus content above 15% of mg/kg dry matter into mg/dm<sup>3</sup>, the weight-related contents are multiplied by the drying room weight.

Submitted (not yet approved by the EC)

## Annex 2

### Guidance, Inspection und Remediation values for organic pollutants in soil

#### 1 Guidance-, Inspection und Remediation values

##### 11 Values for dioxine and furanes (PCDD) (PCDF)

Table B69: Values for dioxine and furanes (PCDD) (PCDF)

Values	PCDD/F-concentrations <sup>1</sup> (ng I-TEQ/kg TS for soil up to 15 % humus, ng I-TEQ /dm <sup>3</sup> for soil above % Humus)	Sampling depth (in cm)
Guidance values	5	0–20
Inspection values		
Usage with possible direct soil intake	20	0–5
Food crop cultivation	20	0–20
Forage crop cultivation	20	0–20
Remediation values		
Children's playgrounds	100	0–5
Private gardening	100	0–20
Agriculture and horticulture	1000	0–20
I-TEQ= international toxicity equivalents	Dm = dry matter	
<sup>1</sup> PCDD/F = sum of polychlorited dibenzo-p dioxins and -furanes		
<sup>2</sup> oral, inhalation, dermal		

## 12 Values for polycyclic aromatic hydrocarbons (PAH)

Table B70: Values for polycyclic aromatic hydrocarbons (PAH)

Values	PAH <sup>1</sup> (mg/kg DM for soil up to 15 % humus, mg/dm <sup>3</sup> for soil above % humus)		Sampling depth (in cm)
	Sum of the 16 leading substances	Benzo(a)pyrene	
Guidance values	1	0,2	0–20
Inspection values			
Usage with possible direct soil intake <sup>2</sup>	10	1	0–5
Food crop cultivation	20	2	0–20
Remediation values			
Children's playgrounds	100	10	0–5
Private gardening	100	10	0–20
DM = dry matter			
<sup>1</sup> The values are valid for the 16 PAH-leading substances of EPA (Priority pollutants list): <i>Naphthaline, Acenaphthylene, Acenaphthene, Fluorene, Phenanthrene, Anthracene, Fluoranthene, Pyrene, Benzo(a)anthracene, Chrysene, Benzo(b)fluoranthene, Benzo(k)fluoranthene, Benzo(a)pyrene, Indeno (1,2,3-c,d)pyrene, Dibenzo(a,h)anthracene und Benzo(g,h,i)perylene</i>			
<sup>2</sup> oral, inhalativ, dermal			

### 13 Values for polychlorinated biphenyls (PCB)

Table B71: Values for polychlorinated biphenyls (PCB)

values	PCB-concentrations <sup>1</sup> (mg/kg DM for soil up to 15 % humus, mg/dm <sup>3</sup> for soil above % Humus)	Sampling depth (in cm)
Inspection values		
Usage with possible direct soil intake	0,1	0–5
Food crop cultivation	0,2	0–20
Forage crop cultivation	0,2	0–20
Remediation values		
Children's playgrounds	1	0–5
Private gardening	1	0–20
Agriculture and horticulture	3	0–20
Dm = dry matter		
<sup>1</sup> Sum of the 7 congeners according to IRMM (Institute for Reference Materials and Measurements), IUPAC-no. 28, 52, 101, 118, 138, 153, 180		
<sup>2</sup> oral, inhalation, dermal		

<sup>1</sup> A guideline, inspection or remediation value is exceeded if the pollutant content in a representative mixed sample from the sampling depths specified in the tables in accordance with Number 1 exceeds this value.

<sup>2</sup> In justified cases, deviations may be made from these sampling depths.

<sup>3</sup> The organic pollutants are extracted as completely as possible (total contents). The Federal Office issues recommendations on sample preparation and analysis.

<sup>4</sup> For the conversion of ng I-TEQ/kg dry matter into ng I-TEQ/dm<sup>3</sup> or from mg/kg dry matter to mg/dm<sup>3</sup> of the pollutant contents in soils with a residual content above 15 percent, the weight-related contents are multiplied by the dry space weight.

## Water protection and Quality

*Federal Act on the Protection of Waters (Waters Protection Act, WPA) SR 814 of 24 January 1991  
(Status as of 1 January 2022)*

### **Art. 1 Purpose**

The purpose of this Act is to protect waters against harmful effects. In particular it aims:

- a. to preserve the health of people, animals and plants;
- b. to guarantee the supply and economic use of drinking water and water required for other purposes;
- c. to preserve the natural habitats of indigenous fauna and flora;
- d. to preserve waters suitable as a habitat for fish;
- e. to preserve waters as an element of the landscape;
- f. to ensure the irrigation of agricultural land;
- g. to permit the use of waters for leisure purposes;
- h. to ensure the natural functioning of the hydrological cycle.

### **Art. 6 Principle**

1 It is prohibited to introduce into a body of water, either directly or indirectly any substances which may pollute it; the infiltration of such substances is also prohibited.

2 It is also prohibited to store or spread such substances outside a body of water if there is a genuine risk of water pollution.

## **Section 2 Treatment of Waste Water and Use of Farm Manure**

### **Art 12 Special cases in areas covered by public sewers**

1 Those responsible for waste water which does not meet the requirements laid down for discharge into the drainage system must subject such waste water to pre-treatment. Such pre-treatment shall be regulated by the cantons.

2 The cantonal authorities shall decide on the appropriate way to dispose of waste water which is not suited for treatment by a central water treatment plant.

3 Non-polluted waste water with permanent flow shall not be passed through a central waste water treatment plant either directly or indirectly. The cantonal authorities may authorise exceptions to this rule.

4 In a farm comprising a substantial stock of cattle or pigs, domestic waste water may be used agriculturally together with the liquid manure (Art. 14) provided that:

- a. residential or industrial buildings and their adjoining land are situated in an area classified as an agricultural zone or the communal authority is taking the necessary measures, particularly in the field of area planning, to classify the buildings and their adjoining land in an agricultural zone;
- b. storage capacity is sufficient for domestic waste water too and the waste water is used on land which is either owned or leased by the farm in question.

<sup>5</sup> If the residential or industrial buildings and their adjoining land in accordance with Art. 4 are not allocated to an agricultural zone within five years, domestic waste water must be discharged into the public sewers.

#### **Art. 14 Animal husbandry farms**

<sup>1</sup> All animal husbandry farms must attempt to balance their use of manure.

<sup>2</sup> Farm manure shall be used in agriculture and horticulture in an environmentally compatible way and according to the state-of-the-art.

<sup>3</sup> The farm must have storage facilities with a capacity for at least three months. However, the cantonal authorities may require a higher storage capacity for establishments situated in mountain areas or in areas with unfavourable climatic or special crop growing conditions. Lower storage capacities may also be authorised for buildings which are occupied by livestock for only short periods of time.

<sup>4</sup> A maximum of three livestock units of manure may be spread on 1 ha of agricultural land. If part of the farm manure is used outside the normal local farming area, the number of animals kept must be such that at least half the manure produced by the farm may be used on the agricultural land owned or leased.

<sup>5</sup> Farms that provide manure must record each delivery in the information system in

accordance with Article 165f of the Agriculture Act of 29 April 1998 [LwG].

<sup>6</sup> The cantonal authorities shall reduce the number of livestock units of manure permitted per hectare if the pollutant-bearing capacity of the soil, the altitude and topographical conditions so require.

<sup>7</sup> The Federal Council may authorise exceptions to the requirements for agricultural land in cases of:

- a. poultry and horse-stabling farms, as well as other already existing small or medium-sized animal husbandry farms;
- b. farms serving the public interest (waste recovery, research, etc.).

<sup>8</sup> One livestock unit of manure corresponds to the average annual production of liquid and solid manure by one cow weighing 600 kg.

#### **Soil Use and Measures applying to Waters**

##### **Art. 27 Soil use**

1 Soils shall be used according to the state of the art, in such a way that waters are not adversely affected in any way, in particular avoiding both washing away and leaching of fertilisers and plant treatment products.

2 The Federal Council may enact the necessary regulations.

#### **Art. 51 Advisory service on fertilisers**

The cantons shall ensure that an advisory service be set up for the enforcement of Articles 14 and 27.

*Waters Protection Ordinance (WPO) SR 814.201 of 28 October 1998 (Status as of 1 January 2020)*

#### **Art. 1 Purpose and principle**

1 This Ordinance shall facilitate the protection of surface and underground waters from harmful effects and enable their sustainable use.

2 For this purpose, all measures taken under this Ordinance must take account of the ecological goals for waters (**Annex 1**).

#### **Art. 2 Scope**

1 This Ordinance regulates:

- a. ecological goals for waters;
- b. requirements on water quality;
- c. disposal of waste water;
- d. disposal of sewage sludge;
- e. requirements for animal husbandry farms;
- f. protection of waters in terms of area planning;
- g. maintenance of appropriate residual flow;
- h. prevention and remediation of other harmful effects on waters;
- i. granting of federal contributions.

#### **Art. 9 Waste water of specific origin**

1 Polluted waste water occurring outside public sewers for which neither discharge into waters, nor infiltration, nor use combined with farm manure (Art. 12 para. 4 [GSchG]) is permitted must be collected in a cesspit which is regularly emptied with its contents being transferred to a central waste water treatment plant or facility for special treatment.

2 Waste water from processing farm manure, hydroponics and other horticultural methods must be used in an environmentally compatible manner and reused agriculturally or horticulturally according to the state of the art.

## **Disposal of Sludge**

### **Art. 18 Sludge disposal plan**

1 The cantons shall draw up a sludge disposal plan and bring it into line with the new requirements within the deadlines imposed by experts.

2 The disposal plan sets the following as a minimum:

1. how sludge from the central waste water treatment plants should be disposed of;
2. which procedures, including construction and modification of installations used for disposal of sludge, are required at what time.

3 The sludge disposal plan shall be accessible to the public.

### **Art. 19 Storage facilities**

1 Persons responsible for waste water treatment plants shall ensure that they can store the sludge until environmentally compatible disposal is guaranteed.

2 If sludge from a waste water treatment plant cannot be disposed of in an environmentally compatible manner at any time, the plant must have a storage capacities of at least two months.

### **Art. 21 Supply**

1 Persons responsible for central waste water treatment plants must keep a record of recipients of sludge, the amount supplied, type of disposal declared and time of supply and retain this information for at least ten years and make it available to the authorities on request.

4 They may only dispose of sludge other than as planned in the cantonal Sludge Disposal Plan with the agreement of cantonal authorities. If sludge is to be disposed of in another canton, the cantonal authorities shall consult the authorities of the receiving canton in advance.

## **Requirements for Animal Husbandry Farms**

### **Art. 23 Livestock units (LU)**

The calculation for converting the number of livestock on any enterprise into LU (Art. 14 para. 4 [GSchG]) is based on the quantity of manure produced by them annually. For one LU, this quantity is taken as containing a total of 105 kg of nitrogen and 15 kg of phosphorus.



#### **Art. 24 Normal local farming area**

1 The normal local farming area (Art. 14 para. 4 [GSchG]) is the agricultural land located within 6 km by road from the livestock buildings in which the farm manure is produced.

2 In order to take account of local farming conditions, the cantonal authorities may reduce or extend this limit by a maximum of 2 km.

#### **Art. 25 Exceptions to the requirements relating to agricultural land**

1 Farms that keep poultry or horses and farms serving the public interest need not have their own or leased agricultural land on which at least half of the farm manure accumulating in the enterprise can be used if it is guaranteed that the farm manure will be used by an organisation or another farm.

3 Farms serving the public interest (Art. 14 para. 7 let. b [GSchG]) are

- a. farms that serve experimental, research or development purposes (research institutes, university farms, performance testing institutions, insemination stations, etc.);
- b. pig farms that cover at least 25 per cent of the energy needs of pigs with food by-products that come from milk processing;
- c. pig farms that cover at least 40 per cent of the energy needs of pigs with food by-products that do not come from milk processing;
- d. pig breeding enterprises that cover at least 40 per cent of the energy needs of pigs with food by products that come both from milk processing and not from milk processing.

4 In mixed animal husbandry farms, the exception under paragraph 1 applies only to that part of the animal husbandry that fulfils conditions for granting an exception.

5 The cantonal authorities shall in each case grant an exception under paragraph 1 for a duration of five years at most.

#### **Protection for Waters in terms of Area Planning**

##### **Art. 29 Designation of water protection areas and determination of groundwater protection zones and areas**

1 When dividing their territory into water protection areas (Art. 19 [GSchG]), the cantons shall indicate those at particular risk and the other areas. Those described in **Annex 4 number 11** as at particular risk include:

- a. water protection area Au for the protection of exploitable underground waters;
- b. water protection area A<sub>0</sub> for the protection of water quality of surface waters if this is required to guarantee a specific use of a body of water;

- c. the area of contribution  $Z_U$  intended for the protection of water quality at existing and planned groundwater wells serving the public interest if the water is polluted by substances which are not sufficiently degraded or retained, or if there is a genuine risk of pollution by such substances;
- d. the area of contribution  $Z_O$  intended for the protection of water quality of surface waters if water is polluted by run-off of pesticides or nutrients.

2 They shall designate groundwater protection zones (Art. 20 [GSchG]) described in **Annex 4 number 12** in order to protect groundwater wells and groundwater recharge installations serving the public interest. They may designate groundwater protection zones even for planned wells and recharge installations serving the public interest, the locations of which and amount of withdrawals from which are established.

3 They shall designate the groundwater protection areas described in **Annex 4 number 13** (Art. 21 [GSchG]) in order to protect the underground waters planned for use.

4 They shall base their decisions on the designation of water protection areas and groundwater protection zones and areas on existing hydrogeological findings. If these are not sufficient, they shall ensure that the required hydro-geological investigations are conducted.

#### **Art. 30 Water protection maps**

1 The cantons shall draw up waters protection maps and adjust these as necessary.

The waters protection maps shall indicate as a minimum:

- a. water protection areas;
- b. groundwater protection zones;
- c. groundwater protection areas;
- d. groundwater outflow points, wells and recharge installations that are of significance for water supply.

2 The waters protection maps shall be accessible to the public. The cantons shall provide the Federal Office for the Environment (BAFU) and neighbouring cantons concerned with the waters protection maps and their annual modifications in digital form.

### **ANNEX 1**

#### **1 Surface waters**

1 The communities of plants, animals and micro-organisms in surface waters and the surroundings influenced by them shall:

- a. be close to nature and appropriate to the location as well as reproducing and regulating themselves;
- b. show a diversity and frequency of species that are specific to unpolluted or slightly polluted waters of the type in question.

<sup>3</sup> The water quality shall be such that:

- a. the temperature conditions are near-natural;
- b. the water, suspended matter and sediments contain no persistent synthetic substances;
- c. other potential water pollutants which could enter the water as a result of human activities,
  - do not accumulate in the plants, animals, micro-organisms, suspended matter or sediments,
  - do not have any harmful effects on the communities of plants, animals and micro-organisms and on the use of the water,
  - do not cause an unnaturally high production of biomass,
  - do not harm the biological processes that fulfil the basic physiological needs of plant and animal life, such as the metabolic processes, the re- productive processes and the olfactory orientation of animals,
  - occur in the body of water in concentrations that are within the range of natural concentrations where they are already present naturally,
  - occur in the body of water only in near-zero concentrations where they are not naturally present.

## 2 Underground waters

1 The biotic community of underground waters shall:

- a. be close to nature and appropriate to the location;
- b. be specific to unpolluted or only slightly polluted waters.

<sup>3</sup> The groundwater quality shall be such that:

- a. the temperature conditions are near natural;
- b. the water contains no persistent synthetic substances;
- c. other potential water pollutants which could enter the water as a result of human activities:
  - do not accumulate in the biotic community or in the inert matter of the aquifer,
  - occur in concentrations that are within the range of natural concentra- tions where these are already present in natural state groundwater,
  - do not occur in groundwater where they are not present naturally
  - have no harmful effects on the use of the groundwater.

## Annex 2

### Requirements on Water Quality

#### 1 Surface waters

##### 1.1 General requirements

1 The water quality must be such that:

- a. no visible colonies of bacteria, fungi or protozoa and no unnatural proliferation of algae or higher water plants are formed in any waters;
- b. fish-spawning grounds are preserved;
- c. after application of appropriate treatment, the water complies with requirements of the legislation on foodstuffs;
- d. groundwater is not contaminated by infiltration of water;
- e. the hygiene requirements for bathing are met at sites where bathing is expressly permitted by the authorities or where a large number of people normally bathe and the authorities do not advise against it;
- f. substances that enter waters as a result of human activities do not detrimentally affect the reproduction, development and health of sensitive plants, animals and microorganisms.

2 After waste water has undergone homogeneous mixing with the body of water the mixture must not result in:

- a. the formation of mud;
- b. any turbidity, discoloration or foam, except in the event of heavy rainfall;
- c. any noticeable alteration in the odour of the water in comparison with its natural state;
- d. any lack of oxygen or unfavourable pH values.

3 The following numerical requirements apply to every water flow after thorough mixing of the waste water discharged into the receiving waters; a reserve may be made for particular natural conditions such as water discharge from mires, rare high- water peaks or rare low-water events.

No	Parameter	Requirements
1	Nitrate ( $NO_3^- - N$ )	For waters which serve as a source of drinking water: 5.6 mg/l N (corresponds to 25 mg/l Nitrate)
2	Lead ( <i>Pb</i> )	0.01 mg/l Pb (total) <sup>a</sup> 0.001 mg/l Pb (dissolved)
3	Cadmium ( <i>Cd</i> )	0.2 µg/l Cd (total) <sup>a</sup> 0.05 µg/l Cd (dissolved)
4	Chromium ( <i>Cr</i> )	0.005 mg/l Cr (total) <sup>a</sup> 0.002 mg/l Cr (III and VI)
5	Copper ( <i>Cu</i> )	0.005 mg/l Cu (total) <sup>a</sup> 0.002 mg/l Cu (dissolved)
6	Nickel ( <i>Ni</i> )	0.01 mg/l Ni (total) <sup>a</sup> 0.005 mg/l Ni (dissolved)
7	Mercury ( <i>Hg</i> )	0.03 µg/l Hg (total) <sup>a</sup> 0.01 µg/l Hg (dissolved)
8	Zinc ( <i>Zn</i> )	0.02 mg/l Zn (total) <sup>a</sup> 0.005 mg/l Zn (dissolved)
9	Organic pesticides (biocidal and plant protection products)	0.1 µg/l per individual substance unless regulated otherwise below.

<sup>a</sup> The dissolved concentration is determinant. If the value specified for the total concentration is respected, it may be assumed that the value for the dissolved concentration is also respected.

Figure 5: Numerical requirements apply for every water flow

## 12 Additional requirements for watercourses

1 The water quality must be such that:

- a. no visible iron sulphide patches form in the channel bed, unless due to particular natural conditions;
- b. nitrite and ammonia concentrations do not interfere with the reproduction development and health of sensitive organisms, such as salmonidae.

2 The oxygen content on the channel bed must not be adversely affected by:

- a. increased oxygen consumption due to an unnatural excess of oxidisable substances;
- b. reduced permeability of the bottom resulting from unnaturally high sedimentation of fine particles (clogging) or artificial sealing.

No.	Parameter	Requirements
1	Biochemical oxygen demand ( <i>BOD<sub>5</sub></i> )	2 to 4 mg/l O <sub>2</sub> The lower value applies to waters which are naturally only slightly polluted.
2	Dissolved organic carbon ( <i>DOC</i> )	1 to mg/l C The lower value applies to waters which are naturally only slightly polluted.
3	Ammonium (sum of <i>NH<sub>4</sub><sup>+</sup> - N</i> and <i>NH<sub>3</sub> - N</i> )	at temperatures: – above 10 °C: 0.2 mg/l N – below 10 °C: 0.4 mg/l N

Figure 6: Additional requirements for water courses

### 13 Additional requirements for standing waters

- 1 The morphology and functions of the upper layers of sediments which are essential for providing the water quality required to preserve the communities of plants, animals and micro-organisms must not be durably altered by changes made to the terrain (e.g. dredging, movement of excavated material within the expanse of water, levelling or backfilling of banks, reinforcement of banks or creation of dikes).
- 2 The nutrient content should allow at most an average production of biomass; subject to particular natural circumstances.

## 2 Underground waters

### 21 General requirements

- 1 The concentration of substances in the groundwater for which requirements are specified in No 22 should not continually increase.
- 2 The quality of the groundwater must be such that it does not pollute surface water after exfiltration. Additional requirements for groundwater which is used for drinking water or is intended as such

### 22 Additional requirements for groundwater which is used for drinking water or is intended as such

- 1 The water quality must be such that after the use of basic water conditioning, it complies with the requirements of the foodstuff legislation.
- 2 The following numerical requirements apply, subject to the particular natural circumstances. For substances originating from polluted sites, these requirements do not apply in the downstream area where the greater part of these substances is degraded or retained.

No.	Parameter	Requirement
1	Dissolved organic carbon ( <i>DOC</i> )	2 mg/l C
2	Ammonium (sum of $\text{NH}_4^+$ - N and $\text{NH}_3$ - N)	In oxic conditions: 0.08 mg/l N (corresponds to 0.1 mg/l ammonium)  In anoxic conditions: 0.4 mg/l N (corresponds to 0.5 mg/l ammonium)
3	Nitrate ( $\text{NO}_3^-$ - N)	5.6 mg/l N (corresponds to 25 mg/l nitrate)
4	Sulphate ( $\text{SO}_4^{2-}$ )	40 mg/l $\text{SO}_4^{2-}$
5	Chloride ( $\text{Cl}^-$ )	40 mg/l $\text{Cl}^-$
6	Aliphatic hydrocarbons	0.001 mg/l per single substance
7	Monocyclic aromatic hydrocarbons	0.001 mg/l per single substance
8	Polycyclic aromatic hydrocarbons ( <i>PAH</i> )	0.1 $\mu\text{g/l}$ per single substance
9	Volatile organic halogens ( <i>VOX</i> )	0.001 mg/l per single substance
10	Adsorbable organic halogens ( <i>AOX</i> )	0.01 mg/l X
11	Organic pesticides (biocidal products and plant protection products )	0.1 $\mu\text{g/l}$ per single substance.

Figure 7: Additional requirements for groundwater used for drinking water or is intended as such

## Annex 4

### Planning the Protection of Waters

#### 1 Description of water protection areas at particular risk and determination of groundwater protection zones and areas

*This section defines the different protection areas as indicated in Art. 29 WPO and is not elaborated here.*

#### 2 Measures for the protection of waters

##### 21 Protection of areas particularly at risk

##### 212 Areas of contribution Zu and Zo

If, due to soil use, waters are polluted in the areas of contribution Zu and Zo by runoff and leaching of substances such as plant protection products or fertilisers, the cantons shall specify the measures required for waters protection. For example:

- a. restrictions of use for plant protection products and fertilisers specified by the cantons in accordance with Annexes 2.5 number 1.1 paragraph 4 and 2.6 number 3.3.1 paragraph 3 ChemRRV;
- b. limiting the areas for production of large crops and vegetables;
- c. limiting crop selection and rotation as well as farming techniques;
- d. refraining from ploughing grasslands in autumn;
- e. refraining from converting pasture into arable land;
- f. maintaining permanent plant cover on the soil in all circumstances;

- g. only using mechanical aids, techniques, equipment and cultural methods that are particularly adapted.

## **22 Groundwater protection zones**

### **221 Zone S3**

1 In Zone S3, the following are not permitted:

- a. industrial and commercial plants that place groundwater at risk;
- b. constructions that decrease the storage volume or the flow capacity of the aquifer; the authority may permit exceptions for good cause if a risk to drinking water sources can be excluded;
- c. infiltration of waste water, except for infiltration of non-polluted waste water from roof tops (Art. 3 para. 3 letter a) through a biologically active soil;
- d. substantial reductions in the protective covering (soil and protective layer);

2 The application of plant protection substances, wood protection substances, as well as fertilisers and similar products, is governed by Annexes 2.4 numbers 1, 2.5 and 2.6 ORRChem.

### **221bis Zone Sm**

1 The following are not permitted in Zone Sm:

2 The application of plant protection substances, wood protection substances, as well as fertilisers and similar products, is governed by Annexes 2.4 numbers 1, 2.5 and 2.6 ORRChem.

### **221ter Zone Sh**

1 In Zone Sh, the requirements of Number 221bis apply; in addition, the following are not permitted:

2 For the application of wood protection substances, plant protection substances and fertilisers, Annexes 2.4 numbers 1, 2.5 and 2.6 ORRChem apply.

- a. industrial and commercial plants that place groundwater at risk;
- b. building activities that have detrimental effects on the hydrodynamics of the groundwater;
- c. infiltration of waste water, with the exception of the infiltration of non-polluted waste water (Art. 3 para. 3) through a biologically active layer of soil and of polluted communal waste water from small treatment plants in compliance with the requirements of Article 8 paragraph 2, if the cost of discharging the communal waste water from the protection zone would disproportionate and a risk to drinking water sources can be excluded;
- d. substantial reductions in the protective covering (soil and protective layer);

### **221ter Zone Sh**

1 In Zone Sh, the requirements of Number 221bis apply; in addition, the following are not permitted:

- a. plants and activities that place groundwater at risk;



- b. the infiltration of waste water, with the exception of the infiltration of non-polluted waste water (Art. 3 para. 3) through a biologically active layer of soil.

<sup>2</sup> For the application of wood protection substances, plant protection substances and fertilisers, Annexes 2.4 numbers 1, 2.5 and 2.6 ORRChem apply.

### **222 Zone S2**

<sup>1</sup> In Zone S2, requirements in accordance with No 221 apply; in addition, subject to paragraphs 2 and 3, the following are not permitted:

- a. the construction of installations; the authorities may permit exceptions for good cause, provided there is no risk to the exploitation of drinking water;
- b. excavations that cause detrimental change to the protective covering (soil and protective layer);
- c. infiltration of waste water;
- d. other activities that place groundwater at risk.

<sup>2</sup> For the application of wood protection substances, plant protection substances and fertilisers, Annexes 2.4 numbers 1, 2.5 and 2.6 ORRChem apply.

### **223 Zone S1**

In Zone S1, the only construction work and other activities permitted are those connected with the supply of drinking water, except for the cutting of grass which is then left on site.

### **23 Groundwater protection areas**

<sup>1</sup> Construction work and other activities carried on in groundwater protection areas must comply with requirements set out in No 222 paragraph 1.

<sup>2</sup> If the position and the extent of the future outer protection zone (Zone S3) are known, the corresponding areas must comply with the requirements set out in No 221 paragraph 1.

*Ordinance of the FDHA on Drinking Water and Water in Publicly accessible bathrooms and shower facilities (TBDV) SR 817.022.11 of 16 December 2016 (as at 1 August 2021)*

### **Art. 3: Drinking water requirements**

<sup>1</sup> Drinking water must be inconspicuous in terms of odor, taste and appearance and must not constitute a health hazard in terms of the type and concentration of microorganisms, parasites and contaminants it contains.

<sup>2</sup> Drinking water must meet the minimum requirements specified in Appendices 1-3.

3 The operator of a drinking water supply system shall also periodically carry out an analysis of the hazards to water resources as part of the overall hazard analysis, taking into account the requirements of the Water Protection Act of 24 January 1991.

#### **Art. 9. Microbiological requirements**

Water intended for contact with the human body shall meet the microbiological requirements set out in Annex 5.

Annex 1

Microbiological requirements for drinking water (Table not shown)

Annex 2: Chemical requirements for drinking water (Table not shown)

Annex 3 Additional requirements for drinking water

Values for TOC and Turbidity among others

Air Protection

*Ordinance on Air Pollution Control (OAPC) SR 814.318.142.1 of 16 December 1985 (Status as of 1 January 2022)*

#### **Art. 1 Aim and scope**

1 This Ordinance is intended to protect human beings, animals and plants, their biological communities and habitats, and the soil against harmful effects or nuisance- es caused by air pollution.

2 It regulates:

- a. the preventive limiting of emissions from installations, as defined in Article 7 of the Act, which pollute the air;
- a bis. 2 open-air waste incineration;
- b. requirements for thermal and motor fuels;
- c. maximum permitted ambient air pollution levels (ambient limit values);
- d. the procedure in the event of excessive ambient air n levels.

#### **Annex 1**

##### **Inorganic substances in gaseous or vaporous form**

##### **Limit values**

The emission concentration of any of the substances listed in Number 62 must not

exceed the following values:

For a Class 1 substance	
at a mass flow of 10 g/h or more	1 mg/m <sup>3</sup>
For a Class 2 substance	
at a mass flow of 50 g/h or more	5 mg/m <sup>3</sup>
For a Class 3 substance	
at a mass flow of 300 g/h or more	30 mg/m <sup>3</sup>
For a Class 4 substance	
at a mass flow of 2500 g/h or more	250 mg/m <sup>3</sup>

## 62 Table of inorganic substances in gaseous or vaporous form

Substance	Class
Ammonia and ammonium compounds, expressed as ammonia	3
Arsine	1
Bromine and its gaseous or vaporous compounds, expressed as hydrogen bromide	2
Chlorine	2
Chlorine compounds, vaporous or gaseous inorganic chlorine compounds except cyanogen chloride and phosgene, expressed as hydrogen chloride	3
Cyanogen chloride	1
Fluorine and its vaporous or gaseous compounds, expressed as hydrogen fluoride	2
Hydrogen cyanide	2
Hydrogen phosphide	1
Hydrogen sulphide	2
Nitrogen oxides (nitrogen monoxide and nitrogen dioxide), expressed as nitrogen dioxide	4
Phosgene	1
Sulphur oxides (sulphur dioxide and sulphur trioxide), expressed as sulphur dioxide	4

Figure 8: Table of inorganic substances in gaseous or vaporous form

**The Ammonia limit value (Point 62) does not apply to stock rearing!**

## ANNEX 2

**Additional or different emission limitation requirements for particular installations**

### 5 Agriculture and foodstuffs

#### 53 Installations for rendering and for dung drying

##### 531 Definition and Scope

The provisions of this Number apply to:

1. rendering installations.
2. installations where animal carcasses, parts of animal carcasses, and products of animal origin are collected and stored for use or disposal in rendering installations;
3. installations for melting animal fats;
4. installations for producing gelatine, haemoglobin and animal feed products;
5. installations for dung drying.

### **532 Structural and operational requirements**

1 Processing installations and storage facilities where odours may develop shall be housed in closed rooms.

2 Strong-smelling flue gases shall be captured and fed into a flue gas purification system.

3 Raw and intermediate products shall be stored in sealed containers.

### **533 Relation to Number 81**

The provisions of Number 81 also apply to installations in which products are treated by direct contact with furnace flue gases.

### **7 Installations for incineration of biogenic waste and products of agriculture**

#### **741 Scope**

1 The provisions of this Number apply to installations in which solid biogenic waste and products of agriculture are incinerated or thermally decomposed alone or together with wood fuels as specified in Annex 5. Farmyard manure and other strong-smelling waste and products must not be either incinerated or thermally decomposed in such installations.

2 If such waste and products are incinerated together with waste as specified in Number 711 or Number 721, the provisions of Number 71 or Number 72 apply.

3 If such waste and products are incinerated together with other fuels as specified in Annex 5, the composite limit value specified in Annex 3 Number 82 applies.

4 The provisions of this Number do not apply to cement kilns (Number 11).

#### **742 Emission limit values**

Emissions must not exceed the following limit values:

		Rated thermal input		
		up to 1 MW	over 1 MW up to 10 MW	over 10 MW
– Reference value: The limit values are based on a flue gas oxygen content of				
	% (v/v)	13	11	11
– Total solids:	mg/m <sup>3</sup>	20	20	10
– Carbon monoxide (CO)	mg/m <sup>3</sup>	500	250	150

		Rated thermal input		
		up to 1 MW	over 1 MW up to 10 MW	over 10 MW
– Nitrogen oxides (NO <sub>x</sub> ), expressed as nitrogen dioxide (NO <sub>2</sub> ) <sup>1</sup>	mg/m <sup>3</sup>	250	250	150

<sup>1</sup> At a mass flow of 2500 g/h or more

Figure 9: Emission limit values

### 743 Prohibition on incineration in small installations

Solid biogenic waste and products of agriculture as specified in Number 741 must not be incinerated in installations with a rated thermal input of less than 70 kW.

### Renewable Energy

*Ordinance on the promotion of the production of electricity from renewable energy (Energy Promotion Ordinance, Energieförderungsverordnung, [EnEV]) of 1 November 2017 (status as of 1 January 2020)*

#### Art. 1 Scope

This ordinance regulates the promotion of the production of electricity from renewable energies, which is financed from the grid surcharge pursuant to Article 35 [EnG].

#### Art. 27 Management fee

Producers in the direct marketing sector receive a quarterly management fee from the enforcement authority in the amount of:

- 0.55 centimes for photovoltaic and wind energy plants;
- 0.28 centimes for hydroelectric plants;
- 0.16 centimes for waste incineration plants;
- 0.28 centimes for other **biomass plants**.

### Annex 1.5 Biomass facilities in the feed-in tariff system

This sub-chapter contains all information on biomass facilities.

[https://www.fedlex.admin.ch/eli/cc/2017/766/de#lv1\\_d4e191](https://www.fedlex.admin.ch/eli/cc/2017/766/de#lv1_d4e191)

#### 4. Common Agricultural Policy in the national law

Federal Constitution of the Swiss Confederation, SR 101 of 18 April 1999 (Status as of 13 February 2022)

##### **Art. 104 Agriculture**

1 The Confederation shall ensure that agricultural sector, by means of a sustainable and market oriented production policy, makes an essential contribution towards:

- a. the reliable provision of the population with foodstuffs;
- b. the **conservation of natural resources and the upkeep of the countryside;**
- c. decentralized population settlement of the country.

2 In addition to the self-help measures that can reasonably be expected in the agriculture sector and if necessary in derogation from the principle of economic freedom, the Confederation shall support farms that cultivate the land.

3 The Confederation shall organize measures in such a manner that the agricultural sector fulfills its multi-functional duties. It has in particular the following powers and duties:

- a. supplementing revenues from agriculture by means of direct subsidies in order to achieve of fair and adequate remuneration for the services provided, subject to proof of compliance with ecological requirements;
- b. encouraging by means of economically advantageous incentives methods of production that are specifically near-natural and respectful of both the environment and livestock;
- c. legislating on declarations of origin, quality, production methods and processing procedures for foodstuffs;
- d. protecting the environment against the detrimental effects of the excessive use of fertilizers, chemicals and other auxiliary agents;
- e. at its discretion, encouraging agricultural research, counselling and education and subsidies investments;
- f. at its discretion, legislating on the consolidation of agricultural property holdings.

4 For these purposes, the Confederation shall provide both funds earmarked for the agricultural sector and general federal funds.

##### **Art. 104a Food security**

In order to guarantee the supply of food to the population, the Confederation shall create the conditions required for:

1. safeguarding the basis for agricultural production, and agricultural land in particular;
2. food production that is adapted to local conditions and which uses natural resources efficiently;

3. an agriculture and food sector that responds to market requirements;
4. cross-border trade relations that contribute to the sustainable development of the agriculture and food sector;
5. using food in a way that conserves natural resources.

Federal Act on Agriculture (Agriculture Act, AgricA), SR 910.1 of 29 April 1998 (Status as of 1 March 2022)

## 1 General Principles

### Art. 1 Aim

The Confederation shall ensure that, through sustainable, market-orientated production, the agricultural sector makes a significant contribution towards:

- a. the reliable provision of the population with foodstuffs;
- b. preserving natural resources;
- c. the upkeep of the countryside;
- d. encouraging decentralized settlement;
- e. guaranteeing animal welfare.

### Art. 2 Federal measures

1 The Confederation shall take measures, in particular:

- a. to create favorable conditions for the production and sale of agricultural products;
- b.<sup>5</sup> **to pay for public and ecological services provided by farms through direct subsidies;**
- bis.<sup>6</sup> **to promote the sustainable use of natural resources and animal and climate friendly production;**
- c. to support the development of agriculture in a socially acceptable manner;
- d. to support structural improvements;
- e. to promote agricultural research and advisory services as well as plant and animal breeding;
- f. to regulate plant protection and **the use of aids to production**.

2 These federal measures are conditional on a reasonable degree of self-help and are coordinated with regional policy instruments.

<sup>3</sup> They support a joint strategy for quality in agriculture and the food industry.

<sup>4</sup> They are based on the principle of self-sufficiency with regard to food, taking into account consumers' needs for high-quality, varied and sustainable domestic products.

<sup>5</sup> Support measures that are likely to distort competition to the detriment of trade and industry are excluded. Procedures are governed by Article 89a. The Federal Council regulates the details.

### **Title 3 Direct Payments**

#### **Chapter 1 General Provisions**

Art. 70 Basic principle

<sup>1</sup> Farmers receive direct payments as compensation for the public services they provide.

<sup>2</sup> Direct payments include:

- a. subsidies for farmland;
- b. subsidies for ensuring supply;
- c. biodiversity subsidies;
- d. subsidies for the quality of the landscape;
- e. subsidies for production systems;
- f. subsidies for the efficient use of resources;**
- g. bridging subsidies.

<sup>3</sup> The Federal Council stipulates the level of subsidies, taking into account the extent of the public services provided the work involved in providing such services and the potential market yield.

#### **Art. 70a Requirements**

<sup>1</sup> Direct payments are made on condition that:

- a. the business is run as a farm;
- b. proof of ecological performance can be provided;
- c. agricultural production methods comply with the provisions of legislation on the protection of waters, the environment and animal welfare;
- d. the land farmed does not lie within a designated building zone that has been legally excluded under planning legislation after this provision comes into force;
- e. a minimum amount of labour on the farm in standard labour units is reached;
- f. a minimum amount of work is carried out by labour employed by the farm;
- g. the farmer is not over a certain age;
- h. the farmer has a qualification in agriculture.

#### **Title 3a Sustainable Use of Natural Resources**



### **Art. 77a Principle**

1 The Confederation shall within the limits of the approved credits provide subsidies to regional and branch specific projects aimed at improving sustainability in the use natural resources.

2 Subsidies are granted to the responsible agency provided:

1. the measures planned in the project are coordinated with each other;
2. the measures are expected to become self-supporting in the foreseeable future.

### **Art. 77b Level of subsidies**

1 The level of the subsidies is governed by the ecological and agronomic effect of the project, in particular the increase in efficiency when using substances and energy. The level amounts to a maximum of 80 per cent of the allowable costs of realizing the projects and measures.

2 If the Confederation simultaneously grants subsidies or compensatory payments under this Act or the Federal Act of 1 July 1966 on the Protection of Nature and Cultural Heritage or compensatory payments under the Waters Protection Act of 24 January 1991 for the same measures on the same area of land, these subsidies or compensatory payments shall be deducted from the allowable costs.

Ordinance on direct payments for agriculture (Direct Payment Ordinance, Direktzahlungsverordnung [DZV]) SR 910.13 of 23 October 2013 (status as of 1 January 2020)

### **Art. 1 Scope**

<sup>1</sup> This Ordinance lays down the conditions and the procedure for the payment of direct payments and determines the amount of the contributions.

<sup>2</sup> It shall determine the controls and administrative sanctions.

### **Annex 1**

#### **2 Equilibrated fertilizer balance**

##### **2.1 Nutrient balance**

**2.1.1** The nutrient balance must show that no excess nitrogen or phosphorus is used. The "Suisse balance sheet" method according to the "Suisse balance sheet" guidelines of the [FOAG] and the Swiss Association for the Development of Agriculture and Rural Areas (AGRIDEA) is used for the balance. The 1.14165 or 1.15166 requirement applies to the calculation of the nutrient balance of the calendar year 2018 and the requirement 1.15 for the calculation of that of the calendar year

2019. The [FOAG] is responsible for the approval of the software programs for the calculation of the nutrient balance.

**2.1.2** For the calculation of the nutrient balance, the data of the calendar year preceding the contribution year are decisive. The nutrient balance must be calculated annually. The completed nutrient balance of the previous year is decisive for the control.

**2.1.3** All shifts of farmyard and recycled fertilisers, into and out of agriculture and between farms must be recorded in the internet application HODUFLU in accordance with Article 14 [ISLV]. Only shifts of farmyard and recycled fertilisers recorded in HODUFLU are recognised for the fulfilment of the "Suisse balance". The canton cannot reject plausible nutrient contents. Upon request of the canton, the donor has to prove the plausibility of the stated nutrient contents at his or her expense.

**2.1.4** If buildings subject to approval are erected, which result in an expansion of the livestock population per hectare of fertilisable area, it must be demonstrated that with the new livestock population and after the inclusion of technical measures and the delivery of farmyard manure, a balanced phosphorus balance is achieved without a margin of error and is maintained to meet the ÖLN even after the construction of the buildings. The cantonal offices keep a list of the affected farms.

**2.1.5** The phosphorus balance of the completed nutrient balance may have an error range of no more than +10 per cent of the crop requirements for the whole farm. The cantons may prescribe stricter rules for certain areas and farms. Farms which provide proof that the soils are undersupplied by means of soil analyses in accordance with a recognised method of a recognised laboratory may claim a higher requirement if a fertilisation plan for the entire farm is included. Less intensively used meadows may not be fertilised. Reservations remain in paragraph 2.1.6.

**2.1.6** Farms which are located in an inflow area (Zo) which has been excluded by the canton in accordance with Article 29 paragraph 1 letter d of the Water Protection Ordinance of 28 October 1998 [GSchV] with regard to the phosphorus problem and which have a phosphorus self-sufficiency rate (quotient of nutrient production before farmyard manure levy and nutrient requirements of the crops) greater than 100 percent according to the "Suisse balance" may apply a maximum of 80 percent of the phosphorus requirement. If the holding proves by means of soil samples taken by the competent inspection authority that no agricultural parcel is in soil supply class D or E according to 2.2, the provisions of 2.1.5 apply. The cantons, in consultation with the [FOAG], define maximum dry matter yields for the nutrient balance in the various regions.

**2.1.7** The nitrogen balance of the completed nutrient balance may have a range of error of no more than + 10 per cent of the crop requirements in total. The cantons may stipulate stricter rules for certain areas and farms.

**2.1.8** The transfer of nutrients to the nutrient balance of the following year is in principle not possible. In viticulture and fruit growing, the distribution of phosphorus-containing fertilizers over several years is permitted. In other crops, phosphorus supplied to the farm in the form of compost and lime may be distributed over a maximum of three years. However, the nitrogen applied with these fertilisers must be fully taken into account in the nitrogen balance of the year of application.

**2.1.9** Farms which do not apply nitrogenous or phosphorous fertilisers are exempt from calculating the total nutrient balance of the holding if their livestock numbers per hectare of fertilisable area do not exceed the following values:

- a. in the valley zone: 2,0 livestock units of manure (DGVE)/ha;
- b. in the hilly area: 1,6 livestock units ( DGVE)/ha;
- c. in the mountain zone I: 1.4 livestock units per hectare;
- d. in mountain zone II: 1.1 livestock units ( DGVE/ha);
- e. in mountain zone III: 0.9 DGVE/ha;
- f. in mountain zone IV: 0.8 DGVE/ha.

**2.1.10** In special cases, e.g. on farms with special crops and animal husbandry independent of the soil, the cantons may require a nutrient balance even if the limits in 2.1.9 are not met.

**2.1.11** The dry matter yields for meadows and pastures according to Table 3 of the Guideline Suisse Balance are regarded as maximum values for the balanced fertilizer balance. If higher yields are claimed, they have to be proven with a yield estimate. The canton may reject implausible yield estimates. At the request of the canton, the applicant must prove the plausibility of the yield estimates or prove their burden.

**2.1.12** The linear correction according to additional module 6 and the import/export balance sheet according to additional module 7 of the "Suisse balance sheet" method according to section 2.1.1 must be completed between 1 April and 31 August of the year of contribution. The calculation period shall cover at least the ten preceding months. The completed linear correction or import/export balance sheet must be submitted to the cantonal enforcement office by 30 September of the contribution year.

## References

All legal documents cited in this report can be found under [www.fedlex.admin.ch](http://www.fedlex.admin.ch)

## NATIONAL LEGISLATION: UNITED KINGDOM

Compiled by Julia Tanzer and Ludwig Hermann (PROMAN)

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### 1. Fertilising products and fertilisation

Rules and requirements around manufacturing and marketing fertilisers in the UK are currently partially harmonised with the EU. This means there are two frameworks - a domestic framework and an EU framework - under which manufacturers can choose to market their products.

The domestic framework consists of

the Fertilisers Regulations 1991 (for Great Britain) and

the Fertiliser Regulations 1992 (for Northern Ireland).

These set out the requirements on the composition, nutrient content, marking, labelling and enforcement of material described as fertiliser, but do not include material designated as 'EC fertiliser' under the EU framework.

Fertilisers with a high nitrogen content are additionally subject to

the Ammonium Nitrate Materials (High Nitrogen Content) Safety Regulations 2003 (for Great Britain)

in Northern Ireland there are licensing requirements for ammonium nitrate under the Control of Explosives Precursors etc. Regulations (Northern Ireland) 2014.

The EU framework (Regulation (EC) No 2003/2003) allows qualifying fertilisers to be designated as 'EC fertilisers' and placed on the market across the EU. The key requirements of the EU framework are:

the 'manufacturer' must be established within the EU. Manufacturer' in the EU framework is defined as: 'the natural or legal person responsible for placing a fertiliser on the market; in particular a producer, an importer, a packager working for its own account, or any person changing the characteristics of a fertiliser, shall be deemed to be a manufacturer. However, a distributor who does not change the characteristics of the fertiliser shall not be deemed to be a manufacturer'

the designation of 'EC fertiliser' must only be used for fertilisers complying with the EU Regulation the fertiliser must be tested to the standards required by a laboratory approved in a list published by the European Commission

Current information is available under <https://www.agindustries.org.uk/sectors/fertiliser.html>.

If the UK leaves the EU without a deal, the current domestic framework allowing fertilisers to be sold in the UK will remain in place, as it is separate from the EU framework.

Continuing both regimes in parallel will provide the greatest continuity in the short-term, and would be the same as the existing requirements. Over time, the regulatory framework would then be reviewed and rationalised. However, there would be some implications for material labelled 'EC fertiliser' in accordance with the EU Regulation and sold in the UK:

- there would be a suitable time-limited adjustment period during which 'EC fertiliser' could be placed on the UK market as now, to ensure continued supply. Government will consult with industry as to how long this time period needs to be, but it is envisaged to be no more than two years. This would mean UK or EU manufacturers would not have to change their labels immediately
- there would be an option to use a new 'UK fertiliser' label for fertilisers placed on the UK market after we leave, in accordance with the EU Regulation as converted into UK law
- after the end of the time-limited adjustment period, fertilisers placed on the UK market would need to comply with the current domestic regime or with the requirements of the new 'UK fertiliser' regime

Government will publish a new list of laboratories approved to test to the standards required for the new 'UK fertiliser' label. The laboratories would need to meet the same requirements as they do now and test against the same standards as set out in the current EU Regulation.

There would be no material change for users of fertilisers. All fertilisers currently marketed in the UK could continue to be imported and marketed in the UK provided they met the requirements set out above. The same standards would continue to apply to fertiliser products.

Information regarding the use of nutrients, particularly spreading of N in compliance with the Nitrates Directive is provided under point 3 ff below.

## 2. Waste management

The Environmental Permitting (England and Wales) Regulations 2007 of 13 December 2007, last recast by The Environmental Permitting (England and Wales) Regulations 2016 of 11 December 2016, last amendment 8 January 2019

The Environmental Permitting Regulations contain provisions to obtain a (bespoke) Environment Agency Permit (bespoke) for the operation of facilities processing waste. Permits are administered by UK Environment Agency.

British Standards Institution Publicly Available Specification (BSI PAS) 110 - Producing quality anaerobic digestate

The BSI PAS 110 developed by The Waste and Resources Action Programme (WRAP) aims to remove the major barrier to the development of anaerobic digestate and its markets for digestion process outputs by creating an industry specification against which producers can verify that they are of consistent quality and fit for purpose.

BSI PAS 110 covers all anaerobic digestion (AD) systems that accept source-segregated biowastes. It specifies:

Controls on input materials and the management system for the process of anaerobic digestion and associated technologies

Minimum quality of whole digestate, separated fibre and separated liquor

Information that is required to be supplied to the digestate recipient

Producers can apply for end of waste criteria for digestate certified under BSI PAS 110, which will mean it can be spread on land without any environmental permit.

### 3. Ground and surface water quality, soil protection, air quality and climate/renewable energy

The Nitrate Pollution Prevention Regulations of 1 September 2008, recast by the Nitrate Pollution Prevention Regulations of 9 March 2015, last amendment 19 December 2016

The Nitrate Pollution Prevention Regulations transpose the Nitrate Directive (91/676/EEC) into national law. It authorises the Secretary of State for Environment, Food and Rural Affairs with the designation of nitrate vulnerable zones and their revision every four years to account for changes in water pollution. The current NVZs for 2017-2020 are shown in figure 10.

Farmers with land in new NVZs have to be informed in advance. For several restrictions a transitional period to reach compliance is granted.



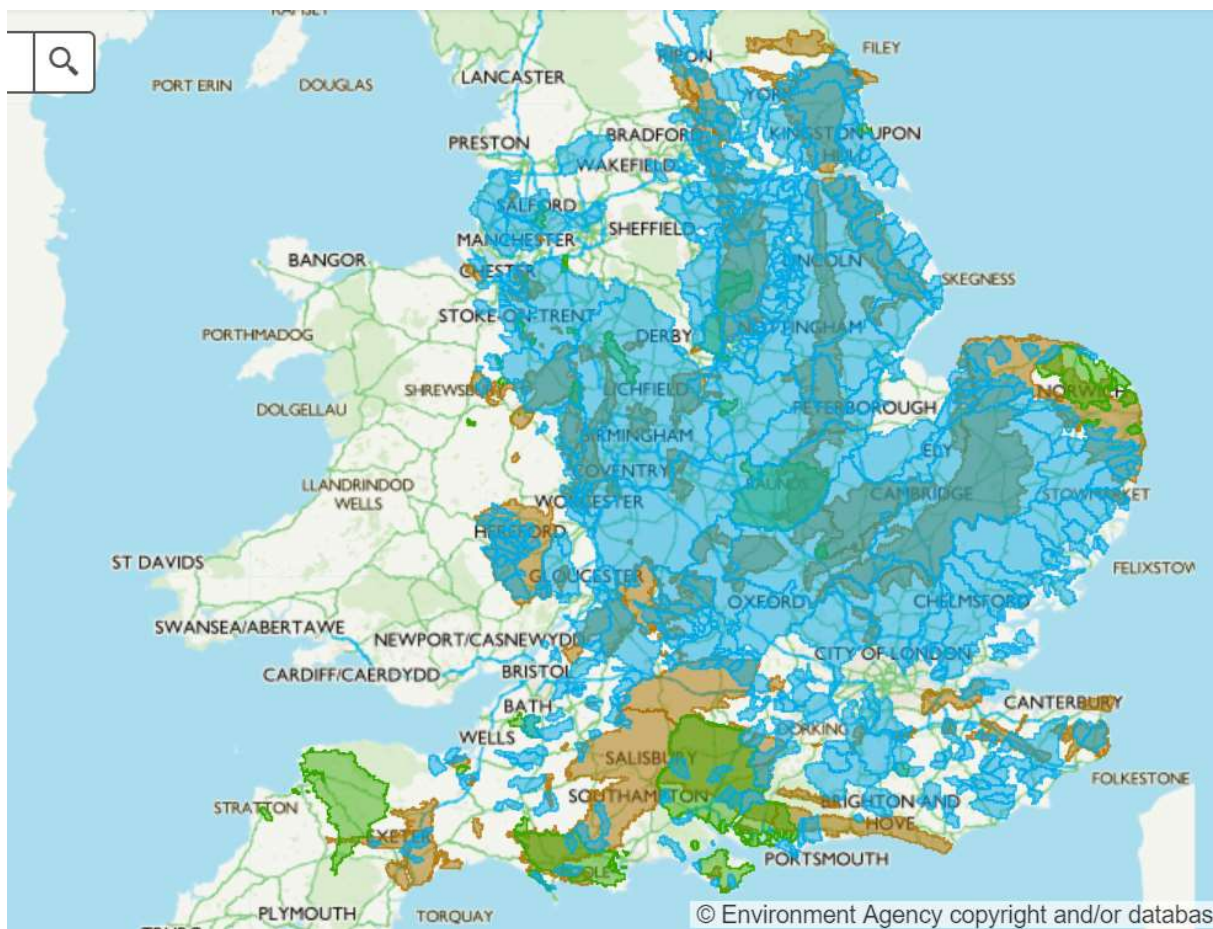


Figure 10: The current NVZs for 2017-2020

In designated NVZs the maximum rate of 170 kg/ha applies for N from livestock manure as an average loading limit across one holding. It includes manure deposited directly by grazing livestock. There is a separate field limit for organic manures (including livestock manure) of 250 kg/ha N spread in any 12 months period. Up to 500 kg/ha of certified green compost may be used every two years if worked into the ground.

A farmer can apply for a grassland derogation to increase the maximum rate of 170 kg/ha for N from livestock manure to 250 kg/ha if the nitrogen comes from grazing livestock manure. Derogations apply for one calendar year after which they have to be reapplied for.

All farmers must use standard values to work out how much nitrogen is produced by the livestock on a farm or bought on to a farm. Farmers must plan N-fertiliser use so that they don't exceed the limit. Planning includes calculating the amount of crop-available N and total N in manure, using the fertiliser manual or the information provided by the supplier. All records of fertiliser use have to be kept for at least 5 years. Records must include the fertilising plant encompassing crops, anticipated yields, calculated fertiliser need, months of manure application, crop N-requirement, etc.

The regulations specify limits on the average amount of manufactured fertiliser and crop-available nitrogen from organic manure that farmers can apply to most crops each year – this is known as the

N-max limit. However, there are a number of exceptions to these rules for designated crops and in case of expecting higher crop yields. On grassland for dehydration or chlorophyll production, up to 700 kg/ha N (irrigated, non-irrigated up to 500 kg N/ha) can be applied.

Nitrogen fertiliser must not be spread on land if there is a significant risk of nitrogen getting into surface water. When assessing the risk of runoff, farmers need to take account of:

- Land that's sloping, especially if the slope is over 12 degrees
- Ground cover provided by vegetation
- The distance to surface water
- Weather conditions
- The soil type and condition
- The presence of land drains

In any case, manufactured nitrogen fertilisers and manures can only be applied on agricultural land used to grow crops (including grass) and must be spread as accurately as possible. Farmers must not spread any manufactured fertilisers or organic manures if a field is either:

- Waterlogged, flooded, or covered in snow
- Frozen for more than 12 hours in the previous 24 hours

Furthermore, farmers must not spread:

- Manufactured nitrogen fertiliser within 2 metres of surface water
- Manufactured nitrogen fertilisers within a 2-metre zone from the centre of an established hedge (this only applies if farmers need to meet cross compliance requirements)
- Organic manure within 50 metres of a spring, well or borehole or 10 metres of surface water. However, slurry, sewage sludge, and anaerobic digestate can be spread up to 6 meters from surface water if manure spreading equipment like
  - Band spreaders (trailing hose or trailing shoe)
  - Shallow injectors (that inject no more than 10 cm below the surface)
  - Dribble-bar applicatorsare used.

An exception applies to the spreading of straw-based solid manure (such as farmyard manure) on land that is notified as a site of special scientific interest or managed under an agri-environmental scheme. This is permitted also within 10 metres of surface water if the following conditions are met:

- Managing the land for breeding wader birds
- The land is designated as a 'species-rich semi-natural grassland'

However, in that case, farmers must only spread between 1 June and 31 October and not

- Directly into surface water
- More than 12.5 tonnes per hectare each year

Apart from restrictions regarding the location of fertiliser application the regulations also define 'closed periods', during which the spreading of manufactured fertiliser and manure is prohibited:



- 'High readily available nitrogen manures' i.e. organic fertilisers with more than 30% of their total nitrogen content immediately available to crops such as poultry manure (layer manure and litter) and liquid organic manures (e.g. sludge, cattle and pig slurries, and anaerobic digestate) may not be spread during certain periods in autumn and winter depending on the type of soil (sand, other) and crop (grassland, tillage land). Exemptions:
  - If farmers sow a crop on sandy or shallow tillage land on or before 15 September, they can apply manures with high readily available nitrogen between 1 August and 15 September inclusive.
  - Organic farmers or farmers formally converting to organic status can spread 'high readily available nitrogen manures' in 'closed periods', provided spread amounts do not exceed 150 kg N/ha and regulations for specific crops and temporal distribution of fertilisation are met
- Manufactured nitrogen fertilisers must not be spread from 15 September (grassland) or 1 September (tillage land) to 15 January. However, for several crops limited amounts of manufactured nitrogen fertiliser can be applied during part of the 'closed period'.

Finally, the regulations contain provisions for the procedure of spreading of slurry and organic manure. Farmers must only spread slurry using precision spreading equipment or equipment that either:

- Has a low spreading trajectory (below 4 metres from the ground)
- Spreads slurry at a maximum rate of no more than 1 millimetre per hour when operating continuously

When farmers spread manure on bare soil or stubble (except if it's been sown with seed), they must:

- Work poultry manure, slurry and liquid-digested sludge into the soil (for example, by ploughing) as soon as it's practically possible to do so and within 24 hours at the latest
- Work any organic manure into the soil (unless it's been spread as mulch on sandy soil) as soon as possible and within 24 hours at the latest if the land is sloping and within 50 metres of surface water that could receive run-off from it

Farmers don't have to work in slurry and liquid-digested sludge if having applied it using a trailing hose, shoe band spreader, dribble bar applicator or an injector.

Inside greenhouses, glasshouses and polytunnels where the land is enclosed for the whole calendar year, farmers don't need to keep to limits on fertiliser use on land. Yet, if land is exposed to the open air at any time (for example, if farmers uncover a polytunnel) the limits apply for the whole of that year. Farmers don't need to keep records of your use of nitrogen fertilisers or the yield of arable crops in a greenhouse.

Similarly, low-intensity farmers don't have to keep a record of actual applications of manufactured fertiliser and organic manure in each field. However, they must keep proof of their meeting of the criteria for low intensity farms, which are the following:

- At least 80% of your land is grassland
- Farmers apply no more than 100kg of nitrogen per hectare per year as organic manure (including any nitrogen in manure deposited on the field by livestock)

- Farmers spread no more than 90kg of nitrogen per hectare per year as manufactured fertiliser
- Farmers don't bring any organic manure onto your holding

Moreover, they must still plan their nitrogen use by keeping a fertilisation plan. Areas, where no fertiliser is spread, or soil is not worked (e.g. rough grazing areas) must not be included in the calculation of fertiliser applications.

Energy Act 1976 of 22 November 1976, last amendment (recast) by the Energy Act 2016 of 12 May 2016

The Energy Act lays down the basis for the British renewable energy support scheme. It puts OFGEM, the Office of Gas and Electricity Markets, a non-ministerial government department and an independent National Regulatory Authority, in charge of the management of the regulative body. OFGEM publishes guidance documents and the annually adapted conditions for supplying renewable energy.

Furthermore, it contains definitions of biomethane and biomass: Biomethane is 'biogas which is **suitable for conveyance** through pipes to premises in accordance with a license under section 7 of the Gas Act 1986 (gas transport license)'. Biomass is 'material, other than fossil fuel or peat, which is, or is derived directly or indirectly from, plant matter, animal matter, fungi or algae' and includes sewage sludge.

The Renewable Heat Incentive Scheme Regulations 2011 of 27 November 2011, last amendment (recast) by The Renewable Heat Incentive Scheme Regulations 2018 of 21 May 2018

The Renewable Heat Incentive Scheme (RHI) for heat, power and biomethane is based on a combination of feed-in tariff, feed-in premium, quota, and tax regulation mechanism. It includes the production of power, biomethane and heat.

Payments according to the RHI scheme will be made for 20 years in the form of quarterly periodic support payments. Once an installation is accredited, a tariff level is assigned to the plant depending on its type and size. A table of RHI tariffs is updated and published on the RHI website annually, with the adjusted rates beginning on 1 April and ending on 31 March of the following year.

A degression mechanism is in place entitling OFGEM to reduce the tariffs in case the fixed annual budget is exceeded.

The following table shows the tariffs for different bio-based sources of energy.

Table B72: Tariffs for different bio-based sources of energy

Energy source and technology	Installation capacity	Tariff (GBX/kWh)
Biomass (incl. waste) <sup>1</sup>	all	Tier 1: 3.05 Tier 2: 2.14

New biomass CHP system	all	4.42
Biogas	< 200 kWth	4.64
Biogas	200 – 600 kWth	3.64
Biogas	> 600 kWth	1.36
Biomethane <sup>2</sup>		Tier 1: 5.60 Tier 2: 3.29 Tier 3: 2.53

1 Tier 1: heat generated by the installation at its installation capacity for the initial 1 314 h (capacity < 1 MWth, tariff start date before 20.09.2017) or 3 066 h (capacity < 1 MWth, tariff start date after 20.09.2017 and capacity > 1 MWth); Tier 2: further heat generated by the installation

2 Tier 1: first 40 000 MWh; Tier 2: second 40 000 MWh; Tier 3: amounts in excess of Tier 2

Feed-in tariffs for bio-based heat generation are considerably lower than for solar collectors (10.75 GBX/kWh) and ground source heat pumps (9.36 in Tier 1).

To receive support under the RHI, an eligible installation will have to be accredited. Accreditation (which is defined in the Regulations) is the term used to denote admission of an applicant to the RHI once OFGEM determines that the installation meets the eligibility criteria of the scheme and that the application for accreditation is properly made. Applicants may apply for preliminary accreditation allowing to forecast the eligibility for accreditation. Biomethane plants apply under a different scheme called registration. The following requirements have to be met:

- Regular self-reporting on feedstock sustainability including greenhouse gas (GHG) lifecycle emissions and land use criteria for biogas plants >1 MW<sub>th</sub> and biomethane producers. Waste biomass is deemed to meet the sustainability criteria
- Installation of permissible meters for measuring the volumes of heat, power and gas
- Independent report on metering arrangements (IRMA) for installations >1 MW<sub>th</sub>
- Air quality compliance by an RHI emission certificate or by an environmental permit
- Health and Safety Executive requirements on gas safety
- Detailed description of the process by which biogas is upgraded to biomethane suitable for conveyance

#### 4. Common Agricultural Policy in the national law

The Common Agricultural Policy (Agricultural Produce) (Protection of Community Arrangement) Order 1973 of 9 February 1973, last amended by the Common Agricultural Policy (Amendment) (No. 2) Regulations 2015 of 7 December 2015;

The Common Agricultural Policy Basic Payment and Support Schemes (England) Regulations 2014 of 8 December 2014, last amended 24 September 2018;

The Common Agricultural Policy (Competent Authority and Coordinating Body) Regulations 2014 of 8 December 2014;

The Common Agricultural Policy (Control and Enforcement, Cross-Compliance, Scrutiny of Transactions and Appeals) Regulations 2014 of 9 December 2014, last amended 30 April 2020

In order to qualify for full payment under the Basic Payment Scheme and other direct payments governed by the CAP, farmers must meet all cross-compliance requirements, including:

- The rules for nitrate vulnerable zones laid down in the Nitrate Pollution Prevention Regulations (known as Statutory Management Requirement 1).
- The Code of Good Agricultural Practice for nitrates if claiming direct payments other than those under the basic payment scheme (for example, agri-environment payments).

The Rural Payments Agency inspects a proportion of farmers who claim Basic Payment under the cross-compliance rules.

Protecting our Water, Soil and Air - A Code of Good Agricultural Practice for farmers, growers and land managers (CoGAP) 2009

The CoGAP offers practical interpretation of legislation and provides good advice on best practice. It has been written by technical specialists from Defra and Natural England.

Good agricultural practice means a practice that minimises the risk of causing pollution while protecting natural resources and allowing economic agriculture to continue. All farm staff and contractors on the farm who handle, store, use, spread or dispose of any substances that could pollute water, soil or air should be aware of their responsibilities and know about the causes and results of pollution. They should know how and when to operate and maintain the equipment they use and know what to do in an emergency.

The CoGAP provides an important point of reference, based around the main operations that farmers, growers and land managers might undertake; the advice covers activities carried out in the field, but also management plans, farm infrastructure and waste management.

On crop- and grassland under an Environmental or Countryside Stewardship agri-environment agreement outside an NVZ, requirements for fertiliser planning, accounts of nutrients available in soil, record keeping, limits of organic manure (250 kg N/ha) and closed periods (1 September to 15 January for cropland, 15 September to 15 January for grassland), as well as application and spreading rules also apply, albeit less strict as in NVZs.

Sewage sludge in agriculture: code of practice of 23 May 2018

The sewage sludge code of practice is for anyone in England, Wales and Northern Ireland who produces, supplies, or uses sewage sludge. Owners or managers of farmland where it is used should also read this guidance. It helps to make sure that when farmers produce, supply, or use sewage sludge they:

- Follow good agricultural practice
- Maintain the long-term viability of the soil
- Avoid public nuisance and water pollution

- Protect human, animal and plant health

Thermophilic or mesophilic digestion is one of the recommended treatments of sewage sludge for reducing pathogens. It allows sludge spreading (untreated sludge must be injected or worked into the soil).

#### Agriculture Act 2020 of 11 November 2020

The Agriculture Act 2020 provides the framework for the transition from the CAP to the new agricultural policy after Brexit. The period for transition currently extends to 2027 but the act gives the Secretary of State for Environment, Food and Rural Affairs power to extend this period. During the period of transition, payments under the CAP will be replaced by the concept of public money for public goods (environmental land management scheme; ELMS). Direct payments will be phased out by the end of the period.

The Secretary of State may give financial assistance for or in connection with any one or more of the following purposes

- managing land or water in a way that protects or improves the environment
- supporting public access to and enjoyment of the countryside, farmland or woodland and better understanding of the environment
- managing land or water in a way that maintains, restores or enhances cultural or natural heritage
- managing land, water or livestock in a way that mitigates or adapts to climate change
- managing land or water in a way that prevents, reduces or protects from environmental hazards
- protecting or improving the health or welfare of livestock
- conserving native livestock, native equines or genetic resources relating to any such animal
- protecting or improving the health of plants
- conserving plants grown or used in carrying on an agricultural, horticultural or forestry activity, their wild relatives or genetic resources relating to any such plant
- protecting or improving the quality of soil
- starting, or improving the productivity of, an agricultural, horticultural or forestry activity
- supporting ancillary activities carried on, or to be carried on, by or for a producer.