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AMENDMENT OF THE UE LEGISLATION ON BIOWASTE MANAGEMENT

Due to constant increase of the biowaste production amendment of UE law is required. In 2000, the third working document on sludge application and in 2001 the second working document on biological treatment of biowaste were published. The sludge directive limits the permissible values for heavy metal concentration as well as introduces the monitoring of organic pollutants. In the biowaste directive composting or anaerobic treatment of separately collected biowaste that is not recycled with the application of compost or digestate for agricultural is proposed. The document defines the list of biowaste for biological treatment, sanitation requirements, environmental quality classes for compost and stabilized biowaste, sampling frequency and methods for analysis and sampling, general requirements for biological treatment plants and general requirements for biogas use. Currently, a connection of those documents with Thematic Strategy on the Prevention and Recycling of Waste is planned.

1. INTRODUCTION

Biowaste is mainly biodegradable municipal waste collected by local authorities from households, some businesses, parks and waste from industry such as food processing and sewage sludge from wastewater treatment plant. Pursuant to Article 5(1) of the Directive Member States must set up a national strategy for the implementation of the reduction of biodegradable waste going to landfills not later than 16 July 2003 and notify the Commission of this strategy. Article 5(2) requires the reduction of biodegradable municipal waste going to landfills to 35% by 16 July 2016. Unfortunately, the amounts of biodegradable waste going to landfills still increase [1]. EU proposed amendment of Directive 86/278/EEC on environmental protection, in particular soil, when sewage sludge is applied in agriculture and new directive on biological treatment of biowaste.

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2. WORKING DOCUMENT ON SLUDGE, 3RD DRAFT ENV.E.3/LM (27 APRIL 2000)

In 2000 the third working document on sludge was published. The document lays down limit values of heavy metals in the soil (Annex II), in sludge (Annex III) and the maximum annual quantities of heavy metals which may be introduced into the soil (Annex V), determines the limit values for concentration of organic compounds and dioxins in sludge for use of land (Annex IV) and sampling frequency (Annex VI).

It has been found that it will be necessary to broaden the scope of the existing regulations and include the management of sludge in outlets as silviculture, green areas and reclaimed land. Sludge should be used on land when there is agronomic interest for the crops or soil quality can be improved without prejudice to other relevant legislation, in particular Directive 91/676/EEC on nitrates. The use of sludge should be carried out in such a way as to minimize the risk of negative effect to human, animal and plant health; the quality of groundwater and/or surface water; the long-term quality of the soil, and bio-diversity. It has been stressed that sludge should not be used in the forest; however, Member States may allow the use sludge in plantations for growing energy crops and for re-forestation purposes without prejudice to Article 4 of Directive 75/442/EEC.

The working document determined also the use of sludge in the soil where the concentration of heavy metals and organic compounds exceeds the limit values (tables 1, 2, 3, 4); possibility of using sludge on land (table 5) and medium and long-term targets for reduction of heavy metals in sludge for use on land (table 6).

Table 1

Limit values for concentration of heavy metals in soil

Elements	Limit values (mg/kg d.m.)			
	Directive 86/278/EEC 6 < pH < 7	5 < pH < 6	6 < pH < 7	pH > 7
Cd	1-3	0.5	1	1.5
Cr	-	30	60	100
Cu	50-140	20	50	100
Hg	1-1.5	0.1	0.5	1
Ni	30-75	15	50	70
Pb	50-300	70	70	100
Zn	150-300	60	150	200

Sludge should not be used for soils whose pH is less than 5.0; for water saturated, flooded, frozen or snow-covered ground. Sludge should be spread in such a way as not to cause sludge run-off and to minimize soil compaction as well as the production of aerosols.

Table 2

Limit values for concentration of heavy metals in sludge for use on land

Elements	Limit values (mg/kg d.m.)			Limit values (mg/kg P) ¹
	Directive 86/278/EEC	Proposed	Decree of Environmental Ministry (1 August 2002) on sewage sludge	Proposed
Cd	20–40	10	10–50	250
Cr	–	1 000	1500–2500	25 000
Cu	1 000–1 750	1 000	800–2000	25 000
Hg	16–25	10	5–25	250
Ni	300–400	300	100–500	7 500
Pb	750–1 200	750	500–1500	18 750
Zn	2 500–4 000	2 500	2500–5000	62 500

¹ The sludge producer may choose to observe either the dry matter or the phosphorus related limit values.

Table 3

Limit values for concentration of organic compounds and dioxins in sludge for use on land

Organic compounds	Limit values (mg/kg d.m.)
AOX ¹	500
LAS ²	2 600
DEHP ³	100
NPE ⁴	50
PAH ⁵	6
PCB ⁶	0.8
Dioxins	Limit values (ng TEQ/kg d.m.)
PCDD/F ⁷	100

¹ Sum of halogenated organic compounds.

² Linear alkylbenzene sulphonates.

³ Di(2-ethylhexyl)phthalate.

⁴ It comprises nonylphenol and nonylphenolethoxylates with 1 or 2 ethoxy groups.

⁵ Sum of the following polycyclic aromatic hydrocarbons: acenaphthene, phenanthrene, fluorene, loulanthene, pyrene, benzo(b+j+k)fluoranthene, benzo(a)pyrene, benzo(ghi)perylene, indeno(1, 2, 3-c, d)pyrene.

⁶ Sum of the polychlorinated biphenyls components number 28, 52, 101, 118, 138, 153, 180.

⁷ Polychlorinated dibenzodioxins/ dibenzofuranes.

In the working document, information requirements for receiver and producer of the sludge were also specified. Codes of good practice for the use of sludge in the different outlets were also proposed.

Table 4

Limit values of heavy metals which may be added annually to soil, based on ten year average

Elements	Limit values (g/ha/y)	
	Directive 86/278/EEC	Proposed
Cd	150	30
Cr	–	3 000
Cu	12 000	3 000
Hg	100	30
Ni	3 000	900
Pb	15 000	2 250
Zn	30 000	7 500

Table 5

Possibility of using sludge on land

	Advanced treatment	Conventional treatment
Pastureland	Yes	Yes, deep injection and no grazing in the six following weeks
Forage crops	Yes	Yes, no harvesting in the six following weeks
Arable land	Yes	Yes, deep injection or immediate ploughing down
Fruit and vegetable crops in contact with the ground	Yes	No. No harvest for 12 months following application
Fruit and vegetable crops in contact with ground eaten raw	Yes	No. No harvest for 30 months following application
Fruit trees, vineyards, tree plantations and reforestation	Yes	Yes, deep injection and no access to public in 10 months following spreading
Parks, green areas, city garden, all urban areas where the general public has access	Yes, only well stabilized and odourless sludge	No
Forestes	No	No
Land reclamation	Yes	Yes, no access to public in 10 months following spreading

Document emphasized that a very important element in a global strategy to ensure the long-term availability for the beneficial use of sludge would be to reduce pollution of wastewater. It was proposed to draw up plans for reducing the amount of potentially hazardous substances, materials, elements or compounds that end up in the sewer, and therefore in sewage sludge.

Table 6

Medium and long-term targets for reduction of heavy metals in sludge for use on land

Elements	Medium term (about 2015)		Long term (about 2025)	
	Limit values for concentration of heavy metals in sludge for use on land (mg/kg d.m.)	Limit values for concentration of heavy metals which may be added annually to soil, based on a ten year average (g/ha/y)	Limit values for concentration of heavy metals in sludge for use on land (mg/kg d.m.)	Limit values for concentration of heavy metals which may be added annually to soil, based on a ten year average (g/ha/y)
Cd	5	15	2	6
Cr	800	2 400	600	1 800
Cu	800	2 400	600	1 800
Hg	5	15	2	6
Ni	200	600	100	300
Pb	500	1 500	200	600
Zn	2 000	6 000	1 500	4 500

3. WORKING DOCUMENT ON BIOLOGICAL TREATMENT OF BIOWASTE – 2ND DRAFT ENV.A.2/LM (12 FEBRUARY 2001)

The second draft of the working document on biological treatment of biowaste was published in 2001. The objectives of the document were: to promote the biological treatment of biowaste; to protect the soil and to ensure that the use of treated and untreated biowaste results in benefit to agriculture or ecological improvement; to ensure that human, animal and plant are not affected by the use of treated and untreated biowaste; to ensure the functioning of the internal market and to avoid obstacles to trade and distortion and restriction of competition within the Community. Biowastes suitable for biological treatment were listed in Annex I of that document. There are several general principles in order to improve biowaste management, i.e.:

- the prevention or reduction of biowaste production (e.g., sewage sludge) and its contamination by pollutants,
- the reuse of biowaste (e.g., cardboard),
- the recycling of separately collected biowaste into the original material (e.g., paper and cardboard) whenever environmentally justified,
- the composting or anaerobic digestion of separately collected biowaste that is not recycled into the original material, with the utilisation of compost or digestate for agricultural benefit or ecological improvement,
- the mechanical/biological treatment of biowaste,
- the use of biowaste as a source for generating energy.

Working document includes several proposals for biowaste composting like home composting, on-site composting and anaerobic digestion and community composting.

Separate collection is promoted. Member States shall set up separate collection schemes, where they are not already in place. The following biowaste shall be separately collected: food waste from private households; food waste from restaurants, canteens, schools and public buildings; biowaste from markets; biowaste from shops, small businesses and service undertakings; biowaste from commercial, industrial and institutional sources unless used on site. It was also found that although paper and cardboard waste are biodegradable they should be, when practicable, recycled.

The separate collection schemes shall be organised in such a way that any nuisance – caused in particular by odours, insects, rodents, dust and noise – is minimised during collection, transport and treatment and shall cover:

- urban agglomerations of more than 100 000 inhabitants within three years;
- urban agglomerations of more than 2 000 inhabitants within five years.

It was recognized that in order to minimize amount of municipal waste, a dispose of shredded biowaste to the sewer should be prohibited. The amount and contamination of residual municipal waste should be reduced to the minimum possible level via the separate collection of municipal waste fraction such as biowaste, packaging, paper and cardboard, glass, metals and hazardous waste.

Table 7

Environmental quality classes for compost and stabilised biowaste

Parameter	Compost/digestate*		Stabilised bio-waste*
	Class 1	Class 2	
Cd (mg/kg d.m.)	0.7	1.5	5
Cr (mg/kg d.m.)	100	150	600
Cu (mg/kg d.m.)	100	150	600
Hg (mg/kg d.m.)	0.5	1	5
Ni (mg/kg d.m.)	50	75	150
Pb (mg/kg d.m.)	100	150	500
Zn (mg/kg d.m.)	200	400	1500
PCBs (mg/kg d.m.)**	–	–	0.4
PAHs (mg/kg d.m.)**	–	–	3
Impurities >2 mm	<0.5%	<0.5%	<3%
Grave and stones > 5 mm	<5%	<5%	–

* Normalised to an organic matter content of 30%.

** Threshold values for these organic pollutants to be set according to the Sewage Sludge Directive.

It was established that only treated biowaste shall be allowed to be spread on land, except for those untreated biowastes specifically mentioned in Annex I and for vegetable plant waste generated and remaining on agricultural or forest land. Whenever justified for ensuring a higher level of environmental protection or for improving the quality and characteristics of the soil, the competent authority shall decide, on a case-

by-case basis, on lower or higher maximum allowable quantities than specified in table 7. Compost or digestate of class 1 shall be used according to best agronomic practice without any specific restriction. Compost or digestate of class 2 shall be used in a quantity not exceeding 30 t d.m./ha on a three-year average. The use of stabilised biowaste shall be allowed on condition of not being repeated on the same areas for at least 10 years and for a total quantity not exceeding 200 t d.m./ha.

It was established that composting process should be carried out under thermophilic conditions with a high level of biological activity, favourable humidity and nutrients contents as well as an optimum structure and optimum air conduction over a period of several weeks (table 8). However anaerobic digestion process shall be carried out in such a way that a minimum temperature of 55 °C is maintained over a period of 24 hours without interruption and that the hydraulic dwell time in the reactor is at least 20 days.

Table 8

Conditions of biowaste composting process

	Temperature	Treatment time	Turnings
Windrow composting	≥ 55 °C	2 weeks	5
Windrow composting	≥ 65 °C	1 week	2
In-vessel composting	≥ 60 °C	1 week	N/A

4. SUMMARY

In 2003, the decision about joining amended Sludge Directive and proposal of Biowaste Directive in the Thematic Strategy for Soil Protection were taken, and then annulled in 2005. Currently, the documents will be introduced to Thematic Strategy on the Prevention and Recycling of Waste.

After analyzing the report on the national strategies for the reduction of biodegradable waste going to landfills [4], pursuant to article 5(1) of directive 1999/31/ec on the landfill of waste the Commission affirmed that there is no one good strategy for biowaste management. Therefore Commission will propose including biological treatment of biowaste in IPPC Directive. Moreover, in 2007, the changes in directive 86/278/EEC will be propose.

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- [2] Working document on sludge, 3rd draft ENV.E.3/LM (27 April 2000)
- [3] Working document on biological treatment of biowaste, 2nd draft ENV.A.2/LM (12 February 2001).
- [4] COM(2005) 105 – Report from the Commission to the Council and European Parliament on the national strategies for the reduction of biodegradable waste going to landfills pursuant to article 5(1) of Directive 1999/31.EC on landfill of waste.

NOWELIZACJA PRAWA UE DOTYCZĄCEGO ZAGOSPODAROWANIA ODPADÓW
ULEGAJĄCYCH BIODEGRADACJI

Stale wzrastająca ilość wytwarzanych odpadów ulegających biodegradacji wymusza nowelizację prawa europejskiego dotyczącego ich zagospodarowania. W 2000 r. został ogłoszony trzeci projekt dokumentu roboczego w sprawie stosowania osadów ściekowych, a w 2001 r. – drugi projekt dokumentu roboczego dotyczący biologicznej przeróbki odpadów ulegających biodegradacji. Proponowane zmiany w dyrektywie osadowej to przede wszystkim zastrzeżenie wymagań odnośnie do zawartości metali ciężkich oraz wprowadzenie monitorowania zanieczyszczeń organicznych. Dyrektywa w sprawie odpadów ulegających biodegradacji proponuje kompostowanie lub stabilizację beztlenową selektywnie zebranych odpadów, które nie podlegają recyklingowi, z wykorzystaniem kompostu lub odpadu przefermentowanego w rolnictwie. Określa listę odpadów ulegających biodegradacji odpowiednich do obróbki biologicznej, wymagania sanitarne, środowiskowe klasy jakości dla kompostu i stabilizowanych odpadów, metody analiz i pobierania prób oraz ogólne wymagania dla instalacji biologicznej obróbki odpadów i wymagania dla użycia biogazu. Obecnie planowane jest włączenie tych dokumentów do przygotowywanej strategii tematycznej w sprawie zapobiegania powstawaniu odpadów i ich recyklingu.