Baltic Marine Environment Protection Commission

Fifth Meeting of the Working Group on Reduction of Pressures from the Baltic Sea Catchment Area

PRESSURE 5-2016

Warsaw, Poland, 25-27 October 2016

Document title	Draft HELCOM Recommendation on Sewage Sludge Handling
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Agenda Item	6 - Draft HELCOM Recommendation on sewage sludge handling
Submission date	19.10.2016
Submitted by	Secretariat
Reference	Outcome of PRESSURE 4-2016, paras 5.1-5.5, Annex 2; Outcome of HOD 50-2016, paras 4.78-4.79

Background

PRESSURE 4-2016 elaborated and agreed on the new version of the draft HELCOM Recommendation on Sewage Sludge Handling, taking note of the study reservations by Germany and Poland (Outcome of PRESSURE 4-2016, paras 5.1-5.5, Annex 2).

Considering the draft HELCOM Recommendation on Sewage Sludge Handling, HOD 50-2016 took note of the study reservations by Germany and Poland as well as by Sweden and welcomed that Germany would provide a suggestion for improving the text of the document within three weeks after HOD 50-2016. The meeting also invited Poland to clarify her position as soon as possible.

HOD 50-2106 requested PRESSURE 5-2016 to consider the further elaborated draft of the Recommendation.

This document contains a version of the draft Recommendation updated by Germany. The document also integrates comments by Poland and minor clarifications by the Secretariat.

Comments received from Finland on 18 October 2018 are also incorporated in this document.

Action requested

The Meeting is invited to consider the updated draft Recommendation on Sewage Sludge Handling and to elaborate the document for further consideration at the meeting of Heads of Delegation.

Draft HELCOM Recommendation on Sewage Sludge Handling

HELCOM Recommendation xx/yy

[Adopted XXXXX]
having regard to Article 20, Paragraph 1 b) of the Helsinki Convention

SEWAGE SLUDGE HANDLING

THE COMMISSION,

CONSCIOUS of the sensitivity of the Baltic Sea area and its marine environment to the introduction of nutrients and, subsequently, the need to prevent pollution from land-based sources,

RECALLING Paragraph 1 of Article 6 of the Convention on the Protection of the Marine Environment of the Baltic Sea Area, 1992 (Helsinki Convention), in which the Contracting Parties undertake to prevent and eliminate pollution of the Baltic Sea Area from land-based sources,

HAVING REGARD also to Article 3 of the Helsinki Convention, in which the Contracting Parties shall individually or jointly take all appropriate legislative, administrative or other relevant measures to prevent and abate pollution in order to promote the ecological restoration of the Baltic Sea Area,

RECALLING Article 5 of the Helsinki Convention, in which the Contracting Parties undertake to prevent and eliminate pollution of the marine environment of the Baltic Sea caused by harmful substances,

RECOGNIZING also the specific requirements concerning the prevention of pollution from land-based sources as laid down in Annex III of the Helsinki Convention,

Commented [A1]: Redundance in language, => deletion;

RECALLING ALSO the Baltic Sea Action Plan (BSAP) adopted at the HELCOM Ministerial Meeting 2007 (Krakow) that calls for urgent actions to reduce the discharges of nutrients and hazardous substances to the Baltic Sea Area,

RECALLING FURTHER that the HELCOM Ministerial Meeting in 2010 (Moscow) and the high-level segment of the Helsinki Commission meeting in 2011 highlighted the need to improve resource efficiency and recycling of nutrients through utilization of sewage sludge,

RECALLING AS WELL that the 2013 HELCOM Ministerial Meeting called for further alignment with regard to the implementation of the ecosystem approach and sustainable use of nutrients, enhancement of phosphorus recycling (especially in agriculture and waste water treatment) and promoting development of appropriate methodologies;

RECOGNIZING that sewage sludge poses a potential threat to the environment as it contains a number of hazardous substances including heavy metals and pharmaceuticals that may be resistant to treatment procedures, while, at the same time, sewage sludge from wastewater treatment plants contains nutrients, micronutrients and particles that increase humus in the soil, and has remarkable potential for energy production, particularly by producing biogas or direct incineration;

Commented [A2]: FIN: As this is a summary of the removed paragraphs (next page) the source reduction of harmful substances should be mentioned:
"RECOGNISING ALSO that measures to reduce content of unwanted substances in incoming wastewater to wastewater treatment plants at the source are necessary in order to obtain i.e. the best possible quality of the sewage sludge."

ACKNOWLEDGING existing, partly overriding national, EU and international legislation and competences, criteria and guidance for sewage sludge handling

RECOGNISING that phosphorus as a limited resource was included into the list of critical raw materials by the European Commission, thus underlining economically feasible recycling from sewage sludge as being of particular importance, as does the EU Circular Economy Package of 4 December 2015,

~~**RECOGNISING FURTHER** the Circular Economy Package adopted by the European Commission on 2 December 2015 and the potential contribution of sustainable utilization of the energetic potential of sewage sludge into the development of alternative sources of energy,~~

~~**RECOGNISING ALSO** that sewage sludge may be a sink for unwanted and hazardous substances including new substances – and that sewage sludge, thus, can be harmful for plants, animals and humans, and that there is concern in contracting parties about this resource, and that reuse and disposal of sewage sludge shall not cause any harmful effects, including accumulation and interactions of harmful substances and its degradation products, on humans, animals, vegetation, soil and waters in either the short or longer term,~~

~~**RECOGNISING FURTHER** that addition of sewage sludge to agriculture may often have a positive effect on microorganisms in the soil, and that treatment of sewage sludge has found to be necessary before it is used in agriculture,~~

~~**RECOGNISING ALSO** that measures to reduce content of unwanted substances in incoming wastewater to wastewater treatment plants at the source are necessary in order to obtain i.e. the best possible quality of the sewage sludge,~~

Commented [A3]: FIN suggests to retain. See the comment above.

TAKING NOTE of that recirculating sludge to agricultural land is a strong driving force raising awareness of the society on control of waste water quality at the source, resulting in both a better sludge quality and a better quality of the treated wastewater discharged into the environment,

NOTING that for the purpose of this Recommendation, the definition of sewage sludge should be the same as in the Council Directive 86/278/EEC of 12 June 1986 on the protection of the environment, and in particular of the soil, when sewage sludge is used in agriculture,

NOTING that the waste management hierarchy set in the EU Waste Framework Directive 2008/98/EC is in principle applicable also for sewage sludge management and contains the following steps: prevention; preparing for re-use; recycling; substantial including energetic recovery ; and disposal,

DESIRING to recycle the nutrients, especially plant available phosphorus, in the sludge; to make use of its valuable properties and energetic potential and to dispose of it safely, efficiently and sustainably,

RECOMMENDS to the Governments of the Contracting States to the Helsinki Convention to apply the Guidance (Annex 1) for sustainable sewage sludge handling in the Baltic Sea region,

RECOMMENDS ALSO that the Contracting Parties establish a program, or any other appropriate action or instrument, for the implementation of this Recommendation and that they provide the Helsinki Commission with the relevant information at the latest by [30 June 2017],

RECOMMENDS to the Governments of the Contracting States to the Helsinki Convention to encourage development of innovative "green" power industry based on production of solid, liquid or gas fuel as a result of sewage sludge treatment processes

Commented [A4]: Secretariat That was a suggestion by RF to promote these technologies at national level.

RECOMMENDS ALSO to the Governments of the Contracting Parties to promote research and development of the sustainable cost-effective solutions, especially for phosphorus recovery from the sewage sludge and products of its treatment.

~~**RECOMMENDS FURTHER**~~ **REQUESTS** that the Contracting States report to the Helsinki Commission every three years starting at the end of [2017] with data from [2016] according to Annex 2

RECOMMENDS that the information on treatment processes of sewage sludge, quality of sewage sludge, existing national limit values and progress in implementing this recommendation will form a knowledge basis for reviewing and, if needed, updating of national legislation including limit values and assuring sustainable sewage sludge handling across the Baltic Sea region.

Commented [A5]: FIN

Commented [A6]: Secretariat This part is suggested instead of the "including via measured parameters/limit values" and in order to retain the idea of further advancing national limit values.

RECOMMENDS, in parallel, to strive for further reduction of the content of unwanted substances in sewage sludge such as e.g. heavy metals including via measured parameters/limit values

DECIDES to review this Recommendation no later than 2021, and thereafter as necessary, taking into account the implementation and review of the HELCOM Baltic Sea Action Plan as well as new developments on national or international and EU level for Member States.

Commented [A7]: This part of the sentence might need some clafification. GER interprets this as a plead for measuring parameters/limit vlaues

Annex 1

Guidance for sustainable sewage sludge handling in the Baltic Sea region

This document provides guidance ~~to promote the application of~~ for sustainable ~~and ecologically sound techniques and handling practices for~~ sewage sludge handling with the aim to ensure maximum effective sustainably managed use of valuable substances and energy potential, while taking into account that the Baltic Sea is a vulnerable ecosystem which environmental status requires intensive efforts towards improvement. Furthermore, this guidance is supposed to ~~enhance~~ facilitate international cooperation and provision of economic incentives while aiming at limiting potential environmental impacts of sewage sludge. As application of untreated sewage sludge is ~~not to be applied~~prohibited at any kind of land, ~~application of~~ the mentioning of the term of sewage sludge ~~treatment~~, in the context of this Recommendation always refers to treated sewage sludge from municipal wastewater treatment plants (MWWTP).

A Overall recommendations regarding sewage sludge handling

1. Endeavour, when applying techniques and practices for sustainable handling of sewage sludge to ensure maximum recycling or recovery of phosphorus and other useful substances and compounds, on the one hand, and to avoid or minimize negative impacts on the current status of the environment and not jeopardize the achievement of a good ecological/environmental/chemical status in the Baltic Sea and its catchment area as agreed upon in the HELCOM BSAP and relevant national, EU and international legislation on the other~~if possible competitively, as well as utilization of its energetic potential and avoidance of the negative impact on the environment~~

2. In the case when sewage sludge is used for mixing with other raw materials (organic material of plant or animal origin or clay, sand, etc.) to produce fertilizing materials, the amount of unwanted substances in the mixed product should not exceed the limits established by international, EU or national rules and legislation as applicable. The fact that sewage sludge may contain other harmful substances ~~than those falling under international or national legislation~~regulated should be duly taken into consideration, too, including potential cumulative effects, when determining the mixing ratio.

3. Irrespective existing law, landfilling of untreated sewage sludge should be avoided; in case of landfilling sewage sludge, it has to be pre-treated in accordance, for instance, with the regulations of Directive 1999/31/EC (landfill directive) for EU Member States, taking duly into account that sewage sludge may contain harmful substances not falling under this legislation and untreated sewage sludge may be a source of harmful emissions (methane), may cause pollution of surface and ground water as well as pose a hygienic risk.

4. Ensure also that leaching of the nutrients to the environment as well as emissions and leakages of substances polluting the environment are prevented by appropriate safe temporary storage of the sewage sludge or products of sewage sludge treatment.

~~5. Ensure that possible negative impacts from sewage sludge handling processes will not hinder the achievement of a good environmental/ecological/chemical status of the Baltic Sea, as agreed upon in the HELCOM BSAP and relevant national and international legislation.~~

(New 5.) 6. Reuse or recycling of nutrients, especially phosphorus, from the sewage sludge as well as utilisation of its energetic potential should also be considered in the perspective of designing new facilities or reconstruction of waste water treatment plants (WWTP). However, waste water treatment, sludge treatment and recycling of sludge should be seen as essential components complementing each other as parts of an integrative waste management concept;

(6.) 7. Incineration of sewage sludge is an advisable alternative in comparison to~~could serve as final solution in cases where Contracting Parties consider the hazardous potential of sewage sludge even after treatment~~

Commented [A8]: FIN

Commented [A9]: PL. The whole draft rec. ignores the size of agglomerations/settlements. One cannot expect phosphorus recovery in in WWTPS serving agglomerations of 2.000 pe. Small WWTPs of this size should be encouraged to composting, which seems to be the best option for them. On the other hand, in biggest agglomerations sewage composition (heavy metals concentration) quite often excludes the possibility of using sludge for fertilising or composting purposes. We have a number of recently constructed sludge incineration plants and in some cases there is no technical possibility to expand them with the recovery installation. This draft recommendation should take into account these various circumstances. Otherwise it will be so general, that will not give any other value.

~~as being too high for~~ application on land as fertilizer. In this case, phosphorus should be recovered from the incinerated material as far as viable technical are available.

(7.) 8. The principle of substitution to decrease, whenever possible, loads of pollutants i.e. heavy metals, pharmaceuticals or organic micro-pollutants entering the WWTP should be applied to ensure high quality of resulting sewage sludge.

(8.) 9. Whenever possible, loads of pollutants, i.e. heavy metals, micro-pollutants and pharmaceuticals entering the WWTP should be decreased, *inter alia,* through mandatory pre-treatment of the waste water released into the sewage system ~~to ensure quality of sewage sludge and prevent release of pollutants to the aquatic environment.~~

(9.) 10. If unwanted substances are identified, sufficient source control measures should be established by polluters. The responsible environmental authorities and/or waste water operators should establish a plan on how to prevent the unwanted substances to enter the sewage network.

(10.) 11. Techniques and practices of sewage sludge handling should prevent or, at least, minimize all kinds of emissions to the air, in accordance with national, EU and international legislation, especially in case of thermal treatment. ~~If possible,~~ Gas produced via anaerobic sludge digestion should be collected and used for energy production, including traffic fuel.

(11.) 12. An effective and transparent permitting and reporting system should be established in the cases when the application of sewage sludge or products containing sewage sludge needs permits.

(13.) 14. International dialog and cooperation, exchange of scientific and knowledge experience up to transfer of especially new environmentally friendly technologies and practices as well as information on concentration of the unwanted substances in the sludge, should be facilitated, as mutually agreed, while considering comparable, possibly compatible harmonized action for the benefit of the Baltic Sea region including effective monitoring and control mechanisms.

B Overall restrictions regarding handling of sewage sludge

1. Sewage sludge from other WWTPs than those for treatment of domestic waste water or waste water which does not have similar composition as domestic waste water should not be applied on or used in soils.
2. Avoid any sewage sludge application in drinking water protection areas in order to prevent contamination with harmful substances such as pathologic components, pharmaceuticals, endocrine disrupters and other anthropogenic micro-pollutants, unless otherwise provided in the national legislation.
3. Sewage sludge must not be applied on land during the cultivation of fruits and vegetables nor on land intended for cultivation of fruits and vegetables within one year before harvest, unless otherwise provided in the national legislation.
4. Sewage sludge must not be applied on permanent grassland or crops which are used as animal feed and could be contaminated with pathogenic components and/or harmful substances, such as e.g. micro-pollutants, unless safe application is ensured by existing~~national~~ legislation.
5. Sewage sludge must not be applied on agriculturally or horticulturally used soils in nature reserves, nature benchmarks, national parks, protected parts of the landscape and other areas of special interest, or according to national legislation.

Commented [A10]: From the GER point of view this wording might be misleading since the original meaning (avoiding hazardous substances at source) is not properly reflected.
Thre are 2 options from our point of view: either deleting the 'principle of substitution (which would lead to a certain redundance with No. 9) or (alternatively) elaborate on the 'principle' in terms of further explanation.
The following wording could be considered:
The principle of substituting environmentally problematic substances by less problematic substances should be applied to decrease, whenever possible, the loads... entering the WWTP to ensure high quality of resulting sewage sludge.

Commented [A11]: Micro-pollutants is agreed – correct technical- language here;

Commented [A12]: FIN

Commented [A13]: This sentence needs to be revised in language; the present wording –only addressing 'waste water' and not sludge- might be misunderstood.

Commented [A14]: FIN

6. Sewage sludge must not be applied in wetlands, potential flooded areas, water protected zones or closer than 10 meters from water bodies or according to national legislation.

C Recommendations regarding agricultural and horticultural use

1. If national legislation allows the use of sewage sludge, ~~B~~before sewage sludge is applied for the first time the soil has to be analyzed on, at least, the following parameters:
   - Heavy metals: Cd, Cu, Ni, Pb, Zn, Hg, Cr, As
   - Nutrients: P, N, K
   - pH and other parameter as required according to national legislation
2. Analysis of the soil should be repeated whenever necessary or according to national legislation.
3. The application of sewage sludge on/in soil has to be critically considered if the soil analyses show that the content of the above listed parameters exceed, at least, one of the limit values established by existing~~national~~ legislation.
4. Sewage sludge or its products like other fertilizers should not be applied on soil if the phosphorus and nitrogen content in the soil is sufficient for crop cultivation.
5. On arable land used for growing feed or sugar beet, insofar as the sugar beet foliage is used as feed, it shall only be allowed to apply sewage sludge before sowing and with subsequent deep-turn tillage. On arable land used for growing silo and green maize, the sewage sludge must be worked into the soil before sowing.
6. If the sewage sludge is to be used in agriculture or horticulture, it has to be hygienized according to national legislation
7. Representative samples should be taken from sewage sludge or the product containing sewage sludge that will be used on arable land and analysis of the sewage sludge, following national/existing legislation, should be made.
8. The application of sewage sludge on/in soil has to be critically considered if the sludge analysis show that the concentration of heavy metals or other unwanted substances exceed the limit values established by existing~~national~~ legislation.
9. The quantity of sewage sludge should be regulated in such a way that the accumulation of unwanted substances are limited by the following parameters:
   - the average amount of five tons dry sewage sludge added per hectare in three years or according to existing legislation;
   - the limit values for the particular substances according to existing legislation,
   - exemptions from existing legislation should be possible, if a lack of special nutrients e.g. copper or zinc is proven in the soil. Contracting Parties may also decide to set stricter limits or to ban the use of sewage sludge in agriculture, horticulture and home gardening, if they consider the hazardous potential of sewage sludge as too high.

Commented [A15]: FIN

Commented [A16]: FIN

Commented [A17]: **PL**. Para 8 refers to treated sludge, while in para 7 there is a reference also to product containing sewage sludge. Definition is needed to avoid interpretations and make clear whether limit values refer to final product, or to the sludge

Commented [A18]: What kind of analysis? Like in no. 1? And/or hygienical/bacteriological? GER proposes to add the marked wording;

D Recommendations regarding use in forestry, green areas, landscaping and land reclamation

1. Application of sewage sludge or mixed products containing sewage sludge at the lands used for forestry should be avoided; exemptions are matter of competent authorities~~y~~.
2. The sewage sludge or mixed products containing sewage sludge can be used in construction and maintaining urban green areas, landscaping including rail and road slopes as well as other elements of road infrastructure to prevent their erosion and land reclamation, if concentration of unwanted substances in the applied materials do not exceed limit values established by existing legislation for these types of land.
3. If the sewage sludge is to be used in landscaping, land reclamation and green areas it has to be hygienized to assure that no problematic pathogens exist in the product and it satisfies the same criteria as item C6.
4. Other recommendations regarding using sewage sludge or sewage sludge products for green areas, landscaping and land reclamation are a matter of the competent authority.

E Recommendations regarding incineration, construction and other applications

1. If sewage sludge is incinerated after removal of phosphorus from sewage sludge or before removing phosphorus from ashes, in line with requirements for their potential application the produced energy has to be collected if technically and economically feasible- and used.
2. If it is not possible to remove phosphorus from the sludge or ashes directly, and the content of phosphorus is considerably high, the ashes should be stored temporarily in mono-landfills to remove phosphorus later when viable techniques are available. The use of best available techniques and best environmental practices for mono-landfills should be applied.
3. Ash after sewage sludge incineration, can be considered as material for production of construction materials, e.g. additive for pavement, ceramic tile, border stone, building mixes etc, provided phosphorus had been recovered from the sewage sludge ashes beforehand of the envisaged application, and if possible, by using available viable techniques and practices.
4. If sewage sludge or the ash after incineration of the sludge is used as a part of construction material for industry, valuable substances, especially phosphorus, should be recovered from the sewage sludge or the ash before application when viable techniques are available, if the substances are not needed in the construction material and are lost for further reuse.

Commented [A19]: GER pleads for inserting this clarifying amendment.

Commented [A20]: PL. Ashes landfilling requires the construction on brand new mono-landfills. Since the timeframe for introduction of BAT for phosphorus recovery is not known, there is no economic rationale behind such investments. There is also no methodology to indicate the WWTPs where P recovery will be economically feasible. Other question that arises is whether these new landfills for ashes should be constructed somewhere in the WWTP location (what is there is no space for this?) or somewhere else (transportation to landfill and back, nobody knows when, generates costs).

Commented [A21]: FIN: To be deleted

Commented [A22]: FIN

Commented [A23]: FIN

Annex 2

Reporting Format for HELCOM Recommendation x/y on Sewage Sludge Handling

REPORTING FORMAT FOR HELCOM Recommendation CONCERNING SEWAGE SLUDGE HANDLING			
Lead Country: Germany/Russia			
Country:			Year:
A. Waste water from origins			
1. Have actions been taken to improve the waste water quality from origins before it reach WWTP (source reduction)?	Yes	No	Unknown/ comments
2. Is improved waste water quality from origins a matter for the central, regional or local governments?	Yes	No	Unknown/ comments
B. Sewage sludge handling			
1. Generated sewage sludge, dry mass, t/a			
2. Used for biogas generation dry mass, t/a			
3. Usage of sewage sludge:	Amount, dry mass, t/a		Number of installations
a) incineration, co-combustion			
b) incineration, mono			
c) landfilling			
d) landfilling, mono			
e) landscaping/green areas/land reclamation			
f) agriculture/horticulture			
g) forestry			
h) other usages			
3. Have actions been taken to reduce the leakage of nutrients from sludge handling?	Yes	No	Unknown/ comments
4. Describe how the Recommendation concerning sewage sludge handling has been implemented; new legislation, amendment to existing legislation or other means.			
5. Does your country technically recover phosphorus from a) waste water, b) sewage sludge or c) sewage sludge ashes?	Yes	No	Percentage of total amount

Information on concentrations of hazardous substances in sewage sludge and national limit values for hazardous substances, pathogens and other relevant parameters in sewage sludge and soil.

Information on the amount of phosphorus recovered from the sewage sludge or products of its treatment.

Commented [A24]: Secretariat. PRESSURE 4 suggested to collect the data to create a knowledge base and then move forward with regional limit values.