PE1563/A

Our Ref: JM/CD/MA/FL/ EXT05-A-F0185566
Your Ref: -

12 June 2015

Ned Sharratt
Assistant Clerk
Public Petitions Committee
The Scottish Parliament
Edinburgh EH99 1SP

By email: petitions@scottish.parliament.uk

Dear Mr Sharratt

CONSIDERATION OF PETITION PE01563
Calling on the Scottish Parliament to urge the Scottish government to ban the use of sewage sludge on land and to look for alternative acceptable methods of disposal as adopted in other European countries

Thank you for your email of 26 May 2015 inviting SEPA to give oral evidence to the Public Petitions Committee on 23 June 2015. As already advised, SEPA will be represented by Mark Aitken, Principal Policy Officer – Land and Chris Dailly, Waste and Landfill Tax Manager. In advance of this, SEPA wishes to submit written evidence which I attach herewith.

As a public body committed to openness and transparency, SEPA feels it is appropriate that this response be placed on the public record. If you require further clarification on any aspect of this correspondence, please contact Mark Aitken, Principal Policy Officer, SEPA Stirling Office, at the address shown below.

Yours sincerely

Janice Milne
Head of National Operations

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Briefing prepared by SEPA for the Scottish Parliament's Public Petitions Committee

Oral Evidence Session on Use of Sewage Sludge on Land - 23 June 2015

Contents

1. Key points

- SEPA supports the use of sewage sludge on land in accordance with regulations and guidance as this is the Best Practicable Environmental Option.
- SEPA has received and investigated complaints across Scotland in recent years related to sludge storage and application to land. Many of the issues stem from odorous materials and inappropriate storage or application to land.
- It is clear that sludge use on land has negatively impacted some communities and that regulatory controls should be improved.
- The on-going Sludge Review and development of new regulatory frameworks as a result of the Regulatory Reform (Scotland) Act 2014 is an opportunity to change the way SEPA regulates the use of sewage sludge.
- A literature review for the EC in 2005 stated that despite a number of studies on possible adverse health effects to the public in the vicinity of sludge spreading operations there have been no unambiguously demonstrated adverse consequences to the public as a result of aerosols from properly conducted treatment and recycling operations.
- The only real alternative to land application is combustion or disposal to landfill.

2. Background

Sewage sludge is produced on a daily basis from sewage treatment works throughout Scotland. These works are operated by either Scottish Water or by other companies via contracts on behalf of Scottish Water. A small number of works are privately owned. The sludge is treated before being distributed by third party contractors for beneficial use on land, energy recovery or disposal. Sometimes, these contractors will provide further treatment to the sludge before distributing to field storage sites.

One of the long-established routes for sewage sludge is for it to be used as a fertiliser on farmland due to its ability to improve soil quality, organic content and water holding capacity as well as provide nutrients for crops. In addition, sludge is often used in non-agricultural settings, such as the in the restoration of derelict land. By adhering to the mandatory requirements of EU and UK legislation and complying with additional guidance, significant benefits can be derived whilst risks to public health, soil quality and the wider environment are minimised. Use on land is a sustainable, cost effective solution that has long been recognised as the Best Practicable Environmental Option.

The use of organic material (including sewage sludge) on farmland is increasing and is driven by a number of instruments which aim to increase the recycling of materials.

Around 22 million tonnes (wet weight) of materials are spread on land in Scotland each year. 95% of the organic materials are manures and slurries from agriculture. The remaining 5% includes residues from food and drink production, sewage sludge from the water industry and small amounts of organic materials derived from other industrial processes.

While sewage sludge contains nutrients and organic matter that are beneficial for the soil, it also contains contaminants such as heavy metals, organic compounds and pathogens. There is clear evidence that, since the mid-1980s, concentrations of heavy metals in sewage sludge have steadily declined due to regulatory controls and improved industrial practices. There are further regulatory controls on heavy metals and pathogens and these are summarised in Section 9.

In addition, as a result of the voluntary Safe Sludge Matrix, any sludge applied to land used for food crops must either be conventionally treated[1] or enhanced treated[2].

3. Scottish Government Review of the storage and spreading of sewage sludge

[1] **Conventionally treated** sludge has been subjected to defined treatment processes and standards which ensure that at least 99% of pathogens have been destroyed.

[2] **Enhanced treated** sludge will be free from Salmonella and will have been treated so as to ensure that 99.9999% of pathogens have been destroyed (a 6 log reduction).

The Cabinet Secretary for Rural Affairs, Food and the Environment has instructed Scottish Government and SEPA to undertake a review of the legislation and guidance relevant to the storage and spreading of sludge to land. The review is led by Scottish Government and the review group has membership from Scottish Government, SEPA and Scottish Water. The Sludge Review will investigate and consider the following issues relating to the use of sewage sludge on land:

a) Treatment of non-agricultural land for the purposes of restoration – rates, methods and guidance and legislation for such activities.

b) Land classification, including the circumstances when land under restoration becomes ready for use in agriculture or forestry

c) Licensing Requirements:

- Criteria for exemptions under Waste Management Licensing (Scotland) Regulations 2011.
- Role of licensing in relation to land restoration projects.
- Options for a "fit and proper person" test and registration scheme.
- Minimum distance of sludge storage and spreading from dwellings
- Role of planning system.
- Approach to identifying 'ecological improvement' and 'benefit to agriculture'

d) Roles, responsibilities and parameters related to treatment and testing sludge, including the legal requirements around treatment and storage of sewage sludge.

e) Links with other legislation, statutory management and planning requirements and voluntary schemes.

f) Communication, consultation and notification: neighbours, landowners and other stakeholders

g) Nuisance issues such as odour, and noise during unsocial hours.

h) Reporting and data collection – quantities of sludge used, locations, materials and regulatory controls etc.

i) Improvements to regulation and guidance, including legal definitions.

j) Improvements to liaison between all delivery partners.

4. Regulatory Reform (Scotland) Act 2014 for future delivery

Through the joint Scottish Government and SEPA 'Better Environmental Regulation' programme, we are working to improve the way environmental regulations work in practice. The Regulatory Reform (Scotland) Act 2014 created;

- a new statutory purpose for SEPA

- a new significant environmental harm offence
- enabling powers for an integrated environmental permissioning framework
- enabling powers for a range of new enforcement powers for SEPA
- new sentencing powers for the courts

The new integrated permissioning framework aims to improve and simplify the unnecessarily complicated regulatory landscape we have today and enable a more proportionate, outcome focussed approach to environmental regulation.

In SEPA's view, The Sludge (Use in Agriculture) Regulations 1989 should be included within the scope of this work and the storage, treatment, transfer and use of sludge more generally should be integrated within in the new framework. This would provide a timely opportunity to implement any outcomes of the Scottish Government's Sludge Review to ensure environmental controls are adequate for the future, are applied consistently regardless of the type of land to which sludge is applied and bring greater clarity to the public as to the roles of the various regulatory bodies.

This work is being developed in close consultation with stakeholders and is being phased in to allow SEPA and regulated industries to prepare for implementation. A consultation on proposals is planned for the end of the year.

5. Sludge use in Scotland

A table of sludge uses in Scotland is represented here:

Sludge Usage	Tonnage	Percentage
Agricultural Land	53,833	51.54
Industrial Use	34,619	33.14
Non-agricultural land	14,683	14.06
Other	1,314	1.26
TOTAL	104,449	100.00

In Scotland, about 9,000 hectares of farmland receives sewage sludge every year. This is equivalent to 0.5% of all agricultural land.

During 2014/15:

- Approximately half of all sewage sludge produced in Scotland was spread to agricultural land. The average application rate is about 6 tonnes/hectare;
- Approximately, 15% of sewage sludge was applied to non-agricultural land. This includes use of sludge in land restoration activities. Sludge used in restoration is typically applied at much higher application rates and can be applied at rates up to 400 tonnes/hectare;
- One third of sludge was incinerated for energy recovery;
- A small percentage is disposed of to landfill

Anaerobic digestion can be used as part of the sludge treatment process to generate conventionally treated sludge which can subsequently be used in agriculture.

According to a DEFRA report produced in 2012, 75% of UK sewage sludge has undergone anaerobic digestion[3].

6. Sludge use in other European countries

Across Europe there are wide differences in sludge use or disposal. In eight Member States (Portugal, Luxembourg, Spain, Cyprus, United Kingdom, France, Denmark and Ireland) more than two thirds of the total was used as fertiliser in agriculture. However, Netherlands, Belgium, Slovenia, Germany and Austria (as well as Switzerland) report incineration as their primary pathway for disposal.

Bulgaria, Italy, Greece and Romania, and Malta discharge into controlled landfills as the primary pathway for sludge disposal. Finland and Estonia compost more than two thirds of their sewage sludge. (Statistics are from EU Eurostat March 2014 and July 2014).

7. Sampling protocols for sewage sludge

Sampling protocols for sewage sludge vary between operators and are also dependent on the nature of the sewage produced, particularly its moisture content. Sampling frequency is also variable, although for sludge that is to be spread to agricultural land the Sludge (Use in Agriculture) Regulations requires testing of sludge at least once every 6 months.

SEPA recommends that legislation is amended to ensure that all sewage sludge is subject to the analyses specified in section 1 of the Sludge (Use in Agriculture) Regulations, irrespective of the final end-use of the sludge. This would improve confidence in the consistency of sludge materials used in land restoration, particularly if the minimum frequency of testing were reduced.

SEPA also undertakes audit monitoring of sludge activities (see Section 12).

8. Biosolids Assurance Scheme

Biosolids is a term used by the water industry to describe treated sewage sludge. SEPA welcomes the current work (under development) which Scottish Water is carrying out with Water UK on the development of the Biosolids Assurance Scheme (BAS).

The Biosolids Assurance Scheme Standard will be used to audit Scheme applicants and participants. Sewage sludge conforming to the Scheme Standard may be awarded Certified Biosolids status.

[3] Anaerobic digestion (AD) is a managed biological process whereby biodegradable waste is broken down by naturally occurring micro-organisms in the absence of oxygen. AD produces a stabilised residue, commonly called "digestate", which is rich in nutrients such as nitrogen, phosphorus and other elements required for healthy plant growth and fertile soil. AD is also a source of renewable energy, since the waste is broken down to produce biogas (a mixture of methane and carbon dioxide), which is suitable for energy production.

A well-developed and managed Scheme would help ensure and demonstrate that sludge is sustainably recycled to agricultural land. A well-managed audit of contractors within the Biosolids Assurance Scheme would likely help increase confidence on sludge use amongst a wide range of stakeholders (local communities, retailers, farm assurance schemes, farmers, regulators etc.).

9. Legislative and non-legislative controls over application of sewage sludge to land in Scotland

There are a range of legislative and non-legislative controls which apply to the use of sewage sludge on agricultural and non-agricultural land in Scotland. Both SEPA and local authorities have regulatory responsibilities under this framework.

The EC Directives relevant to sewage sludge are summarised in Annex 1.

- **The Sludge (Use in Agriculture) Regulations 1989**
  The Sludge Directive is implemented in Scotland through The Sludge (Use in Agriculture) Regulations 1989. The Regulations control the addition to soil of potentially toxic elements (PTE) and restrict the planting, grazing and harvesting of certain crops following the application of sludge. The Code of Practice for the Agricultural Use of Sewage Sludge complements the Sludge (Use in Agriculture) Regulations 1989.

  Before spreading to agricultural land, sludge producers (generally Scottish Water and PFI operators or their contractors) are required to analyse both sludge and soils. Sludge must subsequently be re-analysed at least once every 6 months or after any event which causes a change in the characteristics of the wastewater being treated. Soils must be reanalysed within 20 years of them having first been tested as specified in the 1989 Regulations.

  Sludge producers are also required to maintain detailed records of applications of all sludge to agricultural land, including accurate information on the location spread, the amount spread and the date on which it was spread. These records must be submitted to SEPA on an annual basis.

- **Waste Management Licensing Regulations 2011**
  The other key regulations are the Waste Management Licensing Regulations 2011 which control the storage of sludge prior to use as well as the spreading of sewage sludge on non-agricultural land (e.g. forestry or land restoration) under waste management exemptions.

- **Safe Sludge Matrix**
  The voluntary Safe Sludge Matrix (an agreement between the UK water industry and the British Retail Consortium on sludge use) should also be followed. The Matrix does not allow raw or untreated sewage sludge to be used on agricultural land for food production. Untreated or raw sludge or septic tank sludge is not therefore applied to land used for food crops.

- **General Binding Rules – Water Environment (Controlled Activities) (Scotland) Regulations**

There are also General Binding Rules and guidance on good agricultural practice which cover the technical aspects such as storage and spreading methods and distances from watercourses (these are generic in that they relate to spreading of all organic materials and fertilisers).

- **PEPFAA Code**
  The Scottish Government's Prevention of Environmental Pollution from Agricultural Activity (PEPFAA Code) provides practical guidance for farmers, to help minimise the risk of causing environmental pollution through farming activities.

  The main emphasis of PEPFAA is on prevent or minimise water pollution, and also damage to soil and air quality. The Code gives advice regarding a combination of mandatory and voluntary measures. Contravention of the PEPFAA Code as regards water pollution does not, in itself, give rise to any criminal or civil liability, but it may be taken into account in any legal proceedings involving a water pollution offence.

  A summary of all the main legislative requirements for land-spreading organic materials is given in the Appendix.

10. Authorisation of sludge storage and spreading

- **Sludge Storage**
  Storage of sludge prior to spreading is considered a low risk activity under the current regulatory framework. Storage is authorised under an exemption to waste management licensing and requires only a notification to SEPA rather than any prior assessment / approval.

  The terms relating to sludge storage include a 6 month maximum storage time as well as a requirement not to cause nuisance through odour. SEPA considers that this is too long in the case of odorous sludge.

  There is no minimum distance for storage from sensitive receptors such as communities. In one case sludge was stored 150m from houses which should not be acceptable. There is scope to tighten requirements in this area. Restrictions on duration of storage and a requirement for improved treatment where sludge is used in sensitive locations would improve regulatory control and reduce likelihood of nuisance arising.

  SEPA may remove the waste management exemption should the terms of the exemption be breached. Currently this requires service of a notice which takes 21 days to take effect. This is too long where nuisance is occurring.

  SEPA does not routinely inspect sludge storage sites. However, SEPA has undertaken targeted compliance work in this area, removing a number of waste management exemptions as a result.

- **Sludge Spreading on Agricultural Land**

The spreading of sludge to agricultural land is authorised under the Sludge Use in Agriculture regulations. Spreading activities do not require prior notification to SEPA. Any odour complaints arising from agricultural spreading are dealt with by the Local Authority, usually Environmental Health Departments.

- **Sludge Spreading on Non-Agricultural Land**
  The spreading of sewage sludge to agricultural land is authorised under an exemption to the waste management licensing regulations and includes an assessment by SEPA. However, there is no fit and proper person assessment as in the case of an application for a waste management licence.

  There are lesser sludge treatment requirements for non-agricultural land. Therefore sludge which has not met either conventional or enhanced treatment standards will often be applied to non-agricultural land. This can include the most odorous sludge. In addition application rates used on non-agricultural land are normally much higher than rates used on farmland. This further increases the risk and severity of odour nuisance.

  SEPA is responsible for odour arising from these activities and may remove waste management exemptions if odour requirements are breached. Currently this requires service of a notice which takes 21 days to take effect. This is too long where nuisance is occurring.

11. Regulation of Odour

Odour is the most common complaint SEPA receives associated with sludge activities.

It is also a strategy issue for the sludge producers. That is, where sludge has not undergone the expected level of treatment as a result of breakdowns there may be a consequent increase in odour potential. If the sludge is odorous when produced it is likely to cause issues in transit, storage and spreading. SEPA recommend that Scottish Water and PFI Operators at sewage treatment works have improved systems in place to deal with sludge arising in emergency situations.

Advice and guidance to minimise odour problems from organic materials are given in the Scottish Government's Prevention of Environmental Pollution from Agricultural Activity. SEPA recommends that this guidance is followed and becomes a mandatory requirement in high risk situations.

SEPA do not have regulatory powers to control odour in all circumstances (such as spreading on agricultural land). In order to take enforcement action SEPA must establish whether odour is offensive in accordance with published odour guidance.

SEPA will take enforcement action in line with our published Enforcement Policy and this may include issue of warning or final warning letters, removal of exemptions, service of statutory notices to require removal of sludge stockpiles and reports to the Procurator Fiscal.

There is an acknowledged enforcement gap between the issue of letters and notices (which are not immediate in effect) and reports to the fiscal which may take a significant period of time to be heard in court.

New enforcement tools delivered under regulatory reform will be welcome as will a new permissioning framework which will allow the opportunity to apply proactive risk-based control to sludge storage and spreading activities.

12. SEPA soil compliance monitoring data of sludge activities

Since 2007 SEPA has carried out risk-based soil compliance monitoring to allow the effects of organic material application on soil quality indicators to be monitored, and compliance with the soil limit values set out in the 1989 Regulations to be audited.
Between 2007 and 2014, SEPA sampled soils from 215 fields spread with sewage sludge at 70 farms located throughout Scotland. Soil analysis results found a small number of breaches of PTE limits specified in the Sludge Regulations in spread fields; nickel (2.8 % of samples) and zinc (2.3 %) were the PTEs most likely to breach limits.

13. Reviews of Human Health risks from sludge application

A comprehensive report titled “Environmental, economic and social impacts of the use of sewage sludge on land” was prepared for the European Commission by Milieu Ltd, WRc and RPA in 2005. This report concluded that epidemiological and risk assessment studies on the risks to health from microbial pathogens in sewage sludge for workers and populations in the vicinity of sludge operations have not generally found the risks to be significantly greater than background risks. Overall the health risks from indirect exposure to pathogens have also been found to be low, with no clearly identified public infections from the use of food grown on land where sludge was applied in accordance with the provisions in the Directive.

The 2005 report stated that in terms of public concerns, odour can be an important issue prompting opposition to the use of sewage sludge on land, either due to the odour itself or to a public perception that substances adverse to health may be present. The report went on to state that despite a number of studies on possible adverse health effects to the public in the vicinity of sludge spreading operations there have been no unambiguously demonstrated adverse consequences to the public as a result of aerosols from properly conducted treatment and recycling operations.

In terms of other impacts on human health, the 2005 report stated that recent risk assessments indicate that the exposure resulting from organic compounds in sewage sludge applied to land have not found an adverse effect on human health.
A desk-based literature review of the human health impacts of spreading sewage sludge on non-agricultural land was carried out by medical experts from the University of Aberdeen in 2008 for Project partners: SNIFFER, SEPA, NIEA, Scottish Government, Forestry Commission and Health Protection Scotland. The 2008 report included the following conclusions:

- Many studies in this area, for both occupationally and non-occupationally exposed populations, suffer from small sample sizes. This limits the ability of such studies to identify small levels of risk in the exposed populations and thus runs into the problem of believing that effects do not occur whereas they do but at low level.
- For non-occupational exposures, either as residents or as by-standers, there was only one formal trial of exposure which showed no increases in markers of ill health in the exposed population. Overall, this limited literature is conflicting but shows no consistent effect on health from living near sewage treated land.
- Odour is the main complaint of populations non-occupationally exposed to sewage sludge.

14. References

- CEC (1986) Commission of the European Communities (1986) Council Directive of 12 June 1986 on the protection of the environment, and in particular of the soil, when sewage sludge is used in agriculture (86/278/EEC). Official Journal of the European Communities, No L181/6-12.
- CEC (1999) Directive on the landfill of waste. (1999/31/EC) Council Directive. Journal of the European Communities 16.7.1999 No L 182/1
- CEC (2000) Directive on the incineration of waste (2000/76/EC) Directive of the European Parliament and of the Council of 4 December 2000. Official Journal of the European Communities 28.12.2000 No L 332/91
- Gale et al. 2003, Pathogens in biosolids. Microbiological Risk Assessment. UKWIR, London, UK. ISBN: 1-84057- 294-9
- Smith SC (2008), The implications for human health and the environment of recycling biosolids on agricultural land. Imperial College London Centre for Environmental Control and Waste Management.
- SNIFFER2008 Desk-based literature review of the human health impacts of spreading sewage sludge on non-agricultural land UKLQ09
- Tanner et al 2008, Estimated Occupational Risk from Bioaerosols Generated during Land Application of Class B Biosolids, J Environ Qual.2008; 37: 2311-2321

Annex 1

Summary of the legislative requirements for land-spreading

Landspreading activity	Control
Landspreading agricultural manures and slurries	Agricultural manures and slurries spread to agricultural land for benefit are not considered to be waste providing the spreading is carried in compliance with the PEPFAA code and the 4 Point Plan
Landspreading sewage sludge on agricultural land	Comply with the Sludge (Use in Agriculture) Regulations 1989 as amended
Landspreading sewage sludge on non-agricultural land	Paragraph 8 exemption see Paragraph 8 under Individual paragraph details SEPA Technical Guidance Note
Spreading waste on agricultural land for agricultural benefit or ecological improvement	Paragraph 7 exemption see Paragraph 7 under Individual paragraph details SEPA Technical Guidance Note
Spreading waste on non-agricultural land for ecological improvement	Paragraph 7 exemption see Paragraph 7 under Individual paragraph details SEPA Technical Guidance Note
Spreading waste for reclamation or improvement of land	Paragraph 9 exemption see Paragraph 9 under Individual paragraph details SEPA Technical Guidance Note
Spreading waste on land for “relevant work”	Paragraph 19 exemption see Paragraph 19 under Individual paragraph details SEPA Technical Guidance Note
Spreading pig or poultry ash for agricultural benefit or ecological improvement	Paragraph 50 exemption see Paragraph 50 under Individual paragraph details
Spreading compost	Compost meeting the PAS100 criteria is not regarded as waste and may be spread to land providing it is done for a

	benefit and no harm or pollution occurs as a result. Compost not meeting PAS100 criteria can be spread under paragraph 7, 9 or 19 exemptions as indicated above. Compost may be created under a Waste Management Licence, a PPC permit or a Paragraph 12 exemption
Spreading any waste in an NVZ	Any spreading in a NVZ must comply with the Nitrate Vulnerable Zones (Scotland) Regulations 2008 (as amended). Guidance covering compliance with the NVZ regulations can be found on the Scottish Government website
Fertiliser storage and application	Controlled Activities Regulations: Diffuse Pollution General Binding Rule 18.
Spreading anaerobic digestate	Anaerobic digestate meeting the PAS110 criteria is not regarded as waste and may be spread to land providing it is done for a benefit and no harm or pollution occurs as a result. Anaerobic digestate not meeting PAS100 criteria can be spread under paragraph 7, 9 or 19 exemptions as indicated above. Anaerobic digestate may be created under a Waste Management Licence, a PPC permit or a Paragraph 12 exemption

EC Directives relevant to sewage sludge

- Sludge Directive (CEC, 1986),
- Landfill Directive (CEC, 1999)
- Waste Incineration Directive (CEC, 2000)
- Urban Wastewater Treatment Directive.
- Nitrates Directive,
- Water Framework Directive
- Urban Wastewater Treatment Directive. Required that member states shall ensure that by 31 December 1998 the disposal of sludge to surface waters by dumping from ships, by discharge from pipelines or by other means is phased out. This was implemented in Scotland through the Urban Waste Water Treatment (Scotland) Regulations 1994.