


Manual for certification of sludge

2.2 Metals in sludge – calculations and prioritizing

Municipality of Höganäs

2013

 HÖGANÄS KOMMUN <small>SAMHÄLLSBYGGNADSFÖRVALTNINGEN</small>	Manual for certification of sludge	Revised:	2014-10-21
		Edition:	1.2
2.2.	Metals in sludge – calculations and prioritizing	Approved by:	Fredrik Arthursson
		Established by:	M Gleisner K Bruhn
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Purpose

To ensure that the requirements of the certification rules regarding metals, and targets at Höganäs ARV, are met.



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Range

The routine includes calculations for 7 metals from levels measured in the dewatered sludge. This includes calculation of cadmium - phosphorus ratio, calculating the input of metals to soil and priority starting from the comparison with limits.

For routine sampling see Sec. 2.1. and the routine of mass balances see Sec. 2.4.

Supervisor

The VA - manager is responsible for the routine. The Lab Technician is responsible for entering sludge analysis results, check if limits are exceeded and if so, notify the VA chief.

Instruction

Adding sludge analysis results

Monthly sludge analytical results are completed on the first sheet in the Excel "metaller och Cd_P-kvot_Årtal". Remember to recalculate values to units of mg / kg dw for ammonium, nitrogen and phosphorus.

Calculation of cadmium - phosphorus ratio

On the third sheet in the Excel file "metaller och Cd_P-kvot_Årtal" estimated cadmium - phosphorus ratio (Cd / P ratio) is read and calculated automatically. Date of effect 1/1-2013 may sludge, which the Cd / P ratio is greater than 32 mg Cd / kg P, not be spread on cropland according REVAQ 's certification rules.

Sludge contractor taking action under routine for nonconforming product if sludge batch exceeds Cd / P > 32 mg Cd / kg P.

Expected input of metals compared with the limit values


Amount of metal is expected to be brought to the ground, when spreading of the sludge analyzed in the current sludge analysis calculated automatically on the fourth sheet in the Excel file "metaller och Cd_P-kvot_Årtal." There are also limits and what percentage of the limit value that the metals form. Both the supply and the proportion of limit is automatically calculated when the sludge analysis results are put on the first sheet.

Prioritization and Control

A summary of the percentage of the limit value as the projected supply has corresponded are on the 4 and 5 sheet in the Excel file "metaller och Cd_P-kvot_Årtal".

Latest edition of this document is stored in the binder "Manual för certifiering av avloppsslam".

Pathway for digital file: C:\Users\Ayumi Nakamura\Desktop\Collected and Categorized Euroslam Documents\Levererade dokument Euroslam\Component 3\Self Monitoring Manuals\Self Monitoring Manual Höganäs englisb\2.2_Metaller i slam-beräkning och prioritering.docx

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The metals whose annual mean (expressed as g / ha * year) exceeds 50 % of the limit should be prioritized in future prevention work upstream. See the 4 sheet in the Excel file stated above.

If the value of any metal exceeds the limit for spreading on agricultural land this is seen on the line ” antal månader som mängd>100% av gränsvärde” on the 5 sheet. The sludge contractor should have a routine to calculate the recommended phosphorus dose and, if necessary, lower this until the metal content is below the threshold.

Documentation

Calculations and calculated values are in the folder: Certifiering av slam
2009_Revaq\6_Beräkningar

References

Regulations (SNFS 1994:2 MS: 72) on the protection of the environment, particularly the soil, when sewage sludge is used in agriculture. In binder "Slamcertifiering" tab 10.

The regulations are the thresholds used in the calculations.

Environmental Protection Agency Report 5148 , Eriksson J., *Halter av 61 spårämnen i avloppsslam, stallgödsel, handelsgödsel, nederbörd samt i jord och gröda*. In binder "Slam Certification " tab 10.

Routine 2.1. Sampling of sludge

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