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National Standards Authority of Ireland

STANDARD RECOMMENDATION

S.R. CEN/TR 15584:2007

ICS 13.030.40

CHARACTERISATION OF SLUDGES - GUIDE TO RISK ASSESSMENT ESPECIALLY IN RELATION TO USE AND DISPOSAL OF SLUDGES

National Standards
Authority of Ireland
Glasnevin, Dublin 9
Ireland
Tel: +353 1 807 3800
Fax: +353 1 807 3838
http://www.nsai.ie

Sales
http://www.standards.ie

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TECHNICAL REPORT

RAPPORT TECHNIQUE

TECHNISCHER BERICHT

CEN/TR 15584

July 2007

ICS 13.030.40

English Version

Characterisation of sludges - Guide to risk assessment especially in relation to use and disposal of sludges

Caractérisation des boues - Guide pour l'évaluation du risque en relation avec l'usage et le mise en décharge des boues

Charakterisierung von Schlämmen - Anleitung zur Risikobewertung im Besonderen im Bezug auf Nutzung und Lagerung von Schlämmen

This Technical Report was approved by CEN on 3 March 2007. It has been drawn up by the Technical Committee CEN/TC 308.

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Management Centre: rue de Stassart, 36 B-1050 Brussels

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Foreword

This document (CEN/TR 15584:2007) has been prepared by Technical Committee CEN/TC 308 “Characterisation of sludges”, the secretariat of which is held by AFNOR.

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1 Summary

This report has been prepared within the framework of CEN/TC 308 on Characterization of Sludges. The Scope includes sludges from treating municipal, industrial and food processing wastewaters, sludge from treating raw water to make it potable, and other residues having similar potential environmental impacts.

The objectives of the report are to review the methodology of risk assessment, risk management and risk communication especially as they have been applied to sludges. It includes references to, and reviews of, some major risk assessments and abstracts of others that have been published.

Sludge is the inevitable residue of treating raw potable water and municipal and industrial wastewaters. Treatment of these waters is designed to remove unwanted constituents from the water and concentrate them into a small side-stream - “sludge”. The sludge may also contain surplus biomass cultured during biological treatment processes. The objective of treatment is to avoid adverse impacts on the environment and human health when the effluent is discharged into the environment or water is supplied for human consumption. The concentration of beneficial constituents and of pollutants in (and health risks associated with) a sludge depends on the initial quality of the wastewater or raw water, and the extent of treatment required to meet quality standards for effluent discharge, and potable water.

Where effluent quality standards are raised, in order to reduce pollutant loads on the environment, the quantity of sludge produced inevitably increases. To be consistent, the use or disposal of the sludge must also be environmentally acceptable, sustainable and cost-effective. Sludge management typically represents about half of the overall costs of wastewater treatment. Its management will become increasingly complex as environmental standards become more stringent, and if outlets for sludge become more constrained by legislation and public attitudes.

EU policy on waste is to promote waste avoidance, minimisation and recycling above disposal. Disposal of sludge to sea ceased at the end of 1998. Disposal of sludges to landfill, which is currently the major outlet for some sludges in Europe, is widely regarded as unsustainable. Sludge production cannot be avoided (although the quantity can be reduced by treatment). The only remaining significant options are recycling or destruction by combustion. Recycling options include use on land as an organic fertiliser or soil improver for farming, land restoration, etc. Destruction options include combustion with or without energy recovery, gasification, and using the sludge as a process fuel, with the ash being used or landfilled.

Many sludges and residues contain beneficial constituents and properties with positive environmental advantages. For example, recycling phosphate and thus reducing the need to extract primary raw material and extending the life of the planet’s reserves.

The EU has decided (CEC, 2000) that environmental policies should be proportionate to risk and non-discriminatory. When there is sufficient information, there should be risk assessment and, when there is insufficient information, measures should be put in place to fill the information gap and an interim precautionary approach applied.

In popular understanding, “safe” can be interpreted as “something we don’t have to worry about”. There is a social factor as well as the numerical factor. Some people talk of the “One-hit” model, especially for carcinogens, which assumes that interaction of a single molecule with DNA could trigger mutation that could replicate as cancer but if this were applied universally it would stop all activity. Doing risk assessment lets us understand the aspects that drive the risk and therefore enables us to target the regulation – it improves the way we regulate.

Risk assessment should inform a decision rather than support a decision that has already been taken, i.e. the science should come first and then the politics (informed by the science). Equally the performance of risk assessment needs to be adequately resourced (time, money, people, etc.), it needs to be transparent (i.e. the models and assumptions should be published) and stakeholders need to be involved at the earliest stages. The fundamental question is “risk of what to whom”. Risk communication has emerged as an essential activity.

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