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Spotting SPOSH - when is a lot, too much?

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The starting point for any land contamination assessment project is to determine the legal context and to begin to formulate the conceptual site model. Part 2A of the Environmental Protection Act 1990 and planning policy contained in PPS 23 use an asymmetric test to determine if remediation is necessary. Under planning, developers must show the site is below the boundary between acceptable and moderate risk; in the words of PPS23 they need to demonstrate a site is safe and fit for its intended use. Local Authorities on the other hand must demonstrate that a site is above the boundary between moderate and unacceptable risk before determining a site as contaminated land under Part 2A. This essay discusses toxicological information in a Part 2A context.

Under Part 2A, a significant possibility of significant harm (SPOSH) to human health arises from an 'unacceptable intake' of a contaminant. Toxicologists however have focused on defining intakes that are tolerable or pose a minimal risk for threshold and non threshold behaviour respectively. Toxicological information must also underpin the evaluation of high or unacceptable levels of risk to human health from contamination but such information has not been provided by the Environment Agency or Health Protection Agency reviews of common contaminants. Neither does SR2, the Environment Agency guidance on sourcing toxicological information, provide a framework for risk assessors to derive such information for themselves. Traditional approaches to risk assessment ignore information above the point of departure available for each contaminant from toxicological and epidemiological studies. Instead they wrongly and it seems inconsistently focus on how far over generic assessment criteria representing tolerable or minimal levels of risk site contaminant concentrations may be.

In July 2010, over fifty delegates spent an intensive two days in the University of Nottingham's Ebdon laboratory (scene of the workshops that generated the two editions of LQM/CIEH Generic Assessment Criteria) establishing the dose-response information cloud for most of the substances for which we have toxicological reviews from the work on assessment criteria of the Environment Agency and LQM/CIEH.

Delegates analysed the information contained in the toxicological reviews underpinning the development of the 'new' Environment Agency SGVs and the 2nd edition LQM/CIEH GAC. Working under expert guidance from the Land Quality Management (LQM) team, pairs of delegates captured the full extent of toxicological information reviewed to inform the SGV/ GAC values. They used the dose-response literature for each contaminant and ascribed the response into a series of classes reflecting different levels of adverse effect ranging from enzyme induction right through to teratogenic effects. This information is now being developed into a dose-response road map for each substance that can be used to evaluate better risks to human health under Part 2A or similar regimes in the future. This will accompany updated guidance on determination being prepared by CIEH.

Although this work is primarily intended to assist risk evaluation of existing land uses under Part 2A it will also be of assistance, albeit in a slightly different stage

of the process, to those formulating detailed quantitative risk assessments of future uses of brownfield sites under a redevelopment context.

At the time of writing, Defra had not released their draft revision of the Statutory Guidance underpinning Part 2A for public consultation. However what information was publically available, suggested that the concept of determination of contaminated land would continue to follow on from the identification of unacceptable risk.

To join the online contaminated land community, send an email to jiscmail@jiscmail.ac.uk containing the following message:

join contaminated-land-strategies <*firstname*> <*surname*>

For further details on the publication of the *Dose-Response Road Maps* please contact paul@lqm.co.uk.

The views expressed in this essay are the author's own and were prepared for the time, event and likely audience at which they were aired. Feedback, positive or critical, is welcome.

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Paul Nathanail is the Professor of Engineering Geology at the University of Nottingham (www.nottingham.ac.uk) and Managing Director of Land Quality Management Ltd (www.lqm.co.uk). He chairs IAEG Commission C20: Risk Based Land Management and is a Director of CABERNET (www.cabernet.org.uk). He delivered the Geological Society of London's 10th Glossop Lecture and received the eponymous medal in November 2009.

LQM are known for their work in training regulators and consultants and in peer reviewing countless reports for local authorities and developers. They pioneered the use of bioaccessibility in UK human health risk assessment and worked with CIEH to publish generic assessment criteria some 82 common contaminants to complement the screening values for 10 substances published on behalf of the UK government. This has revolutionised and speeded up the consideration of contaminated land issues through the land use planning system.

He runs a unique vocational masters programme at The University of Nottingham. Over the past decade has helped many consultants and regulators hone their skills in risk based contaminated land management. That program is now entirely delivered by distance learning using a combination of recorded lectures, webinars and online tutorials.