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Risk 'evaluation' of emerging contaminants – accounting for uncertainty, allowing for perceptions

Risk assessment is a four-step process involving the identification (1) and characterisation (2) of the hazardous substance, the estimation of the risk it poses to specified receptors (3), and finally an evaluation (4) of whether that estimated risk merits management in the specific legal context in which the risk assessment is being carried out. Emerging contaminants such as the thousands of PFAS, 1,4 dioxane, nanomaterials or polybrominated diphenyl ethers (PBDEs) present additional challenges to the risk assessor due to the inherent epistemological uncertainty about their properties and how these affect fate, transport and toxicity. However, substances considered emerging in one jurisdiction may be established in another and there is much to be gleaned from looking at practices in other countries and regulatory regimes. Contemporary risk evaluations – whether to support a change of use (e.g. land-use planning or brownfield redevelopment) or inform regulatory-driven remediation – need to reflect the robustness of up-to-date information as well as its relevance to the prevailing circumstances, even as regulatory science is still in progress. By returning to first principles in risk-based land management, practitioners can make and communicate helpful, protective and defensible risk assessments whilst maintaining agility in the response on site.