



Evolving Remediation Practice in Australia: Challenges, Regulatory Variation, and Emerging Best Practices

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Australia has a mature framework for the investigation of contaminated sites; however, the approach to remediation continues to evolve and varies significantly across jurisdictions.

Large and complex remediation projects face numerous challenges including technical limitations, logistical constraints, cost and sustainability pressures, and differences in regulatory expectations. This paper draws on lessons learned from recent Australian remediation projects, highlighting how best practices are emerging in response to these challenges.

Although the National Environment Protection (Assessment of Site Contamination) Measure (NEPM) provides a consistent basis for site investigation, there is considerable variation in how remediation is regulated across Australian states. These discrepancies—such as differing requirements for remediation plans, timelines for regulator engagement, and expectations for validation—can create project inefficiencies, particularly for national developers or consultants working across borders.

A recurring theme is the inappropriate use of Remediation Action Plans (RAPs) as fixed Bases of Design. RAPs should be flexible strategy documents that support adaptive decision-making as site understanding evolves. Successful projects demonstrate the value of early options screening—incorporating contractor experience, sustainability and cost assessments—to avoid premature design lock-in. Several real-life examples illustrate the risks of relying on outdated data or committing to solutions many years before implementation.

The paper also underscores the importance of data relevance: soil remediation should not be designed using groundwater data, and remediation at depth must be informed by site-specific subsurface data. Treatability trials, often delayed until tender, are most effective when integrated earlier in the planning process.

As sustainability and lifecycle costs take a more central role in remediation, project teams are increasingly factoring in carbon impacts, material reuse, and long-term environmental outcomes. Delays in regulatory approvals continue to be a challenge, requiring proactive engagement and flexible design frameworks that can accommodate change.

For an international audience, particularly in Canada, Australia's experience offers valuable insights into the management of large, diverse, and often remote contaminated sites under a federated regulatory structure. The parallels between Canadian provinces and Australian states make these case studies especially relevant. Australian practitioners have had to innovate within a fragmented regulatory environment, balancing prescriptive standards with the need for practical and adaptive site solutions—an approach with increasing global resonance as environmental, economic, and social expectations evolve.

Louise Cartwright

Dr Louise Cartwright, PhD (soil science), B.Ag.Sc (hons) is National Technical Lead, Principal Environmental Scientist, and an accredited contaminated site / land auditor in the majority of Australia (Northern Territory, Queensland, South Australia, Tasmania and Victoria).

She specialises in providing teams with technical insights, program timeframes, sharing lessons learnt and understandings on how contamination impacts the end value of assets. This has extended to educating team members, assisting with keeping contamination off the critical path and driving sustainable remediation.

Louise has a PhD in Soil Science from the University of Adelaide and since 2004 has been recognised as a Certified Professional Soil Scientist (CPSS). In 2018 she obtained the specialised competency Contaminated Site Assessment and Management (CSAM). She has over 20 years' experience in the management of derelict and degraded land in research, consulting and contracting.

Louise has project managed and provided technical input into a large range of contaminated land projects including Per- and polyfluoroalkyl substances (PFAS) projects, Remediation Options Appraisals and baseline soils quality and groundwater quality.

Also a keen learner, she has enjoyed further professional development beyond her initial degree and is a strong believer in providing a place where people can connect to others, to create a sense of community and encourages us to challenge ourselves with new ideas and information. She is a past President of the SSA–Qld Branch, past CPSS Board member and past ALGA-Qld Chair.