

DERT (Diagnostic Environmental Reporting Tool): A Unified Geospatial Platform Transforming Mine Remediation and Environmental Compliance

Samuel Boone², Keith Dimech¹, **Fabian Kohlmann**¹, Wayne Noble¹

¹Lithodat Pty Ltd, Melbourne, Australia, ²The University of Sydney, Sydney, Australia

Effective remediation and secondary metal recovery from mine wastes rely heavily on timely, accessible, and standardised environmental contamination data. Traditional static reporting formats and fragmented datasets frequently hinder efficient decision making, environmental compliance, and risk management, leading to prolonged site closures, delayed approvals, and increased remediation costs. With global mining activity intensifying alongside stricter environmental regulations and heightened community expectations, a novel, integrated solution for environmental reporting is critical.

The Diagnostic Environmental Reporting Tool (DERT) provides a powerful, unified digital platform designed specifically to address these challenges within the minerals industry. Built on robust, four-dimensional (3D plus temporal) geospatial technology, DERT systematically standardises, validates, and archives diverse environmental geochemical datasets, facilitating rapid interrogation and actionable insights via intuitive, browser-based mapping interfaces.

DERT's immediate benefits for mine remediation include automated ingestion of laboratory data, dynamic classification of contamination against relevant regional environmental standards, rapid anomaly detection, and interactive dashboards for streamlined decision-making. By securely integrating historical and contemporary geochemical data into a cloud-based relational model, DERT enables precise environmental assessments, significantly reduces uncertainty, and promotes economically viable recovery of secondary metals from mining residues.

The platform's flexible relational architecture also supports global interoperability, enabling seamless collaboration across industry, consultancy, regulatory bodies, and researchers. Ultimately, DERT accelerates regulatory approvals, reduces operational expenses, enhances transparency, and fosters responsible environmental stewardship across mining projects.

Through its transformative approach to contamination reporting and data management, DERT not only optimises remediation outcomes but also reshapes the perception of mining - from environmentally burdensome to proactive, innovative, and sustainably profitable.