

Process life-cycle management applies to specific operations and their associated risks in relation to the production of minerals and metals, such as exploration, extraction, processing, smelting, and refining. It includes waste management, decommissioning, and site rehabilitation.

Product life-cycle management applies to specific elements, substances, or products and their associated risks based on assessments of all stages in the cycle of manufacturing, use, re-use, recycling, and disposal of that particular element, substance, or product.

### *Risk Assessment and Risk Management*

The application of risk assessment and risk management approaches is inherent in the life-cycle management of minerals and metals. Risk assessment estimates the degree and likelihood of adverse effects resulting from exposure to a substance from a process or product. Risk management is the process of deciding what to do about an assessed risk, taking into account the results of the assessment and the economic, social, and legal factors.

### *Safe Use*

The Safe Use Principle calls for the responsible use and management of environmental and human health factors associated with the production, use, re-use, recycling, and disposal of minerals and metals and is closely linked to the application of life-cycle, risk assessment, and management principles.

Safe use is also based on two premises contained in Canada's Toxic Substances Management Policy (1995): recognition that, as naturally occurring substances, minerals and metals cannot be virtually eliminated from the environment, and that some products containing minerals and metals, or their uses, pose risks that cannot be managed and may, therefore, be candidates for phaseout, bans, or virtual elimination of releases from specific anthropogenic sources.

The Safe Use Principle guides development of regulatory or nonregulatory strategies to manage risk based on the results of the risk assessment for a particular product during production, use, re-use, recycling, and return to the environment. By adhering to the Safe Use Principle, governments will ensure that society continues to benefit from minerals- and metals-related products while protecting human health and the environment in a manner consistent with sustainable development.