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Paper Abstract Submission

Paper Title:	Lithium Mining in Western Australia – Challenges and Opportunities
Topic:	Lithium mining, geochemistry of pegmatite minerals, opportunities servicing the battery industry in Western Australia
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Abstract:	Western Australia is well positioned to provide mineral products required for battery production to service the rapidly expanding demand generated by the electronic vehicle (EV) industry. Lithium is required to satisfy current and predicted demand, particularly from China, for mass production of EV batteries. Western Australia also has substantial deposits of other EV battery minerals including nickel, cobalt, manganese and graphite. Existing mines at Greenbushes, Ravensthorpe and Kalgoorlie already contribute a large proportion of worldwide hard rock lithium production, with the main competition being brine producers in South America and China. The primary source of hard rock lithium is the mineral spodumene, which is found in large quantities in pegmatite deposits. Several large pegmatite deposits have been mined previously in WA for other rare elements including tin, niobium, tantalum and beryllium. However, rapid expansion of lithium mining and potential downstream processing to produce high value materials including lithium carbonate and lithium hydroxide, requires a detailed understanding of the geochemistry, mineralogy, other physical properties of lithium minerals. Co-occurring rare element minerals also need to be characterised and their behaviour understood to ensure mining and processing does not have an adverse impact on the environmental or human health. MBS Environmental has completed several materials characterisation studies in support of new and proposed lithium projects in WA. These studies have identified several emerging issues that need to be considered for identifying and managing environmental risks associated with lithium mining, production of concentrates and downstream refining. This presentation will discuss key findings including the geochemistry and toxicology of rare elements associated with lithium mineral pegmatites including some specialised assessment methods such as LEAF testing not routinely applied to waste characterisation in WA.
About the Presenter/s:	Michael joined MBS Environmental in 2013 and has worked in the field of environmental chemistry for many years in the analysis and interpretation of results, reporting and technical problem-solving. He has 18 years' experience across analytical, environmental, organic, inorganic and physical chemistry as well as occupational hygiene, geochemistry, soil science and materials science. He is a chartered chemist and associate of the Australian Institute of Occupational Hygienists. His areas of expertise include: • Acid mine drainage and waste characterisation including kinetic studies. • Water, groundwater and soil chemistry, analysis review and interpretation including the transport and fate of contaminants in the environment. • Air quality monitoring for both public health and occupational hygiene. • Contaminated sites assessment and remediation including bio-remediation.

	• Drinking water interpretation and advice including treatment, analysis and management. • Waste water treatment and disposal/re-use. • Dangerous goods, international shipping (IMSBC/MARPOL) classification and SDS preparation and health risk assessments. • Chemical speciation and fingerprinting for source apportionment including isotopic ratio analysis and other techniques. • Occupational hygiene monitoring including biological monitoring and toxicology of metals to human health.

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