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Critical Mineral Potential of Jurassic Magmatic Systems in the Eastern Basin and Range

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The intrusive activity of the Jurassic era in the Basin and Range Province is well documented (e.g., Barton et al., 2011) and associated mineralization is generally less significant than later magmatic events, leading to a lack of interest in Jurassic-age intrusions as an exploration target. However, recent discovery of a shallowly buried, strongly altered and weakly mineralized Jurassic magmatic system in Utah (Thompson Knolls) has revived interest in the mineral potential of intrusions in that time period. Jurassic intrusions are known to generate a range of mineral systems, some of which can be high grade and/or contain considerable critical mineral potential, such as at the Gold Hill mining district, Utah. Gold Hill also demonstrates the influence of Jurassic intrusions on later magmatic events by serving as pre-existing pathways of crustal weakness focusing subsequent magmatic emplacement. As noted, later magmatic events tend to have more significant mineral potential, and Gold Hill provides a blueprint for interaction between a Jurassic pluton and later Eocene stock, highlighting the need to understand ages of all magmatic activity in blind exploration targets. Given the diverse mineral potential of Jurassic intrusive systems and their ability to influence later magmatic events, an evaluation of the exploration potential and approach to buried Jurassic systems is discussed, with an emphasis on how these systems factor into the critical mineral exploration scene.

Barton, M. et al., 2011, Jurassic igneous-related metallogeny of SW North America: GSN Symposia Proceedings.