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An Updated Global Compilation of Clastic-Dominated and Mississippi Valley-Type Sediment-Hosted Zn-Pb-Ag Deposits

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Sediment-hosted lead-zinc deposits, including clastic-dominated (CD) and Mississippi Valley-type (MVT) deposits, are the primary sources of lead and zinc production globally and can contain significant quantities of silver. Lead, zinc, and silver are included in the 2025 List of Critical Minerals in part due to their use in batteries, galvanized coatings, and electronics. The U.S. Geological Survey is tasked with assessing and, where possible, quantifying undiscovered critical mineral resources. Updated grade and tonnage data for CD and MVT deposits are necessary for constructing probabilistic models for estimating undiscovered lead, zinc, and silver resources, as well as associated trace elements like germanium. Here, we present an updated compilation of global CD and MVT deposits (n=244) that supplements previous work with grade and tonnage data from code-compliant reporting (e.g., NI 43-101 and JORC technical reports) and more recent references. This compilation aims to reflect original, in-place resources by combining production and current in-situ resource estimates when possible. The lowest cut-off grade was chosen when multiple cut-off grades were given.

The median ore tonnage for CD deposits (n=123) is 14.1 Mt with Zn, Pb, and Ag grades of 5.0%, 2.05%, and 44.3 grams/metric ton, respectively. The median ore tonnage for MVT deposits (n=121) is 7.3 Mt with Zn, Pb, and Ag grades of 6.0%, 2.0%, 31.5 grams/metric ton, respectively. The median MVT deposit is 49% smaller in ore tonnage than the median CD deposit. The median MVT deposit has Zn grades that are 20% greater, Pb grades that are approximately equal, and Ag grades that are 29% lower than the median CD deposit. These data are similar to the most recent USGS compilation, which found a median ore tonnage of CD deposits of 12.2 Mt with Zn, Pb, and Ag grades of 4.9%, 2.3%, and 42 grams/metric ton, respectively, and a median ore tonnage of MVT deposits of 7.0 Mt and Zn, Pb, and Ag grades of 6.0%, 2.0%, and 33.5 grams/metric ton, respectively. These data can be used to fit robust global or regional grade and tonnage models that are integral for mineral resource assessments.