



Potential Sources of Critical Mineral Commodities in Montana

John Metesh

Critical mineral commodities are essential to national security and the U.S. economy. These commodities are used to manufacture everything from electric batteries to computer and car parts to military equipment. Critical mineral commodities are "critical" because their supply is vulnerable to inadequate U.S. reserves and geopolitical complications related to foreign supply chains.

Critical mineral commodities occur as rocks, minerals, or elements that are concentrated in specific rock formations in Montana. The U.S. Geological Survey (USGS) and the White House Office of Science & Technology recently designated a total of 50 commodities, including 15 rare earth elements (REEs, underlined) and platinum group elements (PGEs, *italics*): aluminum, antimony, arsenic, barite, beryllium, bismuth, cerium, cesium, chromium, cobalt, dysprosium, erbium, europium, fluor spar, gadolinium, gallium, germanium, graphite, hafnium, holmium, indium, iridium, lanthanum, lithium, lutetium, magnesium, manganese, neodymium, nickel, niobium, palladium, platinum, praseodymium, rhodium, rubidium, ruthenium, samarium, scandium, tantalum, tellurium, terbium, thulium, tin, titanium, tungsten, vanadium, ytterbium, yttrium, zinc, and zirconium.

Critical Mineral Commodity Potential in Montana

The Montana Bureau of Mines and Geology (MBMG) presents a Critical Mineral Commodity Potential Map for Montana (below) based on in-house records related to historic mineral assessments, our abandoned–inactive mines inventory, and production data from our mine archives database. The MBMG is actively working to update and publicly deliver Montana’s historic mining records in the modern context of critical mineral commodity potential.

Blue areas on the Critical Mineral Commodity Potential Map have high to moderate mineral potential for base and precious metals as determined by USGS, U.S. Bureau of Mines, and MBMG field studies conducted in the 1970s and 1980s. The high to moderate potential areas are concentrated in western Montana and are considered “prospective” for critical mineral commodities because many critical commodities may occur in waste piles of historic base metal and precious metal mines throughout the State.

Beginning in 2020, the MBMG has worked with USGS scientists to identify a target region in Montana for a modern airborne geophysical survey. High-resolution geophysical surveys can be thought of as CAT-scans of the Earth’s crust and are useful

