

Morgan D. Bazilian: Answers to Questions for the Record

“Now Ore Never: The Importance of Domestic Mining for U.S. National Security.”

Held on February 6, 2025.

1. From Rep. Westerman: on improving coordination of US critical minerals lists

Three non-classified lists for critical minerals exist in the US. Each list has a different system boundary, a different focus, and a different methodology. These differences stem from the missions and goals of the various agencies and their stakeholders. The resulting lists are thus very different, albeit with some overlap. The DOD list is the only one with a forward-looking methodology, and the one with a mix of minerals and various materials. Likely the best way to increase coordination is through increased transparency of methods and reporting timelines.

This is not an issue only being addressed by the United States. Many countries have critical minerals lists—in some cases with fundamentally different motivations. Our country has at least three such unclassified lists. The DOD’s efforts are perhaps the most sophisticated, as they consider not just minerals, but processed materials—they also consider future demand scenarios and not just a snapshot of the present. Improving the sophistication of these methodologies, while seemingly prosaic, would help improve decision making. To that end, various parts of the intelligence and defense community are undertaking regular tabletop exercises looking at different vectors of these issues. Those games will help inform how we can plan for, and react to, the myriad risks to national security.

I am not familiar with the HR 8446 legislation in detail, but it seems to suggest including the materials designated in the DOE list to be included in the USGS list. That may bring some clarity to the confusion created by having multiple lists, but the methodologies will likewise have to be aligned in some manner.

**Our recent paper on the topic is here:*

<https://www.sciencedirect.com/science/article/abs/pii/S2214790X23001909>

2. From Rep. Fulcher: on permitting efficiency

With domestic mineral demand forecasted to soar due to America's burgeoning reindustrialization and overseas mineral supplies imperiled by jurisdictional and shipping risks, members of the U.S. executive branch and Congress increasingly support a modernized permitting system that facilitates the development of domestic mining projects. They also generally back high permitting standards for safety, health, labor, emissions, and the environment, as well as Tribal consultation and community engagement. This emerging bipartisan consensus presents an opportunity for federal agencies to update rules and for Congress to pass laws streamlining permitting for new mines that are environmentally and socially responsible. Better coordination between the many departments, regulatory bodies, and agencies would certainly improve permitting efficiency.

Mineral projects have a long phase of development that entails rigorous state and federal permitting processes, regular community engagement, environmental studies, cultural surveys and consultation with tribal sovereign governments. Once a 'feasibility study' is completed to assess a project's viability, mining companies seek to secure permits and financing before they can begin construction.

This phase takes time and money and has an unpredictable timeline. Based on an analysis of 270 active mines, the average duration from a completed feasibility study to mine operation is three years, with 10 percent of projects taking over six years to begin operations. This time frame includes permitting, economic assessment, and construction. Due to permitting or financing challenges, many mining projects with completed feasibility studies do not reach the operational stage. This is where our critical minerals ambitions get stuck: between exploration and construction, unable to secure the financing needed for permitting, engineering, and environmental reviews. It is telling that only three mines have come online in the US over the last two decades, none of which were on federal lands, with roughly 10 projects stuck in development.

**Our recent paper on the topic is in this book on page 78:*

https://csis-website-prod.s3.amazonaws.com/s3fs-public/2025-02/250210_Baskaran_Critical_Minerals.pdf?VersionId=Tfu2TnNrQGIN7ol8HSCakMUT8HTwYukd

3. From Rep. Ezell on palladium and semiconductor minerals supply

Palladium, like gallium and germanium, are essential for semiconductors. They all face supply chain risks, but palladium risk is more from Russia and possibly South Africa – whereas the others have risks largely from China. The US produces a small amount of global demand from mines in Montana.

On December 3, 2024, China’s Ministry of Commerce [announced](#) that “the export of dual-use items such as gallium, germanium, antimony, and superhard materials to the United States will not be permitted.” This announcement likely means that [over 20 mineral items](#) – encompassing both metals and chemicals – are banned from being exported from China to the United States.

Critically, China – the United States’ “most consequential strategic competitor” according to the [2022 National Defense Strategy](#) – is the largest source of U.S. imports for [antimony metal and oxide](#), as well as [germanium metal](#). China is also the second largest source of U.S. imports for [gallium](#). Since China’s export ban takes immediate effect, the U.S. defense industrial base could experience short-term mineral shortages and higher prices. This should not be taken lightly: mineral shortages can impede defense manufacturing and undermine the strength of the military, just as the United States experienced during [World War II](#).

The resulting supply disruptions from China’s new export ban could also have a multi-billion-dollar impact on the U.S. economy. For example, the U.S. Geological Survey recently [calculated](#) that if China blocked all exports of gallium alone, U.S. gross domestic product could decline by up to \$8.2 billion.

**One of our papers on gallium and germanium is here:*

<https://thediplomat.com/2024/12/chinas-mineral-export-ban-strikes-at-the-us-defense-industrial-base/>
