

**Attachment. Matt Vincent, Montana Mining Association, Answers to Additional
Questions for the Record.
November 21, 2024**

The Honorable Earl L. “Buddy” Carter.

1. Can you provide for the committee a general overview of a lifecycle of a mine in the U.S. – from concept to production?

The mining process is complex with many steps, and typically takes years – and sometimes decades – to move from concept to exploration, permitting, and then production. Mine closure, subsequent reclamation/restoration, and in some cases long-term environmental management, are other steps which must also be considered when considering the lifecycle of a domestic mining operation. A recent report by S&P Global¹ ranks the U.S. second to last *GLOBALLY* in the average amount of time it takes for a mine to progress from discovery to production at 29 years! Only Zambia has a longer timeframe at 34 years. Simply put, if we want to solve our minerals supply chain issues, we must do better than this.

From a step-by-step perspective, while every mine is different, the following is generally a description of the mining process from concept to closure and reclamation:

Early-stage Exploration is the first step, which includes gathering data from mineral surveys, etc. and acquiring the rights to further explore target deposits. The latter stages of this step is where a company would need to obtain its first permits if exploration is on state or federal lands (i.e., claims, notice(s) of intent). Planning for stakeholder engagement with local communities and tribal populations is also part of this step. It is also worth noting that according to the National Academy of Sciences, at best, approximately 1 out of 1,000 deposits has the chance to be transformed into an operating mine.

Exploration & Evaluation requires permitting, financing/investments and government-approved bonding secured for any proposed disturbance (roads, drilling, construction, etc.) related to geological, technical and environmental analysis of the deposit(s) and economic feasibility assessments and additional geological, technical and environmental analysis of a proposed development. This step also includes stakeholder engagement and precedes development and obtaining an operating permit.

¹ <https://press.spglobal.com/2024-07-18-United-States-Ranks-Next-to-Last-in-Development-Time-for-New-Mines-that-Produce-Critical-Minerals-for-Energy-Transition,-S-P-Global-Finds>

Operation Permitting, Design & Construction involves securing final investments and approvals for a permit to operate again including stakeholder involvement. Once a permit is obtained, the company must finalize its design and complete construction of roads, mine and mineral processing infrastructure, environmental management systems, employee housing (if necessary) and other steps that may be identified through stakeholder community involvement. It is safe to reasonably assume that outside stakeholders or environmental groups will pursue litigation at one or multiple stages of this process. Litigation can add years, undue expense, and significant uncertainty to this already complex process and robust regulatory framework.

Commercial Production & Processing of minerals can only begin once all permits and approvals are received, and infrastructure is in place. Operation life varies depending on the deposit and other factors including markets, contracts, etc. Exploration often continues for potential mine expansions, which require additional permitting, evaluation, analysis and investments, as do any major changes to the operations.

Closure & Environmental Reclamation/Management. Once a mining operation is completed, it is responsibly decommissioned according to requirements set forth in permit(s), bond(s) and the land and water is managed and reclaimed/restored to a natural and/or economically usable condition, as determined by the original permit. With regard to many historic or “legacy” mining operations, we are now determining that it is economically feasible, in some cases, to responsibly extract additional metals from these former waste sites.

1a. What would you say are the more prolonged parts of the permitting process?

Again, every mine is different and it’s difficult to pinpoint a particular part of the process. That said, it takes significant time during exploration to obtain the data necessary to secure investments to enter the permitting realm. Once a resource is deemed economically, environmentally and socially viable, the permitting cycles begin (both exploration and operations), which takes significant time and even more expense and due diligence. Unfortunately, this is also where most litigation takes place, which is one of the more prolonged, protracted and uncertain parts of the permitting process.

2. It appears China has an advantage in the vertical integration of the complete supply chain. Here, we cannot talk about a robust, domestically based critical minerals supply chain without talking about the financing needed for these projects and the essential need for predictability.

It is a fact that China has an outsized advantage in the vertical integration of the complete supply chain for most minerals/metals.

2a. Are there current challenges to generating investment interest in mining and refining in the United States? If so, what are they?

As the saying goes “money follows vision,” and in regard to mining, a corollary may be that “investment follows certainty.” The uncertainty in the U.S. permitting process due to lapsed timelines for crucial permitting decisions by agencies and resulting litigation have resulted in mining companies and investors putting their money and efforts into projects in other countries. Until we achieve a vision that will provide more certainty in our permitting, we should not expect mining investments to increase in the U.S. – even though we have vast mineral resources that could be developed responsibly to meet our nation’s needs. Put another way, as long as we are in the same class as Zambia for the time it takes to develop a legal mine, we should not expect investments to increase in U.S. projects.

2b. Is reliance only on government grants for limited activities in the supply chain a path to success?

Government grants can make some project viable and good projects better, but it is unreasonable to expect success relying solely on government assistance. Permitting reforms to improve timelines and reduce duplication, judicial reforms, and regulatory certainty are all critically important to ensuring projects can move forward and investments are made in the U.S. Without these improvements to the process, no amount of government funding will be able to overcome our current obstacles.

2c. What role does access to processing have in planning and financing new mining activities?

Increasing our domestic processing and refining capabilities – and also manufacturing – would have major positive effects on planning and financing new mining activities. Development of more American-based mineral processing and manufacturing facilities will result in better economics and efficiencies for mining projects, which will also produce major economic impacts for the states and communities in which both the mines and processing facilities operate. This will also result in stronger stability and certainty for our nation’s supply chains to guarantee our economy and defense will be able to get the metals and products we need, when we need them. Lastly, increased American mining and processing will result in less environmental impacts and social injustices knowing that our nation has the most robust permitting, highest environmental and safety standards and greatest labor standards in the world. Additionally, federal policy needs to prioritize domestic mineral supply chains to feed domestic processing and refining operations.

2d. Would it help to treat mining, extraction, and processing projects as one big, complex delivery system project that needs to be concurrently synchronized to maximize the important commercial and security benefits they will bring?

Mining and processing/refining are indeed one complex delivery system that is crucial to America achieving security in a domestic supply chain. One opportunity to better achieve this system is to amend the recently approved 45X tax credits in the Inflation Reduction Act to extend throughout the entire system – “from mine to consumer,” or “mined in America is made in America.” As recently approved, the credits only benefit a very small fraction of the players in this complex delivery system. While the companies that were included stand to benefit greatly – including the Sibanye-Stillwater platinum group mining and processing facilities here in Montana – the credits as currently applied will do little to achieve supply chain security and commercial benefits.

3. The Bipartisan Policy Center argues the importance of considering each type of mineral individually when developing effective policies to address supply chain challenges, particularly if the aim is to develop robust midstream processing capacity.

3a. Do different minerals have different processing requirements and are they subject to different market dynamics.

Yes, and yes: different minerals have different processing requirements and are subject to different market dynamics. In the case of rare earth elements, China not only has the markets cornered, but they have also secured and restricted the technology necessary for processing and refining.

3b. Will investors back new projects without confidence that policies and capabilities are in place to navigate the risks and barriers each minerals market presents?

Please see response to Question 2a.

4. Please distinguish for me the difference between exchange-traded and non-exchange-traded minerals.

“Exchange-traded” metals/minerals are those that appear on one or more of the global markets, such as the Chicago Mercantile Exchange (CME) COMEX, NYMEX or London Metal Exchange (LME) and include more commonly known mineral commodities such as gold, silver, aluminum, platinum. “Non-exchange-traded”

minerals do not appear on these aforementioned markets and as such, are more opaque with greater potential for manipulation by geopolitical adversaries.

4a. How are the supply chain dynamics different for minerals that are not exchange-traded versus those that are?

The dynamics of exchange-traded minerals are generally more transparent in terms of market influences, etc. Non-exchange-traded minerals are less understood and market dynamics are much less transparent, which may lead to easier manipulation by those who control the supply of specific minerals (e.g., China).

4b. What is China’s influence over global markets in each group of minerals?

China has a significant influence in the global markets for all metals and minerals and an outright stranglehold in some cases. As many studies have indicated, including the International Energy Agency (IEA)², China controls 60% of the mining for most of the metals/minerals necessary for green energy production – not to mention many technology advancements and our national defense security. Even more alarming, China controls 90% of the processing and refining of these minerals, putting the U.S. and our allies at a distinct risk of vulnerability.

Further, China is not “resting on its laurels,” so to speak and is taking aggressive actions to increase its influence on mineral markets across the globe. Examples include its export and technology restrictions of graphite, gallium, germanium and antimony. Additionally, China is greatly influential in BRICS, which has identified minerals as a priority area³. The Forum on China-Africa Cooperation (FOCA) is also of concern, with China pledging more than \$50B in investments into the African continent over the next three years, including a focus on industrialization, green technology and thousands of scholarships for technology transfer, all of which include minerals.⁴ And most recently, last week Chinese President Xi Jinping engaged in a “weeklong, diplomatic blitz” of South America to expand its trade relations with the continent including a \$1.3B port in Chancay, Peru, largely to increase exports of South American metals to China⁵.

The Honorable Rick W. Allen

1. You indicated in your written testimony that the Biden Administration has taken steps to acknowledge and begin addressing the permitting process.

² <https://www.iea.org/reports/the-role-of-critical-minerals-in-clean-energy-transitions/executive-summary>

³ <https://www.csis.org/analysis/six-new-brics-implications-energy-trade>

⁴ <https://www.chathamhouse.org/2024/09/china-africa-summit-why-continent-has-more-options-ever>

⁵ <https://www.reuters.com/world/chinas-xi-arrives-lima-apec-open-pacific-megaairport-2024-11-14/>

What immediate actions can the administration take to address the current inefficient permitting process?

Given the 2024 presidential election results, the least and most immediate action the Biden Administration could take in its limited time remaining to help begin to resolve the current inefficient permitting process would be to NOT make any further adverse decisions (e.g., mineral withdrawals, lease cancellations/restrictions, etc.) nor enact any additional rules or policies (i.e., application of the Conservation and Landscape Health rule⁶, implementation of recommendations from the Interagency Working Group report⁷, amended RMP approvals⁸) that would result in additional challenges to securing our domestic mineral supply chains. The best and most immediate actions the administration could take would be to repeal or recommend for substantive amendments, any rules, policies, incentives or decisions that have been deemed or challenged to unnecessarily impede mineral development.

The Honorable Russ Fulcher

- 1. Your written testimony describes the prolonged permitting process for Sandfire Resources America's Black Butte Copper Project. Beginning since exploration to a granted permit, Black Butte has taken 14 years, produced over 90,000 pages of permit and supporting documents and has been met with litigation nearly every step of the way. Can you provide the committee with some suggestions for improving the permitting process?**

First a clarification: the 14 year time frame for the Black Butte Copper project (Sandfire Resources America) in Meagher County, MT only includes the time between its first exploration permit and when it received its operating permit after a long legal battle that ended in front of the Montana Supreme Court (MTSUPCO). If early exploration is included, another 10+ years needs to be added to that time frame and reams of additional study. With a permit finally in hand, the Black Butte project still awaits one more MTSUPCO decision on litigation filed by environmental organizations over its water permits⁹. Once development can begin without uncertainty, it will still take approximately 3-4 years before the mine is in production.

Suggestions for improving the permitting process include much better coordination and efficiency among federal regulatory agencies, consistent and enforceable time frames for agency reviews on permit documents and, arguably

⁶ <https://www.blm.gov/policy/ib-2024-035-change-1>

⁷ <https://www.doi.gov/sites/default/files/mriwg-report-final-508.pdf>

⁸ <https://eplanning.blm.gov/eplanning-ui/project/2021155/510>

⁹ <https://dailymontanain.com/2024/03/29/supreme-court-hears-arguments-on-water-permits-for-copper-mine-near-smith-river/>

the most critical, judicial reform. Sadly, the Black Butte example is more the norm and not an exception in today's reality. Senators Manchin and Barrasso's energy permitting reform bill has a lot of good in it, including an effort to curb the incessant litigation currently standing in the way of progress. Regulatory and policy coordination coupled with permitting and judicial reform will give mining projects improved certainty necessary for development.

2. Your testimony highlights that the U.S. is recognized as a country with vast natural resource development potential, second only to Russia. In describing some of the challenges to progress, can you highlight some key proposals and decisions by the administration that would run counter to our economic competitiveness and national security goals?

A myriad of actions by the current administration has created sizeable challenges to the U.S. being able to responsibly develop its wealth of natural resources needed for achieving our economic and national security. Mineral withdrawals (e.g., Superior mineral withdrawal¹⁰), lack of project approvals (e.g., Ambler Road project¹¹), pursuing regulatory actions that negatively impact mineral and other key projects (e.g., Phase 2, NEPA¹²), and failure to support an integrated "Mined in America is Made in America" incentive program (e.g., 45x¹³) are to name a few major categories of discord. Our federal government must adopt a coordinated and consistent approach if America is to fully develop its domestic critical minerals supply chain, from the ground up.

3. Permitting is a primary hindrance to securing our mineral supply chains. Can you describe another key hindrance – a qualified and robust mining workforce?

If all the problems with policies and permitting were fixed and the litigation settled tomorrow, America would still be looking – albeit more urgently – to bolster the workforce necessary to drive future growth in the mining industry.

It is currently forecasted that half of the existing mining workforce will retire by 2029 and 71% of companies report that talent shortage is a key reason they are unable to meet production targets. Meanwhile, it is estimated more than 300 new mines will be needed by 2035 to meet the mineral supply necessary to keep up with battery demand. And in higher education there were 327 degrees

¹⁰ <https://naturalresources.house.gov/news/documentsingle.aspx?DocumentID=416624>

¹¹

https://eplanning.blm.gov/public_projects/57323/200091317/20118938/251018918/Ambler%20Road%20BLM%20ROD_508.pdf

¹² <https://www.federalregister.gov/documents/2024/05/01/2024-08792/national-environmental-policy-act-implementing-regulations-revisions-phase-2>

¹³ <https://nma.org/2024/10/24/treasury-declines-to-fully-include-extraction-in-45x-credit/>

awarded at the U.S.'s 14 recognized mining and mineral engineering schools – a 39% net drop since 2016. Conversely, China currently has 44 mining schools graduating more than 5,000 students annually.¹⁴ These sorts of shortfalls in labor and talent take significant time and focus to address and it is encouraging that there are many efforts underway in an attempt to make up ground. The most direct way to address the existing and coming shortfalls is to get more mines exploring, developing and operating so that the next generation of our society understands the needs and the excellent opportunities for them in this challenging and exciting industry.

3b. How can we support our workforce to ensure we have the tools and the women and men necessary to achieve our energy and security objectives?

As a nation, we need to show broader support for domestic mining and the hard working women and men producing the materials that make our quality of life and security possible. The industry is focusing on improved and expanded promotion and education about our industry, as well as what we need to do to increase the skilled mining workforce. Two examples from the industry: The National Mining Association has a Mining Workforce Development working group among its members dedicated to understanding and addressing the industry's pressing talent shortages; and the American Exploration and Mining Association has an outstanding outreach and education campaign "I Am Mining..." which aims to engage and educate the public to modern American mining through the personalized stories of the people in its workforce¹⁵.

There is a lot of good going on and planned right now at the federal and individual state levels to help address the mining workforce shortages acknowledged and described herein. Montana Technological University (MTU) in Butte, MT has a unique training and research laboratory for underground mining, the Underground Mining Education Center¹⁶. Our association supports MTU's mining, geological, metallurgy and mineral processing, environmental and safety engineering programs with scholarship funding each year to help its recruitment efforts. And the Department of Defense recently funded MTU with \$6.5M to deploy an innovative on-line curriculum for engineers to upscale their skillsets to meet the growing needs of a critical minerals workforce.¹⁷ Federally, the Mining Schools Act of 2023 appears poised to pass, which will allocate \$10M/year for technology advancements to strengthen our domestic mining education

¹⁴ Figures from the National Mining Association presentation, "Mining Workforce & Trends" presented by M.K. Kirlin at the Montana Mining Association 2024 annual meeting.

¹⁵ <https://www.miningamerica.org/iammining>

¹⁶ <https://www.mtech.edu/umec/>

¹⁷ <https://mtech.edu/news/2024/09/montana-technological-university-awarded-6.5-million-via-the-defense-production-act-investments-office-to-create-online-stackable-certificate-programs-to-meet-demands-for-critical-minerals-rare-earth-elements.html>

programs at institutions such as MTU. And there are provisions in CHIPS Act of 2022 aimed at mining research and development and workforce funding. These are great acknowledgements and will help begin to resolve the issues. Much more needs to be done.

Another idea to complement everything we can continue to do to grow our domestic 21st mining workforce could be to consider establishing a program to incentivize and recruit immigration of skilled mining workers from around the globe who want to help America achieve its critical minerals supply chain security goals. Many of the companies currently invested in operating U.S. mines and processing facilities are multi-national corporations with projects across the world, every one of them staffed with highly skilled workers in the global industry. The incentives for these foreign skilled mine workers to come live and work in America could be significant. Compensation for skilled workers in the mining industry globally varies greatly, with the U.S. leading all others for salaries, benefits and worker safety, not to mention environmental protections. In the early 20th century, our nation was made great by the influx of skilled workers from Europe and elsewhere who wanted to be part of the American dream. One specific example is my hometown of Butte, where at one time there were 15,000 workers toiling around the clock in “The Mining City’s” underground copper mines and smelters. Butte’s copper was said to electrify the nation and had a role in our allied forces victories in both World Wars. None of this would have been possible without the immigration of workers and their families from all parts of Europe, Mexico and Asia. Our country could benefit from a second wave of help from abroad to contribute to our critical mining workforce needs.

The Honorable Nanette Barragán

The clean energy transition will require additional mining and the processing of critical minerals, but workforce shortages are a challenge we need to overcome. What can the federal government do to provide additional support for workforce development in the mining and critical minerals industry?

The clean energy transition will require additional mining and processing of critical minerals in an amount hard for anyone to fathom. For instance, a typical electric vehicle uses 6x the minerals of a conventional car and an on-shore wind farm requires 9x more minerals than a gas-fired power plant with a similar output¹⁸. In addition to these mentioned, there is off-shore wind development (much more minerals intensive than on shore), geothermal, nuclear, solar generation, battery storage, electricity networks to connect renewables to the grid, grid expansion, hydrogen use in electrolyzers and fuel-cell EVs, as well as

¹⁸ <https://www.iea.org/topics/critical-minerals>

the necessary pipelines for its storage and transport, and finally the removal systems and pipelines required for carbon capture utilization and storage (CCUS). These will all require an absurd amount of additional minerals, which is something necessary to consider when evaluating the feasibility of net-zero and energy transition targets.

In addition to energy transition, there is also going to be an exponentially increased demand for minerals in the deployment of datacenters for AI, the electrification and automation of everything else imaginable (Internet of Things) and let's not forget the necessary rearmament of the U.S. and allied military forces (as well as our adversaries) after costly wars in Ukraine, the Middle East, etc. and the technology advancements crucial to keep pace in defense for our national security.

Perhaps copper is the best mineral on which to focus, as there are increased supplies needed for all of the above. According to data from USGS and BMO Capital Markets presented to the Montana Mining Association at its 2024 annual meeting, the next 20 years will require as much copper (700 million metric tonnes) as the amount that has been mined in the current history of civilization – and this just to meet 3% GDP growth globally *not including achievement of energy transition goals*. This should emphasize an alarming need for new mining, as increased and expanded recycling and reuse of minerals will only be able to meet a fraction of our society's needs.

Relative to supporting the development of our necessary work forces, please see the answers above for Congressman Fulcher's questions 3 and 3b.