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NOW ORE NEVER: THE IMPORTANCE OF DOMESTIC MINING FOR U.S. NATIONAL SECURITY

OVERSIGHT HEARING

BEFORE THE

SUBCOMMITTEE ON ENERGY AND MINERAL RESOURCES

OF THE

COMMITTEE ON NATURAL RESOURCES
U.S. HOUSE OF REPRESENTATIVES

ONE HUNDRED NINETEENTH CONGRESS

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HOUSE COMMITTEE ON

NATURAL RESOURCES

CHAIRMAN BRUCE WESTERMAN

To: House Committee on Natural Resources Republican Members

From: Energy and Mineral Resources Subcommittee Staff, Rob MacGregor: Robert.MacGregor@mail.house.gov, x6-2466; Oversight and Investigations Subcommittee Staff, Michelle Lane: Michelle.Lane@mail.house.gov, x6-4137

Date: February 3, 2025

Subject: Oversight Hearing titled "*Now Ore Never: The Importance of Domestic Mining for U.S. National Security*"

The Subcommittee on Energy and Mineral Resources will hold an oversight hearing entitled "*Now Ore Never: The Importance of Domestic Mining for U.S. National Security*" on **Thursday, February 6, 2025, at 10 a.m. in 1324 Longworth House Office Building**.

Member offices are requested to notify Jacob Greenberg (Jacob.Greenberg @mail.house.gov) by 4:30 p.m. on Wednesday, February 5, 2025, if their Member intends to participate in the hearing.

I. KEY MESSAGES

- To ensure national security, the U.S. must ensure mineral security.
- The United States imports many critical minerals from China and other adversarial nations. This import reliance is a vulnerability that places America's domestic supply chains at risk.
- While the U.S. has many mineral deposits within its borders, long permitting timelines and anti-mining policies advanced by previous administrations have stymied domestic mining activity.
- Encouraging a streamlined mining process from discovery to development for domestic mining projects and decoupling our reliance on foreign adversaries for any segment of the mineral supply chain will create economic certainty and security.
- China recently implemented export bans on critical minerals essential for defense purposes, like gallium, germanium, and antimony. China has also repeatedly used its mineral supply to flood markets and stifle foreign competition strategically, including U.S. attempts to establish secure domestic supply chains.

II. WITNESSES

- **Dr. Morgan Bazilian**, Director, Payne Institute for Public Policy, Colorado School of Mines, Golden, CO
- **Mr. Jeremey Harrell**, CEO, ClearPath, Washington, DC
- **Ms. Mckinsey Lyon**, Vice President of External Affairs, Perpetua Resources, Donnelly, ID
- **Dr. Dustin Mulvaney**, Environmental Studies Professor, San Jose State University, San Jose, CA (Minority Witness)

III. BACKGROUND

Minerals are essential to the U.S. economy, and most are used in various civilian and military applications. Mineral materials consumed by downstream industries in the U.S. created an estimated value of $3.84 trillion in 2023 and a 6 percent increase from 2022 levels.[1] Unfortunately, the U.S. is largely dependent on hostile nations for a significant amount of critical minerals, creating a significant threat to our national security. On December 20, 2017, President Trump issued Executive Order (EO) 13817, entitled "A Federal Strategy to Ensure Secure and Reliable Supplies of Critical Minerals," which directed the Department of the Interior (DOI), in coordination with other agencies, to publish a list of minerals determined to be "critical," also referred to as the Critical Minerals List (CML).[2]

The U.S. Geological Survey (USGS) publishes and updates the CML every three years, with the next iteration expected to be published early this year.[3] The most recent list was published in 2022 and consists of 50 hardrock minerals.[4] To be classified as "critical," a mineral commodity must be: (1) a nonfuel mineral or mineral material essential to the economic and national security of the United States; (2) produced from a supply chain that is vulnerable to disruption; and (3) serving an essential function in the manufacturing of a product, the absence of which would have substantial consequences for the U.S. economy or national security.[5] While the listed minerals were especially susceptible to supply chain shocks at the time of CML publication, policies that favor critical minerals exclusively rather than supporting *all* mineral development could inadvertently endanger unlisted mineral markets in the future. Furthermore, different federal agencies rely on their own mineral classification methods. For example, the Department of Energy's (DOE) Critical Materials List focuses on commodities that are essential in energy technologies. In contrast, the Defense Logistics Agency (DLA) focuses on materials vital to defense applications and national security.[6,7]

On day one of his second term, President Trump further prioritized efforts to secure mineral supply chains by releasing EO 14154, entitled "Unleashing American Energy," which directs federal agencies to revise and rescind agency actions that impose undue burdens on domestic mining and processing capacity and instructs the Secretary of the Interior to consider updating the CML, including the potential for listing uranium.[8]

IV. U.S. MINERAL PRODUCTION DIFFICULTIES

Mining is restricted to the location of deposits around the globe, the concentration of desired minerals in each deposit, and the economic feasibility of extraction. As such, no one country is fully self-sufficient in terms of the entire critical mineral supply chain. However, the U.S. severely lags behind competitors' mineral production and processing capabilities.

Despite the availability of multiple material deposits, the U.S. is disadvantaged by permitting delays and legislative restrictions that discourage domestic investment and restrict long-term mineral supply.[9] A 2024 study by S&P Global found that U.S. critical mineral projects take an average of 29 years from discovery to production—the second-longest in the world.[10] U.S.-based mining projects also lose over one-third of their value due to delays during the permitting process.[11] A June 21, 2021, White House review of President Biden's E.O. 14017 on America's Supply Chains stated of the American critical minerals supply chain, "[c]urrently, the United States has limited raw material production capacity and virtually no processing capacity. Without processing capacity, the United States exports the limited raw materials produced today to foreign markets . . ."[12] Without significant adjustments to this sector, the U.S. will continue to expose its resource supply chains to foreign influence and control.

During the 118th Congress, House Committee on Natural Resource Republicans warned that sustained reliance on adversarial nations, especially China, for various minerals rather than domestic sources jeopardizes U.S. supply chains and constitutes a pressing national security threat. To address these issues, House Republicans included an entire title on mining in H.R. 1, the Lower Energy Costs Act, which passed in March of 2023 by a vote of 225–204.[13]

V. FOREIGN IMPORT RELIANCE

In 2023, the U.S. was over 50 percent import-reliant on apparent consumption of 49 nonfuel mineral commodities and 100 percent net import-reliant for 15 of those commodities.[14]

Figure 1: Leading Import Sources (2019-2022) of Nonfuel Mineral Commodities for Which the United States was Greater than 50% Net Import Reliant [15]

Of the 50 minerals on the 2022 CML, the U.S. was over 50 percent import-reliant on 29 and 100 percent net import-reliant on 12.[16]

China and Canada supplied the most significant percentages of these mineral commodities, with China supplying 24 mineral commodities with greater than 50 percent net import reliance.[17] Overall, China controls 60 percent of global production, an estimated 90 percent of processing, and over 75 percent of manufacturing of critical minerals.[18] In terms of individual minerals, China refines 72 percent of the global refined cobalt, 98 percent of the global gallium, and 85 percent of the global refined rare earth elements (REEs).[19]

While China controls large portions of mid- and downstream operations, it lacks upstream reserves of multiple critical minerals. For example, 70 percent of global lithium is extracted in Australia and Chile, 70 percent of cobalt is extracted in the Democratic Republic of the Congo (DRC), 30 percent of nickel is extracted in Indonesia—the largest single source—and 40 percent of copper is extracted from Chile and Peru.[20] China is aggressively investing in global suppliers to offset its natural resource deficits. China owns the largest foreign stake in Indonesian nickel, and Chinese companies finance 15 of 19 cobalt-producing mines in the DRC, giving them unprecedented control over the supply of these minerals.[21]

Chinese mining and processing operations abroad have consistently been linked to labor and human rights abuses, elevating concerns regarding the ethics and stability of mineral supply chains. According to the U.S. Department of Labor (DOL), there were over 5,000 documented cases of child labor in DRC mines between 2018 and 2022.[22] However, the potential for underestimating these figures is high due to a lack of reliable monitoring systems.[23] Human rights organizations have also alleged that between 2018 and 2020, communities local to a copper and cobalt mine operated by a subsidiary of the Chinese multinational, Jinchuan Group, in the Congo "were deprived of their most basic rights, including the right to property, a decent home, food, water, a healthy environment, and even life."[24] Similarly, in September, DOL added Indonesian nickel produced in Chinese-financed industrial parks to its extensive list of foreign products made using forced labor.[25] DOL reported that Indonesian workers face abuses like unsafe conditions, deceptive requitement, unpaid wages, restricted movement, and even physical violence as a means of punishment.[26]

While abusive labor practices abroad are well documented, a widespread lack of transparency across various stages of the mineral supply chain has obstructed accurate tracking of materials and end products made with poor labor standards. In response to these unjust practices and insufficient mineral traceability, President Trump's EO 14154 directs the Secretaries of Commerce and Homeland Security to assess the inflow of minerals produced with forced labor into the United States and the national and economic security implications of relying on such imports.[27]

VI. EXPORT BANS

In July 2023, China curbed gallium and germanium exports, followed by high-purity and high-quality graphite and REE mining, mineral processing, and smelting technology later in the year.[28] On August 14, 2024, China issued export restrictions on antimony, a mineral vital for the defense industry.[29] On Tuesday, December 3, 2024, China announced export bans on "dual-use" technologies explicitly targeted at the U.S. after the U.S. took steps to limit exports of semiconductor and artificial intelligence (AI) technologies to China.[30] Chairman Westerman decried China's December ban and the lack of the Biden administration's lack of urgency predating the announcement, saying, "[d]espite the concerns of elected officials, national security experts, local communities and mineral producers, the Biden-Harris administration has made it more difficult to access the rich mineral resources here

in America and ceded control of the global mineral supply chain to our adversaries."[31]

Table 1: Recent Chinese Mineral Bans to U.S. and Common Uses

Mineral	Uses	U.S. Net Import Reliance as percentage of apparent consumption[32]
Antimony	Bullets and shot; flame retardant in personal protective equipment (PPE), electronic devices, aircrafts, and automobiles; batteries; communication equipment; night vision goggles; explosives; submarines; warships; optics; laser sightings.[33]	82%
Germanium	Electronics and solar applications; fiber-optic systems; infrared optics; chemotherapy; metallurgy.[34]	> 50%
Gallium	Semiconductors; integrated circuits (ICs) including laser diodes, light emitting didoes (DEDs), photodetectors, and solar cells; aerospace applications; medical equipment; high-performance computers.[35]	100%
Graphite	Batteries, especially in lithium-ion batteries; brake linings; lubricants; powered metals; refractory applications; steelmaking.[36]	100%

In addition to the military applications outlined in the graph above, the remainder of the minerals on the CML are also integral to ensuring our national security. For example, cobalt is used in smart bombs, aircraft, and precision-guided missiles,[37] nickel is used in superalloys for jet engines, and lanthanum is used in night vision goggles.[38] According to Department of Defense (DOD), each Virginia-class submarine requires 9,200 pounds of REEs, and a single Aegis destroyer contains 5,200 pounds of REEs.[39]

Due to a recognition of the importance of resources for defense applications, the DOD's DLA Strategic Materials Office manages the National Defense Stockpile, comprised of 50 unique commodities stored in nine locations throughout the U.S.[40] DOD is so reliant on secure mineral sourcing that the Ukraine Supplemental Appropriations Act provided $600 million to DOD to secure critical minerals for missiles and munitions.[41] DOD is using these funds to issue grants to companies like Perpetua Resources to permit its Stibnite-Gold Project, currently the only domestic site that could produce antimony. Reliability in the critical mineral supply chain is imperative to the well-being of our national defense network, and without robust support for the domestic mining industry, the U.S. will continue to cede control of important resources to adversarial nations.

China has repeatedly used its mineral supply to strategically flood markets and stifle foreign competition, including U.S. attempts to establish secure domestic supply chains. In 2023, after new Chinese-backed production in the DRC drove a steep decline in cobalt prices, Idaho Cobalt Operations (ICO), America's only cobalt mine, was forced to suspend construction mere weeks before it came online.[42] ICO would have supported over 250 good-paying jobs and supplied 1,915 metric tons of cobalt annually,[43] enough to meet about 23% of U.S. reported consumption in 2023.[44] Instead, the project remains idle today, waiting for cobalt prices to rebound from a near 20-year low.[45] Similarly, in 2015, California's Mountain Pass mine was driven into bankruptcy as a result of Chinese dumping practices, costing the U.S. its only domestic source of rare earth minerals.[46] Fortunately, the mine resumed operations in 2018 and has since received federal support under the Defense Production Act (DPA) to reshore rare earth processing capacity.[47]

Foreign price manipulation has also had a severe impact on mineral supplies from allied nations, particularly Australia. Notably, BHP warned in July 2024 that "nearly two-thirds of Australia's nickel market is in danger of closing amid low market prices fueled by a 153% increase in Indonesia's nickel from 2020 through the end of last year," much of which was backed by China.[48] With mineral demand poised to skyrocket in the coming years, the U.S. cannot afford to sit idly by and allow national security to be threatened as China continues to subsidize its production around the world, dump products onto the market, and make U.S. and allied reshoring efforts uneconomical. This is especially pressing for commodities such as cobalt and copper, where supply is projected to outstrip demand in the coming years.[49,50] To counter these concerning trends, President Trump's recent EO 14154, Unleashing American Energy Dominance, directs the United States Trade Representative to assess whether exploitative practices and state-assisted mineral projects abroad are unlawful or unduly burden or restrict United States commerce and suggests comprehensive policy responses.[51]

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[11] *Id.*
[12] 100-Day Reviews under Executive Order 14017, The White House, *Building Resilient Supply Chains, Revitalizing American Manufacturing, and Fostering Broad-Based Growth* (June 2021), at 95, https://www.whitehouse.gov/wp-content/uploads/2021/06/100-day-supply-chain-review-report.pdf.
[13] United States House of Representatives, Office of the Clerk, Roll Call 182 | Bill Number H.R. 1, https://clerk.house.gov/Votes/2023182.
[14] USGS, Mineral Commodity Summaries 2024, at 6, https://pubs.usgs.gov/periodicals/mcs2024/mcs2024.pdf.
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[16] *Id.*
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OVERSIGHT HEARING ON NOW ORE NEVER: THE IMPORTANCE OF DOMESTIC MINING FOR U.S. NATIONAL SECURITY

Thursday, February 6, 2025
U.S. House of Representatives
Subcommittee on Energy and Mineral Resources
Committee on Natural Resources
Washington, D.C.

The Subcommittee met, pursuant to notice, at 10:01 a.m. in Room 1324, Longworth House Office Building, Hon. Pete Stauber [Chairman of the Subcommittee] presiding.

Present: Representatives Stauber, Wittman, Gosar, Fulcher, Tiffany, Hunt, Collins, Hageman, Ezell, Crank, Begich, Hurd, Westerman; Ansari, Magaziner, Min, Rivas, and Huffman.

Also present: Representative Stansbury.

Mr. STAUBER. The Subcommittee on Energy and Mineral Resources will come to order.

Without objection, the Chair is authorized to declare a recess of the Subcommittee at any time.

Under Committee Rule 4(f), any oral opening statements at hearings are limited to the Chairman and the Ranking Minority Member.

I ask unanimous consent that the gentleman from Nevada, Mr. Amodei; the gentlewoman from Colorado, Ms. Boebert; and the gentlewoman from New Mexico, Ms. Stansbury, be allowed to participate in today's hearing.

Without objection, so ordered.

I now recognize myself for an opening statement.

STATEMENT OF THE HON. PETE STAUBER, A REPRESENTATIVE IN CONGRESS FROM THE STATE OF MINNESOTA

Mr. STAUBER. Today, the Subcommittee on Energy and Mineral Resources will host an oversight hearing to examine and emphasize the importance of domestic mining for our Nation's security.

I would like to begin by thanking our witnesses for being here to discuss this important topic.

By now, we all understand that hard rock minerals are essential not only to our modern life in the United States, but also to our future. Demand for these minerals is projected to skyrocket in the coming years, even outpacing anticipated global supplies in some cases.

This subject is highly personal to me. I have been fighting for years to unleash the economic powerhouse of several critical mining projects across northern Minnesota. Unfortunately, the Biden administration has spent the last 4 years unfairly and unilaterally blocking dozens of important mining projects, including those in my district. In fact, the Biden administration finally acted at the

eleventh hour last month on Perpetua's Stibnite Gold Project that we will be discussing today. Only after China announced a mineral export ban, forcing the Pentagon to have to plead with the White House to approve the project. This project should have been approved years ago, and the Biden administration's failure to do so earlier has put our country's national security at risk.

Given the importance of these minerals and their existence throughout the United States, it is astonishing that we rely so heavily on imports. The U.S. Geological Survey's own figures show that the United States is forced to import more than 50 percent of the minerals on its critical minerals list. Wildly, we import 100 percent of nearly a quarter of minerals that we list as critical. Worse yet, our close allies are not the nations upon which we rely for these key commodities. Most notably, China controls approximately 60 percent of global critical minerals production, 90 percent of processing, and 75 percent of manufacturing.

According to the International Energy Agency's 2024 Global Critical Minerals Outlook, by 2030 Indonesia is also projected to control 62 percent of global nickel mining, and the Democratic Republic of Congo will account for 66 percent of cobalt mining, where they mine cobalt using child slave labor. And that is a fact. Many of these mines are directly financed by China, which was a point highlighted in a recent report compiled by AidData at the College of William and Mary. According to the report, between 2000 and 2021 Chinese financial institutions provided nearly $57 billion in loans to 19 low and middle-income countries, including copper and cobalt from the Democratic Republic of Congo and Peru, and nickel from Indonesia.

Not only does Chinese mineral dominance enable worldwide labor and human rights abuses, including child and forced labor, but it also gives the communist country of China a stranglehold on America's economic and our national security. Two months ago China announced a ban of critical mineral exports to the United States to include antimony, gallium, germanium, and other dual-use minerals vital for both civilian and defense applications.

China also has a long track record of strategically dumping its products onto global markets in order to stifle our attempts to build out secure mineral supply chains. And just this week the CCP placed new export controls on five additional minerals that are key components in a range of industries from energy development to cell phones to infrared missiles.

Our reliance on foreign critical minerals is completely unacceptable. Yet, rather than heed the call of House Republicans to combat our Nation's failure to secure our domestic critical mineral supply chains, former President Biden chose to kneecap America by canceling decades-old mineral leases and withdrawing hundreds of thousands of mineral-rich acres in States like Minnesota, Arizona, and New Mexico, among others.

But our self-inflicted wounds do not end there. A recent S&P global study revealed that it takes an average of 29 years for a critical mineral project to progress from the discovery of the mineral to production in the United States. The only country in this world that takes longer to open up a mine is in Zambia. This absurd timeline is driven by high cost and uncertainty from permitting

delays and the risk of litigation initiated by radical anti-mining groups.

Fortunately, on the first day of his second term, President Trump signed an Executive Order titled, "Unleashing American Energy," which directs Federal agencies to review and revise or revoke any agency actions that potentially burden the development of domestic energy sources, including critical and other hard rock minerals.

This Committee looks forward to working with the Trump administration to realize a golden age of American domestic critical mineral dominance, and I hope that my colleagues on both sides of the aisle will join me today for a dynamic discussion about the importance of critical minerals to our economic and our national security, and how we can secure domestic critical minerals supply chains to propel us towards a brighter future.

I want to thank the witnesses again for their willingness to testify today, and I look forward to hearing about how we can assure our national security by ensuring mineral security.

And now I want to yield to my new ranking colleague, Representative Ansari, for her opening statement.

Representative, it is great to have you on this Committee. You are going to do great work, and I look forward to our conversations. Welcome.

Ms. ANSARI. Thank you. Thank you so much.

STATEMENT OF THE HON. YASSAMIN ANSARI, A REPRESENTATIVE IN CONGRESS FROM THE STATE OF ARIZONA

Ms. ANSARI. Thank you, Chair Stauber. It is great to join you. I am thrilled to be here today, and I am honored to serve as the Ranking Member of the Subcommittee on Energy and Mineral Resources this Congress. I look forward to working collaboratively and in a bipartisan way to get things done whenever possible.

I was drawn to the Energy and Mineral Resources Subcommittee because we are handling issues that touch the daily lives of all of our constituents. When we in Congress make decisions about mining and energy development, it impacts everything from jobs to the cost of energy to the quality of the air that we breathe and the water that we drink and, of course, if we are addressing the climate crisis or making it worse.

My constituents sent me to Washington, D.C. to fight for them for clean air, clean water, lower prices, and safe places to live, work, and play. Arizonans know too well what it is like to live with the impacts of climate change. The communities I represent are on the front lines, facing unprecedented extreme heat and water scarcity. In fact, hundreds of Arizonans die every summer as a result of extreme heat, and this is driven by our dependence on polluting fossil fuels which puts our well-being at the whims of big oil companies and their billionaire allies.

This dependence must end. It won't be easy, but we can and we must transition to a clean energy economy. This transition relies on materials like copper, lithium, and cobalt to build the transmission lines, batteries, solar panels, and wind turbines that we need.

During my time on the Phoenix City Council, I served as a councilwoman and vice mayor of the city, fifth-largest city in the

country. I led the charge to electrify our city fleets, invest in renewable energy, and fast-track the transition to clean electric vehicles. I did this to improve our air quality and public health, while also knowing that it would require more mineral resources and advancements in our supply chain.

Beyond clean energy, everything from the cell phones that we use to lifesaving medical technologies rely on critical minerals. This is what we are here to talk about today: domestic mineral needs for national security. I agree with Chair Stauber we should all be concerned that so many of our critical mineral supply chains rely on unfriendly or unreliable trading partners, and I agree that there is an opportunity to grow a modern, responsible, sustainable domestic mining industry that creates jobs and supports local economies.

But mining is only part of the solution, and we need to make sure that it is done right. Mining on U.S. public lands is still governed by the Mining Law of 1872. It is not a surprise that a 150-year-old law that has never been reformed is not fit to handle modern challenges. The mining law has no specific environmental or public health protections, gives mining priority over all other uses of public lands, and doesn't require any royalties back to American taxpayers. If we did have a royalty, it could fund even more jobs by cleaning up the more than 100,000 abandoned hardrock mines across the West, including Arizona, and 500 abandoned uranium mines on the Navajo Nation.

The Mining law also contains no specific tribal consultation requirement, yet 89 percent of copper, 79 percent of lithium, 97 percent of nickel, and 68 percent of cobalt resources are within 35 miles of tribal land. And while the mining industry has changed a lot since 1872, it is still an incredibly resource-intensive process that creates mountains of toxic waste and uses trillions of gallons of water, which in the West is becoming an increasingly scarce and unreliable resource with climate change.

In Arizona, loopholes in water laws allow mining companies to use groundwater without any restrictions, taking essential resources away from communities' scarce drinking water. Because of these issues, we need to look at national security and propose mines holistically, with a broad view of solutions on the table that will result in a stronger economy and more security for all Americans.

If we all work together in good faith, we could manage many of these problems. Together we could reform the mining law, get serious about acknowledging and planning for the environmental impacts of mines, and make sure mines pay the full cost of doing business while consulting sovereign tribal nations, ensuring communities have the water that they need and the clean air to breathe.

And looking beyond mining, the Federal Government should work to support a circular economy, recycling the precious resources we already have so they don't end up in landfills. I look forward to hearing from our witnesses about how we can recapture and reuse minerals to fill gaps in our supply chains, making them more nimble, resilient, and environmentally friendly.

Thank you again for being here and I look forward to the discussion.

I yield back.

Mr. STAUBER. Thank you, Representative Ansari. I now will recognize the Full Committee Chair, Representative Westerman, for his opening statement.

STATEMENT OF THE HON. BRUCE WESTERMAN, A REPRESENTATIVE IN CONGRESS FROM THE STATE OF ARKANSAS

Mr. WESTERMAN. Thank you, Chairman Stauber and Ranking Member Ansari.

And, you know, this Committee is going to address a lot of important issues in this Congress, but I am not sure we will address one any more important than making America more productive when it comes to minerals and our resources. We have, again, a lot of good things that we can do together, and I hope that we can work together to address this issue of the shortages of these minerals and elements that we have here in our country.

Our reliance on hardrock minerals for everything from transportation to communication to national security is no secret to any of us here today. These minerals are essential for things like cell phones, defense systems, and satellites. The fortunate part of it is that we are blessed here in America with some of the richest deposits of critical and hardrock minerals. A U.S. Geological Survey national map of currently identified potential critical mineral resources shows likely deposits in every single State. In my home State of Arkansas, for example, the brine from the Smackover Formation holds millions of tons of lithium reserves that will be vital to meet rising demands in the coming years.

Yet, for decades we have allowed our capabilities to discover, extract, and process critical in other hardrock minerals to languish. Not only have we allowed refineries and processing facilities to shutter, but we have also suffocated key prospective mining operations with red tape. Worse yet, we have failed to effectively combat the lawfare waged by some groups to determine further delay and devastate promising mining projects.

Because of our inability to make efficient use of the critical minerals in our own borders, we have become increasingly reliant on importing these materials to meet our ever-growing needs. And because many of the nations upon which we rely, like China, are not allies, our mineral dependency presents a serious national security threat.

I had a meeting just yesterday with an individual with a graphite deposit in New York. And if you look at the USGS list of how much graphite we use in America, I think it is 52,000 tons a year, and 100 percent of it is imported. Yet, we have one single mine that I know of that could produce 10, 20, or 1,000 or more tons per year, but we have to be able to get that graphite to market.

It is disheartening to know how much of our economy and our security depends on these minerals and elements, and how much China and other countries are pulling the strings. And we see this happen when a new mine is announced in the U.S. Take the

lithium, for instance, in my home State. What is China doing right now? They are dumping lithium in the world market to lower prices. This is not going to be easy. It is going to produce financial challenges for people trying to develop resources, and we have to unite together as Americans to be able to use these things that we are blessed with to make the country better.

So, I am looking forward to the testimony today and to the discussions that we have, and I hope we will all take this as a serious challenge to the future of our country on how we develop new mines, how we do it the most environmentally friendly way possible, how we recycle more things, how we use innovative technology.

I had a chance to visit one of our national laboratories last summer, and I found that they are looking at ways to take aluminum cable and recycle that cable and use different technologies and, with the same amount of aluminum, get 20 percent more conductivity through it. So, when we talk about need for more transmission, you know, we keep forgetting that we have always been the world leaders on innovation, and we can figure out how to use these resources better than anybody else in the world.

We can also learn new ways to get these things out of the ground, to do it in a more environmentally friendly manner, and to do it in a way that obviously doesn't cause human rights violations like we see in some parts of the world.

So, again, I am looking forward to not only this hearing, but the many hearings and markups that we will have along the way. And I hope that we can work together to do something good for America.

I yield back.

Mr. STAUBER. Thank you, Chair Westerman. I will now go to my colleague, the Tennis co-Caucus chair with me, and the Ranking of the Full Committee, Representative Huffman.

STATEMENT OF THE HON. JARED HUFFMAN, A REPRESENTATIVE IN CONGRESS FROM THE STATE OF CALIFORNIA

Mr. HUFFMAN. I thank you, Mr. Chairman, and good to be back with you. I want to congratulate our Ranking Member Ansari for her new position, and for the Ranking Member and the Chairman for calling us together to discuss a really worthwhile topic.

We can all agree that critical minerals are important for our national security and for the future, certainly, of clean energy. The question before us is whether we are going to take a smart and strategic approach to address these issues or fall for the false promise that we can simply dig our way out of this problem.

And I have been on this Committee now for 12 years. I assure you I have seen every possible material, including sand and gravel, masquerading as a critical mineral that was essential to our national security. I have seen every mine in every location, including really special and sacred places, represented as critical to our national security. And in the last Congress many of my colleagues across the aisle were saying, well, we have to do all this new mining to support electric vehicles. Well, fast forward to now you are trying to get rid of electric vehicles, but you still want to do the mining.

So, look, some of these mines we need and we also need some other strategies to address our critical mineral needs. But some of these mines are solutions in search of a problem, and we have to be thoughtful and careful enough to tell the difference. I worry about whether we are heading down that path of thoughtfulness and care because President Trump, Elon Musk, and their allies here in Congress seem to believe that if we just let mining companies do whatever they want wherever they want, the problem will fix itself. And that is nonsense.

Our colleagues across the aisle blame common-sense environmental protections and legal challenges for holding up mining projects. Well, folks, permitting exists to ensure that companies follow basic environmental and safety standards. Having access to the courts is essential because sometimes you have to protect a community's drinking water supply that is going to be unlawfully poisoned. Or sometimes you have to protect sacred lands that are going to be desecrated or destroyed. The people affected in these situations should have a voice. They should have the right to seek justice through legal avenues.

But even if we eliminated every permitting requirement tomorrow, we still would not have a secure, totally domestic supply of all the materials we need. According to USGS, we can't meet our needs with domestic reserves. This is not a problem that the United States can solve alone.

But let's say we had every mineral that we wanted. Mining in America doesn't mean that these minerals stay here, and we need to talk about that, too, when we consider some of these controversial mining proposals. Most mining in the U.S. is done by massive, multi-national conglomerates that mine publicly-owned minerals from our public lands, and then turn around and sell them to the highest bidder, often shipping them overseas, and they do it without paying a cent back to the American taxpayer in royalties. Mining alone gets this special exemption. Every other use of public land, including oil and gas development, is required to return 16 percent of their profits back to the American people.

So, let's be clear: foreign mining companies are taking America's resources for free, selling them to the highest bidder, often overseas, sometimes to geopolitical rivals, and leaving American communities to deal with the pollution and the destruction that they leave behind. And now you want to take away those last safeguards to protect our communities.

Here is an example. Resolution Copper, a proposed mine in Arizona, would permanently destroy Oak Flat, a sacred site of the San Carlos Apache Tribe. Resolution Copper is owned by two multi-national, multi-billion-dollar conglomerates, Rio Tinto and BHP. The largest shareholder of Rio Tinto is a Chinese state-owned company. Resolution Copper has not committed to keeping the copper in the U.S. Most of what BHP and Rio Tinto mines ends up in China for processing. So, that proposal would bring no money to the U.S. taxpayers and would give away not only American public lands but a sacred tribal site to a multi-national, CCP-owned company to mine copper that is just going to be sent abroad. It is a good example of the kind of giveaway that we need to scrutinize

instead of exalting, which I see all too often in some of our deliberations here in this Subcommittee.

So, I hope that we have an opportunity to work together to help separate the smart, strategic decisions that can actually make us safer, that can give us progress towards a reliable source of these materials without compromising other important values. And certainly, Democrats are here to work with our Republican colleagues toward that end, if we can.

And with that, Mr. Chairman, I yield back.

Mr. STAUBER. Thank you very much. We will now move to introduce our witnesses.

Let me remind the witnesses that under Committee Rules they must limit their oral statements to 5 minutes, but their entire statement will appear in the hearing record.

To begin your testimony, please press the "talk" button on the microphone.

We use timing lights. When you begin, the light will turn green. When you have 1 minute remaining, the light will turn yellow. And at the end of 5 minutes, the light will turn red, and we will ask you to please wrap up your statement.

I will also allow all witnesses to testify before Member questioning.

Our first witness is Dr. Morgan Bazilian, and he is the director of the Payne Institute for Public Policy at the Colorado School of Mines, and he is stationed in Golden, Colorado.

Doctor, you are now recognized for 5 minutes for your opening statement.

STATEMENT OF MORGAN BAZILIAN, DIRECTOR, PAYNE INSTITUTE FOR PUBLIC POLICY, COLORADO SCHOOL OF MINES, GOLDEN, COLORADO

Dr. BAZILIAN. Chairman Stauber, Ranking Member Ansari, and members of the Subcommittee, it is an honor to appear before you today on this important topic of critical minerals and national security. My name is Morgan Bazilian. I am a professor and Director of the Payne Institute for Public Policy at the Colorado School of Mines. I am one of the world's leading scholars on the topics being discussed at today's hearing. The Colorado School of Mines has an extraordinary depth of knowledge on these topics, and has been pursuing them for over 150 years.

This area will benefit from both humility and a truly interdisciplinary approach. Making trade-offs explicit and acknowledging that they change over time will help you make better policy.

This is not a new topic, especially as it relates to security and war-fighting. Historians, geologists, and government officials have long acknowledged the nexus between a state's mineral resources and its economic and military power. In 1902, historian Brooks Adams asserted that all experience has demonstrated that the center of mineral production is likely also to be the seat of empire.

I believe strongly that the United States should urgently ramp up our domestic mining and refining operations in a manner that utilizes best technical and safety practices, has a focus on environment and community engagement, seeks transparency, and puts our Nation in a strong position on global supply chains. This is in

the economic and security interests of the country and will also support American workers and companies.

There are positive developments from Arkansas to Arizona, from Nebraska to Nevada, from Minnesota to Montana that can become world-class mining assets. But many remain stymied. It is time to unlock this potential. The United States possesses a wealth of these minerals in the Earth's crust, on the ocean floor, and at the School of Mines we study it even from the perspective of the moon and asteroids. They are also available as co-products and through recycling.

The primary impetus for this hearing and related discussion stems from the Chinese dominance of the sector. And I am using that term, "dominance," not as rhetorical flourish, but one based on empirics. By 2022, China had assumed the top position in the production of 30 out of 50 minerals listed as critical by the USGS. This reliance exposes the United States to disruptions and economic pain such as the recent export bans that China imposed on antimony, gallium, and germanium.

Last year colleagues and I correctly noted that, moving forward, China could impose export controls on other minerals like bismuth, rubidium, and tantalum. Much of this has now come to pass in the unproductive tit for tat between the United States and China. We largely ceded our leadership in the sector many decades ago to China, and they are not standing still. They are, rather, investing tens of billions of dollars all over the world today.

Minerals are necessary for American national defense, economic prosperity, and energy security. Rare Earth elements are used in Virginia-class attack submarines; copper is used in 155-millimeter artillery shells; platinum group metals are used in catalytic converters; and gallium is used in advanced semiconductors; tungsten is used in exploration drill bits; copper is used in transmission lines and electric motors. In short, minerals are foundational across the modern economy and becoming more so.

Strengthening U.S. mineral supply chains is an important area of bipartisan agreement, and this 119th Congress has a chance to take action. I give you 10 areas that require attention and prioritization.

First, improve permitting and associated regulations.

The existing national defense stockpile is insufficient for supporting the U.S. military in a major conflict. This needs to change, and quickly.

Third, grow the workforce and support research.

Fourth, restart the Bureau of Mines. Institutions are important to success.

Fifth, provide well-focused financing not just for supply, but also demand.

Sixth, think in terms of supply chains, not just ore.

Seventh, increase the viability and functioning of global markets. That will help investment decisions.

Eighth, ensure that cutting-edge mining technologies and processes are deployed at scale.

Ninth, engage meaningfully, early, and with respect for the sovereignty of Native American Tribes and people.

And lastly, work with allies globally.

It is time for America to become an important mining country again.

Thank you for having me here today.

[The prepared statement of Dr. Bazilian follows:]

PREPARED STATEMENT OF DR. MORGAN D. BAZILIAN, PROFESSOR AND DIRECTOR, PAYNE INSTITUTE FOR PUBLIC POLICY AT COLORADO SCHOOL OF MINES

Chairman Stauber, Ranking Member Ansari, and Members of the Subcommittee, it is an honor to appear before you today on the important topic of critical minerals and national security.

My name is Morgan Bazilian, and I am a Professor and Director of the Payne Institute for Public Policy at the Colorado School of Mines. The Institute distills and translates cutting-edge scientific and engineering research into insights for decision-makers globally. I have spent the bulk of my career in public service across three decades and several continents—most recently as lead energy specialist at the World Bank focused on addressing energy poverty. I am one of the world's leading scholars on the topics being discussed at today's Hearing.

The Colorado School of Mines has an extraordinary depth of knowledge on these topics, with expertise ranging from mining and metallurgy, to economics, policy, anthropology, and chemistry. While I cannot adequately reflect the entirety of that portfolio in this testimony, I will emphasize that this area, like most, requires both humility and a truly interdisciplinary approach—technocratic perspectives alone will prove myopic.

IMPETUS

Let me begin by saying that I believe strongly that the United States should urgently and effectively ramp up our domestic mining and refining operations in a manner that utilizes best practices for environment and community engagement, employs sophisticated financial tools, and puts our nation in a strong position on global supply chains. This is in the economic and security interests of the country and will also support American workers and companies.

There are positive developments from Arkansas, to Nebraska, to Nevada that can become world-class mining assets. However, in designing approaches that move us to greater economic and security benefits one should be aware that the value add to an economy is much greater through the production of advanced technologies than ores. Additionally, the various supply chains are complex, dynamic, and deeply intertwined with the wider economy.

The United States possess a wealth of these minerals—in the Earth's crust, on the ocean floor, and possibly in space. They are also available as co-products and recycling. That said, we largely ceded our leadership in this sector many decades ago to China. Catching up is unlikely to be a productive policy goal, as China is hardly standing still. They are, in fact, investing billions all over the world, and are more effective at building large infrastructure than our system will (or should) allow. *AidData* reported last week that between 2000–2021, Chinese Banks and their partners issued $57 billion in loans to low- and middle-income countries for producing and processing several critical minerals.

The primary impetus for this hearing and related discussions stems from the Chinese dominance of the sector—and I am using that term not as rhetorical flourish, but one based on empirics. In the late twentieth century, China emerged as a formidable global power and the predominant mineral producer worldwide. According to the US Geological Survey, the most noteworthy transformation in global mineral production from 1990 to 2018 was the exponential increase in China's mineral output. By 2022, China had assumed the top position in the production of 30 out of the 50 minerals listed as critical by the US. This reliance exposes the United States to supply chain disruptions, such as the export ban that China imposed on antimony, gallium, and germanium to the United States last year.

Last year, we correctly noted that "Moving forward, China could impose export controls on other minerals—like bismuth, rubidium, and tantalum." And further, "China could expand its export bans to include other minerals on its dual-use export control list. These minerals include the following: aluminum, beryllium, bismuth, calcium, graphite, hafnium, magnesium, nickel (powder), rhenium, titanium, tungsten, zinc, and zirconium." Much of this has now been signaled by China.

Minerals are necessary for American national defense, economic prosperity, and energy security. Rare earth elements are used in Virginia-class attack submarines, and copper is used in 155 mm artillery shells. Platinum group metals are used in catalytic converters, while gallium is used in advanced semiconductors. Tungsten is

used in exploration drill bits, and copper is used in transmission lines. In short, minerals are foundational across the modern economy and becoming more so. In a positive development last week, *MP Materials* commenced commercial production of neodymium-praseodymium metal and trial production of automotive-grade, sintered neodymium-iron-boron magnets in Texas.

These so-called critical minerals—the once forgotten elements crucial to modern day technology—have made it to the top of the geopolitical agenda. They have become a common refrain and part of the accepted lexicon in government and industry alike. While this attention remains, it is worth trying to fundamentally shift the perception of an industry that has suffered a poor reputation for millennia. Still, these issues largely remain quotidian to much of the population.

My comments will focus on the national security implications, as opposed to the more typically elucidated energy demands for these materials. That said, I have written and researched these sometimes disparate topics in some depth and have provided links to several of these pieces in the References.

HISTORY

This is not a new topic—especially as it relates to security and warfighting.

Historians, geologists, and government officials have long acknowledged the nexus between a state's mineral resources and its economic and military power. In 1902, historian Brooks Adams asserted that, "all experience has demonstrated that the centre of mineral production is likely, also, to be the seat of empire. In 1916, US Secretary of the Interior Franklin K. Lane prioritized minerals as the foremost "foundations of power," a sentiment echoed by US Geological Survey Director George Otis Smith, who affirmed "that mineral wealth is the foundation of power." In 1939, geologist C. K. Leith highlighted, "Military power used to be measured principally by manpower, but is coming more and more to be measured in terms of guns, ships, automobiles, and airplanes, and the fuel to drive them. These mean minerals."

The Defense Production Act, which was modeled after the War Powers Acts of 1941 and 1942, allows the federal government to begin prioritizing national defense over private-sector needs. The current version of the law allows the president, through executive order, to allocate "materials, services, and facilities" for national defense purposes and to offer loans or guarantees to private companies. During the 1950s, President Truman used the act to regulate the steel and mining industries, ensuring the U.S. military could procure adequate wartime supplies. As the Cold War escalated, the Truman administration employed the DPA to boost the supply of manganese, a mineral critical for steel production and one that was put under an embargo by the Soviet Union. Truman also invoked the DPA to establish domestic aluminum and titanium industries through the provision of capital and interest-free loans.

During the first decade of the Cold War, the US government stockpiled enough minerals to cover a five-year conflict with the Soviet Union. By 1962 this meant a reserve worth over $77 billion adjusted for current prices. This stockpile was housed at over two hundred locations, ranging from military depots to commercial warehouses, and it contained large-volume minerals like aluminum, copper, lead, and acid-grade fluorspar—some of the most commonly used minerals by the Department of Defense. Today, the existing National Defense Stockpile is insufficient for supporting the US military in a major conflict. The stockpile targets enough inventories for just a one-year conflict with China, followed by a three-year recovery. Even so, the present reserve—which is worth only $912.3 million and stored at just six locations—meets less than half of the military's estimated demand in this scenario. It also lacks any inventories of critical aluminum, copper, lead, and acid-grade fluorspar.

To reduce the risks of mineral disruptions, the US government—across multiple administrations—has taken various actions. In his first term, President Trump signed Executive Order 13817, which directed the Federal Government to publish a list of critical minerals and a federal minerals strategy.

President Biden continued and expanded the efforts of the first Trump Administration. Backed by significant appropriations from Congress, the Department of Energy committed billions of dollars in loans to mineral processing projects, and the Department of Defense awarded hundreds of millions of dollars in grants for mineral projects in both the United States and Canada. The State Department also established the Minerals Security Partnership—following the development of a diplomatic effort under the first Trump Administration known as the Energy and Resource Governance Initiative.

It is worth recalling that American jobs—in Pennsylvania, Kentucky, West Virginia, Michigan, Indiana and across our industrial heartland—depend on

Canadian critical minerals. Nickel in particular, a critical mineral essential for military and defense applications. America has only one nickel mine in the entire country, and it is slated to close within the next 10 years. We have no nickel refinery, so everything we mine we send to Canada and then buy back. For more than 70 years this has been a stable, reliable, affordable relationship with our most significant ally and trading partner. Canada supplies roughly 50% of the nickel used in our military and more than 80% of the nickel used in our aerospace sector. Uranium is another strategic mineral consideration for trade with our northern partners—and not an insignificant one for either energy or security needs. Likewise, Canadian potash is essential for our agricultural sector and food security.

We certainly need to develop our own mines and refineries—but working with allies will be indispensable to success in creating robust, secure, and resilient supply chains.

While international financing is important, investing in developing and emerging countries carries significant risk. That has been evident in the default of US backed loans (from DFC and DOE) for a graphite project in Mozambique due to civil unrest in that country. The graphite was destined for processing in Louisiana. It remains important to look for such opportunities, but the groundwork and diligence required takes time and sharp analysis. Related, initiatives like *The Copper Mark* that bring improved transparency to supply chains will expand in relevance—they also can bring competitive advantage for the United States as we produce these materials under strict regulations.

Finally, as a reminder, 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.

ACTION

Last November, colleagues and I outlined several considerations for furthering the vital role of critical minerals and materials in supporting US national security.

President Trump has already issued several Executive Orders that involved critical minerals, including the "Unleashing American Energy". While previous federal actions on minerals largely sought to increase financial support for mineral projects, the President's new EO directs other actions too, such as tariff investigations and permitting actions.

Most notably, the EO directs the Council on Environmental Quality to rescind its implementing regulations for the National Environmental Policy Act (NEPA) and instead issue guidance for agencies to implement NEPA regulations. This action could represent the most serious change to NEPA since its inception depending on what agency-level regulations are eventually adopted. Additionally, the next Trump administration could permit more mines on federal lands. For example, the Biden administration banned mining in Minnesota's Boundary Waters Canoe Area Wilderness and surrounding watershed for 20 years—that decision may be reversed.

Another key domestic project is the Resolution Copper project in Arizona. I had the opportunity to visit Resolution last year, and travel several thousand feet down their mine shaft. It is located in the footprint of an existing mine, in an area called the "Copper Triangle" of Arizona where mining has been a fabric of the rural economy for more than 100 years. The deposit is planned be mined using underground methods and has the potential to produce up to 25% of US demand for copper, as well as a host of critical mineral co-products. In addition, the managing company produces final refined copper and critical minerals from one of two operating smelters and refineries left in the U.S. This is down from about 20 such operations existed a few decades ago. For a sense of scale, China operates over 50 copper smelters and refineries.

Adopting demand-side policies that support US mineral projects—crucial for making financing work is essential for getting to financial investment decisions. On the upstream side, rebuilding America into a mineral powerhouse faces a financial pitfall on the verge of production: mineral projects often struggle to secure funding for turning a mineral discovery into an operational mine. The reasons are various, including the large upfront capital investment and long payback time, as well as permitting risks and price volatility. The United States needs a bridge over this somewhat unique "valley of death" in the mineral project lifecycle.

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. For 450 non-operational projects, it has been an average of seven years since the feasibility study was conducted, with 10 percent of projects taking longer than 11 years. 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.

The markets for this diverse set of minerals and chemicals are often small, illiquid, have poor transparency and even worse price discovery. Lithium carbonate's price (according to the excellent Benchmark Minerals Intelligence team) rocketing from $8,500/tonne in December 2020 to $81,000/tonne in December 2022 and now back down to about $14,500/tonne, underlines the aggressive nature of how these inflexible markets can flip. It also makes investment decisions exceedingly difficult. The case of Jervois' Idaho cobalt project is instructive here. The once only active cobalt mine in the country halted construction because of falling cobalt prices.

Strengthening U.S. mineral supply chains is an important area of bipartisan agreement. Thus, this 119th Congress offers a significant opportunity for substantive action on critical minerals. Several areas stand out.

Congress could pass legislation increasing funds for mineral stockpiling, including for minerals used heavily in conflict but presently absent from the U.S. stockpile, such as copper. Mineral stockpiling already receives bipartisan support in Congress, as evidenced by pending FY 25 legislation to allocate $600 million to the National Defense Stockpile Transaction Fund. Congress could also explore expanding the purpose of the National Defense Stockpile from "national defense only" to include economic security, such as stockpiling minerals from domestic mineral producers at above-market prices amid price slumps. China already uses its own stockpiles this way, allowing it to exert a powerful influence on market prices. As I noted, the frailty of current markets makes it even easier for China to exert this control.

Congress could fund more educational and research programs, too, including grants for recruiting and educating mineral-focused students—as the bipartisan Mining Schools Act, advanced last Congress by this committee, would provide. Mining and geological engineers are expected to have modest employment growth of 2 percent from 2023 to 2033, but more than half of the current U.S. mining workforce is expected to retire by 2029, leaving a workforce gap. And the workforce pipeline is bottlenecked: The number of mining-related graduates has dropped 39 percent since 2016. Today, there are 14 mining engineering programs in the U.S.—down from 25 in 1982. Last year, these mining schools collectively enrolled 590 undergraduate students, graduating just 162 students for an industry demand of 400–600 new mining engineers each year. In comparison, China's 45 mining engineering programs currently enroll about 12,000 students and graduate approximately 3,000 a year—about 18.5 times the number of graduates in the United States. Increased R&D investments in next generation mining technologies for identifying, mining, recycling, and processing minerals and to reclaim, remediate, and reuse existing mines would be an important complement to this training.

Congress could pass legislation seeking to streamline the permitting process for mineral projects. Specifically, the legislation could modify the litigation process for mineral projects. A team at the Institute for Progress recommended establishing a time limit for injunctive relief—that is, a court order preventing construction—for projects subject to review under the National Environmental Policy Act. The time limit would begin with the initiation of the NEPA review and end shortly after the conclusion of the NEPA review.

Another area for improved legislation is enhancing the industry's supply chain reporting in government procurement, especially by the Defense Department. In previous years, the National Defense Authorization Act has included reporting requirements on the provenance of minerals in permanent magnets. These reporting requirements could be expanded to other defense goods, such as munitions and platforms like naval vessels.

Lastly, institutions are part of the solution set as well. Congress could pass legislation reviving the Bureau of Mines or creating a similar entity, such as a proposed National Critical Minerals Council. Established in 1910, the Bureau of Mines initially worked on addressing mine health and safety issues, eventually expanding into information gathering on the domestic and global mineral industries as well as research on mining and processing technology. As its functions were largely absorbed by other federal agencies over time, the bureau was dissolved in 1996 amid budgetary battles in Congress.

All of these actions could be included in the development and implementation of a national critical mineral strategy.

LAND

My final comment is on a topic often overlooked in these proceedings. That is: critical minerals security and success in the United States is intimately tied to Indian Country.

Native American Tribes stand to benefit greatly from mining and processing the critical minerals needed to drive the energy transition in the United States—but only if we acknowledge the sordid history of mining on Tribal lands and properly remediate legacy issues while forging a new approach that is transparent, fair, and centered on Tribal sovereignty and creating vibrant economies.

Mining offers Tribes a major opportunity. Tribal lands hold roughly 50% of US uranium reserves. And, approximately 97% of U.S. nickel reserves, 89% of its copper reserves and 79% of its lithium reserves lie on or within 35 miles of Native American reservations (MSCI). Tribes could also benefit from choosing to become better networked and integrated into domestic and global supply chains. To wit, a deal was inked last week allowing the US company Energy Fuels Ltd. to transit uranium across the Navajo Nation, and also engage in the cleanup of abandoned mines.

If the federal government respects Tribal sovereignty, resource extraction and related projects such as natural gas development, power plants, and data centers on Tribal lands can help create economic prosperity.

Thank you very much for the privilege of speaking in this august chamber today.

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QUESTIONS SUBMITTED FOR THE RECORD TO MORGAN D. BAZILIAN, DIRECTOR, PAYNE INSTITUTE FOR PUBLIC POLICY, COLORADO SCHOOL OF MINES

Questions Submitted by Representative Westerman

Question 1. During the hearing, you discussed ways to improve coordination between federal agencies that maintain separate lists of critical minerals and materials.

1a) Can you elaborate on how Congress can streamline processes between agencies like DOD, DOE, and DOI when it comes to determining criticality?

1b) How would H.R. 8446, the Critical Minerals Consistency Act of 2024, which passed through the House last Congress, contribute to these goals? Do you recommend any additional policies to accompany this bill specifically in the 119th Congress?

Answer. 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

Questions Submitted by Representative Fulcher

Question 1. How critical is it that land management agencies, the Department of Defense, and other key departments work together to streamline timelines and cut through bureaucratic delays? When it comes to permitting, how can these agencies better engage with industry-both to understand their challenges and to collaborate on solutions that ensure we meet permitting milestones efficiently, from exploration to full-scale development?

Answer. 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=Tfu2TnNrQGlN7ol8HSCakMUT8HTwYukd

Questions Submitted by Representative Ezell

Question 1. Semiconductors, critical to autos, military, and other key national security applications rely on palladium supply for their fabrication. We saw the disruption to many of our key national industries due to the semiconductor supply chain disruption during the early onset of the pandemic. Will we see this again if palladium supplies are withheld from the U.S.?

Answer. 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/

Mr. STAUBER. Thank you, Dr. Bazilian. I will now recognize my colleague, the gentleman from Arizona, Dr. Gosar, for 30 seconds to introduce our next witness.

Dr. GOSAR. Thank you, Mr. Chairman. I would like to introduce Jeremy Harrell, the Chief Executive Officer of ClearPath. I am excited to introduce Jeremy today, as he is a proud alumni of my staff. From 2011 to 2013, Jeremy served as my Legislative Director before moving over to the U.S. Senate and then onto ClearPath, first as their policy director and then eventually moving up to the ranks of CEO. I am proud to see a great Capitol Hill staffer succeed and join us here today on the other side of the dais.

Welcome, Jeremy.

I yield.

Mr. STAUBER. Thank you.

Mr. Harrell, you are now recognized for 5 minutes.

STATEMENT OF JEREMY HARRELL, CHIEF EXECUTIVE OFFICER, CLEARPATH, WASHINGTON, D.C.

Mr. HARRELL. Thank you, Mr. Chairman.

Thank you, Dr. Gosar, for the very kind introduction. It is great to be back here at the Committee.

Thank you, Ranking Member. I am excited to discuss this important topic today. My name is Jeremy Harrell, and I am the Chief Executive Officer of ClearPath.

Securing mineral supply chains is paramount to our Nation's economic competitiveness. Global demand is rapidly increasing, and our Nation's dependence on foreign supply chains is a significant risk to our national security. We often take for granted the materials in everyday consumer products and the clean energy that powers our Nation. Estimates show the U.S. may need to double grid capacity over the coming decades to meet rising demand. Expanding this capacity requires substantial infrastructure that relies on various materials.

The International Energy Agency predicts that by 2040, global demand for minerals like lithium, cobalt, graphite, and nickel could grow 20 to 40 times. Our Nation needs a strategy that synchronizes U.S. R&D capabilities with targeted free-market incentives, regulatory modernization, and proactive trade policies. That strategy should start with three key objectives: one, restore predictability to the permitting process; two, streamline judicial review of administrative actions; and three, de-risk private investment in domestic mining and processing.

First, predictability is essential. Never has the phrase "time is money" been more appropriate. A typical mining project loses more than one-third of its value because of permitting delays. Far too often these delays make a project financially unviable. The energy and infrastructure projects most often impacted by this permitting purgatory offer the greatest benefits to our Nation. Take the largest proven lithium reserve in the U.S., Nevada's Thacker Pass mine. Initial exploration began in 2007, but it didn't receive approval until 2021. Several permitting issues delayed the project, and it is now slated to begin production in 2028. Twenty-one years later is simply unacceptable.

The U.S. must eliminate unnecessary bureaucracy where the economic and environmental benefits outweigh the opportunity cost. The National Environmental Policy Act, or NEPA, has been contorted far beyond Congress' initial intent. NEPA is intended to be a procedural law that requires Federal agencies to assess the environmental impact of their actions, not one that imposes new, substantial requirements. The NEPA process is just the start to letting America build. Agencies ranging from the EPA to Interior need to also issue relevant permits such as Endangered Species Act permits, Clean Water Act permits, and others before construction.

New reforms should expedite the approval process for projects that bring net benefits and comply with laws to ensure clean water and clean air. This can be done faster without sacrificing environmental outcomes.

Second, the judicial review of agency actions must be reformed. The current system is tilted towards those who seek to delay or block projects. It is simple. Once approved, legal challenges should be addressed, yet nearly every major mining project faces litigation that drags on for years. This results in years of delays that change little to nothing about the project. Litigants exploit these delays, aiming to stretch the process until developers run out of funding and ultimately abandon projects.

Congress could consider limiting legal challenges to plain errors related to the natural resources laws, narrowing the scope, and setting strict review timelines. Without changes, our Nation is needlessly undermining our own mineral supply chain goals.

And third, the Federal Government could leverage its financial tools to de-risk private-sector investment. Chinese state-owned enterprises use heavy subsidies to undercut American companies, distort prices, and dominate markets, leading to shortages of critical minerals and increased prices.

Out-subsidizing China is not an effective strategy, but targeted incentives like the 45X tax credit, public-private partnerships, and low-cost debt financing can foster investment and protect American industries from unfair competition. The 45X tax credit could be strengthened to support U.S. production goals. The credit should provide meaningful incentives for domestic mines that send mineral concentrates to the U.S. or allied refineries, and it should allow domestic refiners to claim the credit. Leveraging these types of tools can accelerate new mines and processing facilities.

These are just a few common-sense reforms that Congress could consider to further American mineral security and manufacturing competitiveness. As global demand for minerals increases, the U.S. will either responsibly develop resources at home and alongside of our allies, or continue to rely on foreign sources, many of which pose human rights concerns, national security risks, and significant environmental consequences. ClearPath believes the U.S. should lead from the front.

I look forward to working with this Committee to push commonsense reforms across the finish line. Thank you for the opportunity.

[The prepared statement of Mr. Harrell follows:]

PREPARED STATEMENT OF JEREMY HARRELL, CHIEF EXECUTIVE OFFICER, CLEARPATH, INC.

Good Morning, Chairman Stauber, Ranking Member Ansari and members of the Subcommittee. My name is Jeremy Harrell, and I am the Chief Executive Officer of ClearPath, a 501(c)(3) organization that works to accelerate American innovation to reduce global energy emissions.

Thank you for the opportunity to testify today and for holding this important hearing. It is exciting to see that the Committee prioritizing, in one of its first hearings of the 119th Congress, the urgent need to secure the mineral supply chains for our nation's energy and manufacturing future . Reducing our vulnerabilities are paramount to U.S. competitiveness, and it is essential that our nation makes progress over the next two years.

U.S. energy demand is rapidly increasing, and our nation's current dependence on foreign adversaries to supply these critical materials poses a significant risk to national security and economic growth. Critical materials are used in products like cell phones, computers, appliances, vehicles, and batteries that American families rely on. Strengthening the U.S. domestic supply chain will ensure that the American people have secure access to these essential technologies.

Some estimates show the U.S. will need to double the capacity [1] of its bulk power system over the coming decades to meet expected energy demand. Expanding this capacity requires substantial infrastructure—batteries, transmission systems and more—all of which rely on various materials. Consequently, the International Energy Agency (IEA) predicts that demand for energy-related minerals like lithium, cobalt, graphite and nickel could grow 20 to 40 times by 2040.[2]

As demand for energy and materials increases, the choice for American policymakers is clear: the U.S. will either responsibly develop these resources here at home, or continue to rely on foreign adversaries like China, which pose national security, human rights, and environmental concerns. Our nation needs a comprehensive strategy that synchronizes U.S. R&D capabilities with targeted free market incentives, regulatory modernization, and proactive trade policies to put the U.S. back in a leadership role. In my testimony, I will outline a strategy that expedites American production.

But first, we need to be clear eyed about U.S. dependence on foreign supply chains.

- In the just released USGS Mineral Commodity Summaries 2025, the U.S. remains 100 percent reliant on imports for 12 of the 50 minerals deemed "critical" by USGS.[3]
- In 2024, the United States was 100 percent net import reliant for 15 minerals, unchanged from 2023, and imports made up more than one-half of the U.S. apparent consumption for 46 nonfuel mineral commodities, down slightly from 49 in 2023.[4]
- Meanwhile, China was the leading country producing 30 of 44 critical minerals.[5]
- Of the 50 mineral commodities identified in the "2022 Final List of Critical Minerals," the United States was 100% net import reliant for 12, unchanged from 2023, and an additional 28 (down from 29 in 2023) had a net import reliance of greater than 50 percent.[6]
- Breaking down the processing even more, China processes 90% of global rare earth element supply and 60–70% of global lithium and cobalt supply.[7]
- In 2023, the United States was ranked 78th among 87 countries in manufacturing cost competitiveness by US News & World Report.[8]

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[7] https://www.iea.org/reports/energy-technology-perspectives-2023/clean-energy-supply-chains-vulnerabilities

[8] U.S. News & World Report. 2023. "These Countries Have the Cheapest Manufacturing Costs."

A bold three-step American strategy

Exploration of materials within U.S. borders will form the basis of a secure supply chain. Investment in modern exploration techniques and streamlining accreditation processes can identify viable deposits more quickly and efficiently. However, the U.S. must also prioritize extraction capabilities to convert these identified resources into viable supplies.

Regulatory approvals for mines at home have fallen to the lowest level in decades, coinciding with substantial demand growth for essential raw materials for key grid and transportation infrastructure. Increasing domestic mining and materials capacity is crucial to meeting demand and reducing foreign control over the critical materials supply chain.

Even when the United States makes headway on mining for more domestic materials and minerals, processing remains a major bottleneck because China controls global refining. Establishing U.S.-based processing facilities will reduce raw materials sent abroad, allowing the U.S. to add value domestically and create a resilient supply chain. For example, copper and zinc, essential electric grid components, and nickel and lithium, critical for battery storage technologies, are foundational to energy infrastructure. Dependence on China will become a critical vulnerability when the United States needs to build essential infrastructure and cannot proceed because China refuses to sell us the materials the American people rely on.

President Trump's Executive Order "Unleashing American Energy"[9] takes initial steps to address this issue by revising or rescinding regulatory barriers that hinder domestic mining and production. Failure to scale up domestic production of minerals and materials undercuts our nation's ability to compete globally. While recycling plays a role in supplementing raw material supply, it cannot meet the scale of surging demand caused by manufacturing, data centers, and artificial intelligence (AI) infrastructure growth.

Without robust domestic production and processing capabilities, the U.S. remains exposed to potential export restrictions or geopolitical leverage. Investing in the domestic critical materials supply chain—exploration, extraction, and refining—will ensure that the United States can meet future infrastructure demands without being at the mercy of foreign adversaries. Building this capacity now is essential to safeguarding America's energy independence.

To fix this urgent problem, policymakers could focus on three key objectives:

- One, restore predictability to the permitting process;
- Two, streamline judicial review; and
- Three, derisk private investment in domestic mining and processing with targeted incentives and public-private partnerships.

First, restoring regulatory predictability is essential. Never has the phrase "time is money" been more appropriate. Regulatory delays greatly increase project costs. For example, Nevada contains the largest proven lithium reserve in the United States. The Thacker Pass lithium mine in Humboldt County will produce an initial 40,000 metric tons of battery-grade lithium carbonate per year for use in lithium-ion batteries for vehicle, electronics and energy storage. However, lawsuits and delays have plagued the construction for years. Initial exploration of the mine began in 2007, and the Bureau of Land Management issued a Record of Decision approving the project in 2021. The mine was initially planned for production by 2026, but several permitting issues and litigation delayed the project. The mine is now expected to be at full capacity by 2028. The projects most likely to be held up in the permitting purgatory are those that offer the greatest benefits to our nation.

Overall, a typical mining project loses more than one-third of its value, as a result of bureaucratic delays in receiving the numerous permits needed to begin production.[10] The higher costs and increased risk that often arise from a prolonged permitting process can cut the expected value of a mine in half before production even begins. The combined impact of open-ended delays can lead to mining projects becoming altogether financially unviable.

The United States must eliminate unnecessary bureaucracy in areas where the economic and environmental benefits outweigh opportunity costs. The National Environmental Policy Act (NEPA) is a procedural law that requires federal agencies to assess the environmental impact of their actions.

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[9] https://www.whitehouse.gov/presidential-actions/2025/01/unleashing-american-energy/

[10] https://nma.org/wp-content/uploads/2021/05/Infographic_SNL_minerals_permitting_5.7_updated.pdf

Furthermore, NEPA is just the start of the process of building major infrastructure projects, including mines. Federal agencies will also most likely need to issue permits under several other relevant statutes, including, among many others, the Endangered Species Act, the Clean Air Act, the Clean Water Act, the Migratory Bird Treaty Act, the Resource Conservation and Recovery Act, the National Forest Management Act, the Solid Waste Disposal Act, and the National Historic Preservation Act.

It is essential to understand what NEPA really is. NEPA imposes no substantive requirements to help protect the environment, such as emissions standards or new technology requirements. NEPA requires that federal agencies provide the public with what the law describes as a "detailed statement" on the potential environmental impacts of actions such as distributing grants and issuing permits.

Reforms should change the paradigm to expedite the approval process for projects that bring net benefits and comply with laws meant to ensure clean water and clean air.

Federal action can also no longer vacillate according to political whims. Developers must be able to rely on decisions from one Administration to the next. The last time I testified before you at a field hearing in July 2023 I talked about two critical mines in Arizona and Minnesota, and both are still stuck in the wheel of litigation and administrative actions, despite Congress taking specific legislative action to drive them forward. U.S. policy must provide certainty for projects such as these with Congressional action to stop reliance on materials sourced from overseas.

Instead, the system should create jobs here, promote American innovation, and foster better global environmental outcomes.

Second, the judicial review of agency actions must be reformed. The current system is overwhelmingly tilted toward those who seek to delay or block projects. Once a project is approved, further legal challenges should be addressed expeditiously, yet nearly every major mining project faces litigation that often drags on for years.

These legal challenges rarely contest the decision to allow a project to proceed but instead target the tens of thousands of pages of analysis that accompany the approval. Judges, often without subject matter expertise, focus on minor details, suggesting that if only the agency had done slightly more—maybe 11,000 pages of review instead of 10,000—the project might proceed. This results in years of additional analysis that often changes little to nothing about the project. Meanwhile, injunctions halt progress, paralyzing the project and jeopardizing investments.

Litigants exploit these delays, knowing that time is money. By repeatedly filing lawsuits, they aim to stretch the process until developers run out of funding and abandon their projects. These issues affect all energy projects but are especially troubling for mining projects, where development costs often reach billions, and the design and construction process takes years, even under ideal circumstances.

Last Congress, this body passed H.R. 1, the Lower Energy Costs Act—important legislation with a number of key provisions, including one to require legal disputes be resolved in less than one year. Other major House and Senate permitting proposals include injunctive relief, standing clarifications, and deadlines on the statute of limitations. These reforms represent progress, but judicial unpredictability is among the biggest wildcards in the current permitting system.

Congress should limit legal challenges to plain and obvious errors related to the natural resources laws, narrow the scope, and adhere to a strict review timeline. Without these changes, billions in investment and years of progress will continue to be wasted, undermining the nation's ability to build critical infrastructure and secure a reliable supply chain for essential minerals.

Lastly, the U.S. must allow mining and refining entities equal access to certain financial incentives to compete globally. Chinese state-owned enterprises use heavy subsidies to undercut American companies,[11] distort prices, and dominate markets. These actions have led to shortages of critical minerals and increased prices, disrupting supply chains and exposing the U.S. economy to risk. The U.S. defense industrial base,[12] for example, faces potential delays in manufacturing munitions and weapons systems due to Chinese export bans on gallium, germanium, antimony, and superhard materials.

"Out subsidizing" foreign state-owned enterprises is not an effective strategy, but tax incentives, like the 45X advancing manufacturing production tax credit, can help foster additional private sector investment in responsible U.S. mining and refining while protecting our nation's industries from unfair competition. However, 45X, as interpreted by the Biden Administration, fell short in two key areas. First, it fails

[11] https://naturalresources.house.gov/news/documentsingle.aspx?DocumentID=416731&utm

[12] https://thediplomat.com/2024/12/chinas-mineral-export-ban-strikes-at-the-us-defense-industrial-base/?utm_source=chatgpt.com

to provide meaningful incentives for domestic mines that send mineral concentrates to U.S. or allied refineries, a step necessary to achieve economies of scale and competitive costs. Second, it allows domestic refiners to claim the credit even when sourcing feedstock from foreign entities of concern, effectively feeding our nation's vulnerability.

These adjustments to 45X could strengthen its impact to better support domestic production. This tool, if updated, can help America build the mines and processing facilities needed to compete with China and Russia and reclaim control of U.S. resources. Other targeted public-private partnerships, for example at the Department of Energy, can also help derisk private investment in nationally significant projects. New mines and facilities succeed by embedding their supply chains, ensuring buyers are in place before production begins.

As global demand for critical minerals and materials increases, the U.S. will either responsibly develop these resources here at home or continue to rely on foreign sources that, in many cases, pose human rights challenges, present national security risks, and result in increased environmental impacts.

In conclusion, reliance on foreign minerals supply chains threatens U.S. national security, the American people, and their economic future. Congress can implement a national strategy to maximize public and private sector investments in critical minerals supply chains.

ClearPath looks forward to working with this Subcommittee to further American minerals independence, and I look forward to today's discussion.

QUESTIONS SUBMITTED FOR THE RECORD TO JEREMY HARRELL,
CEO OF CLEARPATH, INC.

Questions Submitted by Representative Ezell

Question 1. Key lifesaving industries like pharmaceuticals, drug formation, and farming would be impacted by such disruptions in supply of palladium. Have any of you looked at these industries to evaluate the nation's security threat to our health and basic nutritional needs if the flow of these critical minerals was disrupted?

Answer. While palladium has not been a primary focus of study for ClearPath, disruptions in the critical minerals supply chain present a significant risk to national security, including essential industries such as pharmaceuticals, drug formulation, and agriculture. Critical minerals serve as the foundation for modern manufacturing, and any supply chain instability could lead to shortages in lifesaving medications, disrupt food production, and hinder medical and technological advancements.

Palladium, a platinum-group metal, is classified as a critical raw material and plays an essential role in catalytic converters for reducing emissions, as well as in the chemical and electronics industries. Additionally, its properties are crucial in pharmaceutical drug formation and agricultural processes. The global palladium supply is highly concentrated, with Russia historically controlling approximately 40% of global mine production and 30% of total exports by value. Following Russia's invasion of Ukraine, concerns over supply disruptions have intensified, as Western markets remain heavily dependent on Russian palladium. While some alternative sources exist in South Africa, Zimbabwe, Canada, and the United States, the flexibility to accommodate shortages remains limited.

China, while not a dominant producer of palladium, remains a major refiner and importer, exerting significant influence over supply chains. China's strategic use of state-owned enterprises to manipulate global markets has been demonstrated in other critical minerals, such as rare earth elements, lithium, and cobalt. The risk of geopolitical leverage remains a pressing concern. Similar disruptions have already affected semiconductor production, defense supply chains, and advanced energy technologies. If applied to palladium, such actions could result in substantial shortages in the automotive industry, pharmaceutical manufacturing, and key agricultural applications, ultimately impacting public health and food security.

Given these risks, strengthening domestic mining, refining, and supply chain resilience is a necessary priority. Without proactive measures to secure critical materials, the United States and its allies will remain vulnerable to external supply shocks that threaten economic stability, technological leadership, and essential public services. Addressing these challenges requires a focus on three key areas: restoring predictability to the permitting process, streamlining judicial review, and de-risking private investment. Without these reforms, domestic projects will strug-

gle to compete, and the U.S. will remain dependent on foreign-controlled supply chains, undermining national security and long-term economic resilience.

Questions Submitted by Representative Dingell

Question 1. Mr. Harrell, do you agree that the direct loans from the Biden Administration for domestic critical mineral processing projects are a benefit to our domestic supply chains?

Answer. Debt-financing for large-scale domestic critical mineral processing projects can help de-risk private investment and expand U.S. refining capacity. However, the U.S. remains heavily reliant on foreign processing, with China controlling over 60% of global refining. To compete globally, mining and refining entities must have equal access to certain financial incentives that support domestic production.

The 45X advanced manufacturing tax credit has the potential to strengthen domestic mining and refining, fostering private sector investment while reducing reliance on foreign-controlled supply chains. Targeted improvements—such as stronger incentives for domestic mines supplying U.S.-sourced materials—would enhance its impact. Expanding public-private partnerships, like those at the Department of Energy, alongside a strengthened 45X credit can help de-risk investment in nationally significant projects, ensuring new mines and refineries integrate into resilient domestic supply chains and support long-term economic growth.

Beyond financial incentives, permitting delays remain one of the biggest barriers to domestic production. Mining projects face an average 7–10 year permitting timeline, with approvals often stalled by duplicative reviews and lengthy litigation. Even after permits are issued, legal challenges can drag projects into years of uncertainty, deterring private capital investment.

Without permitting reform, domestic projects will struggle to compete, leaving the U.S. vulnerable to supply chain disruptions and geopolitical leverage.

To build a resilient supply chain, the U.S. must align financing tools with comprehensive permitting reform, including clear review timelines, streamlined judicial processes, and coordinated federal-state approval processes to provide certainty needed for domestic projects to move forward.

Question 2. Mr. Harrell, similarly, do you agree that federal support for battery recycling is vital for U.S. manufacturing and the jobs that will come with it?

Answer. Battery recycling plays an important role in supplementing domestic critical mineral supply and reducing reliance on foreign sources. However, while recycling can help alleviate supply chain vulnerabilities, it cannot meet the scale of surging demand driven by manufacturing, data centers, and AI infrastructure. Federal support for battery recycling can contribute to U.S. manufacturing and job creation, but it must be complemented by expanded domestic mining and processing to ensure a secure and resilient supply chain for critical materials.

Mr. STAUBER. Thank you, Mr. Harrell. Our next witness is Dr. Dustin Mulvaney, and he is a Professor of Environmental Studies at San Jose State University, and he is stationed in San Jose, California.

Dr. Mulvaney, you are now recognized for 5 minutes.

STATEMENT OF DUSTIN MULVANEY, PROFESSOR, ENVIRONMENTAL STUDIES DEPARTMENT, SAN JOSE STATE UNIVERSITY, SAN JOSE, CALIFORNIA

Dr. MULVANEY. Thank you to the esteemed members of this Committee. It is a great privilege to be here to speak before you today. I am a professor of environmental studies, as was said, at San Jose State University, where I study supply chains, life cycle assessment, land use change, and recycling and waste impacts of energy technologies and infrastructures.

Supply chain disruptions from bottlenecks, geographic concentration, and trade restrictions have shown vulnerabilities to the

domestic economy and energy systems, and why securing adequate supplies are crucial to national security, economic prosperity, and safeguarding the planet we share. But there are a few important considerations I would like to raise in these opening remarks.

One, mining's legacy of water contamination and waste warrants a more sustainable approach to mining and mineral extraction. New sites of mineral extraction cannot come at the expense of our wildlife, water-dependent ecosystems, and riparian habitats. Half of known critical mineral deposits in the U.S. are within trout and salmon habitat, and 1 in 10 deposits are in protected public land areas like wildernesses. Many critical minerals overlap with sage grouse habitat and big game wildlife corridors across the West. One lithium mine being proposed by an Australian mining company has potential impacts to an entire population of an endangered buckwheat plant that only exists in that particular spot. Most land-based critical minerals are located in areas already facing high or extreme high levels of water stress.

Two, domestic critical minerals development should protect Native American sovereignty, self-determination, and provide meaningful consultation on cultural resources. It is not uncommon to hear that the Federal consultation process for the National Historic Preservation Act, for example, is failing Tribes on adequate and meaningful consultation. The United States should strengthen tribal consultation around ideas of self-determination and free, prior, and informed consent as described by the International Labor Organization's Convention 169. The Department of the Interior's new pre-plan coordination is a step in the right direction, bringing stakeholders together to understand others' priorities and concerns.

Public policy should also encourage the United States to move away from the take, make, waste economy towards a circular economy. More progress is needed to move towards a circular economy. The U.S. lacks a comprehensive Federal policy to encourage electronics and electrical equipment recovery and recycling. These are critical mineral resources in our hands that we let slip through our fingers. Analysts emphasize the need to develop new copper mines, for example, yet less than 40 percent of copper is currently recycled, and the rest is landfilled. A circular economy approach means extracting more critical minerals from mine waste streams, end-of-life products, and reducing demand through resource efficiency and material substitution.

The Infrastructure Investment and Jobs Act directs the Secretary of Energy, in coordination with the Director of the National Science Foundation, to issue grants to support research on critical minerals, mining, recycling, reclamation strategies, and technologies.

Four, undermining environmental laws will increase the time to build mines by making it harder for mine developers to obtain social license to operate. A social license to operate in trust is something gained through notification, consultation, listening, providing community benefits, and offering ownership stake, et cetera. This becomes extremely difficult to do under circumstances such as fast-tracking without substantial coordination. And no doubt there are idiosyncratic and frustrating situations in mine developments, but the reality is the time to permit a hardrock mine is closer to 2

years, according to the GAO, and where delays occur, they are overwhelmingly caused by the applicant.

Predictability is often emphasized in describing environmental review of mining, but predictability is also important to environmental groups and Tribes to know what land, water, and air is predictable. More predictability on all sides will help avoid the most intractable controversies.

Five, the U.S. should build a modern critical minerals program around a modern mining law, not a 153-year-old law signed by Ulysses S Grant. The 1872 law was intended for settlement of the American West. Without key reforms, this antiquated mining law will continue to cause unnecessary environmental degradation and environmental inequality. The mining law is a bad deal for U.S. taxpayers as well, as developers get these minerals royalty-free, sometimes being exported to other countries to be processed. These royalties also could be used to pay to finance some of the cleanup and remediation of legacy mine pollution.

Finally, reshoring domestic supply chains while undermining incentives for electric vehicles sends mixed signals and is a recipe for contradictory outcomes. Developing critical mineral supplies would be strengthened by maintaining policies to encourage electric vehicles, including the Clean Car Rule and Inflation Reduction Act incentives. Uncertainty about the fate of these laws and policies sends signals to buyers that perhaps demand might not materialize. Certainty is crucial for major infrastructure investments, and mixed signals does not inspire certainty.

In closing, we have a responsibility to steward the lands and waters where critical minerals will be extracted, and some places should be off limits to development. Responsible and sustainable mine development, paired with efforts to close the loop and waste streams, will be needed to meet critical mineral demands in coming decades. At the end of the day, critical minerals are exhaustible. Earth will not endlessly provide these natural resources.

Thank you, and I look forward to a productive conversation.

[The prepared statement of Dr. Mulvaney follows:]

PREPARED STATEMENT OF DUSTIN MULVANEY, PROFESSOR, ENVIRONMENTAL STUDIES, SAN JOSÉ STATE UNIVERSITY

To the esteemed members of this committee, it is a great privilege to speak before you today.

I am a Professor of Environmental Studies at San José State University. This testimony reflects my views and expertise on the topics herein, and I am not speaking on behalf of my affiliated organizations or anyone but myself.

My areas of expertise and research are on land use change, life cycle analysis, and recycling & waste impacts of energy technologies, supply chains, and infrastructures with an extensive emphasis on the life cycle impacts of solar photovoltaics and lithium-ion batteries. I have a Ph.D. in Environmental Studies from the University of California, Santa Cruz, a Master's of Science degree in Environmental Policy Studies, and a Bachelor's of Science degree in Chemical Engineering, the latter two from the New Jersey Institute of Technology. Professional private sector experience includes work in chemical manufacturing, environmental remediation, and environmental consulting. I have been an expert witness at the California, New York and Utah Public Utilities/Service Commissions, and have participated in the development of waste, land use, and energy policy with legislators, across federal, state, county, and service agencies and commissions over the past decade and a half. I serve on the Technical Advisory Committee to the Recycling and Waste Reduction Commission of Santa Clara County, the Technical Committee for Sustainability and Ultra-Low Carbon Solar standards for photovoltaics developed by the Green

Electronics Council, advisor to the PV Perovskite Accelerator for Commercial Technologies hosted by Sandia National Labs/National Renewable Energy Laboratory, and was selected to be an author of the southwest chapter of the 6th National Climate Assessment of the U.S. Global Change Program. I am also part of the Lithium Valley Equity Technical Advisory Group advising Comite Civico del Valle on issues related to the development of geothermal and lithium near the Salton Sea in Imperial County, California.

Introduction

The development of domestic supply chains for critical minerals is crucial to energy, technology, and military applications. We are in the midst of a low carbon energy transition—one where solar, wind, batteries, and electric vehicles are outpacing even the expectations of professional analysts. This means high demand for materials like lithium, nickel, graphite, cobalt, rare earth elements, and others.

Supply chain disruptions from bottlenecks, geographic concentration, and trade restrictions in recent years have shown vulnerabilities to the domestic economy and energy systems. The dependence on critical minerals of many key technologies to the U.S. economy make securing adequate supplies crucial to national security, economic prosperity, and safeguarding this planet we share.

1. Mining's legacy of water contamination and waste warrants a more sustainable approach to mining and mineral extraction.

From acid mine drainage and heavy metal tailings pollution, to groundwater over-extraction and stream dewatering, mineral extraction has impacted to groundwater and freshwater across the U.S. Water contamination from mining can impact drinking water and affect aquatic plants, fish, and wildlife. Groundwater depletion can occur from over-extraction. Using global data from the U.S. Geological Survey, the World Resource Institute found that "at least 16% of the world's land-based critical mineral mines, deposits and districts are located in areas already facing high or extremely high levels of water stress."[1]

The Thacker Pass mine under construction in Nevada will use 2,500-acre feet per year for 41 years, which is about 104,000 acre-feet of water total, posing threat to over-drafting the Kings River aquifer. There are several new gold mines under development and proposed in Nevada not far from Death Valley National Park, that are using substantial amounts of water, including one mining operation that will use water from a spring in the park, which receives about two inches of rain per year.

Even alternative extraction techniques can impact groundwater. Direct Lithium Extraction (DLE) for example near the Salton Sea, where several pilot projects are underway to extract lithium from brines in the Salton Sea geothermal anomaly. DLE project proposed near the Salton Sea has raised questions about where water will come from, as the region already is the largest customer of Colorado River water, and impacts such as wastewater reinjection and subsidence, and was fined by the USEPA in 2024 for 1,200 dewatering 1,200 acres of wetlands.[2] The dead vegetation made fuel for a wildfire in the wetland in November 2024.

The extraction of metals and minerals can be made cleaner. Even the most controversial mining projects today, when comparing old versus new techniques and best practices, the difference could not be more stark. New mines are cleaner and better, more efficient, and less polluting, and produce less waste. However, questions about mining can be more complicated by impacts to specific places indigenous communities, wildlife, landscapes, and water. One can have the most sustainable mining practices in the world, but if the site is a place people value, it will face opposition. To build infrastructure projects, getting community support in a collaborative way that provides communities with benefits is imperative. Finding a way to get communities, NGOs, and Tribes involved from the start can help ensure the community accepts and gives consent to the project, an makes it more likely benefits from the project recirculate in the community.

2. The development of new sites of mineral extraction cannot come at the expense of our wildlife, water-dependent ecosystem, and riparian habitat.

The impacts of mining to water resources and riparian habitat across the United States cannot be understated. According to an analysis from Trout Unlimited, "half

[1] WRI. 2024. Critical Minerals Mining Water Impacts. https://www.wri.org/insights/critical-minerals-mining-water-impacts

[2] USEPA. 2024. EPA Settles with Hell's Kitchen Geothermal over Wetlands Discharge, Impact on Salton Sea. https://www.epa.gov/newsreleases/epa-settles-hells-kitchen-geothermal-over-wetlands-discharge-impact-salton-sea

of the known critical mineral deposits in the U.S. are within trout and salmon habitat, and one in ten deposits are in protected public land areas like wilderness."[3] The same report notes that many critical minerals overlap with sage grouse habitat and major big game wildlife corridors. Rhyolite Ridge is a lithium mining project being developed by an Australian mining company that will impact Tiehm's buckwheat (*Eriogonum tiehmii*), a species that only exists on that particular site.

In Nevada's Amargosa Valley near the Ash Meadows reserve, an exploratory lithium development project was almost allowed under that 1872 law to drill 30 boreholes without any environmental review, within 2,000 feet of springs that are critical habitat for the endangered Ash Meadows Amargosa pupfish. If not for the community and an environmental group recognizing the BLM mistake, this critical habitat could have been comprised by a speculative venture.

Things we all agree on is the importance of our nation's water, wildlife, and other natural resources. The question is what approaches help to achieve that. Some say we need to reform the Endangered Species Act or National Environmental Act or take away community inputs. But this would be counterproductive and runs contrary to the best practices for mining or any energy infrastructure development. Public policy efforts to develop critical minerals should do so responsibly and should not undermine bedrock environmental laws.

Predictability to developers is often emphasized when describing environmental oversight of mining, but predictability is also important to environmental groups and Tribes to know what land, water, and air is protected, and that there are community safeguards like strong environmental rules and opportunities for public participation. More predictability on all sides will help avoid the most intractable controversies.

3. Domestic critical minerals development should protect Native American sovereignty, self-determination, and meaningful consultation cultural resources.

Critical minerals development is likely to be significantly impactful to Native American tribes. Most mining activity in the United States is in the American West, and within close proximity to Native American communities. Morgan Stanley Capital International states that 79% of lithium mining claims, 89% of copper deposits, and 97% of nickel deposits are within 35 miles of a Native American reservation. Furthermore, the Bureau of Land Management has an obligation to conduct prior consultation on projects proposed across public lands because of important sacred sites off-reservation on their ancestral territories.

Mining activities that put drinking water and cultural resources at risk, making it crucially important to ensure community acceptance and respect for tribal sovereignty and cultural resources. It is not uncommon to hear that the federal consultation process for National Historic Preservation Act to take one example is "failing tribes" on adequate and meaningful consultation. Instead of looking for ways to short circuit environmental and cultural resource review—by undermining nation-to-nation consultation or fast-tracking review—the United States should strengthen Tribal consultation around the ideas of self-determination and "Free, Prior and Informed Consent" as described by International Labour Organization's Convention number 169, the United Nation Declaration on the Rights of Indigenous Peoples.

It is frequently stated that the United States' mining practices are the best in the world because they have the strongest global environmental regulations. That may be true. But the issue of Tribal consultation needs significant improvement to catch up with international norms and standards on relations between mining activities and Indigenous peoples. The Department of the Interior's Interagency Working Group report makes a variety of recommendations to improve the permitting process for mining projects, including prioritizing mine plans that maximize environmental and social best practices, and developing clear procedures for engaging stakeholders earlier in the process and in a more meaningful way. The Department of the Interior's new "pre-plan coordination" is a step in the right direction by bringing stakeholders together to understand each other's priorities and concerns.[4] Several projects proposed in recent years including the Oak Flat-Resolution Copper case study, show that Tribal concerns are still not adequately considered in the decision-

[3] Trout Unlimited.2023. Critical Minerals Report. A Path Forward. https://www.tu.org/cmr-a-path-forward/

[4] BLM. 2024. BLM announces actions to improve mine permitting, early engagement. https://www.blm.gov/press-release/blm-announces-actions-improve-mine-permitting-early-engagement

making process. We have to respect that some places are sacred to Indigenous communities and should not be developed.

4. Domestic critical mineral supply chain resilience means reshoring the entire supply chain

Importantly, it is crucial to realize that without ensuring the entire supply chain is domestic, it is still vulnerable to disruption. Domestic mining that still requires overseas smelting or chemical processing before returning to domestic manufacturing is still a system vulnerable to disruption and geopolitical tensions. Increased mining alone will not solve this. If the entire supply chain is not reshored, it is not a domestic supply chain, and it is still vulnerable to global geopolitical or trade issues. Not that reshoring should be the goal, but that national security risks from supply chain disruption do not simply go away because the extraction phase of the commodity chain is located in the U.S.

The fact that the U.S. lacks many of the processing, separation and production steps in the critical minerals supply chain, is why there were so many investments in the Infrastructure Investment and Jobs Act and Inflation Reduction Act intended to increase domestic production, separation, and processing.

5. Move away from the "take-make-waste" economy, toward a circular economy

We cannot recycle our way out of critical minerals challenges. But more progress is needed away from take-make-waste and toward a circular economy. The U.S. lacks a comprehensive federal policy to encourage electronics and electrical equipment recovery and recycling, leaving states to patch together policies. These are critical mineral resources in our hands that we let slip through our fingers.

It is common hear about the urgency to develop mines for the materials that are foundational to our technological development and energy technologies. Copper for example is crucial to modern economies and energy systems and forecasted supplies risk falling short and may be subject to price volatility, leading analysts to emphasize the need to develop new copper mines. Yet, according to the Copper Alliance, less than 40% of global copper is currently recycled. Research from Fraunhofer Institute for Systems and Innovation finds similarly that 2/3rds of end-of-life copper are sent to landfills annually.

Building a circular economy means developing resources, but ensuring those resources stay in the economy after the end-of-life. This means extracting critical minerals from waste streams, end-of-life products, reduce demand through resource efficiency and material substitution.

Waste flows from end-of-life electronic products often have significantly more critical minerals by percent than the ores they are obtained from in mining. Rare earth elements in end-of-life electronics are almost all lost through waste flows in the United States. Less than 5% of rare earth elements globally are recycled according to the trade press *Recycling International*. Recycling consumer electronic products and utilizing byproducts of other materials processing could yield double to ten times the rare earth elements that could be extracted through processing the raw materials. Three to four times more dysprosium can be obtained from recycling headphones than from rare earth element ores. An iPhone touch screen has more lanthanum to make those bright colors, than is typically found in rare earth element ores. Similarly, there is a higher percent of neodymium obtained from recycling wind turbine magnets, than are found in those rare earth element ores. In an era of declining ore grades, these waste flows should be seen as resources to boost critical mineral supplies.

Critical minerals from mine waste

Here is an example from today's headlines. Tellurium is critical to the development of thin film photovoltaics. US-based thin film photovoltaic manufacturer First Solar—arguably the only solar manufacturing company that has successfully fought off competition from China over the past decade and a half—uses about 40% of the global supply of tellurium.

On Tuesday February 4th 2025, China announced tellurium and four other key critical minerals would be subject to tariffs and export controls. USGS reports that China supplies about 67% of global tellurium. First Solar's tellurium supplier 5NPlus doesn't disclose their tellurium suppliers, but First Solar's conflict minerals

SEC disclosure says a quarter of the smelters and refineries in their supply chains are in China.[5]

Tellurium is found with copper but not profitable enough to extract at most copper mines. Rio Tinto partnered with First Solar and 5NPlus in 2021 to invest $2.9 million in a tellurium plant to produce about 20 tons annually, or about 4% of estimated global production last year, at its Kennecott mine near Salt Lake City, Utah. This production did not require opening new mines or changing environmental laws. The production is the mines waste stream. Waste and "tailings valorization" approaches like these are another strategy to augment critical mineral supplies.

Critical minerals from recycling and resource efficiency

First Solar also recycles their photovoltaic modules and can recover 95% of the tellurium from their process. These materials are recovered and sent to their supplier who can make new tellurium feedstock for cadmium telluride semiconductors.

First Solar also has worked to reduce the material intensity of tellurium in First Solar's modules has been reduced by over 50% in the past decade.

The government has an important role to play. A recent partnership between First Solar and the Department of Energy created the Cadmium Telluride Accelerator Consortium and intends to make solar more affordable and develop and "Maintain or increase domestic CdTe PV material and module production through 2030."[6]

A well-supported National Science Foundation can also play an important role. The Infrastructure Investment and Jobs Act section 40210 on critical minerals mining and recycling research, directs the Secretary of Energy, in coordination with the Director of the National Science Foundation to issue grants to support research on critical minerals mining, recycling, and reclamation strategies and technologies to make better use of domestic resources and to eliminate national reliance on minerals and mineral materials that are subject to supply disruptions.

Critical minerals research and development

A circular economy approach to tellurium involves (1) recovering the critical mineral from mine waste, (2) recycling end-of-life products that contain critical minerals, and (3) reducing demand for critical materials through greater material utilization and resource efficiency.

Materials recovery in mining and downstream processing is optimized for profitability not maximizing materials or biproducts. More incentives to develop biproducts, recover materials at smelters, or increase recovery rates could help drive up recycling of materials. Smelters in the United States are not designed to recover many critical minerals. For example, there are no smelters that can recover cobalt in the United States.

There are also excellent examples of resource efficiency avoiding significant amounts of materials. A photovoltaic module today, thanks to increased resource efficiencies, uses about five times less silver than a photovoltaic module yesterday. Similar, semiconductor wafers in the same technology are two to three times thinner than just a decade ago. This has translated to lower energy inputs and silicon feedstocks needed for the solar industry.

Other ways to increase resource efficiency across society as well. In a recent report from the Climate and Community Project they found up to 90% of lithium demand can be reduced by encouraging public transportation and more lightweight electric vehicles and other modes of transportation.

To date, much of the conversation and public policy effort on critical minerals has focused solely on mining. But recycling, alternative extraction techniques, resource efficiency, and harvesting materials from waste streams offer significant promise for enhancing the nation's supply of critical minerals, and lessening the risks of and exposures to supply chain disruptions. It seems profoundly wasteful that we would allow critical materials be landfilled at the same time we talk about the dire national security consequences of a lack of supply and promote greenfield mine vdevelopment elsewhere.

The United States has some of the premier research institutions in the world that could be working on these. My friend and colleague here from the Colorado School of Mines for example, can tell you more about work that's happening at the nation's premier mining university. They are ahead of the game, and working on projects

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[5] M. Copley. 2021. First Solar's growth plans hinge on opaque market. SBC Global. https://www.spglobal.com/market-intelligence/en/news-insights/articles/2021/12/first-solar-s-growth-plans-hinge-on-opaque-market-for-tellurium-68010925

[6] First Tellurium. 2022. China Mineral Export Restrictions Could Restrict Future Tellurium Supply. https://firsttellurium.com/china-mineral-export-restrictions-could-restrict-future-tellurium-supply/

from recovering minerals from mining waste to mining asteroids. More emphasis on research and development will help close the loop for a circular economy in critical minerals. This wouldn't preclude the development of mines of course, no one is saying that recycling will meet the future demand for all the materials we need. Multiple resource streams including wastes will be required to for a holistic approach to ensuring resilient supply chains.

6. Undermining environmental laws will increase the time to build mines

Ask any scholar or mining executive and they will tell you the most important thing to help a mine move forward is a social license to operate. This trust is something gained through notification, consultation, listening, providing community benefits, offering an ownership stake, etc. This becomes extremely difficult to do under circumstances such as "fast-tracking" without substantial coordination.

The need to prioritize development of domestic minerals supplies should not undermine meaningful environmental review. Conservation groups, Indigenous peoples, and local communities feel that environmental review, even where an environmental impact statement might be required, is a foregone conclusion. Many communities view the NEPA process as a "decide-announce-defend" development strategy where developers and investors decide where they want to propose a project, announce it to the public, and then spend the review process defending the project.

I disagree with the sentiment of advocates of "permitting reform" that we can wave a magic wand and make mine approvals move faster. This a bipartisan sentiment shared by climate hawks and energy dominance narratives alike, and unfortunately it is not based in fact. Instead, more collaborative approaches are shown to be effective at gaining community support and trust—the social license to operate. Transparent and meaningful public participation processes should result in responsible mine development and reduced community opposition to new mines.

It is often claimed that it takes 7 to 10 years or more to permit a new mine. The memo for this hearing says it takes 27 years to develop a mine from idea to production. But most of this time is exploring and making business decisions, not permitting.

The reality is the time to permit a hard rock mine is two years according to the Government Accountability Office. The GAO found some mines take up to 11 years, but their interviews with agencies and mine operators found delays were overwhelming caused by the applicant. More broadly, another GAO report found only 1% of NEPA covered projects need an Environmental Impact Statement. Only 5% of covered projects require an Environmental Assessment, a shorter environmental disclosure document that typically is completed in nine months or so.

Critical minerals designations are used to develop resources with fewer safeguards, less community engagement and Tribal consultation, and shorter time for public review. Designation of certain minerals as critical minerals simply to have the ability to fast-track projects does not help ensure we have domestic supply chains and undermines efforts to gain the social license to operate.

The US already has tools to expedite mine permitting like FAST-41. The IRA made the FAST-41 Act permanent, extended the provisions of the law to mining, and provided significant funding for agencies to process permits.

What appears to some to be an industry stalled by "red tape and bureaucracy" is probably better explained by low commodities prices and business decisions in the face of uncertainty.

7. Build a modern critical minerals program around a modern mining law

The 1872 mining law makes mining the highest and best use of public lands and reflects a time long since passed. The 1872 law was intended for settler colonialism on the western frontier not for mining in a modern high-tech economy. Federal and public lands should not be new sacrifice zones for critical minerals. Without key reforms, the antiquated mining law will continue to cause unnecessary environmental degradation and environmental inequality.

The exploratory claims-based system is outdated, with most other parts of the world having lease-based systems that are more competitive and result in better decision-making on land uses.

Mining law needs a better plan to pay for remediation of old mines. The 1872 mining law set the bar too low for bonding mine sites for reclamation and cleanup. The Government Accountability Office (GAO) estimates that federal agencies spent $2.9 billion in the decade from 2008 to 2017 on cleanup activities, and this could cost taxpayers up to $54 billion to clean up the nation's 400,000 to 500,000 abandoned mine sites that pose hazardous threats to communities.

The Initiative for Responsible Mining Assurance (IRMA) could be a model for reforming the 1872 law. IRMA allows for independent audits of mines to ensure environmental and social performance. Even the White House refereed to IMRA as a "method for U.S. companies and the Federal Government to ensure that minerals are being sourced from mines with robust environmental, social, and financial responsibility policies."[7]

The mining law also is a bad deal for U.S. taxpayers. Because of an outdated mining law, developers of these minerals get them royalty free. This is not a deal just for American companies, foreign companies can also mine materials before shipping them to be processed overseas. Reforming the mining law signed by Ulysses S. Grant would go far to bring the law into conformance for what is needed in a modern economy. Reform to the royalty system would benefit taxpayers, given there are no royalties for hard rock mining under the law today. Reform of the royalty program could raise substantial revenues to help finance the clean up and remediation of legacy mine pollution.

8. Provide community benefits for developing critical minerals

Where mines will be developed, bringing community benefits to the table will be important tools for public support, buy-in, and trust. Furthermore, to reap more community benefits, more value-added industries to support the development of critical minerals supplies can ensure more jobs and local revenues are generated. Mining tends to have a very low value added without these downstream manufacturing activities.

Community benefits should be broadly construed to benefit as many as possible. The widely celebrated community benefits agreement between Lithium Americas and Thacker Pass and the Fort McDermitt Paiute and Shoshone Tribe is a one example worth looking at closely. While benefits accrue to some communities from this project, other tribes with ancestral claims to the landscape such as the People of Red Mountain feel their voices were not acknowledged and will receive no benefits.

Other examples that could be a model for how to build in community benefits is the approach used in the Salton Sea and suggested by the Blue Ribbon Commission on Lithium Extraction in California. That process is early on, but will be worth watching closely.

Community benefits will help gain local acceptance and collaboration with project development.

9. Reshoring domestic supply chains while undermining incentives for electric vehicles will result in contradictory outcomes

What many mistake for an investors lack of commitment to mining projects is more about ensuring projects are economically viable. This often requires partnerships. China's state-backed enterprises mean that mine developers there have a backstop to ensure projects are completed. In the US, extractive industry developments around critical minerals often seek out OEM partners, including many automobile manufacturers.

Developing critical minerals supplies would be strengthened by maintaining policies to encourage electric vehicles include the Clean Car rule and Inflation Reduction Act incentives. But uncertainty about the fate of these laws and policies sends signals to buyers that perhaps demand for lithium and other key battery parts do not materialize.

In summary, we need to be strategic and thoughtful about how to grow domestic extractive industries, especially mining industries, and build a low carbon economy. Failure to do so will undermine the benefits that critical minerals development and an energy transition will bring and risk leaving vulnerable and historically marginalized communities behind, and falling short of meeting broader national security and technological development imperatives. I believe we can responsibly safeguard environmental protections, cultural resources, respect Native American self-determination and sovereignty, and create quality high-road domestic jobs in a critical minerals circular economy. Durable due diligence and risk management grounded in international best practice to evaluate impacts and make good decisions can reduce potential harms to communities, maintains companies' social license to operate, and protects US investments.

Critical minerals are exhaustible. Earth will not endlessly provide these resources. We have to steward the lands and water where critical minerals are extracted, and close the loop to keep them in our economy.

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[7] The White House, *Building Resilient Supply Chains, Revitalizing American Manufacturing, and Fostering Broad-Based Growth: 100-Day Reviews Under Executive Order 14017*, June 2021, https://www.whitehouse.gov/wp-content/uploads/2021/06/100-day-supply-chain-review-report.pdf

Thank you again to this committee for hosting this discussion and I look forward to any questions and a productive conversation.

QUESTIONS SUBMITTED FOR THE RECORD TO DR. DUSTIN MULVANEY, PROFESSOR OF ENVIRONMENTAL STUDIES AT SAN JOSE STATE UNIVERSITY

Dr. Mulvaney did not submit responses to the Committee by the appropriate deadline for inclusion in the printed record.

Questions Submitted by Representative Huffman

Question 1. Could you clarify the potential for recycled critical minerals to meet by demand by 2030 versus by 2050? What role has federal research played in achieving those goals?

Question 2. Are there examples of policies, standards, and certifications that would more rapidly facilitate a circular economy in critical minerals?

Question 3. Could you provide a few more examples of where early collaboration resulted in better outcomes with critical minerals mining projects?

Question 4. What are the key characteristics of a critical minerals extraction project that has social license?

Question 5. What are the key characteristics of a critical minerals extraction project using best practices that can be built quickly?

Mr. STAUBER. Thank you for your testimony. Our final witness is Ms. Mckinsey Lyon, and she is the Vice President of External Affairs at Perpetua Resources, and she is based in Donnelly, Idaho.

Ms. Lyon, you are now recognized for 5 minutes.

STATEMENT OF MCKINSEY LYON, VICE PRESIDENT, EXTERNAL AFFAIRS, PERPETUA RESOURCES, DONNELLY, IDAHO

Ms. LYON. Good morning, Chairman Stauber, Ranking Member Ansari, and members of the Subcommittee. My name is Mackenzie Lyon. I am an Idahoan and I am Vice President of External Affairs for Perpetua Resources.

In the heart of central Idaho, the Stibnite Gold Project is designed to return to and to restore an abandoned mining site, to breathe economic vitality into our rural communities, to responsibly produce gold, and provide the only domestically-mined source of the critical mineral antimony. And it is actually the history of this site that I think is so relevant to our conversation today, because on the eve of World War II it was the blockade in the Pacific that meant the United States no longer had access to the antimony and the tungsten we needed. So, the U.S. Government turned to Stibnite, Idaho that then produced the majority of the antimony and tungsten used during the war effort. At the end of the war the U.S. Munitions Board then credited the men and women of Stibnite, Idaho for having shortened World War II by a year, thus saving a million American lives. So, the minerals in my backyard changed the course of history.

But after World War II and the Korean War, our sources of antimony here domestically went offline. And once again, our industrial base became completely reliant on China for a source of antimony. Today, antimony has a huge array of commercial applications, from

semiconductors to solar panels, lubricants, and fire retardant. The Department of Defense today uses a specific form of antimony called antimony trisulfide as a unique, non-replaceable component in over 300 types of ammunition.

Despite antimony's importance in America's defense and manufacturing base, we are almost entirely dependent on non-allied nations. All told, China, Russia, and Tajikistan control 90 percent of global antimony, 80 percent of which goes through Chinese processing facilities. With this level of dominance, in 2021 China was able to cut off America's sole supply of military-spec antimony trisulfide for the Department of Defense, wounding our defense readiness. Taking it further, just last year the Chinese Government struck our exposed Achilles heel, turning off and completely banning all antimony products being exported to the United States. And today, a once very little paid-attention-to supply chain is now unable to provide antimony.

The good news is the Stibnite Gold Project is the nearest-term solution to this urgent challenge. We hold a reserve of 148 million pounds of antimony, the only reserve of antimony identified in this country. And last month, we received our final record of decision from the U.S. Forest Service.

For us, 8 years of permitting came after 6 years of early community engagement and environmental planning. Getting to this point, however, represents a $400 million investment that includes up to $75 million in Defense Production Act funding and Army research funds. We need to begin our 3-year construction process this summer if we are going to produce antimony by 2028. However, we do still wait on one Federal authorization.

We also hope to utilize debt financing from the U.S. Export-Import Bank under the Make More in America program and the China Transformational Exports Program. Our anticipated 18-year timeline from prospecting to production is just too long. Our Nation can't wait 18 years to bring critical resources online, especially for vital technology, energy, and manufacturing needs that put our security and our economy at risk when China decides to turn off the tap.

When we choose to control our critical minerals, we protect our future. I am often reminded of a quote from Benjamin Franklin saying, "But for want of a nail, the kingdom fell." And critical minerals, while they may be sometimes obscure or used in small volumes, are our proverbial nail. They are the foundation of our economic, energy, and national security. And it is time to learn from our history, and it is time to bring back the American mining industry by choosing to bring responsible mining home.

Mr. Chairman, thank you and I look forward to the discussion.

[The prepared statement of Ms. Lyon follows:]

PREPARED STATEMENT OF MCKINSEY M. LYON, VP OF EXTERNAL AFFAIRS, PERPETUA RESOURCES

The Stibnite Gold Project:
Our Nearest-Term Solution to China's Antimony Crackdown

Good morning Chairman Stauber, Ranking Member Ansari, and members of the subcommittee. My name is Mckinsey Lyon, I am an Idahoan, and I serve as Vice President of External Affairs for Perpetua Resources.

My road to becoming a miner was unconventional. When this company came to my office in 2012, they said they wanted help making sure they did this "right from the start"—and saw community and stakeholder communication as a pillar of that vision. However, I started out as a skeptic, not wanting to see mining return to my backyard. Then I met the people in mining and saw that we shared values. Quickly, I then learned more about the regulatory system that shapes the safety and environmental rigor of the industry. But, I truly became a miner when I came to recognize that I was more comfortable with mining in my backyard than I was with the reality of pushing these impacts to places I will never go, to people I will never meet, under conditions I can never control. I joined this team fully in 2017 and see the Stibnite Gold Project as the right project for my backyard and for my country.

Located in the heart of central Idaho, our Stibnite Gold Project is designed to return to and restore an abandoned mine site, breathe economic vitality into our rural communities, responsibly produce gold, and provide the only domestically mined source of the critical mineral antimony.

Our site's history is particularly important to today's discussion. It goes back to the eve of World War II when blockades in the Pacific cut off America's supply of antimony and tungsten being sourced from China. The Stibnite Mining District in Idaho was then tapped to supply antimony and tungsten for the war effort. At the conclusion of war, the US Munitions Board credited the men and women of Stibnite with shortening World War II by a year and saving one million American lives. But following the Allied victory, all domestically mined sources of antimony were taken offline. And once again, our industrial base became reliant on Chinese-sourced antimony.

Today, antimony has a huge array of commercial applications, from semiconductors and batteries to lubricants and fire retardants. The Department of Defense uses antimony trisulfide as a key, non-replaceable component in the primer for hundreds of munition types. Despite antimony's importance to America's defense and manufacturing base, we are almost entirely dependent on non-allied nations.

All told, China, Russia, and Tajikistan control 90% of mined antimony, up to 80% of which is distributed through China's processing facilities.

With this level of dominance, in 2021, China was able to cut off America's supply of military grade antimony trisulfide—*wounding* our defense readiness. Taking it further, last year, the Chinese government struck our exposed Achilles heel, completely banning all antimony exports to the US, expanding the impact to all industrial and manufacturing uses of antimony. Today, US manufacturers are receiving force majeure notices that supply chains, once paid little attention to, are now unable to provide antimony.

The Stibnite Gold Project is the best and nearest-term solution to this urgent challenge. We hold a reserve of 148 million pounds of antimony, and last month, we received our Final Record of Decision from the U.S. Forest Service, capping eight years of NEPA review.

Our 8 years in permitting came after 6 years in early community engagement and environmental planning—in total representing over $400 million in investment to-date—including nearly $75 million in Defense Production Act funding and army research funds.

And to be clear, we have not yet been able to put a shovel in the ground. We still need a few more authorizations before we can begin the 3-year construction process this summer. We also hope to utilize debt financing from US EXIM under the Make More in America and China Transformational Exports Programs. Getting into construction this year is vital to meet the DOD's need for antimony by 2028.

Without a secure source of antimony trisulfide soon, our warfighters may be at risk. While we are new to the industrial base, we are taking our role as a potential supplier with utmost urgency. Without DOD's focus on antimony, and the Defense Production Act funds made available, we would not be here today.

This 18-year timeline from prospecting to production is far too long—our nation cannot wait 18 years to bring critical resources online—especially for vital technology, energy and manufacturing inputs that put our security and economy at risk when China decides to turn off the tap.

When we control our access to critical minerals, we control our prosperity and protect our future. Benjamin Franklin is quoted as saying "but for want of a nail, the kingdom fell." Critical minerals, while they may be obscure or used in small volumes, are our proverbial nail—the foundation of our economic, energy and national security. It is time to learn from our history and reaffirm our commitment to building back American industry by bringing responsible mining home.

Thank you, Mr. Chairman, and I look forward to our discussion.

BACKGROUND on the STIBNITE GOLD PROJECT

The Stibnite Gold Project (Project) is in the abandoned Stibnite Mining District in central Idaho. The site produced 90% of the antimony and 50% of the tungsten used by the US war efforts during World War II and the Korean War. Gold production occurred intermittently until the mid-1990's. Between 2000–2012, the site was officially abandoned by former operators and government parties.

Today, Perpetua Resources is nearing final permitting approvals to redevelop the site for the remaining 4.8 million ounce gold reserve and 148 million pound antimony reserve. With gold as the economic driver, the Project is also designed to repair environmental legacies left behind from mining activities that started over a century ago, leaving the environment better than it is today.

The Stibnite Gold Project is the only identified domestic reserve of antimony (USGS 2025) and the only domestic source of mil-spec antimony trisulfide.

Project:

Perpetua Resources, earlier known as Midas Gold, began investigating the site for redevelopment in 2010 and submitted the Plan of Restoration and Operations to the U.S. Forest Service for evaluation under the National Environmental Policy Act (NEPA) process in September of 2016.

Altogether, the Stibnite Gold Project has undergone 14 years of scientific study, community engagement, and engineering (2010–2024); 8 years in the National Environmental Policy Act ("NEPA") permitting process (2016–2024); 150 days of formal public comment in which 28,000 letters were received, with approximately 85% expressing support for the Project; and a 90-day objection and resolution period led by the U.S. Forest Service.

Through the long and detailed permitting process, Perpetua has worked with stakeholders and regulators to improve the environmental outcomes of the project to reach the ultimate vision of being able to "restore the site." From the original plan submitted in 2016 to the Draft EIS in 2020 and then the Supplemental Draft EIS in 2022, the project when through a number of design changes and improved outcomes, including:

- 13% reduction in project footprint over original design.
- 70% reduction in Hangar Flats Pit over original design.
- 20+ miles of habitat opened for migrating fish.
- 96% reduction in arsenic in Meadow Creek vs. existing conditions.
- 40% reduction in arsenic in EFSF Salmon River (below Sugar Creek) vs. existing conditions.
- 140% uplift in wetlands quality (wetland functional units).
- 63% net increase in wetland acres vs. existing conditions.
- Water temperature reduced to be at, or below, existing conditions.
- 60% reduction in mercury emissions over original design to be less than 20% of applicable EPA standards.
- 9.5% uplift in stream habitat quality (stream functional units).

Significantly, the 2022 Supplemental EIS found *"The restoration activities, particularly providing volitional passage in the East Fork SFSR, would result in major, permanent, regional, and beneficial effect on Chinook salmon, steelhead, bull trout, and westslope cutthroat trout within the vicinity of the mine*." (US Forest Service, 2022 SDEIS)

In the Final Record of Decision published in January 2025, the US Forest Service conditioned approval on a number of mitigation measures specific to tribal interests. These mandatory mitigations include a Tribal Monitoring program and a Tribal Observation program in addition to a Tribal Member Access program to ensure tribal members can access the site.

Antimony:

Antimony, a listed critical mineral, is essential for national defense, technology, and energy applications. It is a primer in hundreds of munition types, a doping agent in semiconductors and printed circuit boards, and a central component in solar panels and wind turbines. However, today, no domestically mined supply of antimony currently exists. The United States meets 18 percent of demand through the recycling of lead-acid batteries, but is otherwise import reliant on China (63 percent), Belgium (8 percent), India (6 percent), and Bolivia (4 percent). (CSIS, 8.20)

Globally, ~50 percent of antimony usage goes to flame retardants, 20 percent in photovoltaic glass to improve solar cell performance and the remainder goes to

products like lead-acid batteries, break pads, lubricants, and defense applications such as ammunition, infrared missiles, nuclear weapons and night vision goggles.

Antimony is a listed critical mineral, not only because of its essential role in defense and energy products, but also because access to the mineral is constrained. In August 2024, the Chinese government announced the intent to restrict antimony exports and in December 2024 moved to ban the export of all antimony products. As a result, some analysts believe that 97 percent of antimony has stopped moving out of China. Recent reporting has also illuminated that over the last 20 years, China spent over $57 billion on securing critical mineral resources worldwide (Mining, 1.25).

In the US, the leading uses of antimony include antimonial lead and ammunition, as well as flame retardants, according to US Geological Survey in 2024 (South China Morning Post, 8.15) and flame retardants, as well as ceramics, glass and rubber products (Bloomberg, 8.15).

Antimony products will typically rely on either antimony trisulfide, antimony oxides or antimony metal. Antimony trioxide is arguably one of the most important of the antimony compounds—it is primarily used in flame-retardant formulations. (South China Morning Post, 8.15). And the use of antimony trioxide as a clarifying agent in photovoltaic glass has been on the rise in the past years (South China Morning Post, 8.15). About a fifth of antimony was used to make photovoltaic glass to improve the performance of solar cells (Reuters, 8.16). Antimony hydride is used in the semiconductor industry to dope silicon with small quantities of antimony via the chemical vapor deposition (CVD) process.

The defense industrial base uses many types of antimony but the most critical is antimony trisulfide, which is a non-replaceable component for more than 300 types of munitions (Wall Street Journal, 8.20). Antimony is used in bullets, nuclear weapons production and lead-acid batteries. Antimony is used in military equipment such as infrared missiles, nuclear weapons, products requiring lead-free solder, night vision goggles, and as a hardening agent for bullets and tanks (Asia Times, 8.17).

Perpetua Resources' 2020 Feasibility Study estimated 115 million pounds of antimony will be produced from the 148 million pound reserve. This is enough to meet about 35 percent of US demand in the first six years of operations. Perpetua's Feasibility Study in 2020 assumed a price of about $7,700 per ton. Prices in 2024 reached a peak of ~$33,000 per ton after the export ban announcement from China.

Price fluctuation and foreign manipulation of critical mineral prices is often a liability to the long-term stability and economic feasibility critical mineral projects domestically. In this case however, 95 percent of the project economics are based on gold, helping to insulate the production of antimony from price drops related to market flooding or changing market conditions.

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Ms. Lyon's testimony contained an attachment. The full document is available for viewing at:

https://docs.house.gov/meetings/II/II06/20250206/117845/HHRG-119-II06-Wstate-LyonM-20250206.pdf

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QUESTIONS SUBMITTED FOR THE RECORD TO MS. LYON, VP OF EXTERNAL AFFAIRS, PERPETUA RESOURCES

Questions Submitted by Representative Stauber

Question 1. While the permitting process for domestic mining projects is far too slow and convoluted, in an effort to better understand what has worked well for your project, what federal government entities, tools, or processes have been helpful to advancing Perpetua's project, outside of financing through the Export-Import Bank's China Transformational Export Program/Make More In America initiatives or funding through the Department of Defense's Defense Production Act (DPA) Title III program?

Answer. While the path has certainly been lengthy and complex, several factors within the federal government's purview were vital to our ultimate success in spite of the statutory and regulatory issues that require reform. Ultimately, the unique circumstances of an abandoned mine in need of restoration coupled with our critical

mineral resource necessary for national security helped underscore the project's public and national interest value.

Our project shows that the lead agency must actively take the lead in coordinating the multiple other agencies, setting schedules, and identifying solutions in order to navigate the process. The U.S. Forest Service approached this task with a genuine commitment to its multiple-use mandate. In the last few years, leadership of the Payette National Forest and U.S. Department of Agriculture drove collaboration among federal agencies. These leaders rose to the challenge of leading the Department and Forest Service in producing a robust, defensible final Record of Decision for an immensely complex project.

While interagency coordination is essential for any project, given the many veto points and potential for "cooperating agencies" to be far from cooperative, we have seen that a clear lead agency must set the tone, maintain momentum, and ensure that all contributing agencies remain focused on shared objectives. In our case, the Forest Service was highly effective in this regard, given the wide range of agencies involved in approving a project of this nature (such as the Fish and Wildlife Service, NOAA's National Marine Fisheries Service, the Army Corps of Engineers, the Environmental Protection Agency, and more).

The Forest Service also recognized how the Stibnite Gold Project can deliver meaningful environmental benefits by remediating legacy environmental damage at an abandoned mine site. While we initially believed that the restoration at the heart of our plan would streamline review, the reality proved more complicated. Nonetheless, the agency's approach ultimately confirmed the long-term environmental benefits that will result from restoring this historic mining district—and this required leading agencies that were not inclined to come to the table looking for solutions to participate in a constructive manner, rather than enabling delay through inaction.

Additionally, our nation's need for a reliable domestic source of antimony—a mineral vital to national defense and other strategic industries—helped focus agency interest and support for timely decision-making. Use of the Department of Defense's Defense Production Act Title III program funding not only provided the capital infusion the company needed to continue to progress through permitting and toward development, but it highlighted the need for all areas of government to take the review of the Project with seriousness and priority status.

Lastly, clarity on the national security objectives of the project ultimately fostered a more streamlined interagency review where dedicated agency leadership helped provide the information, attention, and comfort to move the project forward.

We hope these insights provide a clearer picture of the processes and partnerships that helped advance the Stibnite Gold Project—and perhaps can illustrate key lessons for future projects. Even as Congress takes on necessary permitting reforms, and the Trump administration makes key regulatory improvements, we feel that successful projects will still require strong leadership from the lead agency, interagency coordination, improved cooperating agency approaches, and political will to move projects in a timely fashion. As we move forward with the Stibnite Gold Project, we remain committed to demonstrating how responsible mining can yield critical minerals while performing transformative environmental restoration.

Questions Submitted by Representative Fulcher

Question 1. Ms. Lyon, your project represents an important investment in my district—can you speak to the jobs it will create and how Perpetua has made sure there is outreach to the community?

Answer. Thank you for your question, Congressman Fulcher. We are proud that the Stibnite Gold Project will provide family-wage jobs, infrastructure, and generational investment to rural Idaho for years to come.

Over the lifespan of the Stibnite Gold Project, we will employ hundreds annually. During our three-year construction period, we anticipate employing up to 1,000 workers. Once we commence operations, we expect to create approximately 500–600 jobs, supporting economic diversity and family wages in rural Idaho.

Opportunities will be available for professionals in an array of fields, from craft and trade jobs to highly specialized roles. While we believe the Project will attract talented individuals from across the region, especially given our competitive compensation and two-week on/two-week off schedule, we are focused on looking to Idaho first for team members and vendors wherever possible. Already, we have created partnerships with local schools through funding Career Technical Education programs in Valley County and worked with a number of truly fantastic student apprentices from the College of Western Idaho. We are also excited to see Idaho's

Universities build programs of study in geology, engineering, computer sciences, and material sciences that will support the in-demand roles that come with mining projects.

Clear, accountable, and transparent communication with our communities is central to our actions as a company. Our team has designed the Stibnite Gold Project so it benefits our local community as well as the environment. Together with our neighboring cities and counties, we developed a community agreement that creates a collaborative environment for us to work with local communities throughout the life of the project and provides a venue for residents to address concerns and opportunities directly with the company.

We have also worked diligently to build a transformational investment in our region's future. Over the life of the Project, we have committed to a multi-million-dollar investment in our communities through the Stibnite Foundation, which was created as a part of our community agreement.

In addition, we have spent over $108 million in Idaho since 2014. We have made $3.2 million total community contributions since 2014 and volunteered in excess of 15,000 hours since 2015. We will invest approximately $2.2 billion in Idaho just to construct the Stibnite Gold Project. An economic impact study estimates we will spend more than $232 million each year we are in operation. We will generate millions in new revenues through state and local taxes and our employees will contribute additional money for schools and local governments through local property taxes.

Additionally, the Project is designed to take on abandoned environmental legacies that degrade water and habitat today. Through private investment and redevelopment of this historic site, Perpetua is offering to take on the restoration cost that would otherwise be the burden of the taxpayer and has already invested $19 million in early cleanup activities.

We are excited to be an engine of Idaho's economy and woven into the fabric of our communities for many years to come.

Mr. STAUBER. Thank you for your comments, Ms. Lyon. I want to thank all the witnesses for their testimony today. The Chair will now recognize Members for 5 minutes of questions, and I will recognize myself for 5 minutes.

Mr. Harrell, the Twin Metals project in the 8th congressional district of Minnesota that I represent, it stands to generate substantial economic benefits and create thousands of jobs. Unfortunately, the Biden administration sided with the anti-mining and anti-jobs activists and unilaterally blocked this project from moving forward, refusing to examine the science. How can Congress provide greater certainty for domestic mining projects and ensure that critical mineral development is not derailed by shifting political priorities?

Mr. HARRELL. Thank you, Mr. Chairman, for the question, and thank you for your leadership on these mining issues. I think it really drives forward the need to restore some regulatory predictability, and the Twin Metals project is a great example; the previous administration unilaterally took those lands out of play for consideration.

We need to balance speed and safety. We need to do environmental analysis on these things. But when we have an immense resource that is available here it should be reviewed on its environmental merits, and we should ultimately get to a yes or no answer based on those merits. So, we have to restore more predictability. We can't have the regulatory environment hopping back and forth between administrations and transitions.

Mr. STAUBER. Thank you very much. And I will remind you that on that specific project the former Secretary of the Interior was asked by the Senate, if there were critical minerals, why she shut

that down. And her words were, "I didn't think there were critical minerals in there." It is the biggest copper nickel find in the world.

I will just add that yesterday I reintroduced the Superior National Forest Restoration Act, which will reverse the Biden administration's actions to block this project and finally provide the legal and regulatory certainty for this important mine to move forward. This will prevent future anti-mining administrations from shutting it down.

Ms. Lyon, how large of a role will reclamation play in Perpetua's plans to develop the Stibnite Gold Project?

Ms. LYON. Thank you, Mr. Chairman. The vision of the Stibnite Gold Project was to go back to an abandoned mine site that had been mined for over a century, and to use the resources of redevelopment to improve the environmental conditions.

Today, one ton of arsenic leaches into the river every single year. We can improve that. We can improve water quality through mining, getting Meadow Creek at Stibnite down to a reduction of 90 percent of arsenic. So, by looking at the challenges of Stibnite today, millions of tons of legacy tailings remain, water quality is impaired, the East Fork-South Fork of the Salmon River flows into an abandoned mining pit, and salmon are blocked from miles of habitat.

Now, after 8 years of permitting, I can sit here and tell you that we will restore this site. We can improve water quality. We will improve and reconnect fish habitats so that once again salmon can reach up to 20 miles of habitat and overall be able to uplift the environmental conditions of Stibnite.

Mr. STAUBER. So, it is safe to say that, when all is said and done, you will leave the mine site in a better condition than it is today?

Ms. LYON. Yes, sir.

Mr. STAUBER. You know, you brought up the antimony in your testimony. I believe that the only reason at the eleventh hour that the Biden administration approved your mine was because the Chinese communist country decided not to export antimony, which they know we need. So, by politics they were forced. They weren't using the science and the facts. It was political in nature. Yet, we are here today.

Before I yield, I want to ask a quick yes or no of each of our witnesses. Do you agree that domestic mineral extraction and production using the American workers, the American environmental standards, and the American labor standards is superior to overseas mining operations?

Dr. Bazilian?

Dr. BAZILIAN. It certainly is, you can never ask an academic yes-or-no question.

[Laughter.]

Mr. STAUBER. Can you turn on your mic?

Dr. BAZILIAN. Thank you very much.

Mr. STAUBER. There you go.

Dr. BAZILIAN. Yes. In general, the standards in the United States are superior to many other countries, not all countries.

Mr. STAUBER. Thank you.

Mr. Harrell?

Mr. HARRELL. Yes. That is why U.S. leadership is so important.

Mr. STAUBER. Yes. Mr. Mulvaney?

Dr. MULVANEY. I would echo Dr. Bazilian.

Mr. STAUBER. Ms. Lyon?

Ms. LYON. Yes, I will always bet on the American miner.

Mr. STAUBER. Thank you very much. I will now yield to the Ranking Member, Representative, oh, all right. OK, sorry. I will now yield to the Ranker of the Full Committee, Mr. Huffman from California for 5 minutes.

Mr. HUFFMAN. Thank you, Mr. Chairman, and thanks to the witnesses.

We have been talking about the mining law of 1872, a law that was codified to reflect Gold-Rush-era values when we wanted to incentivize mining on public lands and promote settlement of the West. Of course, this ancient law, this anachronistic law holds no regard for the values that we that we have today, things like environmental responsibility and respect for Indigenous sovereignty and treaty rights. So, relying on this ancient law from 1872 to guide a modern, responsible domestic mining industry, all the things we say we want to do today is a little bit like asking President Ulysses S. Grant to come back and regulate artificial intelligence. It is tough to do.

The mining law prioritizes mining over everything else on our public lands. It does nothing to protect the environment or to direct consultation with Tribes who are disproportionately impacted often by mining projects. And on top of all this, mining corporations are not expected to pay anything in royalties for using our Federal land. They can hold on to mining claims for as little as $10 per acre per year.

So, Dr. Mulvaney, we say we want to evolve into a modern, responsible, sustainable mining industry to meet these challenges. That is a pretty generous framework from that 1872 law. Do you know of any other industries that enjoy sweetheart terms like that?

Dr. MULVANEY. No. In fact, on private lands or in State lands, for example in Utah, there are much higher royalties paid to the State of Utah on adjacent properties that would be mined on the Federal side. Oil and gas industries pay 16.67 percent, I believe, for their leases. A solar development is going to pay somewhere between $1,000 and $5,000 an acre for public lands on an annual basis to lease that. So, it is a pretty good deal, I would say, for mining companies, including multi-national companies that have no base here in the United States.

Mr. HUFFMAN. Yes, I am just surprised because we say that we are looking for savings, we are looking to address the deficit and the debt. Elon Musk and his tech bro fake public officials are rummaging through databases and crashing through the doors of Federal agencies and trying to break things in search of efficiency and savings, but they haven't found their way to this 1872 law. And I am just wondering why that would be.

I mean, if hardrock mining paid the same royalties as just oil and gas, what would that do to the U.S. Treasury? Yes.

Dr. MULVANEY. Well, I think when we think about the legacy contamination from mining industries, you could use those revenues to help clean up and restore sites, so that is something that would otherwise come out of taxpayer pockets, so——

Mr. HUFFMAN. But if they paid the same royalties as oil and gas, we are talking about hundreds of millions, if not billions of dollars——

Dr. MULVANEY. Yes.

Mr. HUFFMAN [continuing]. Into the United States Treasury, right, at a time when we say we are really looking under every sofa cushion for that kind of savings.

So, I am hoping Elon and your tech bros, if you are listening, maybe find your way to the 1872 Mining Law and take a look at that instead of rummaging through our most sensitive personal taxpayer records and all other things that you really shouldn't have your hands on.

Dr. Mulvaney, can you explain the environmental consequences of a mad rush to a mining free-for-all rather than a measured, thoughtful approach? What happens when you do it that way?

Dr. MULVANEY. Well, what could happen is if you approve a bunch of mines hastily and they are all competing with each other, you might end up with a couple of bankrupt mines that start to develop sites and don't actually produce anything before they go bankrupt. So, it does take a measured response to figuring out which mines to develop, because every proposed mine shouldn't be developed. We should screen for impacts to Tribes and environmental impacts, and really try to choose the least conflicted sites that are also productive.

Mr. HUFFMAN. Thank you.

And Dr. Bazilian, you at the Colorado School of Mines are doing a lot of important research into these areas, trying to help us find the right strategies, the right mix of technologies and minerals, and I just want to ask you about the funding that the Colorado School of Mines receives from the Inflation Reduction Act and the Bipartisan Infrastructure Law, both of which are in the crosshairs right now of President Trump. He has issued Executive Orders purporting to freeze funding and has said he wants to claw it back.

My understanding is programs like the Department of Energy's Loan Program Office funding have really been important to the research and the good work that you and your colleagues are doing. Can you tell us what this uncertainty means for your university and the critical mineral supply chains work that you are doing more broadly?

Dr. BAZILIAN. Thank you, Congressman. I am afraid I don't have that data for you. I am not aware of the quantum, nor the details of the funding we get from those specific mechanisms. Thank you.

Mr. HUFFMAN. Yes. You might want to take a look at that.

And with that, I will yield back, Mr. Chairman. Thank you.

Mr. STAUBER. Thank you very much. The Chair will now recognize Representative Wittman for 5 minutes.

Dr. WITTMAN. Well, thank you, Mr. Chairman. I would like to thank our witnesses for joining us today. I want to focus on what is happening with China.

As you know, they are laser-focused on critical minerals and rare Earth elements, and we know that they have just now issued their third round of export controls. Exporters are now required to get CCP approval for a list of minerals now including tungsten, tellurium, bismuth, indium, molybdenum, and the list continues to

grow. This is the third round of growing that list. And last week, the International Trade Commission told us what we already know, and that is China is doing everything they can to prevent an American graphite industry from emerging. Again, unfair trade practices, we see that.

We also know too that they own 100 percent of the world's source of gallium, 98 percent of the world's source of germanium. They are using that for both their strategic and economic advantage. We know by the U.S. Geological Survey and their modeling that this could create up to a $3.4 billion hole in our GDP by these unfair trade practices. That is why I am very honored to lead the Critical Minerals Working Group for the Select Committee on the Strategic Competition between the United States and the Chinese Communist Party.

This is a priority for our Nation to get back into not just the mining business, but also the refining and smelting business because China is also looking to dominate in those areas. So, I would like to go to our witnesses and, Mr. Harrell, I will start with you. Can you give me your thoughts about the things that we can do to combat these unfair trade practices?

And I have a number of bills that we are putting in to try to create some structure there for U.S. producers and for U.S. consumers, especially in critical national security industries, to make sure there is an assured and reliable source of these critical minerals and rare Earth elements and to make sure, too, that they are operating within a free market, not in a government-restricted place that China wants the world market to operate within.

Mr. HARRELL. Thank you, Congressman, for the question. And thank you for your leadership on this critical minerals issue and national security issues as a whole.

You are underscoring a critical vulnerability here. And if I had to oversimplify kind of three key points that I think we have to do, we are competing globally on price, and we struggle because of some of the labor issues with some of our competitors, Chinese subsidies and foreign subsidies. So, I would say we need to innovate here, we need to find ways to ultimately do these mining processes in a lower-cost way and in a more environmentally sustainable way.

We need to drive down the cost of those mechanisms. We need to use innovative financing tools not to out subsidize China because we are never going to win that fight, but to catalyze some of these early investments in processing and in the infrastructure that we need.

And then three, we need to use the world-class innovators here in the United States to ultimately make products that aren't going to need some of these things, as well. We need to innovate on batteries and energy storage that use Earth-abundant resources, because in the end there is a wide variety of defense applications that we are going to need these critical minerals.

Dr. WITTMAN. Very good. Dr. Mulvaney, I will go to you and just get your perspective. How do we combat these unfair trade practices? How does the United States create and sustain an industry that includes extraction, refining, and smelting?

Dr. MULVANEY. Well, I think one of the reasons that China is able to compete is because they have had sustained partnership between their government and those developments. So, we probably need to strengthen partnerships with OEMs, for example, to make sure that automakers are also investing in mines or defense industries are also investing in mines. And for that to happen we need to have a stable policy environment and send signals to the market that, you know, we are planning on developing certain resources.

Dr. WITTMAN. Very good, thank you. I want to emphasize too that by the United States buying minerals from these mines, remember, 16 of the 18 mines in Africa are owned by China, they use forced labor, and they destroy the environment. So, for us to sanctimoniously say that we are for all these things and yet we buy and we enable the Chinese to exploit human beings and destroy the environment is unbelievably, unbelievably unacceptable for the United States to do that.

Ms. Lyon, I would like to get your perspective in the last 30 seconds.

Ms. LYON. Absolutely, Congressman, and thank you. We need long-term strategy that enables the left hand of government to understand what the right hand needs.

We also need to reconfirm on the short-term tools that we can utilize as an industry today to be competitive against that $57 billion China is using to support while it takes us 29 years to get to the finish line. Those resources include things that helped us, like title three of the Defense Production Act or the U.S. Export-Import Bank's China and Transformational Export Programs. We need these programs today to be sustained in order to move forward.

Dr. WITTMAN. Thank you, Ms. Lyon.

Mr. Chairman, I yield back.

Mr. STAUBER. Thank you very much. The Chair recognizes the Ranking Member of this Committee, Representative Ansari, for 5 minutes.

Ms. ANSARI. Thank you all very much for the informative testimony.

As we have discussed, mining can be part of the solution to our mineral needs, but it won't be the only solution. Recycling and reuse can help reduce the demand for mined materials and can make our supply chains more adaptive to demand, which, with technology, as we know, is always changing. So, my first question is for Dr. Mulvaney.

Could you give us a ballpark for the quantity of minerals we are losing to landfills each year, compared to the amount of minerals that we take out of the ground?

Dr. MULVANEY. Yes, and there are not a lot of studies of how much gets diverted into landfills, because it is not something we track, obviously. It is, you know, everybody is putting stuff into their garbage. But one study that is frequently cited by the USGS from 2004 found that in the United States, about 1.1 million tons of copper are landfilled annually, and that matches roughly about with how much is extracted in the United States on an annual basis.

That is just copper. Other materials would have to be looked at. We don't have a lot of information, partly, I mean, you think about cell phones, right? People stockpile cell phones in their closets and drawers and things like that. So, everything that doesn't always make it into the landfill right away, but that is roughly the numbers that I could have.

Ms. ANSARI. Thank you. And how much can recycling contribute to our mineral needs if systems are set up properly and products are actually designed to be recycled at the end of their lives?

Dr. MULVANEY. The metals that I am most familiar with are the ones in batteries, and I see nickel, cobalt, and manganese numbers in the 10 to 20 to 30 percent amount.

It requires, I think, having recycled content standards. So, in Europe they have recycled content standards for batteries, and that requires that purchasers of batteries are buying materials that have some recovered content. You have to send signals to waste industries to build the equipment to recover the materials, and having strong recycling laws is one way to do that.

Ms. ANSARI. And on that can you talk a little bit about the challenges that we face to get there, and how the Federal Government could possibly support these efforts?

Dr. MULVANEY. Yes. Well, in Europe they have a comprehensive waste recovery law, and we do not have a Federal policy like that. We leave electronic waste, we regulate hazardous waste, we don't regulate all electrical equipment, and we leave e-waste management, which is where we are going to find a lot of these metals, to the States. And then we end up with a patchwork of laws that are a little different in every State.

So, I think, you know, working through the Federal Government to make sure those laws are harmonized would be one pathway to ensuring that we have a robust and resilient recycling infrastructure.

Ms. ANSARI. Thank you. I would also like to talk a little bit about water use. As I mentioned, communities in my district are on the front lines of the climate crisis, particularly when it comes to extreme heat and drought. They are an example of how access to clean water resources is just as important to security as anything else.

In Phoenix, we have been able to reduce water demand even as our population and our economy have boomed. But we need long-term solutions, and all of the industries in the West need to be developed with these scarce water resources in mind. In Arizona, loopholes exempt mining from water use laws. And unfortunately, we are already hearing of examples of mines in places like our neighbors in Nevada that are running groundwater aquifers dry.

So, my question, and this is also to you, Dr. Mulvaney, I know you have done research on lithium mining and its impact on water resources in particular. Can you tell us more about the ways that we can improve water use in mining?

Dr. MULVANEY. Sorry, yes. I will submit for the record a paper we just published on lithium and water impacts across the life cycle.

We have different new technologies emerging, direct lithium extraction, for example. There are still questions around what the

water use looks like for that. But that is possibly a new generation of lithium extraction technologies where we might be able to pull minerals from brines. The Salton Sea is an area where I have been closely working with groups in the Lithium Valley.

But also, just ensuring that mine development doesn't have impacts on groundwater. I think through the Thacker Pass controversy we saw a result that led to a mine that was ultimately developed that had less impact on groundwater than was initially proposed. So, having strong environmental review and looking at groundwater impacts in that review is one way that we can ensure that mines are developed appropriately.

Ms. ANSARI. Thank you so much.

I yield back.

Mr. STAUBER. Thank you, Representative Ansari. The Chair now recognizes Representative Gosar from the great State of Arizona for 5 minutes.

Dr. GOSAR. Thank you, Mr. Chairman. As a representative of Arizona, the Copper State, this hearing brings home this whole issue: mineral security is national security.

Thankfully, President Trump understands the importance of domestic mineral production. For example, his Unleashing American Energy Executive Order calls on agency heads to identify actions that will impose undue burdens on the mining and processing of non-fuel minerals. Ending such burdens on mining is crucial to unlocking our domestic production potential. We need to make mining great again, we hope to ensure our country does not rely on our adversaries or countries with unacceptable environmental or labor conditions for important mineral necessity for energy and computers.

Mineral security is also economic security. President Trump recognizes this and signed an Executive Order calling for the creation of a sovereign wealth fund. Tying natural assets, including minerals, to the economic security of American people is a wonderful idea. In fact, my legislation, H.R. 3004, the LASSO Act, gives the President the legislative format to achieve just this. I look forward to seeing what President Trump and this Congress can do to ensure mineral dominance for Americans.

Mr. Harrell, you have firsthand knowledge of the mining aspects in Arizona. Can you talk to us about the Biden's abuse of abuse of the Antiquities Act to create a 1.6 million-acre national monument adjacent to the Grand Canyon to restrict uranium mining and economic development in our State, but also posing risks to the national security interests of our country at large?

Mr. HARRELL. Thank you for the question, Congressman Gosar, yes.

Again, as we are talking about these unilateral withdrawals that are done administratively and millions of acres, like, certainly that tool was envisioned to be used for very small areas, right? And it has been abused over years by, frankly, Republican and Democratic administrations. In the end, we want to balance speed and safety on environmental reviews, but we want everyone to be given a fair shake here.

So, we have acute uranium production needs. There is global consensus that we are going to need to as much as 3X nuclear to meet

energy and climate goals. U.S. innovators are leaning forward, and we are significantly reliant on Russian nuclear fuel products. And we should be mining it here, we should be enriching it here, and we should ultimately be fabricating fuel in this country.

So, we need to evaluate these sites by a case-by-case basis, see if they merit a yes or a no. And sometimes we will ultimately land on no. But this system far too often is a default now.

Dr. GOSAR. So, let me ask you a quick question. Understanding the extraction of uranium may take some education again, because you have breccia pipes up in northern Arizona that are very concentrated. They are also a sunken collapsed matrix.

My dad was a geologist from the Colorado School of Mines, so I am telling you I used to hate rocks, now I love rocks.

[Laughter.]

Dr. GOSAR. But what it basically does is every time it rains, every time it blows, you get exposure to these breccia pipes. But when you take them out, they are very concentric. They are about 20 to 40 acres. They take out that breccia pipe, and a lot of times they have these caliche clays that are formed, these subsurface barriers for water permeation. So, what you are actually getting is increased permeation, and you are getting rid of the long-standing exposure. Would you agree with that?

Mr. HARRELL. Yes, I have toured multiple of these sites across this country, in the United States, including in northern Arizona, and they use very innovative processes to remove this in an environmentally sustainable way. And you can do it in a way that protects and maybe even improves risks to groundwater impact.

Dr. GOSAR. So, you are also familiar with Resolution Copper. Now, who is right on this? You know, the San Carlos say that these are their traditional religious grounds, but yet, you have a tribal historian, who has no purview to anything else other than the records, saying this was never a religious area. What gives here?

Mr. HARRELL. Congress is right. In 2014, legislation was signed into law, due to your leadership and this Committee's leadership, to enact a land exchange to enable this project moving forward. It was signed into law by President Obama. And we are still, over 10 years later, debating and driving towards a 2030 production date.

Dr. GOSAR. Are you——

Mr. HARRELL. This project has been evaluated extensively, and it has been yo-yoed back and forth based on political transitions and positions.

Dr. GOSAR. How many mining companies do you think could actually afford the two billion-plus dollars they have put into reclaiming that mine site there in Superior?

Mr. HARRELL. Very few. And Resolution has taken—you know, I have been at that site five-plus times. They have submitted a significant long-term plan on how they are going to reclaim that site, produce what is one of the largest copper reserves in the entire world, could meet 25 percent of our domestic demand, and revitalize a community that is in the heart of copper country, close to significant mining infrastructure, and ultimately deliver results that I think would be good for our national security, good for the Arizona economy, good for the national economy.

Dr. GOSAR. OK, I got one last question. Sorry about this one, but it is very quick.

All of you, can you tell me why our Constitution is antiquated at almost 250 years of age? Is it antiquated, Dr. Bazilian?

Dr. BAZILIAN. Sorry, Congressman, you mean the——

Dr. GOSAR. U.S. Constitution.

Dr. BAZILIAN. The Constitution.

Dr. GOSAR. Is almost 250 years old. We are going to celebrate that very quickly in the next 2 years. Is it antiquated?

Dr. BAZILIAN. Geez, Congressman, I am not a specialist on constitutional law.

Dr. GOSAR. Mr. Harrell?

Dr. BAZILIAN. Sorry.

[Laughter.]

Mr. HARRELL. I think we uphold the Constitution.

Dr. GOSAR. Yes. How about you, Doctor?

Dr. MULVANEY. I am going to echo Dr. Bazilian again.

Dr. GOSAR. This is an easy one.

Ms. Lyon?

Ms. LYON. And I am not an expert. But, sir, there are elements of our Constitution that we are here to uphold.

Dr. GOSAR. Thank you very much, I appreciate it.

I yield back.

Mr. STAUBER. Thank you very much, Dr. Gosar. The Chair now recognizes Representative Rivas from the great State of California for 5 minutes.

Ms. RIVAS. Thank you, Chair Stauber and, you know, Ranking Member Ansari.

One of my biggest priorities in Congress, I am a new Member from California, is environmental justice, elevating communities that often don't have a voice in our Federal Government. My district is in Los Angeles, in the San Fernando Valley. It is an area that has, unfortunately, had a lot of environmental injustices impacted our communities in the past and present due to, you know, poor land use decisions by all levels of government. And it is kind of the genesis for me to fight for these issues and to be that voice on Natural Resources Committee. And I did that as a State legislator in California, and I will continue to do that here in Congress.

You know, we are talking about developing a modern mining industry in our country, and I strongly urge our colleagues to consider environmental justice in decision-making, especially for tribal communities. You know, mining has a long and well-documented history of committing environmental and human rights injustices across the globe, including in the United States, especially for Indigenous people.

Now, you know, I know the mining industry is different than it was back then, you know, years ago. But unfortunately, our mining laws have not changed, and Indigenous communities will continue to bear the brunt of expanded mining without major reforms. So, my question is for Dr. Mulvaney.

Considering this history of hardrock mining and negative effects on environmental tribal lands, what policies or actions do you recommend Congress take to rebuild our relationships with Tribes and address a clean energy future?

Dr. MULVANEY. Very briefly, strengthening consultation, early consultation, is a key strategy for that. And the most recent preplanning initiative from the Department of the Interior that came out in November or December last year, I think, is a step in the right direction. That is where people could understand when a site is sacred and maybe a site shouldn't be developed.

We had a project down in Southern California, a gold mine that the Quechan thought was on, you know, it doesn't matter how sustainable your mining practice is if it is on a site that somebody wants, or thinks is wilderness, or is a sacred site. And through the process of, you know, thinking through that mine, they ended up not building that mine. That mine is no longer going to be developed, and it is nice to know that it is not competing against a more sustainable gold mine somewhere else in the United States. So, I think that that is an area that we could strengthen, prior consultation early.

Ms. RIVAS. OK. Yes, thank you. Thank you for that insight as we look forward to building this economy. Thank you.

[Pause.]

Ms. RIVAS. I yield back my time.

Dr. GOSAR [presiding]. I thank the gentlewoman, and the gentleman from Idaho, Mr. Fulcher, is now recognized.

Mr. FULCHER. Thank you, Mr. Chairman. It is great to have an Idahoan on the panel today.

Mckinsey, thank you for being here and for your hard work in advancing the permitting process for the Stibnite mine in Idaho. Did I understand correctly that that was an 18-year process from start to finish?

Ms. LYON. Congressman, yes, it was.

Mr. FULCHER. Eighteen years. And Mr. Chairman, I was going to point out that that probably meant that Congressman Huffman was still in grade school during that process, but he is not here to hear me say that. So, I guess I won't point it out.

Anyway, the Stibnite Mine project is the only source of mined antimony in the United States, critical for defense, energy storage, and technology. And I am a visual learner. So, thanks to our friends at Stibnite, this is what it looks like, Mr. Chairman.

[Slide.]

Mr. FULCHER. This is the pre-processed form, but this is an example of what we are going after and what is so critical here. The project is even more critical as China, which currently dominates global antimony production, has increasingly restricted exports of this mineral, further highlighting the need for domestic supply.

So, I am proud that Perpetua in Idaho is leading the way in securing this resource for our Nation. In fact, Idaho resources play a key role in securing our Nation's future, and I will continue to advocate for responsible mining projects like Stibnite that bring lasting benefits to our State and country.

With that, I want to get to a question for Ms. Lyon, but China banned the export of antimony just this Tuesday, and they have expanded their export controls over additional forms of tungsten and other critical minerals. I was just going to ask Ms. Lyon if I understand the history correctly.

There was some tungsten activity in this project once upon a time. Can you talk about the possibility of restarting that resource extraction at the Stibnite project?

Ms. LYON. Absolutely. And Congressman, thank you for the support of our project.

Historically, as I mentioned, Stibnite produced 90 percent of the antimony and 50 percent of the tungsten used in World War II. As we look at redeveloping the site we have been able to identify, we know we have 148 million pounds of antimony remaining. We know that because it is a byproduct of gold production. We are also fairly confident and we see in our mineralization existing tungsten. But we have not gone back to fully flush out the full mineral resource that could be remaining at Stibnite today. But we are always happy to do that investigation and continue to have Idaho help play a role in our national security.

Mr. FULCHER. Great, thank you for that. A question for Mr. Bazilian, and this has to do with the various lists of critical minerals.

But the *Wall Street Journal* reported earlier this week China has added five additional critical minerals subject to export restrictions. Tungsten is one. Tellurium, bismuth, molybdenum, and indium are others. This follows the ban on gallium and germanium exports just in December. So, these are all essential for electronics, the energy sector, national defense.

The U.S. Geological Survey identifies non-fuel minerals vital to our economy and national security, that agencies like the Department of Energy and Defense Logistics also maintain separate lists for energy and defense. Is there an opportunity for some better coordination there, Mr. Bazilian?

Dr. BAZILIAN. Thank you very much, Congressman. Yes, I think it is an important question.

It is a little bit wonky for politics typically, but the way we calculate mineral criticality, we have three unclassified lists in the United States: one from the USGS, one from the Department of Energy, and one through the Department of Defense. Only the Department of Defense list includes not just ores but chemicals and materials. And that is an important way we can help refine the other lists.

And the other innovation that DOD does is that they look forward. The other lists are snapshots of a current point in time.

I will just add that the way the United States calculates mineral criticality is not dissimilar to some other jurisdictions like European Union or a recent UK list, but it is fundamentally different than how Canada and Australia looks at mineral criticality. So, I think there is considerable more sophistication that could be brought to these calculations, and that would help inform decisions.

Mr. FULCHER. Great. Thank you for that.

Moving quickly because I am about out of time, Mr. Harrell, just a quick comment for you having to do with judicial review, and I will abbreviate the question by saying, can some judicial review reform help prevent unnecessary litigation that delays these projects for, like, 18 years that Ms. Lyon was talking about? Are there opportunities there?

Mr. HARRELL. Absolutely. I think it is one of the single largest opportunities here. We want to ensure that communities have a chance to use the legal system. But the way it is structured today, it is being completely abused and ultimately is a major source of these significant decades-long delays.

Mr. FULCHER. Thank you.

Mr. Chairman, I have a lot more questions, but I will submit those in writing because I am out of time.

I yield back.

Mr. STAUBER [presiding]. Thank you, Representative Fulcher. The Chair now recognizes Mr. Magaziner from Rhode Island for 5 minutes.

Mr. MAGAZINER. Thank you, Chair.

I am glad that my colleagues on both sides of the aisle and the witnesses today all agree on the importance of securing critical mineral supply chains. And Mr. Bazilian, you mentioned in your testimony that "working with allies will be an indispensable part of our success in creating robust, secure, and resilient supply chains." This is an absolutely vital point.

The United States must maintain good relationships, particularly with the developing world, so that we can access the critical minerals that we need to grow America's economy and maintain a high standard of living. This is one of the many reasons why it is wrong and self-defeating for Donald Trump and Elon Musk to be shredding our relationships with mineral-rich countries around the world, particularly the developing world.

Here are the facts. Less than 1 percent of all cobalt reserves are in the United States. Cobalt, of course, is used to make batteries and cell phones, laptops and cars. More than 50 percent of the world's cobalt is in Africa.

The world's largest copper reserves are in South America.

The United States has only one-tenth of 1 percent of the world's nickel reserves, nickel, of course, used primarily to make steel. Indonesia and Brazil have nearly half of the world's nickel.

Rare Earth minerals are used in semiconductors and advanced medical equipment and consumer electronics. The U.S. has less than 1 percent of the world's rare Earth mineral reserves. And in order to have a stable supply, we need strong relationships with countries like India and Brazil and Tanzania and South Africa. So, we need these relationships.

But what have Donald Trump and Elon Musk done over the last 2 weeks? They have shut down USAID, our most important agency for building goodwill in the developing world. All across the developing world right now, people are waking up to see their health clinics shut down, access to medicine for their children cut off, access to food cut off, American-supported infrastructure projects canceled, all because Donald Trump and the richest man in the world are illegally and stupidly shredding our relationships with the very countries we need as partners to access these minerals, to say nothing of the cruelty of the richest man in the world gleefully taking food away from hungry children and medicine away from the sick. But that is another story.

And guess who is stepping in, ready to save the day? China, China's Belt and Road Initiative. Our greatest competitor, China,

will be happy to step into the void that Trump and Musk are creating. But China's help will come with a price. So, congratulations, Donald and Elon. In the global race to secure rare Earth minerals, most of which are in the developing world, you have surrendered the battlefield to our greatest adversary.

And of course, there is another big country with vast reserves of critical minerals that I haven't mentioned yet. In fact, it is the country that today the U.S. imports the most minerals from: Canada. Canada, which the stable genius has decided to start a trade war with, aluminum, copper, cobalt, graphite and more, Canada has become a vital supply of these critical minerals to the United States. Now, don't worry, Donald Trump only wants to tax these critical minerals at 10 percent at the border instead of 25 percent. Mexico also supplies critical minerals, by the way.

Now, look, I know we are here today to talk about domestic mining, and that is important. And it is a good conversation to have. But the fact remains that the vast majority of reserves of critical minerals lie outside the United States, and no amount of domestic mining can change that. So, Donald Trump and Elon Musk need to stop doing everything that they can to make it harder for us to access those minerals and easier for our adversaries to do so.

Dr. Mulvaney, does the U.S. have enough critical mineral reserves that we don't need to rely on partnerships with other countries?

Dr. MULVANEY. No.

Mr. MAGAZINER. And are other countries going to be more likely to give us access to critical minerals when we are pulling food and medicine and other assistance away from them?

Dr. MULVANEY. I can't speak to that necessarily, but your intimation sounds like it might be right.

Mr. MAGAZINER. And is it wise for us to be posing new taxes on the importation of critical minerals from places like Canada and Mexico?

Dr. MULVANEY. Tariffs in general are not very helpful for American consumers.

Mr. MAGAZINER. All right.

Dr. MULVANEY. Or business——

Mr. MAGAZINER. I just want everyone to keep in mind the context that we are operating in here.

Thank you very much, and I yield back.

Mr. STAUBER. Thank you very much. The Chair now recognizes the full Committee Chair, Representative Westerman.

Mr. WESTERMAN. Thank you, Chairman Stauber. And again, thank you to the witnesses for being here today.

Dr. Bazilian, my undergraduate degree is in engineering.

And Dr. Mulvaney, my graduate degree is in forestry, which was kind of the original environmental study, so I feel a little bit of kinship here, but also probably think in a different way than a lot of people because I like to make things into outlines, and categorize stuff, and go to work on it, kind of the engineering method of solving a problem.

So, as I look at America's mineral future, if I was going to say here are the goals that I have for America's mineral future, I wrote three of them down: reduce dependence on Chinese and other

adversarial suppliers; the next one would be attract investments in domestic mining, refining, recycling, and manufacturing; and the third big goal would be to lead the world in conservation, innovation, workers' health and safety, and so on. So, that would be, like, my big goals for America's mining future.

But then, you know, going through that kind of scientific method, I would say, OK, what are the specific objectives to achieve those three main goals, and maybe we could add more to the goals or debate what they should be. But the one objective I see that addresses all three of those things would be to streamline our existing permitting process to promote rapid development of mining, refining, recycling, and manufacturing of domestic minerals, and to do that in a way that doesn't wipe out environmental sideboards, but actually incorporates maybe new ways to make those environmental sideboards better.

Now, I have a lot of other ideas, but what I want to hear are your ideas on what other specific objectives should we put on the list, because at some point somebody has to write a piece of legislation and try to get it passed through the House and through the Senate and get it on the President's desk.

Dr. Bazilian, what specific objective should we work towards?

Dr. BAZILIAN. I think your objectives make a lot of sense, Congressman.

You know, as some other colleagues have said here, it is very important to look at trade-offs and be explicit about the costs and benefits and the impacts. So, I think keeping that in mind is an important one.

Certainly, reducing our import dependence is important, but at the same time I think the other side of the coin there is ensuring that our portfolio of partners across supply chains is robust and resilient. And that is very important, as——

Mr. WESTERMAN. So, maybe like a Western Hemisphere alliance or Western civilization alliance, where we work with our partners who maybe have a lot of these resources in more abundance than we do to make sure that we have strong supply chains?

Dr. BAZILIAN. I think that is important. You know, when we think about our allies in this, the first department that recognizes the need to work with allies is the Department of Defense. I think we, under the first Trump presidency we had something called ERGI, the Energy Resource Governance Initiative, at the State Department that was meant to do exactly what you just said. Under the Biden administration it morphed into something called the Mineral Security Partnership, and I imagine both of those are not dissimilar, in fact.

Mr. WESTERMAN. So, I want to get some input from the other panelists.

You can go, Mr. Harrell.

Mr. HARRELL. Yes, absolutely. I think you sum it up very well, four key things: How do we invest and mine and process more here in the U.S.; how do we maximize the resources we have here today, so reuse and recycling; how do we innovate on the products that need these materials; and fourth, how do we partner with allies because there are inherent limitations of what is under our feet.

Mr. WESTERMAN. Mr. Mulvaney.

Dr. MULVANEY. That sounds like a great list. I will add a small piece here which is characterizing some of our waste resources.

One of the things I understand that precludes us from developing tailings, for example, at mine sites is just not understanding what is there. So, having Federal support to try to characterize what is at waste sites, what is at intentionally reclaimed mines——

Mr. WESTERMAN. So, more research and development on——

Dr. MULVANEY. Yes, or just characterization of what resources we actually have.

Mr. WESTERMAN. All right. Ms. Lyon?

Ms. LYON. Chairman, I think in the long term our experience is that our projects are complicated. We have 12 State and Federal environmental agencies around the table in the permitting process for the Stibnite Gold Project. We need a forum by which those agencies can come together and not just identify problems, but find solutions. Commerce, State, the Department of Defense, and the Department of Energy also need to be able to be at that table to signal strategic need in balancing the environmental interests of this country, as well.

Mr. WESTERMAN. That would all fall under streamlining, permitting.

Ms. LYON. Yes, sir.

Mr. WESTERMAN. Right. If you will bear with me 1 second, Mr. Chair, I heard former Secretary Zinke, our colleague. He made an analogy of a salmon and a trout swimming up a river that is regulated, the salmon by NOAA, the trout by U.S. Fish and Wildlife, with a forest managed by the Forest Service and other land managed by the BLM on a river that has a Corps of Engineers dam and maybe a Bureau of Reclamation. And you start looking at all of the overlap, it is amazing we are able to get anything done. So, I think that has to be an important part of streamlining.

I yield back.

Mr. STAUBER. Thank you very much. The Chair now recognizes Representative Stansbury for 5 minutes.

Ms. STANSBURY. Thank you, Mr. Chairman, both our Chairmen, and also our new Ranking Member. It is wonderful to be here today.

Thank you all so much for being here. I was just reviewing your testimony. I am sorry I wasn't here in person at the beginning of it.

As some of you may know, I actually used to work at the Office of Management and Budget, and I did the budget for USGS, and I was actually part of the interagency team within the Executive Office of the President that convened for many years to try to untangle the critical minerals supply chain issues. So, I appreciate the comments that were just made. We need an all-of-the-above, you know, coordinated strategy across all of our Federal agencies working with the private sector, working with Tribes and environmental groups.

But, you know, unfortunately, what we see often happen here in Congress is these issues get highly politicized and then deployed for the purpose of supporting an ad hoc piece of legislation here, an ad hoc piece of legislation there. And I do think, for the purposes of this hearing, and I know many of you have touched on this

in your testimony, it is important that this not just become a conversation to drive legislation that is just going to, you know, provide unfettered access to sensitive lands and completely undermine our environmental laws.

You know, looking at the testimony both for Mr. Bazilian as well as Mr. Mulvaney, Dr. Mulvaney, I apologize, Doctors, you know, what I am struck by reading both of your testimonies, which I think is fully concurrent with the work that has been done for many years in this sector, is, No. 1, identifying, I mean, there is just a basic geologic reality about the Earth's crust, which is that we need hundreds of different minerals, and they are not all in the United States. In fact, some of the largest supplies of critical minerals are in Central Asia, they are in Africa. They just don't exist here on the North American continent, but they have become very important to the supply chain and to manufacturing in the United States.

So, to that point which I think Mr. Magaziner was touching on, we will have to continue to engage in international relationships. Europe is also very much struggling with these issues, especially since China has been stockpiling minerals that are not only on the Asian continent, but also using their diplomatic pressures to buy up mines throughout the world and to create partnerships. So, we have to be conscious that part of the solution here is actually diplomatic.

And it is true that we have to continue to have diplomatic relationships with these countries, and the undermining of international affairs that folks may not realize is that part of how we have diplomatic relationships with other parts of the world is that we provide aid to them, and that is actually important to the critical supply chain. But that is only one piece of the equation.

You know, we do need to increase domestic mining, but only in places where it is appropriate, where the minerals actually can be mined in a safe manner, where it is not going to actually destroy the aquifer, and in places that are not going to undermine tribal sovereignty and sacred cultural places. And you know, there are a number of really important places that have been set aside especially during the last administration.

And I know, Mr. Chairman, we will very much disagree on this because I know you are very passionate about this, but there are places like the Boundary Waters, like Resolution Copper's desire to mine in a tribal sacred site that has for thousands of years been a place where the Apache people have gone for ceremonies that, yes, there may be great geologic deposits there, yes, they may be able to provide for supply chain certainty for the United States, but there are other reasons and other values that we have about these places that make it such that we don't want to mine there.

And I think that we have to not lose sight of that because once you especially have, like, a vast surface mining operation, it will never be the same again. So, we have to be really thoughtful about how we approach this issue and not undermine tribal sovereignty, not undermine, you know, the sacred places that are important to our communities, and to do it in a smart and really coordinated manner.

I am short on time, but I think I just wanted to say that I appreciate you all coming in here, and I hope that this testimony is not used as a foil to undermine environmental laws and tribal sovereignty. So, thank you.

Mr. STAUBER. Thank you. The Chair now recognizes Representative Tiffany for 5 minutes.

Mr. TIFFANY. Mr. Chairman, we just heard the strategy from the other side: Not in my backyard. Get it someplace else. That is what we are going to do here in the United States of America. What a strategy for national security, for economic security, for job security.

Dr. Mulvaney, name——

Ms. STANSBURY. Mr. Tiffany, would you yield?

Mr. TIFFANY. Name a location or two, one or two, where we should build——

Ms. STANSBURY. Mr. Tiffany?

Mr. TIFFANY [continuing]. A mine in the United States of America?

Mr. STAUBER. Would the gentleman——

Ms. STANSBURY. Would the gentleman yield?

Mr. STAUBER. The gentleman stop.

Ma'am?

Mr. TIFFANY. No, I am not going to yield. I only have 5 minutes, Mr. Chairman. That is all you are giving me.

Mr. STAUBER. Go ahead, Representative Tiffany.

Ms. STANSBURY. OK.

Mr. TIFFANY. Dr. Mulvaney, where could we build a mine in the United States right now, in your mind? Where could we build one real soon?

Dr. MULVANEY. Choosing a site for a mine is a complicated and very place-based process. So, I hesitate to say, because I don't want to speak for other communities. I lived next to a mine for 10 years.

Mr. TIFFANY. Sure, thank you for that answer.

We had the former head of the U.S. Forest Service here, Mr. Chairman, just a couple of years ago, and he was fighting the project up in northern Minnesota. And I posed the same question to him. He said, "Well, we can't do it near water, we can't do it," and I said, well, how about Resolution Copper in Arizona, some place where it is dry? "Well, I don't know about that, either."

Where can we build a mine here in the United States of America? Give me a deposit. Name an example right now, Dr. Mulvaney.

Dr. MULVANEY. We have built, we have permitted a bunch of mines in the last year in Nevada. So, not-in-my-backyard is not happening everywhere. I understand that there are, and I have learned through this Committee from previous testimony, the Boundary Waters and the Resolution Copper projects are extremely contentious.

Mr. TIFFANY. You——

Dr. MULVANEY. I would say they are very unique in terms of their issues.

Mr. TIFFANY. I am going to change course here a little bit. You cite the 1872 law, and you say it is a disaster, and we should get

to the modern era, Ulysses S. Grant and all the rest. Don't all the States have modern mining laws?

Are you familiar with Wisconsin's mining law that I rewrote a decade ago?

Dr. MULVANEY. No, I am not, but the 1872 law governs mining on public lands specifically. So, State law doesn't supersede the Federal law in this case.

Mr. TIFFANY. If you built a mine on Federal land in the State of Wisconsin, wouldn't you also have to comply with the State requirements?

Dr. MULVANEY. I think we have heard many times there are many, many agencies at multiple levels involved in all of these things, and that is what makes it complicated.

Mr. TIFFANY. That is exactly right, and isn't it a red herring on your part to cite this 1872 law, when you know very well there are modern mining laws that have been passed in States like Minnesota, Wisconsin, Michigan, that there are modern mining laws that are in place that are protective of the public? Don't you think it is a bit duplicitous to not give some context and say, yes, but there are other requirements in place?

Ms. Lyon, I suspect Idaho has a comprehensive mining law. Am I correct?

Ms. LYON. Yes, and we are still subject to the Clean Water Act, the Clean Air Act, the Endangered Species Act, and financial assurance.

Mr. TIFFANY. You cited the sage grouse habitat, Dr. Mulvaney. There is a massive solar site going up in central Wisconsin that conservationists are concerned about as a result of the grouse. Should they be building that massive solar site there when you have conservationists that are very concerned about it?

Dr. MULVANEY. I will ask a student whose dissertation committee I am on who is studying an area right around Wisconsin, a University of Wisconsin student. So, I will ask them and put it in the record.

But solar farms are also controversial, and they face the same issues. If the landscape is sacred, if it is important it is going to face the same kind of opposition.

Mr. TIFFANY. Mr. Chairman, the term was just used, "solar farms." They are not farms. They are industrial sites. They are producing electricity. Anyone that uses the term "farm," that is incorrect, they are not growing anything unless you say electricity is grown.

Are you familiar with the Ivanpah project in California?

Dr. MULVANEY. Yes, I camped on that site before it was built. I have studied that site for 15 years.

Mr. TIFFANY. What just happened to the Ivanpah project?

Dr. MULVANEY. First of all, the Ivanpah project is a concentrated solar farm that also burns natural gas. It burns so much natural gas that it has to participate in California's cap and trade program.

Mr. TIFFANY. Is the Ivanpah operating currently?

Dr. MULVANEY. That project has always had problems. That project was——

Mr. TIFFANY. Is it correct, Dr. Mulvaney, that the project went broke? How many billions of dollars went from the——

Dr. MULVANEY. They didn't——

Mr. TIFFANY [continuing]. American taxpayer to the Ivanpah project?

Dr. MULVANEY. If I recall, it is in my book, "Solar Power"—$1.8 billion or so.

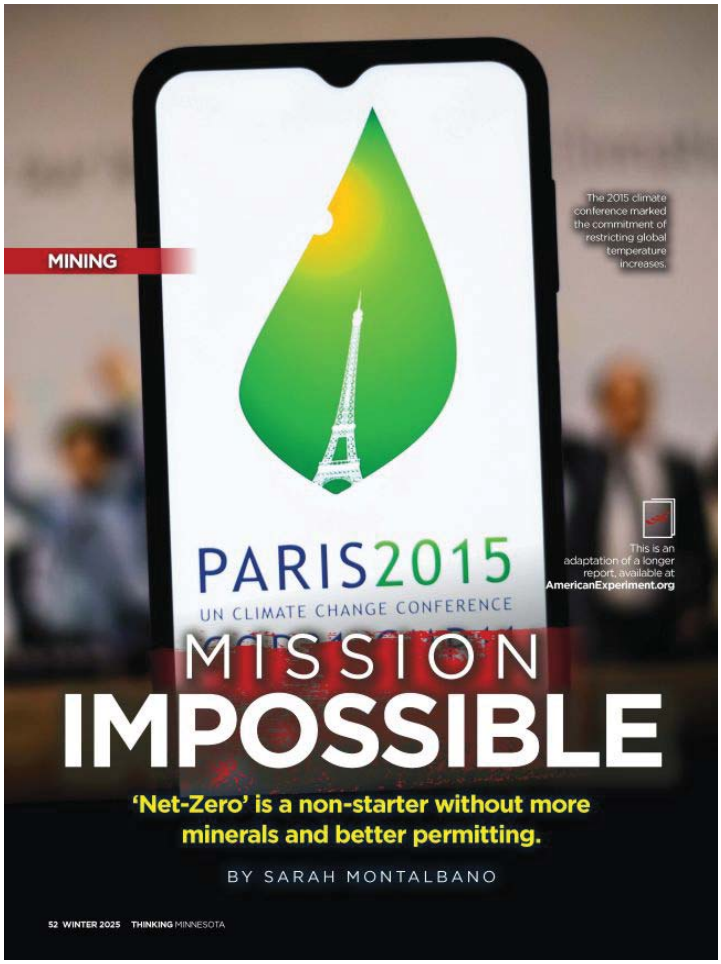
Mr. TIFFANY. Unfortunately, my time has run out. Yes, it failed.

Dr. MULVANEY. I would love to talk more at some point, Mr. Tiffany.

Mr. TIFFANY. For the record, I would ask unanimous consent, Mr. Chairman, to introduce into the record "Net Zero is a Non-Starter Without More Minerals and Better Permitting," by Sarah Montalbano.

Mr. STAUBER. Without objection.

[The information follows:]



n 2018, Center of the American Experiment released a report evaluating how environmentally responsible mining would boost Minnesota's economy. With the help of economist John Phelan and Debra Struhsacker, a seasoned hardrock mining policy expert, we estimated that mining would bring 8,500 jobs and $3.7 billion to Minnesota's economy.

In October, we published another report, again enlisting the expertise of Struhsacker, entitled, "Mission Impossible: Mineral Shortages and the Broken Permitting Process Put Net Zero Goals Out of Reach." Why revisit mining in 2024? Because the importance of mining to America's future has never been greater. Without enough critical minerals, achieving Net Zero by 2050 (NZE) is unattainable — and trying to achieve it will endanger national security and the modern economy.

"Net Zero by 2050" refers to the 2015 Paris Agreement, where 190 nations, including the U.S., committed to restricting global temperature increases to 1.5 degrees Celsius above pre-industrial levels by 2050. The U.S. is implementing policies to this end, such as requiring that 50 percent of all new passenger vehicles be electric by 2030, and 100 percent by 2050. Other policies, like the EPA's Clean Power Plan 2.0, are phasing out reliable and 24/7 dispatchable coal and natural gas power plants in favor of intermittent wind and solar. Many states, including Minnesota, have set their own goals for "clean" electricity by 2040, electric vehicle (EV) adoption, and renewable energy generation.

Our report doesn't take a position as to the wisdom of an energy transition. Instead, we highlight the realities of mineral shortages, permitting delays, decreasing electric grid reliability, and unintended consequences — and argue that these should be seriously considered in any cost-benefit accounting. Looming mineral shortages and a lengthy, litigious permitting process make these goals unachievable within the ambitious timeline set by policymakers, if not altogether impossible.

Critical mineral demands outpace mineral supplies

Few people truly understand how dependent they are on minerals for their standard of living. Every American uses *3.02 million* pounds of minerals in their lifetime, or about 40,630 pounds per year, according to the United States Geological Survey. The average American uses over 55,000 pounds of cement, nearly 252,000 pounds of coal, more than 1,000 pounds of copper, and over 18,000 pounds of iron throughout his or her lifetime. It isn't a simple question of quantity, either; a modern lifestyle uses a wide variety of minerals. A smartphone, for instance, uses aluminum, cobalt, copper, gold, lead, lithium, nickel, silver, silicon, and zinc — to name a few.

Many minerals are needed to construct wind turbines, solar panels, battery storage, and electric vehicles, including copper, nickel, cobalt, and rare earth elements (REEs). A 3-megawatt wind turbine, the average size of a new turbine in 2021, requires nine tons of copper, 335 tons of steel, 1,200 tons of concrete, three tons of aluminum, and two tons of rare earth elements. An average offshore 3.6 MW wind turbine requires approximately 32 tons of copper.

The primary driver of energy transition mineral demand is battery electric vehicles, which use 80 kilograms of copper compared to 22 kilograms for an average internal combustion engine (ICE) vehicle. EVs also need manganese, lithium, nickel, cobalt, graphite, and rare earths — materials not needed for ICEs. Electric buses are even more mineral-intensive, needing 253 kilograms of copper.

Copper will be strained further as more is needed to expand the grid to accommodate EV charging stations and transmission lines. In 2021, the U.S. used only 11 terawatts of electricity to charge EVs; by 2030, electricity demand for EVs is estimated to rise to 230 terawatts.

The 2022 Inflation Reduction Act has compounded U.S. demand for electrification minerals. An S&P Global report estimated that "energy-transition demand for lithium will be 15% higher by 2035 than projected pre-IRA; 14% higher for nickel; 13% for cobalt; and 12% for copper."

Achieving NZE by 2050 will require a veritable treasure trove of minerals like lithium, copper, nickel, cobalt, graphite, and rare earths. However, policymakers are starting to realize that we won't have enough minerals in time. The International Energy Agency (IEA) predicts copper demand will outstrip supply after 2025, with cobalt and nickel demand exceeding supply after 2030.

The vogue issue of 2024 has been power-hungry artificial intelligence (AI), and it is no mere hype that more

China has already demonstrated its willingness to wield critical minerals as a geopolitical pawn.

AI data centers will exacerbate electricity demand. Data center construction is already exacerbating copper demand. Copper is used in data centers' power cables, busbars, electrical connectors, and other components, needing "27 tonnes per MW of applied power," according to the Copper Development Association. JP Morgan estimates that additional power consumption by data centers will expand a predicted global copper deficit by another 2.7 million metric tons by 2030. Bank of America estimates that data centers will add around 200,000 metric tons of copper demand per year between 2025 and 2028.

The IEA proposes that mining for new materials may require 50 new lithium mines, 60 more nickel mines, and 17 more cobalt mines constructed by 2030. Other estimates from the UN Conference on Trade and Development suggest 80 more copper mines, 70 new lithium and nickel mines each, and 30 new cobalt mines by 2030, which would cost anywhere from $360 to $450 *billion*. Recycling and technological advances, such as efficiency improvements in battery technology, might help, but they will not fully close the gap between what we have and what we might need.

It's a matter of national security, stupid

Minerals are indispensable for alternative energy tech like wind, solar, and EVs. But aerospace, defense, telecommunications, electronics, and transportation sectors will still need critical minerals, even if policymakers prioritize NZE instead.

The U.S. government officially recognizes 50 critical minerals. In 2022, the U.S. was 100 percent reliant on imports for 10 and more than 50 percent import-reliant for 31 others. China is a major supplier of many critical minerals, including 35 percent of the U.S.' graphite and geranium and 74 percent of the U.S.' rare earth elements. This is a serious problem. The Department of Defense warns that in a conflict with China, the U.S. would face shortfalls of 69 minerals, 20 of which are primarily sourced from China. This reliance on a geopolitical rival is precarious and could jeopardize national defense and other essential sectors.

China has already demonstrated its willingness to wield critical minerals as a geopolitical pawn. In July 2023, China imposed restrictions on gallium and germanium exports, which are used in high-tech semiconductor chips. The consequence? Exports of germanium plummeted from 8.63 metric tons pre-ban to *one kilogram* in August 2023; exports of gallium fell from 5.57 tons pre-ban to *zero*.

In August 2024, China restricted exports of antimony, which is used in military applications such as armor-piercing ammunition, night vision goggles, flame retardant fabrics, and precision optics. The U.S. imports 83 percent of its antimony, with 63 percent coming from China. Antimony prices surged to a record high of $25,000 per metric ton post-ban. China is currently restricting exports of germanium, gallium, graphite, rare earth elements — and antimony.

An easy but insufficient solution is to increase imports from friendly nations rather than import from unfriendly ones. Yet this strategy isn't risk-free. For example, the U.S. relies on Canada, the second-most important source of minerals behind China, for 66 percent of its zinc and 45 percent of its nickel. Yet Canada may need to prioritize domestic mineral use for its own economic and energy goals, and China's significant investments in Canadian mining companies complicate national security concerns. The Canadian government is attempting to limit Chinese influence in its mining sector, but whether it does so successfully is uncertain.

U.S. mines are among the safest and cleanest in the world. Foreign mines often lack the stringent safety and environmental standards that U.S. mines adhere to. Mines in foreign countries have higher carbon emissions due to coal-based electricity for mining and processing. Some unregulated "artisanal" cobalt mines in the Democratic Republic of the Congo, which produces 65 percent of the world's cobalt, employ child labor. According to the IEA, over one million children work in mines and quarries worldwide. It's abhorrent that U.S. policymakers today utilize an "out of sight, out of mind" mentality as an acceptable solution to America's growing mineral demands.

Federal policies hinder mining access and impede NZE goals

The U.S. cannot grow its domestic mining industry because of the *lengthy*, *litigious*, and *politicized* permitting

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process under the National Environmental Policy Act (NEPA). NEPA mandates federal agencies to thoroughly analyze the impacts of *any* proposed project that could affect the environment — including mining, wind and solar projects, oil and gas, and transmission lines. A prolonged permitting process extends U.S. dependence on foreign countries for critical minerals and endangers national security.

NEPA significantly delays and cancels critical projects. Prolonged permitting timelines chill investments: hundreds of millions of dollars and years of permitting, with no guarantee of success, is a hard pill to swallow for companies that might otherwise invest in Minnesota.

The primary driver of energy transition mineral demand is battery electric vehicles, which use 80 kilograms of copper compared to 22 kilograms for an average internal combustion engine (ICE) vehicle.

The NorthMet and Twin Metals projects are poster children for the protracted and litigious permitting system that has thwarted the development of important mineral resources. Permitting for the NorthMet mine began in 2004 with the initial projection that construction could begin as early as 2015. Twin Metals was proposed more recently in 2019. Yet the Biden-Harris administration derailed the permitting process for both projects when it revoked the Clean Water Act Section 404 permit for the NorthMet project and canceled the federal mineral leases for the Twin Metals project. Adding insult to injury, lands were withdrawn from mineral development in the Superior National Forest where Twin Metals is located. For future investors to consider undertaking hundreds of millions of dollars and two decades, as in the case of NorthMet, they must have confidence that the rug won't be yanked out from under them by a politicized permitting process.

But NEPA doesn't just affect oil, gas and mining; it affects *every* kind of project that would be needed to achieve ambitious net-zero timelines. The time required for renewable energy projects to move from proposal to construction has more than doubled since the early 2000s. To achieve net-zero by 2050, over one million miles of transmission lines would need to be built — a tall order considering the U.S. constructs only about 700 line-miles per year.

Our report spells it out clearly: "At this rate, *it will take 1,400 years* to permit one million miles of transmission lines… policymakers have embraced grossly unrealistic goals and timelines in which to achieve any semblance of an energy transition."

NEPA is not a *protection* act, it's a *policy* act. NEPA requires an analysis of impacts; it does not prescribe the rules and standards that protect the environment, like the Clean Air and Clean Water Acts. Recent Council on Environmental Quality (CEQ) rulemakings fundamentally distort NEPA's purpose: Rather than being a procedural analysis of environmental impacts, the CEQ's rules require agencies to identify and select alternatives that achieve an environmentally preferable outcome — as defined by the CEQ. These rules preclude agencies from meeting their statutory obligations to permit a certain level of environmental impact for necessary projects.

Congress might consider shortening the statute of limitations for claims under NEPA, which currently stands at six years from the date of the final agency action, require agencies to act quickly on remanded permits, set time limits on injunctions, and consider streamlining other processes under other environmental regulations. Some congressional proposals, including the Energy Permitting Reform Act of 2024 introduced in the Senate, would establish a 150-day statute of limitations and implement other reforms.

Although many mines are developed on private and state lands, exploration and development on public lands is hindered. The likelihood of discovering a copper deposit has significantly decreased in recent years. Approximately 20 new copper deposits of at least 0.1 million tonnes (Mt) per year were discovered between 2001 and 2010. From 2015 to 2022, fewer than 10 discoveries were made each year. Currently, the probability of finding an initial copper occurrence is one in 5,000. Once an initial occurrence is identified, the chances of it becoming an economically viable deposit range from one in 100 to one in 800.

More than 10 federal policies within the Biden-Harris administration's tenure have damaged domestic mining and access to public lands. For instance, the Bureau of Land Management (BLM) recently finalized its Public Lands Rule, which allows third parties to lease lands for "conservation" and "mitigation," potentially restricting public access for up to a decade. This rule is currently facing legal challenges from five states (Alaska, Montana, North Dakota, Utah, and Wyoming) as well as various public land user groups.

The BLM has also finalized its Western Solar Plan, which prioritizes utility-scale solar energy development over mining and other land uses on 31 million acres across 11 western states. Unless a formal claim validity examination confirms the discovery of a valuable mineral deposit, solar development is given precedence over ongoing mineral exploration and development.

Conclusion

It is imprudent for the U.S. to persist in its "Net Zero by 2050" dreams while hindering domestic mining development and compromising national security. Every time the U.S. decides to outsource the environmental, worker health, and safety impacts of mining to foreign countries, it reflects a value judgment. Should an energy transition proceed if it comes at such a steep cost, and what values are we projecting when America makes such decisions? ★

Mr. TIFFANY. And I yield back.

Ms. ANSARI. Mr. Chairman, I would like to ask for unanimous consent to enter into the record this fact sheet from the Biden-Harris Administration on critical minerals that outlines the important investments they made and that, through the Bipartisan Infrastructure Law and the Inflation Reduction Act, one thing we can all do to advance critical minerals is to acknowledge the Article I constitutional authority of Congress and get these investments flowing again.

Mr. STAUBER. Without objection.

[The information follows:]

FACT SHEET: Biden-Harris Administration Takes Further Action to Strengthen and Secure Critical Mineral Supply Chains

Department of Energy Battery Supply Chain Awards Build on Four Years of Whole-of-Government Effort to Increase Domestic and Allied Supply of Critical Minerals

Critical minerals are essential building blocks of the modern economy and our energy security, from clean energy technologies like high-capacity batteries and wind turbines to semiconductors, advanced defense systems, and consumer electronics. Over the past several decades, China has cornered the market for processing and refining of key critical minerals, leaving the U.S. and our allies and partners vulnerable to supply chain shocks and undermining economic and national security. As the world builds a clean energy economy, demand for critical minerals is projected to grow exponentially.

President Biden recognized this challenge and took immediate action. In his first weeks in office, he signed Executive Order 14017, America's Supply Chains, which mandated a 100-day review of U.S. critical mineral supply chains. Following the report's recommendations, the Biden-Harris Administration has mobilized historic resources to strengthen domestic critical minerals supply chains, from mining to manufacturing to recycling. These investments are strengthening U.S. energy and national security; boosting American manufacturing; creating good-paying and union jobs in mining, construction, and manufacturing; and reducing reliance on unreliable supply chains.

Since President Biden took office, companies have announced more than $120 billion in investments in battery and critical mineral supply chains. Through the Biden-Harris Administration's Investing in America agenda, the Department of Energy, the Department of Defense, the Department of the Treasury, and the Department of Commerce are supporting the domestic battery and critical mineral supply chain through grants, loans, and allocated tax credits. That investment has created new jobs: over 250,000 new American energy jobs were added last year—with clean energy jobs growing twice as fast as the rest of the sector.

This investment has also dramatically expanded the U.S. critical minerals industrial base and reduced reliance on foreign and unreliable supply chains. In 2021, the U.S. had enough operating and announced battery manufacturing capacity to power 500,000 electric vehicles—today, announced battery gigafactories will power 10 million electric vehicles, enough to meet domestic demand by 2030. In 2021, U.S. lithium producers met just 5 percent of global demand. Thanks to investments in processing and manufacturing, the US is not just keeping pace with the fivefold increase in lithium demand but is on track to outpace it: the U.S. is set to supply more than one-fifth of global demand outside of China by 2030.

After years of ceding ground to China , we are now winning the competition for the 21st Century, protecting our industrial base and creating good jobs, and strengthening our energy and national security thanks to the Biden-Harris Administration's actions to secure critical mineral supply chains.

Battery: Material Processing and Manufacturing

Today, the Department of Energy is announcing over $3 billion across 25 projects through the Bipartisan Infrastructure Law to extract, process, and recycle critical minerals and materials and manufacture key battery components, as well as support next-generation battery manufacturing. Combined with the first round of battery material processing and manufacturing awards, funding from this program will generate $16 billion in public and private sector investment throughout the entire battery supply chain. Project details can be found here.

This announcement supports a whole-of-government effort to build an end-to-end domestic supply chain for electric vehicle and grid storage batteries:

- The Department of the Treasury allocated $800 million through the first round of allocations under the Inflation Reduction Act Section 48C Qualifying Advanced Energy Project Tax Credit for critical mineral processing, refining and recycling, including for lithium-ion battery recycling, battery material processing, and battery component manufacturing.
- The Department of Energy Loan Program Office closed a loan of $2.5 billion to Ultium Cells and issued a conditional commitment of $9.2 billion to BlueOval SK, joint ventures between General Motors and LG Energy and Ford and SK respectively, for six total battery manufacturing facilities with more than 200 gigawatt hours of capacity, enough to power more than 2 million EVs.

- The Loan Program Office has also issued a $2 billion conditional commitment to Redwood Materials for a first-of-its-kind battery material manufacturing and recycling project in Nevada to produce critical battery components that are currently dominated by China using recycled batteries and material.
- The Loan Program Office issued a $102 million loan to Syrah Technologies to produce graphite-based active anode material for EV batteries in Louisiana. Syrah processes natural graphite from its Balama, Mozambique mine, which received conditional commitment of up to $150 million in financing from the U.S. International Development Finance Corporation to support the full graphite supply chain.
- The Department of Commerce awarded $21 million to the Nevada Tech Hub, led by the University of Reno, Nevada, to build a globally competitive full lithium supply chain and innovation cluster from extraction through recycling, building on the lithium assets, workforce, and research institutions in the area.
- In May, President Biden directed his U.S. Trade Representative to raise tariffs on imported EV and grid storage batteries from China, as well as certain critical minerals, to counter China's unfair trade practices, which will defend U.S. manufacturers from being undercut by artificially cheap products.

Supporting Responsible Domestic Mining

To meet the nation's climate, infrastructure, and global competitiveness goals, the U.S. must expand and accelerate responsible domestic production of critical minerals in a manner that upholds strong environmental, labor, safety, Tribal consultation, and community engagement standards. By responsibly permitting, managing operations, and remediating mines, the U.S. can set a global standard for responsible mineral development and create good-paying jobs in communities across the country:

- The Department of Energy Loan Programs Office issued a $2.26 billion conditional commitment for lithium processing at the fully permitted Thacker Pass lithium mine in Nevada, which will produce enough lithium to power more than 800,000 EVs annually when operational.
- The Department of Energy Loan Programs Office issued a $700 million conditional commitment for lithium processing at the Rhyolite Ridge lithium mine in Nevada, which plans to produce enough lithium to power 370,000 new EVs annually when operational. Yesterday, the Bureau of Land Management issued the final Environmental Impact Statement for the project.
- The Department of Defense awarded Albemarle $90 million through the Defense Production Act to support the restart of the Kings Mountain lithium mine in North Carolina, which could produce enough lithium to power 1.2 million new EVs annually when operational.
- The Department of Energy awarded $39 million through the Advanced Research Projects Agency-Energy Mining Innovations for Negative Emissions Resource Recovery (MINER) program to 16 projects to develop technologies to increase the domestic supply of critical minerals while reducing energy use and emissions.
- The Department of the Interior approved the Gibellini vanadium project in Nevada, the first vanadium mine in the U.S., which will support next-generation energy storage batteries, steelmaking and advanced alloys.
- The Department of Agriculture issued a final Environmental Impact Statement and draft Record of Decision for the Stibnite gold-antimony project in Idaho. Supported by $60 million in funding through the Defense Production Act, the project will be the only domestic source for antimony, a necessary critical mineral for munitions and next-generation battery technologies.
- The $1.7 billion Hermosa zinc-manganese project in Arizona became the first mining project to receive FAST-41 coverage, supporting coordination, collaboration and transparency in the permitting process. Today, South32 also received a [$x] Department of Energy award to process the manganese produced by the mine for electric vehicle batteries.
- The Department of Energy Loan Programs Office clarified that domestic critical minerals mining and extraction projects are eligible for financing under the Title 17 Clean Energy Financing Program, broadening its support for critical minerals projects.

Establishing a "Mine-to-Magnet" Supply: Chain for Rare Earth Elements

Rare earth permanent magnets power everything from electric vehicle motors and wind turbines to missile defense systems. Currently, large portions of the supply chain, from mining to processing to magnet manufacturing, are controlled by China. Through the Department of Defense and the Department of Energy, the Biden-Harris Administration is taking action to secure domestic production throughout the magnet supply chain.

- The Department of Defense has awarded $45 million to MP Materials for rare earth oxide processing at Mountain Pass, the only operating U.S. rare earth element mine, and more than $288 million to Lynas USA to establish commercial-scale rare earth oxide production.
- Down the supply chain, the Department of Defense has invested more than $94 million in E-VAC Magnetics to establish a commercial-scale magnet manufacturing facility in South Carolina, as well as metals and alloys. E-VAC also disclosed that it was allocated $112 million through the Inflation Reduction Act 48C tax credit to support its manufacturing facility.
- M.P. Materials voluntarily disclosed that it was allocated nearly $60 million through the Inflation Reduction Act Section 48C tax credit to advance its rare earth permanent magnet manufacturing facility in Fort Worth, Texas, which will produce enough permanent magnets to power more than 500,000 General Motors Ultium electric vehicles.
- The Department of Energy awarded $17.5 million to Niron Magnetics through the Advanced Research Projects Agency-Energy Seeding Critical Advances for Leading Energy technologies with Untapped Potential (SCALEUP) program for pilot production efforts to commercialize an iron nitride based rare:-earth free permanent magnets.
- The President directed his U.S. Trade Representative to increase tariffs on permanent magnets beginning in 2026, which will protect U.S. magnet producers from being undercut by unfair trade practices.

Mr. STAUBER. The Chair now recognizes Representative Collins.

Mr. COLLINS. Thank you, Mr. Chairman. I would like to yield 20 seconds at least, to the gentleman——

Mr. TIFFANY. Yield a couple of seconds.

I just want to remind the Committee that it was a couple of years ago in this Natural Resources Committee where my colleagues on the other side of the aisle had a witness and talked about why we couldn't mine in northern Minnesota and why we couldn't mine in Arizona. She said it was too wet in Minnesota and too dry in Arizona. I asked the same question of her: Where should we mine? And she said the quiet part out loud in this Committee, and she says, "Nowhere."

[Laughter.]

Mr. TIFFANY. Representative Collins, back to you.

Mr. COLLINS. Thank you, Mr. Chairman. You know, gosh, I have so many notes over here I don't really know where I want to start. But I do want to say it is nice to see that there is a common theme this morning of national security and economic growth through mining. And Mr. Chairman, as a sophomore up here I want to say that one of the best things that ever happened were the field hearings that we had.

I actually went to Duluth, Minnesota. I was up there at the mine. I saw people sitting across from me that, Ms. Lyon, you are exactly right, the best of the best. They were worried to death about the next generation and what they were going to do because they couldn't get that mine permitted. As a matter of fact, the

Federal piece of property couldn't get mined, but they were mining on the State property. It really didn't make any sense to me.

I went to Arizona, saw where, man, some of the most skillful mining operations that there are today. Impressive. It is amazing what technology does and what we do in the United States.

And Ms. Lyon, I am just like you. I would never bet against America. We are the best. We are the best country in the world. We are the biggest on the block, and there is no problem with me saying I am proud to be America first, and we should all be America first.

I just want to go through a few things that I know. Matter of fact, China, and I heard it even with our Ranking Member talking about China processing, of course China is processing everything. The majority of our critical minerals are processed by China. Why? Because we are down to three smelters here in the United States and we have to send over 80 percent of what we do process in the United States to China so that they can process it and send it back here from what we are mining. And that is because I think that, in a lot of ways, we are our own worst enemy. We create our problems through the Federal Government and the Federal bureaucracy that has continued to interfere in all industries.

But Mr. Harrell, in the short time that I have, I heard you say when Mr. Wittman was asking you a few questions, pricing. Pricing is an issue. It is an issue. And I read your testimony, and I just want you to expand a little bit on maybe judicial review and how that plays a part in pricing, and what happens to mines when judicial review, and the time frame it takes to get a mine up and going.

Mr. HARRELL. Absolutely. Thank you, Congressman Collins, for your leadership on these issues.

Effectively, the regulatory process in many cases can cut one-third of the value of a mining project here. And that uncertainty, time is money. So, we have to find a way to balance speed and safety, but get to yes or no on these answers reviewing quickly.

The judicial process draws this out particularly long in multiple ways. One, the process itself is long. The amount of time in which people can object to projects, the amount of time it takes the judicial system to review these projects and other parts of that area.

The other part is so many of our Federal agencies are trying to litigate-proof their environmental analysis. That is how we are getting these thousands and thousands of pages of documents that are starting to evaluate things that are not even in the scope of a project or far beyond what Congress ever intended because they are putting together environmental impact statements to try to make it litigation-proof.

Mr. COLLINS. Would you say that a number of these litigation problems, to put it lightly, come from frivolous lawsuits from environmentalists?

Mr. HARRELL. They are one stakeholder that plays a significant role in suing to try to block projects.

Mr. COLLINS. I would agree 100 percent.

Mr. Chairman, before I yield back, I just have to comment on how we talk about our tribal lands and our Native American Tribes. I find it rich that we just had a hearing here less than a

year ago with tribal communities talking about how drug trafficking, crime, and how they need help from the American people and from our law enforcement to help keep them safe and we failed them at that, but then we just had a hearing where the Navajo want to do their own mining, but we had an environmentalist sitting next to him talking about how they are suing them so that they can't mine on their own property when these people want to be economically independent and take care of themselves. But yet, we sit here and we say we are going to take care of you on one side, we fail you, but then we say you are not able to mine on your own property and take care of your own people. That is kind of hypocritical.

With that, Mr. Chairman, I yield back.

Mr. STAUBER. Welcome to my world. Thank you very much.

Before I go on to Representative Hageman, I do want to ask unanimous consent to enter into the record the following reports.

It is a May 23rd report commissioned by the Biden administration's Department of Labor, titled "Forced Labor and Cobalt Mining in the Democratic Republic of the Congo," where they admit there is child-forced labor.

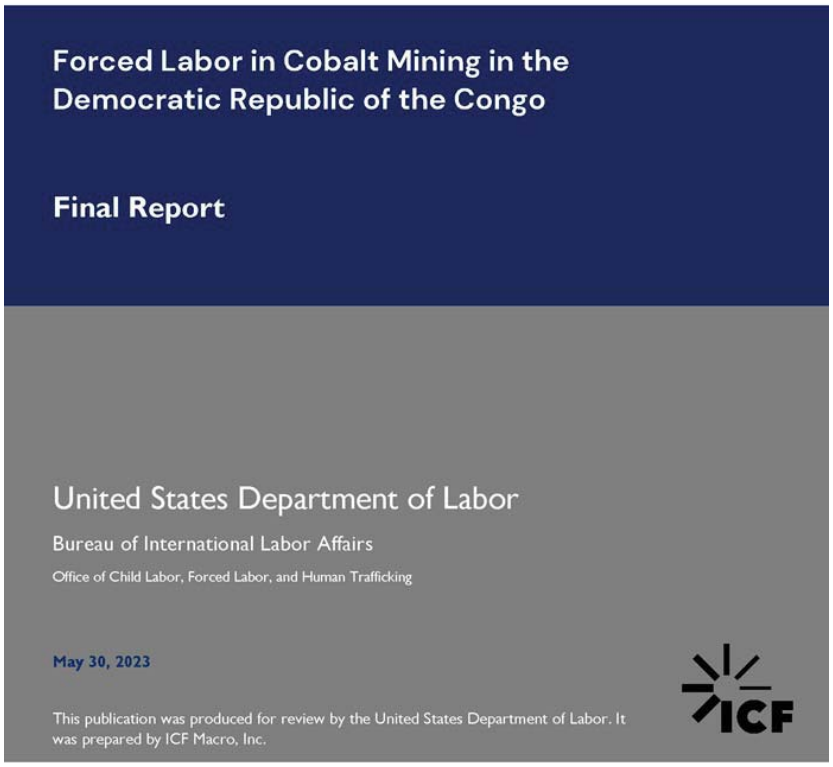
The next thing I would like to request to be placed into the record by unanimous consent is a letter from the North America's Building Trades, where they support the expansive benefits of domestic mining and the impediment caused by our permitting system.

And then The American Experiment talks about their absolute support for mining in Minnesota.

And then the Institute for Energy Research, the "Economic and Strategic Importance of Domestic Mineral Production Supporting Domestic Mining in this Country."

Without objection, so moved.

[The information follows:]



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North America's Building Trades Unions
Washington, DC

February 6, 2025

Hon. Pete Stauber, Chairman
Hon. Yassamin Ansari, Ranking Member
House Natural Resources Committee
Energy and Mineral Resources Subcommittee
1324 Longworth House Office Building
Washington, DC 20515

Dear Chairman Stauber and Ranking Member Ansari:

On behalf of North America's Building Trades Unions (NABTU) and the three million members we represent, we thank the subcommittee for holding this important hearing. Across our nation, thousands of our members remain in limbo due to the lack of permitting certainty surrounding the construction of mines. These men and women are eager to get to work supplying our nation with a greater sense of self-sufficiency found by diminishing our reliance on mineral imports from adversarial nations, thereby ensuring our national security and growing our ability to establish numerous domestic industries.

As the highest skilled workforce in the country, the Building Trades are committed to constructing these mines with the utmost professionalism, addressing our imminent need to both extract these minerals and protect the communities where they are located. The construction of these projects typically requires thousands of skilled construction professionals, many coming from the rural communities where they are sited. They are a crucial engine for growth both locally and nationally.

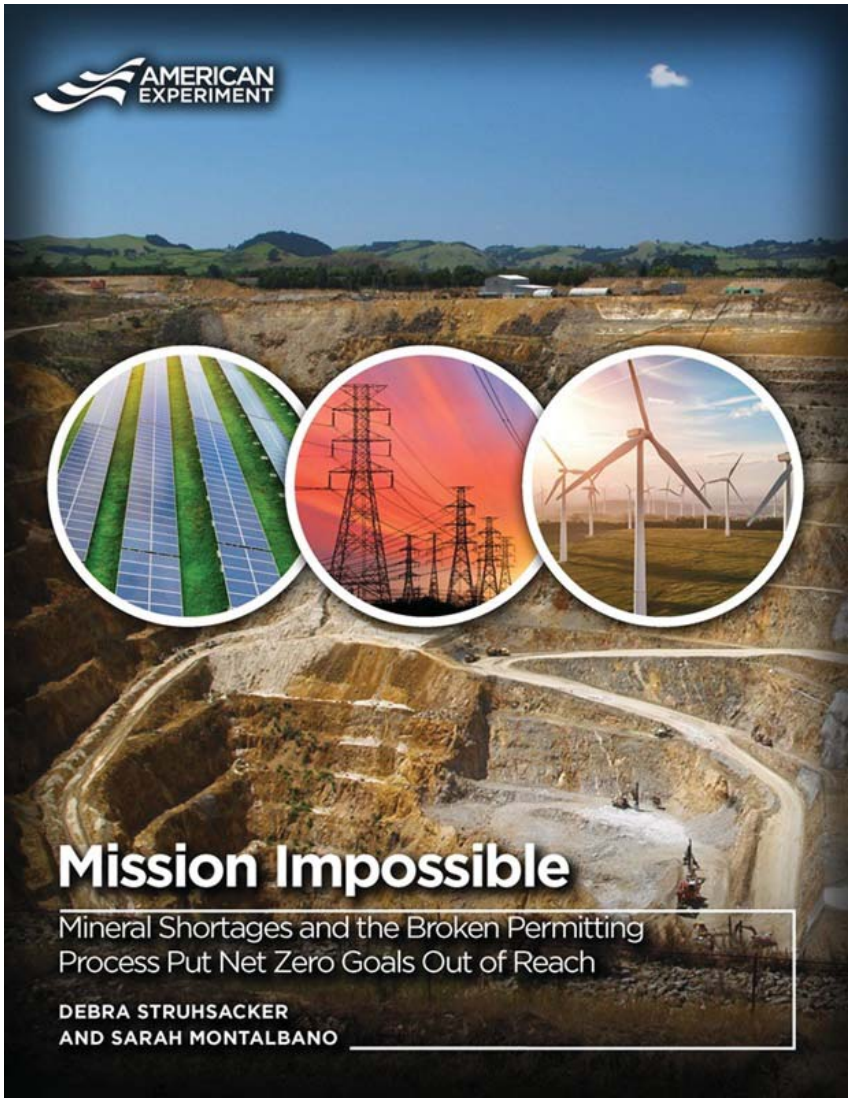
We at NABTU have urged all Members of Congress to recognize the two critical factors in this debate; the expansive benefits of domestic mining, and the impediment caused by our permitting regime. In many cases the minerals from these mines go to develop domestic industries where our members are building manufacturing facilities or deploying technologies at larger scale.

The jobs from these mines are not limited strictly to the project's boundaries, they are exponential by nature. However, these benefits cannot be fully felt until Congress overhauls our permitting framework. It is unacceptable for projects to be held in a permitting purgatory for a decade while workers wait to see whether their highly anticipated role in the project will come to fruition.

We thank the committee for its steadfast commitment to responsibly addressing this issue and its continued support for the working men and women of the Building Trades.

Sincerely,

SEAN MCGARVEY,
President



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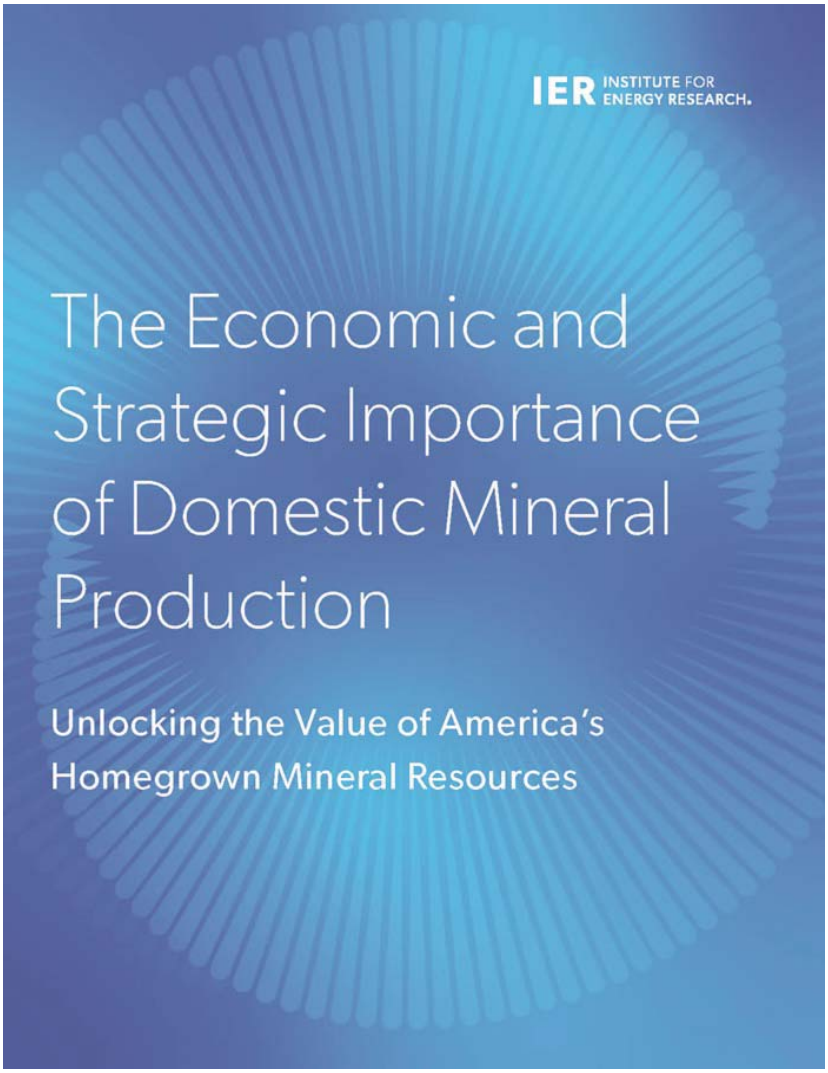

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Mr. STAUBER. And I will recognize Representative Hageman from Wyoming for 5 minutes.

Ms. HAGEMAN. Thank you. It is an honor to be here. Congratulations on your chairmanship. We look forward to your leadership over the next 2 years.

Wyoming is the largest coal producer in the Nation, and what I want to say to everyone is you are welcome.

[Laughter.]

Ms. HAGEMAN. We keep the lights on, and we heat your homes. We do a beautiful job of it, and I invite everyone on this Committee to come to Wyoming and tour our mines. And I can assure you, you will be impressed.

In talking about our native populations, the Navajo Tribe is the owner of one of our largest coal mines, and it is important that we keep those operations in place and that we, in fact, expand them.

Coal is the energy of the future. It is not the energy of the past, and the hysteria over global warming and climate change is not improving our environment. It is making us poor. It is creating more energy poverty, and it is making us weaker on a national and international stage.

Ms. Lyon, you state in your testimony that a two-decade timeline from prospecting to production is far too long for critical minerals. And I agree with you because Wyoming is also home to many critical minerals. The permitting process for new mines in the U.S. is overly cumbersome, unnecessarily complex, and makes resource development uncompetitive with other countries. How would you propose to streamline this process so that critical mineral projects like Bear Lodge Rare Earth Project in Wyoming can help to secure and domesticate this critical supply chain?

Ms. LYON. Thank you, Congresswoman, for your question. As I have mentioned, we need long-term solutions and short-term tools. Those long-term tools, or solutions, include permitting reform and streamlining that will help our agencies work together, rather than work against each other. And all of those voices need to be at the table.

We need timelines that we can count on, and we need some judicial review reform in order to ensure that, after a $400 million investment, we know we have a permit we can act on, and we can get these minerals out of the ground after we have earned the right and the ability to do so.

Ms. HAGEMAN. Certainty and stability seem to be two of the most important issues that you are describing there.

In the 118th Congress, we passed Senate File 2228, which exempted semiconductor projects from NEPA, even though the mining industries which produced the minerals and fuels needed to produce the chips enjoy no such exemption. Do you think only exempting certain industries when widespread permitting reform is needed is wise national policy-making?

Ms. LYON. No, ma'am.

Ms. HAGEMAN. I don't, either. That is why I introduced H.R. 676, which uses the same approach as Senate File 2228, but for minerals and fuels. In order to sustain our grid, ensure national security, and support industries such as the semiconductor industry, do you think legislation such as this is needed?

Ms. LYON. While I am not familiar with the specific legislation, semiconductors to all technologies are absolutely required for our national security and our energy future to produce the energy we need as a country.

Ms. HAGEMAN. Energy security is national security. I think it is that simple.

Ms. LYON. Yes, ma'am.

Ms. HAGEMAN. And regardless of what it is that we are producing, whether it is oil and gas or uranium, phosphorus, potash, whatever it may be, it is absolutely critical for our food supply chain, our energy supply chain, and making sure that we can maintain the same standard of living that we have right now. Isn't that true?

Ms. LYON. Absolutely, ma'am. Our energy resources are also reliant on an infrastructure behind it to get it onto the grid that uses all of the minerals that you can think of.

Ms. HAGEMAN. Yes. Uranium plays a critical role in our energy and national security, supporting 20 percent of the electrical grid, our nuclear navy, nuclear deterrence, and other defense applications, and lifesaving medical applications as well.

In 2018, the U.S. Geological Survey, or USGS, included uranium on its inaugural Critical Minerals List. In 2022, the Biden administration improperly removed uranium from its updated list with no consideration given to the underlying merits. This decision puts uranium at a disadvantage in the Federal permitting process and critical minerals programs and is counterproductive to our legislative achievements over the past 2 years.

Mr. Bazilian, how is the intent of the Prohibiting Russian Uranium Imports Act and Nuclear Fuel Security Act being undermined by the exclusion of uranium on the USGS Critical Mineral List and the DOE Critical Mineral List?

Dr. BAZILIAN. Thank you, Congresswoman.

Uranium is terribly important to the United States. It is also important to Native American lands, as you know. We import lots of our uranium from Canada, our closest neighbor, of course Kazakhstan, as well, but Canada is an important part of that supply chain.

I would also note that very recently there has finally been a deal to transport uranium across the Navajo Nation, and part of that deal includes helping clean up and the possibility with new technologies of getting new uranium from those resources. So, I think having it as top of mind is very important.

Ms. HAGEMAN. Do you think it should be on the Critical Minerals List?

Dr. BAZILIAN. The current Critical Minerals List of USGS needs to be refined in many ways.

Ms. HAGEMAN. OK. Thank you, I yield back.

Mr. STAUBER. Thank you.

Before I go to Representative Ezell, in my opening statement I mentioned that it took on average 29 years to open a mine, and there were some concerns about whether that was accurate or not. For the record, I am going to now submit the S&P Global Report that specifically says it takes an average of 29 years for a critical mineral project to progress from the discovery of the mineral to production in the United States. I wanted to clear that up if anybody had any concerns.

I ask unanimous consent to enter it into the record.

Without objection.

[The information follows:]

The full document is available for viewing at:

https://docs.house.gov/meetings/II/II06/20250206/117845/HHRG-119-II06-20250206-SD007.pdf

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Mr. STAUBER. Representative Ezell, you are up for 5 minutes.

Mr. EZELL. Thank you, Mr. Chairman, and thank you for your leadership. I want to give 30 seconds to Dr. Gosar. Just 30 seconds.

Dr. GOSAR. Thank you so very much.

First of all, I would like to talk about patents. I think this is very interesting for this aspect because in 2011 we went from first to discover to first to file, and that has been very problematic.

I want to bring up, for example, Dr. Bazilian, are you familiar with the new Schlumberger lithium concentration process?

Dr. BAZILIAN. Roughly, yes.

Dr. GOSAR. OK. So, this is going to be something revolutionary because now what we have turned in is real usable water, because lithium concentrations take up a lot of water, and they are actually cleaning it at the same time they are actually producing it. I think this is a whole other realm we haven't even talked about.

Last but not least, what percentage of our critical minerals are recycled, Doctor?

Dr. MULVANEY. Very little. It is 5 percent of rare Earths, zero gallium, zero germanium. Now, tellurium, if we, you know, First Solar uses 40 percent of the tellurium supply, and they are able to recycle their panels and recover 95 percent of that. And that is partly because of a condition for entering the European Union market 15 years ago, where they required it because they had cadmium also in the solar panel.

Dr. GOSAR. Well, I am a big recycler, so we need to really put that in place. Thanks.

I yield back to the gentleman.

Mr. EZELL. Thank you. America's future depends on critical minerals which are essential to our military economy and national security. We have all talked about that this morning. Yet, we remain dangerously dependent on foreign adversaries like China.

While it takes us nearly 30 years to open a mine due to bureaucratic red tape and radical environmental litigation, China is rapidly expanding its control over global mineral supply chains. This is a direct threat to our national security. We have the resources, workforce, technology to mine and process these critical minerals right here at home. One example is in my home State of Mississippi, Gulfport, Mississippi.

Chemours is the world's largest producer of titanium dioxide through the chloride process. China also produces this product, but uses a less efficient and more dangerous method. The process is so valuable that the Chinese attempted to steal it. But IP theft is not our only challenge. Just remember this: the Chinese are not our friends. China's economic aggression is being aided by the failed Biden policies and decades of regulatory overreach.

Thankfully, President Trump signed an Executive Order on the first day in office and cut the red tape to restore American mineral independence. It is time to unleash domestic mining, put America, not China, in control of our future. I look forward to all this Committee will accomplish in partnership with the administration.

Dr. Bazilian, you also cite the importance of the President's EO, as I mentioned earlier. As you know, palladium is essential for the U.S. auto industry, yet the industry's reliance is largely dependent on South Africa and Russia. How might our dependence on these foreign suppliers impact our supply of vehicles for the market?

Dr. BAZILIAN. Thank you, Congressman.

Just starting with your first point, today in the United States we produce 162 mining engineering students per year in the entire country and China produces roughly 20 times that. So, in terms of innovation of technologies, processes, and mining, they are far ahead in the talent pool, which underlies everything else, including your question about vehicles.

I think that we are going to need to think not in terms of ores, as I have said, but across the supply chains from the upstream supply of the ores all the way down to the vehicles you assess in order to make good decisions.

Mr. EZELL. Thank you. We know our military depends on critical minerals, materials for everything from fighter jets to missile defense systems. You mentioned this in your testimony, sir, but you can expand on the most immediate national security risk from the dependence, and what steps should Congress take right now to mitigate these risks.

Dr. BAZILIAN. Thank you, sir.

I have briefed most of the combatant commands on this issue, and they are all taken with it for different reasons, the regional combatant commands. And as we speak, from 6 months ago to 6 months in the future there will be on the order of 10 tabletop wargame exercises looking at optimization for their specific needs. And I think what we need to do is take the system boundary of everything and focus it in on the specific needs of those military applications first and then move out.

Mr. EZELL. Thank you.

Mr. Harrell, even when U.S. companies try to compete, China actively manipulates global markets to drive them out of business. Who would have ever dreamed that that could go on right here in America? We saw this with cobalt when Chinese-backed production in the Congo drove prices so low that the only cobalt mine in the U.S. had to shut down. This is blatant economic warfare, and we are allowing this to happen. How can the U.S. counter these practices by the Chinese?

Mr. HARRELL. Yes, these are global commodities. And the Chinese are using their subsidies and tools, and then many of our competitors are doing it to impact the marketplace, right? So, it does mean that we need to find ways to enable development here. We need to work with partners.

Nuclear fuel is a great example where, you know, the five leading nations that are involved in the nuclear world made a joint commitment at the G7 last year that they are going to wean off Russian fuel products. Then this Congress, or the previous Congress, passed a Russian fuel import limitation. We are not going to be able to do this alone in the global marketplace, and so we need to leverage those allies closely.

Mr. EZELL. If I might have one more?

Dr. GOSAR [presiding]. Sure.

Mr. EZELL. Ms. Lyon, thank you for telling us about these years and years of delays, and thank you for all you have done. Let's continue to bring this to light, these delays that are causing us to fall behind.

So, thank you all for being here today and providing us with this good information.

Thank you.

Dr. GOSAR. I thank the gentleman from Mississippi. The gentleman from Colorado, Mr. Crank, is recognized for 5 minutes.

Mr. CRANK. Thank you, Mr. Chairman. I apologize for being a little bit late. I, at the same time, had a classified briefing over on the House Armed Services Committee where I serve on the threat from China. So, we won't be talking about any of that here today. But clearly, there are continuing threats that we are talking about in this Committee, as well.

The United States conceded dominance of the mineral markets to China, and we are paying a price for it economically, environmentally, with labor norms and with our national security. It is evident in all of the witness testimony before us that China has the ability, at the flip of a switch, to ban the export of key minerals or processing technologies, or dump minerals on the market to prevent us from reclaiming a domestic market.

So, to put it simply, China has no intention of relinquishing its choke hold on any part of the mineral supply chain.

And rather than taking a proactive and thoughtful and strategic approach to minerals, the past 4 years the Biden administration stifled domestic mineral production, issuing public lands withdrawals or vacated leases to stop energy and mineral production on Federal lands. They issued a report on mining reforms that lacked any substantial ideas to improve the permitting timelines or projects, and they botched the implementation of Fiscal Responsi-

bility Act NEPA reforms that were intended to make the permitting process predictable. It appears that only when it was necessary or an existential threat to national security or their climate agenda did the Biden administration take any positive action on domestic mining.

Mr. Harrell, I completely agree that the U.S. needs a better domestic strategy not only for our economic prosperity, but also for our national security. However, China has a global strategy to retain mineral dominance. So, what actions globally should the U.S. be considering to re-assert dominance in the minerals market?

Mr. HARRELL. Thank you, Congressman Crank, and it is a great question. It is an important piece of the puzzle. We have to do things here at home and there are global moves that we need to make. These bilateral, multi-lateral agreements with partners that jointly try to wean off the Chinese dominance in this realm, I think, are going to be really important.

We need to use tools in the tool belt that we have here in the U.S., things that are going to come before this Congress in the next 2 years. The Development Finance Corporation's reauthorization will be coming up here soon. That is one tool in the tool belt where we can help finance projects abroad as well that can support our mineral needs.

I think, as Ms. Lyon referenced, the Export-Import Bank of the United States, that is up for reauthorization in 2026: another important tool to catalyze and promote U.S. technology and infrastructure here in this country if we use it the right way.

So, we have to use those tools in our tool belt. We are never going to out subsidize China, so we need to use these innovative, free-market financing tools that the U.S. has at its disposal to really compete.

Mr. CRANK. Yes, they are waging economic war against us. And we had a subcommittee hearing in another subcommittee of this Committee, and we talked about cables and, you know, how we just tie ourselves up with environmental regulations and the Chinese just laugh. They must be laughing at us, the way that we do this to ourselves.

Dr. Bazilian, you mentioned in your testimony it may not be realistic for the U.S. to catch up to China. Are there more formal frameworks between the U.S. and its allies that we should be looking at to create an alternative mineral market?

Dr. BAZILIAN. Thank you, Congressman. I will repeat what I said, that China is producing roughly 20 times the experts in the area that we are today. They are investing tens of billions of dollars, and not just domestically but all over the world. That is not diplomacy. That is actual investment in projects that the countries want.

We also have to improve markets for these goods. Without transparent markets with decent price discovery, it is incredibly difficult for domestic companies to go to their board and make a financial decision to invest.

We should focus on military needs very specifically. And the war games I just mentioned, the 10 or so war games going on, are an important input into your decision-making.

And finally, going back, working with allies across this is incredibly important, but diplomacy is slow. We had ERGI under the first Trump administration, we have MSP under Biden. And what you do in this Congress will make a big difference in the outcomes.

Mr. CRANK. Thank you.

I yield back 1 second, Mr. Chairman.

Dr. GOSAR. I thank the gentleman from Colorado. The gentleman from Alaska, Mr. Begich, is recognized for his 5 minutes.

Mr. BEGICH. Thank you, Mr. Chairman. I would just like to start with a statement.

It is incredible to me to see some of my colleagues in Congress and their amazing faith in government. It just blows my mind sometimes. The faith is so great, in fact, that there are some colleagues in this body who believe that Congress can pass laws that will change the weather, an incredible amount of faith.

I don't have that much faith in government, but I do have some questions for those who are here today. You know, Alaska has nearly every critical mineral on the Critical Minerals List and has those minerals in economic quantities. And we heard statements to the contrary today, but I would just like to counter that point and say Alaska is the answer to so many of our critical mineral challenges.

One of the challenges that we have heard discussed at length today is regulatory overburden. We just have too many laws, too many agencies, too much nexus on the books. And when you have a mine time that takes 29 years from the time you discover a mine until the time you can actually actively mine that resource, China is doing this in 12, 18, 24 months. And we have to do everything we can do to streamline that process. I call this regulatory arbitrage. Regulatory arbitrage, where other jurisdictions, other nations have made mining a critical priority, whereas we have done apparently everything we can do in this body and across other bodies in the Nation to stymie mineral development.

So, my question first to Dr. Bazilian: What frameworks would you recommend to address this regulatory arbitrage that seems to exist?

Dr. BAZILIAN. Thank you, Congressman.

One of the first things we need to do to get to financial decisions here, even with economically viable resources, is to improve markets and improve the transparency, the price discovery, the liquidity of those markets. Today, if I ask anyone in this august chamber to tell me the price of crude oil in Dubai, you can do it in 10 seconds, as can your children. If you try to do that for graphite, it will take you all day and you will still get the answer wrong, and it might be traded in yuan.

So, the fundamental need to improve these markets helps everything else on this supply chain. So, that is at least one answer to your question.

Mr. BEGICH. Thank you. So, let me now turn to Mr. Harrell.

The hearing memo references the USGS CML and the need to republish it every 3 years, which will take place this year. The most recent list only included 50 minerals as critical, with a definition of "being essential to economic and national security of the United States, produced from a supply chain vulnerable to disrup-

tion, and serving an essential function in the manufacturing of a product." It is astounding that copper, gold, and silver are not currently included, and I will be pushing for their inclusion this year. In my mind, critical minerals are important and hard to get. Copper is critical for electrification and its exclusion is more than a gross oversight, it is gross negligence in my view.

Aside from ensuring our agencies publish lists of minerals we actually need and must be able to have access to, are there other areas that you believe Congress should focus on to ensure development and production of all minerals that society needs can become a become a reality?

Mr. HARRELL. Yes, thank you for the question, Congressman, and no doubt we need to modernize these lists and figure out how we are better prioritizing the production of these things. Copper, one of the top areas where we need it for aerospace, defense technologies, clean energy technologies, nuclear power, energy storage. I mean, we need it for literally almost everything in our everyday lives.

The lists are really about, like, access to certain programs to drive forward and invest in our domestic capacity. So, you know, I think we absolutely need to modernize these lists, but ultimately, we need a comprehensive strategy that is using these tools where we innovate, where we try to foster more private-sector finance in this space. How do we direct investments here?

So, if we look at this comprehensively, we try to restore some regulatory predictability, and we can support U.S. industry because we are not fighting on a level playing field in the global realm, I think we can make immense progress here. But it is going to be a long fight, right? Like, we are not going to rein back, you know, China has 80 percent, effectively, in aggregate of global processing capacity. It is going to take a while, but we need to start now.

Mr. BEGICH. Thank you. And if I may just for a moment make the statement, you know, we have heard a lot about the importance of critical minerals and mining generally for national security. It is also critical for restoring domestic supply chains. We can mine things here, but we have to be able to smelt and refine those products here in order to move them through to a manufactured state, a finished state.

One of the things that we see is, even when we do mine successfully in the United States, oftentimes those minerals are sent to jurisdictions like China. The next time we see those minerals is in an iPhone, and we have missed out on all that economic activity domestically. That is something we need to change. And in order to change it, we have to make sure that we are encouraging the next step in mineral processing, which is smelting and refining.

Thank you, and I yield back.

Dr. GOSAR. I thank the gentleman. The gentleman from Texas, Mr. Hunt, is recognized for his 5 minutes.

Mr. HUNT. Thank you, Mr. Chairman. Thank you, witnesses, for being here.

On November the 5th, 2024 the American people spoke. The American people answered the question of what they want the future to look like. The American people want the United States to

control its own destiny and not rely on hostile nations. That is why domestic mineral production and processing is so important.

China dominates the mineral supply chain, controlling approximately 60 percent of global production and an estimated 90 percent of processing. We must mine in the United States and grow our processing capacity and manufacturing base, and that is exactly how you make America great again.

If you have ever spoken to my dear friend, Mr. Stauber, he would immediately tell you that the largest cobalt find in the world is in his home State of Minnesota. In fact, he will probably lead with that before he gave you his own name.

We must be able to access our domestic resources to stave off our adversaries. Another way is through the collection of polymetallic nodules. And these potato-sized rocks are full of cobalt, copper, iron, manganese, nickel, zinc, and rare Earth minerals. These minerals are found in the Cook Islands and in the Clarion-Clipperton Zone, right off the coast of Hawaii. Because the CCZ is governed by the United Nations, I am once again introducing a resolution encouraging the United Nations to issue rules and regulations related to the CCZ. These regulations will allow American companies working with friendly countries to collect these minerals responsibly, denying China yet another opportunity to strangle another facet of the mineral supply chain in the entire world.

I encourage my Democrat colleagues to consider my resolution and support Mr. Stauber's legislation and helped thwart China's domination of the minerals that our country and the world so dearly needs.

Thank you all so much for being here. I really appreciate it. I yield back the remainder of my time to the Chairman.

Dr. GOSAR. I thank the gentleman. The gentleman from Colorado, Mr. Hurd, is now recognized for 5 minutes.

Mr. HURD. Thank you, Mr. Chairman. Good morning. Thank you to the witnesses for bearing with us in these questions.

Dr. Bazilian mentioned that critical mineral security and success are, in your words, intimately tied to Indian Country. And also, Dr. Mulvaney in his testimony addresses the issue of tribal and community engagement. These things are near and dear to me as the Chairman of the Indian and Insular Affairs Subcommittee here on Natural Resources.

My question, though, is to you, Ms. Lyon. Can you tell me what Perpetua has done on this front to thoughtfully engage Tribes and other communities around the Stibnite Project?

Ms. LYON. Yes, Congressman, thank you for the question.

It started with our vision that we could go back to an abandoned mine site, improve water quality, and improve salmon habitat, and overall restore the degraded resources available at this site. And then we put that into action through listening. So, early engagement with our tribal communities helped us understand many of the needs and interests held by our Tribes in Idaho.

It then included action. So, we have now invested $19 million right now in going and cleaning up a legacy for a mess we didn't make to help improve those resources today. We have made a number of changes to our mine plan to accommodate it.

But it is not just our early action. The U.S. Government has also upheld their trust obligation through government-to-government consultation. And through the last 8 years and then in the culmination of our final Record of Decision, mandated tribal access through Stibnite, tribal observation, and tribal monitoring plans.

Mr. HURD. Great. Thank you, Ms. Lyon. And a quick follow-up question to you. You mentioned that this project is designed to repair environmental legacies left behind from mining activities that occurred more than 100 years ago. I know that you haven't been able to move even a single shovel of dirt yet, but can you talk about what the Stibnite Project looks like now, from an environmental standpoint, and what effect would this project have on that site from an environmental standpoint?

Ms. LYON. Congressman, thank you for the question again.

Today, Stibnite is a mess. It has seen over 100 years of mining activity off and on before it was abandoned. So, there are no solutions to the fact that one ton of arsenic leaches into the river. There are no solutions to the fact that 20 miles of fish habitat are blocked, except for our project, which was designed specifically to take on those legacies and improve them through mining.

So, we know we could improve water quality. We know we can open access to salmon habitat. And even the U.S. Forest Service found that we will have a long-term benefit to the salmon accessing Stibnite.

Mr. HURD. Ms. Lyon, is it fair to say that the Stibnite mining project would leave the environment better than it is right now?

Ms. LYON. Absolutely.

Mr. HURD. Thank you.

Dr. Bazilian, quick question. Can you help me understand the difference between the phrase "critical minerals" and "rare Earth minerals"? What is the difference between those? Just help with basic terminology there.

Dr. BAZILIAN. Yes. Rare Earths are a group of 17 minerals, so they are a subset of the wider Critical Minerals List, at least in the United States.

Mr. HURD. OK. That is helpful, thank you. So, it is different. One is a subset of the other, then. Got it.

Dr. BAZILIAN. Yes, sir.

Mr. HURD. One thing that I wanted to ask you and also Dr. Harrell about are the need to not just mine these minerals, but the processing whereby we can make the minerals capable of being used. Can you talk a little bit about that and the importance of doing that here domestically, as well?

Dr. BAZILIAN. Yes, sir. As I have said, it is very important to think of this area in terms of the full supply chain. And how it works is that mining ore brings less value-add to an economy than producing advanced manufacturing. So, that is the first thing.

And the second is that refining is one step in that, and then it needs to lead to advanced manufacturing in order to get the best financial returns for companies as well as jobs for our people.

And I will just end, Congressman Hurd, by noting that I think it is very important, your work with Native American Tribes, and that the focus should be not only on sovereignty and listening, but on creating vibrant economies.

Mr. HURD. Thank you, Doctor.

Dr. Harrell, anything else on the processing component of this?

Mr. HARRELL. I would just add again we are competing on price here. So, in the end, more steps that involve having to export this product or move it around or take it out of our borders does add significant cost, right? So, to the extent that it is feasible, we should be trying to do as much as possible here if we want that product to ultimately contribute to our domestic challenges.

Mr. HURD. Wonderful. Thank you very much, Mr. Chairman, I yield back.

Dr. GOSAR. I thank the gentleman.

I just want to make a statement. We heard the last three speakers talk about the concentration process. And I think this is something we overlook because these are typically in rural areas. And these are good-paying mine jobs, incredible to the economy of rural America.

And we are coming up with some great ideas of what is coming, because with copper comes other different metals that you can actually get and collect. And that is why I brought up the one with Schlumberger. This technology is growing rapidly, as you have said, Doctor, and it is one of those things that we really need to keep advantage of.

Now, we may not have all the rare Earths in the world, but we have critical amounts of those in some of those areas that you can then parlay. It is called leverage. And we can have our clean air, clean water all the way at the same time.

So, from that standpoint I want to thank the witnesses for your valuable contribution today and your techniques.

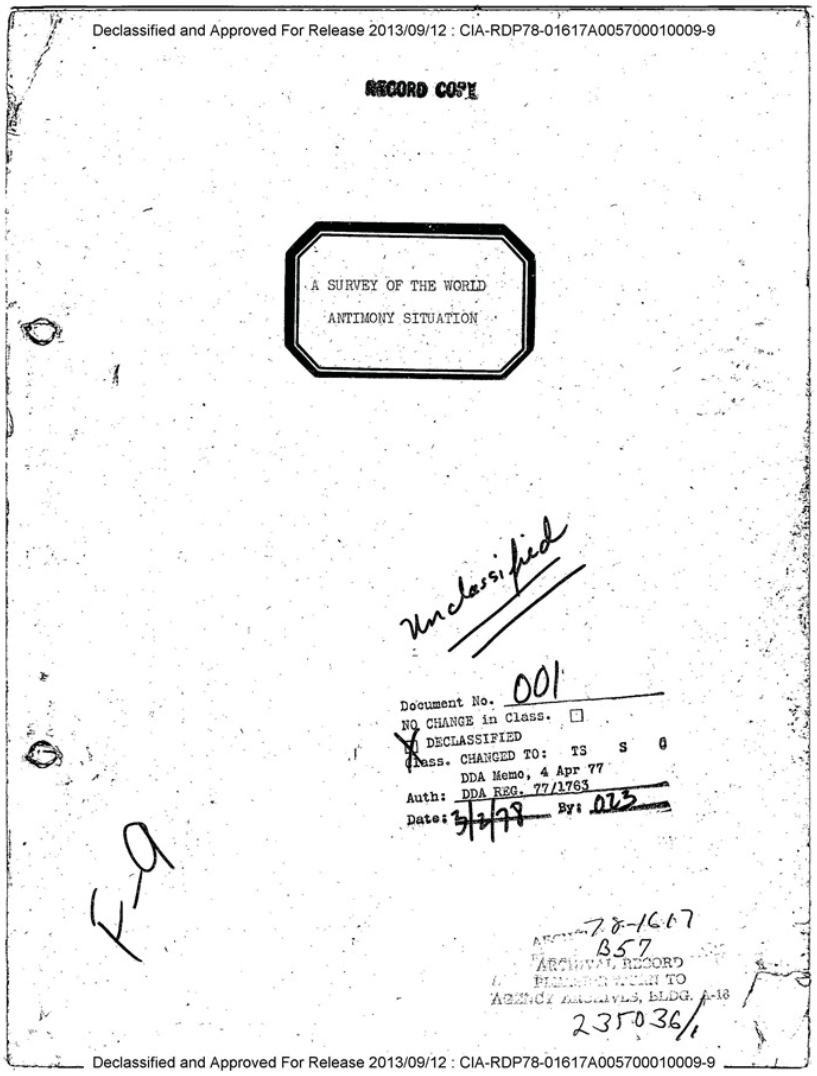
The members of the Subcommittee may have additional questions for the witnesses, and we will ask you to respond with those in writing. Under Committee Rule 3, members of the Committee may submit these questions to the Committee Clerk by 5 p.m. on Tuesday, February 11. The hearing record will be held open for 10 business days for these responses.

If there is no further business, without objection, this Committee stands adjourned.

[Whereupon, at 12:25 p.m., the Subcommittee was adjourned.]

[ADDITIONAL MATERIALS SUBMITTED FOR THE RECORD]

Submissions for the Record by Rep. Stauber



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