



**Written Testimony of
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President and CEO
The Fertilizer Institute**

**House Subcommittee on Energy and Mineral Resources,
Natural Resources Committee**

Legislative Hearing on

- **H.R. 6395 (Rep. Curtis)**, "*Recognizing the Importance of Critical Minerals in Healthcare Act of 2023*";
- **H.R. 8446 (Rep. Ciscomani)**, "To amend the Energy Act of 2020 to include critical materials in the definition of critical mineral, and for other purposes"; and
- **H.R. 8450 (Rep. Cammack)**, "*Phosphate and Potash Protection Act of 2024*".

June 4, 2024

Good morning, Chairman Stauber, Chairman Westerman, Ranking Member Ocasio-Cortez, Ranking Member Grijalva, and members of the subcommittee.

My name is Corey Rosenbusch, President and CEO of The Fertilizer Institute (TFI).

TFI represents companies engaged in all aspects of the fertilizer supply chain from manufacturers to distributors to retailers. The fertilizer industry ensures that farmers receive the nutrients they need to grow the crops that feed our nation and the world.

I want to thank the subcommittee for holding this hearing and providing the opportunity to discuss the bipartisan H.R. 8450, the *Phosphate and Potash Protection Act of 2024*, introduced by Representatives Cammack and Slotkin.

Phosphate and potash are two of the three most common forms of fertilizer, along with nitrogen. Phosphorus is present in every living cell, both plant and animal. Phosphate (P) is crucial to key energy reactions in plants, including photosynthesis, speeding maturity and reproduction, and increasing yield. Phosphorous deficiency has been cited as a key cause for below-optimum crop yields.¹ The European Union includes phosphate on its critical raw materials list.² Potash (K) is particularly important for high-carbohydrate crops like potatoes, sugar beets, and grapes. It also provides plants with starch, enabling them to resist wilting and survive winter conditions.³

¹ Fertilizer 101: Nourish, Replenish, Grow, pp 28-30, Copyright 2010. The Fertilizer Institute.

² [An extractive bioeconomy? Phosphate mining, fertilizer commodity chains, and alternative technologies | Sustainability Science \(springer.com\)](#)

³ *Id.* at Fertilizer 101, p. 31.

Canada includes potash on its own critical minerals list.⁴

The book *Alchemy of Air* by Thomas Hager begins with an account of Sir William Crookes opening an 1898 meeting of the British Academy of Sciences by dramatically declaring that “all civilized nations stand in deadly peril.” Having achieved the desired effect of shocking his audience into paying attention, Sir William went on to state: “As mouths multiply, food sources dwindle.” He noted how recent advances in public health and medicine had significantly extended lifespans. But, he also foresaw uncontrollable population growth, soil infertility due to overuse on limited available acreage for farming, and, ultimately, mass global starvation. At that time, the world population stood at approximately 1.65 billion people.

The only solution, he said, was extraordinary expansion in the production and availability of fertilizer to enable growing more food without needing more land on which to grow it.

Today, half of all global crop yields can be attributed to fertilizer use⁵ at a time when the world’s population exceeds 8 billion people and is forecasted to surpass 9.5 billion people by 2050.

H.R. 8450, "Phosphate and Potash Protection Act of 2024 "

The U.S. fertilizer sector, an industry supporting 487,000 American jobs with annual wages in excess of \$34 billion, thanks Congresswoman Cammack for her leadership and supports her bill, H.R. 8450, which would require the United States Geological Survey (USGS) to conduct a timely review for adding phosphate and potash to the Critical Minerals List and report back to key committees of jurisdiction on the issue.

The U.S. and Global Fertilizer Industry

The modern fertilizer sector is a highly competitive global industry with more than 60 countries engaged in the production of fertilizer; one-third of those countries have three or more fertilizer-producing entities. In addition to competition, the fertilizer industry is also subject to international markets, geopolitical pressures, and weather events. In some instances, a fertilizer-producing organization may be a state-run entity with lower worker safety and environmental standards or even with an eye towards tilting the global economy.

The U.S. fertilizer market only accounts for the production of about 7% of all global fertilizer. We are a net importer. Production is just one part of the story, as exports and usage are also key considerations. More than 90% of global nutrient use currently occurs outside the United States (although last year the U.S. was responsible for 16% of global grain and 19% of global oilseeds production according to the U.S. Department of Agriculture). The two largest users of fertilizer are China and India,⁶ and demand continues to grow across emerging economies in Latin America, Asia, and Africa. As the attached International Fertilizer Association (IFA) map of trade routes at the end of this document indicates, the global fertilizer industry is, not surprisingly,

⁴ [The Canadian Critical Minerals Strategy - Canada.ca](https://www.canada.ca/en/natural-resources/canadian-minerals/critical-minerals-strategy.html)

⁵ Stewart, W.M., Dibb, D.W., Johnston, A.E. and Smyth, T.J. (2005), The Contribution of Commercial Fertilizer Nutrients to Food Production. *Agron. J.*, 97: 1-6. <https://doi.org/10.2134/agronj2005.0001>

⁶ [Impacts and Repercussions of Price Increases on the Global Fertilizer Market | USDA Foreign Agricultural Service](https://www.usda.gov/foreign-agricultural-service/impacts-and-repercussions-of-price-increases-on-the-global-fertilizer-market)

heavily dependent on international trade and supply chain logistics.

IFA projects that by 2027 global consumption of phosphates usage will grow by 12%, primarily due to increased needs in Africa and West Asia, while potash usage will grow by 17%, driven by Belarussian trade with China.⁷

All of these factors combine to impact supply and demand, both domestically and globally. Prices for fertilizer here in the U.S. are unavoidably linked to global prices. In turn, this has a tremendous effect on food availability and food security in the U.S. and throughout the world.

The Energy Act of 2020 defines a “critical mineral” as a non-fuel mineral or mineral material essential to the economic or national security of the U.S. and which has a supply chain vulnerable to disruption. Critical minerals are also characterized as serving an essential function in the manufacturing of a product, the absence of which would have significant consequences for the economy or national security. My testimony this morning will clearly outline how both phosphate and potash meet the criteria established in The Energy Act of 2020. After all, food security IS national security.

Inclusion of phosphate and potash on the USGS Critical Minerals List is all about contingency planning for the future. Contingency planning is appropriate to deal with unforeseeable disruptions as the pandemic, global supply chain challenges, foreign export limitations, sanctions, and wars over the last four years combine to demonstrate.

The USGS Critical Minerals List

The USGS quantitative methodology is based on an approach that defines supply risk as the confluence of three factors: (1) the likelihood of a foreign supply disruption; (2) the dependency of the U.S. manufacturing sector on foreign supplies; and, (3) the vulnerability of the U.S. manufacturing sector to a supply disruption.

Although potash appeared on the 2020 USGS Critical Minerals List, both phosphate and potash received low scores for supply risk and trade exposure in the most recent USGS Critical Minerals List and were left off. Note that the 2022 Critical Minerals List was released just two days before Russia invaded Ukraine in February of that year, greatly disrupting international fertilizer markets and exports to the U.S.

Further, despite much evidence to the contrary, USGS in recent comments continues to insist phosphate and potash are not subject to supply chain vulnerabilities.

Phosphate

Under the three-pronged test for inclusion on the Critical Minerals List, the first two prongs regarding likelihood of a foreign supply disruption and the U.S. degree of dependence on foreign supply are clearly met and should be given significant weight. The U.S. government itself has

⁷ International Fertilizer Association, “Helping to Feed the World Sustainably: Public Summary Medium-Term Fertilizer Outlook 2023 – 2027,” pp. 4-6, June, 2023

stated that supply chain disruptions are common, which clearly effects manufacturing, meeting the third part of the Critical Minerals List test.

According to industry statistics, there are only 11 major phosphate producing countries globally. U.S. phosphate production is not insignificant, currently providing 9.6% of global production according to the USGS⁸. But, it is well below that of countries such as China (42%) and Morocco (15.9%) for global production. Those two countries combine to hold 80% of the world's reserves.⁹

Further, as noted above, exports and usage are also key considerations. Some phosphate-producing countries consume a large portion of their production domestically, significantly impacting global availability and prices. Although it presently comprises more than 40% of global production, China accounted for only just over 20% of the world's exports in 2022 due to its recent effort to stabilize its own domestic supply of fertilizer by limiting exports. China's policy of export quotas greatly impacted global supply. China had previously constituted about 30% of total world trade according to Chinese customs data.¹⁰ During this time, China reduced the sale of its phosphate fertilizers to Brazil, one of its leading customers, by 50%¹¹. In turn, this required Brazil, an emerging economy, to seek phosphate fertilizers elsewhere, only further disrupting global supply and driving up prices. Likewise, before Russia invaded Ukraine, Russia constituted as much as 14% of global exports.¹² In the first three months after the invasion, prices for phosphate rock spiked by 38%.¹³ More recently, Russia has imposed its own export quotas.

At this time, none of the announced capacity expansions to phosphate rock production are occurring in the United States. According to IFA, significant new mining projects planned for completion by 2026 are occurring in Morocco, Brazil, India, Egypt and Australia. Significant new mining projects planned for completion after 2027 are under development in China, Tunisia, Saudi Arabia and Australia. The global average build cycle for adding substantial new capacity is four-to-five years. In the U.S, it's longer. A permitting effort at an Idaho-based phosphate mine required 10 years and tens of millions of dollars.

In the absence of available phosphate from countries such as China and Russia, USGS states that 98%¹⁴ of U.S. phosphate rock imports are now sourced from Peru, a country with which the U.S. has a free trade agreement (FTA). The implication is that availability of Peruvian phosphate makes it unnecessary to include phosphate on the Critical Minerals List. However, Peru lacks a sufficient store of reserves to ensure future availability; its 2022 output accounted for only

⁸ U.S. Geological Survey. Mineral commodity summaries 2023. (U.S. Geological Survey, 2023).

⁹ NATIONAL SCIENCE AND TECHNOLOGY COUNCIL, SUBCOMMITTEE ON CRITICAL AND STRATEGIC MINERAL SUPPLY CHAINS, *Assessment of Critical Minerals: Screening Methodology and Initial Application* ix, 7-10 (March 2016), available at

<https://www.whitehouse.gov/sites/whitehouse.gov/files/images/CSMSC%20Assessment%20of%20Critical%20Minerals%20Report%202016-03-16%20FINAL.pdf>.

¹⁰ [China issues phosphate quotas to rein in fertiliser exports - analysts | Reuters](#)

¹¹ [China reduces fertilizer exports to Brazil in 50% this year | Agribusiness | valorinternational \(globo.com\)](#)

¹² [High fertilizer prices contribute to rising global food security concerns | IFPRI : International Food Policy Research Institute](#)

¹³ [USDA ERS - Global Fertilizer Market Challenged by Russia's Invasion of Ukraine](#)

¹⁴ [Mineral Commodity Summaries 2024 \(usgs.gov\)](#)

1.9% of global production. Further, when comparing the 2014 USGS Phosphate report¹⁵ with the 2023 USGS report¹⁶, Peruvian phosphate reserves have declined by nearly 75% over the last decade, falling from 820,000 in 2014 to 210,000 in 2023. Meanwhile, the largest investor in the Peruvian mining industry across the range of sectors is China.¹⁷ So, the U.S. is dependent on getting nearly 100% of its phosphate imports for domestic production from a country that currently generates less than 2% of the global market, has diminishing reserves, and is heavily dependent on Chinese investment.

Further, regarding U.S. vulnerability to supply chain disruption, the Environmental Protection Agency (EPA) says in a study of phosphate availability, “Agricultural use of phosphate-based fertilizer, trade disputes, and reliance on a small number of countries for imports have led to limited supply and dramatically increased price of phosphate rock.” EPA goes on to say, “There have been historic widespread supply disruptions due to decreased production in countries that are significant suppliers to the international market. Supply disruptions have impacted availability of derivative products”.¹⁸

In fact, although USGS focuses on imports of phosphate rock, the rock by itself is not fertilizer; it must be converted to fertilizer in the U.S. manufacturing process. Without the availability of phosphate especially due to supply chain disruptions, maintaining the scale of U.S. processing of triple superphosphate (TSP), diammonium phosphate (DAP), and monoammonium phosphate (MAP) is not possible. Separately, the U.S. frequently imports phosphate-processed fertilizers. According to industry statistics, the U.S. imported 27% of its phosphate fertilizer in 2021 and 20% in 2022 used to satisfy American farmer needs. In 2022, four countries, Morocco (27%), China (21%), Russia (16%), and Saudi Arabia (15%), accounted for nearly 79% of processed phosphate exports.

Potash

Again, applying the three-pronged test for inclusion on the Critical Minerals List regarding the likelihood of a foreign supply disruption, the U.S. degree of dependence on foreign supply, and the potential impact on U.S. manufacturing are all clearly met.

U.S. production is globally insignificant at only 1% of global mine production, according to industry figures. Global potash production is extremely concentrated with 10 countries combining to produce over 92% of the world’s supply; two-thirds of the world’s potash supplies come from just three countries Canada, Russia, and Belarus¹⁹. At present, U.S. sanctions on Belarus combined with the impacts of Russian aggression in Ukraine have greatly impeded the availability of potash from these sources. As USGS itself has said, “supply uncertainty from ...

¹⁵ [Phosphate Rock \(d9-wret.s3.us-west-2.amazonaws.com\)](https://d9-wret.s3.us-west-2.amazonaws.com)

¹⁶ [Phosphate Rock \(usgs.gov\)](https://www.usgs.gov)

¹⁷ Evan Ellis, The Evolution of Peru’s Multidimensional Challenges, Part III: Engagement with China, Global Americans (August 3, 2022), <https://theglobalamericans.org/2022/08/the-evolution-of-perus-multidimensional-challenges-part-iii-engage-ment-with-china/#:~:text=By%20the%20end%20of%202021,percent%20of%20its%20copper%20output.>

¹⁸ [Water Treatment Chemical Supply Chain Profile- Phosphate Rock \(epa.gov\)](https://www.epa.gov)

¹⁹ [Impacts and Repercussions of Price Increases on the Global Fertilizer Market | USDA Foreign Agricultural Service](https://www.usda.gov)

Belarus and Russia caused potash prices to rise in the first half of 2022.”²⁰ By some estimates, global pricing for potash increased by 500% over the previous year due to Russia’s invasion of Ukraine, among other factors.²¹

Importing more than 80% of our potash from Canada, the U.S. is the third largest global importer at 17%, trailing only the developing economies of Brazil (23%) and China (18%) according to industry statistics. Once again, China is a major producer, accounting for 12% of the global supply, but it is not a significant exporter.²² Meanwhile, Israel is in the top four of exporting countries even though it provides only 6% of global production; nevertheless, Israel is currently at war. Canada, Russia, Belarus and Israel, accounted for over 80% of Potash global exports.²³

At this time, none of the announced capacity expansions to potash production are occurring in the United States. According to IFA, significant new mining projects planned for completion by 2026 are located in Laos, Canada, Russia and Jordan. Significant new mining projects that are planned for completion in 2027 and beyond exist in Canada, Spain and Belarus. The global average build cycle for adding substantial new capacity is eight-to-10 years.

All three prongs on the USGS Critical Minerals List criteria are met. As USGS declared in a recent press release, “According to a recent USGS global assessment of potash resources, the costs of importing potash long distances can limit its use and imports are subject to supply disruptions,”²⁴ which satisfies the first prong. As concerns the need for dependence on foreign supply under the second prong, USGS also stated, “some (U.S.) regions lack potash deposits needed for optimal food crop yields.”²⁵

The U.S. currently imports nearly all of its potash, getting it primarily from Canada, a country with which the U.S. enjoys strong trade relations. However, even Canada is not immune to supply chain disruptions. During the pandemic, the Biden administration was forced to impose cross-border vaccine requirements, which impeded truck traffic. Moreover, in its 2024 USGS Potash report, USGS notes that “production in Canada was lower in part owing to a dock workers strike in July 2023 that curtailed shipments of potash from the port of Vancouver, British Columbia. This led to temporary closures of some mines in Canada. Production resumed at those mines after the strike was settled in August.”²⁶ This disruption lasted fewer than two months. Still, Canada’s potash production declined 11% in 2023 relative to 2022. Now, Canada faces the possibilities of mid-summer strikes involving rail workers as well as workers in its west coast ports and at the Port of Montreal.

Finally, regarding the third prong, lack of availability of potash to U.S. manufacturers negatively impacts fertilizer production. Potash goes into important plant nutrients such as potassium chloride, potassium nitrate, and potassium sulfate, among other potash-based fertilizers.

²⁰ [Mineral Commodity Summaries 2024 \(usgs.gov\)](#)

²¹ [Potassium Depletion: The Invisible Threat to Global Food Security \(scitechdaily.com\)](#)

²² [Potash facts \(canada.ca\)](#)

²³ *Id.* Canada (46%), Russia (17%), Belarus (10.7%) and Israel (7.6%), respectively

²⁴ [Plenty of Potash, but Some Regions Lack Low Cost Sources for Crop Production | U.S. Geological Survey \(usgs.gov\)](#)

²⁵ *Id.*

²⁶ [Mineral Commodity Summaries 2024 \(usgs.gov\)](#)

Conclusion

Thank you again for the opportunity to be with you all this morning. On behalf of the fertilizer industry, thanks as well to Ms. Cammack and Ms. Slotkin for leading on H.R. 8450.

Contingency planning is appropriate to deal with unforeseeable disruptions, including supply chain disruptions of imports, impacting U.S. manufacturing. And, in this case, on disruptions that impact U.S. crop yields and food security. Whether it be food security, national security or commercial reliance, phosphate and potash are both essential nutrients that American farmers depend upon to reliably and sustainably meet the country's food security requirements. They should be included in the Critical Minerals List.

I am happy to answer any questions.

