Deep-Sea Mining Outlook Murky, But May Be Getting Clearer

By **Sean Pribyl, Elizabeth Craddock and Jason Hill** (July 28, 2025)

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Critical minerals are legally defined as minerals that are vital to the nation's economic and national security, have susceptible supply chains, and play an essential role in the manufacture of key products.[1]

The U.S. considers reducing reliance on China for critical minerals essential to mitigating risks such as supply disruptions, trade restrictions, price volatility and economic vulnerability.

As a result, U.S. policymakers are prioritizing alternative sourcing strategies that include diversifying supply chains, investing in domestic mining and refining capabilities, and strengthening strategic international partnerships.

The Trump administration has placed renewed emphasis on exploring deep-sea mining for critical minerals. On July 1, in Washington, D.C., the foreign ministers of Australia, India and Japan launched the Quad Critical Minerals Initiative, which aims to strengthen economic security and resilience by collaborating to secure and diversify supply chains for critical minerals.[2]

Given China's current dominance in critical mineral and rare earth production and refinement, and its use of this advantage in trade negotiations, securing alternative sources has become a significant priority for the U.S.

For industry stakeholders interested in deep-sea mining, the renewed emphasis on U.S. critical mineral production may create new prospects for growth and investment, while also requiring careful navigation of the regulatory framework governing offshore resource extraction.

Current policies are designed to decrease dependence on foreign sources, including China, with the intention of stabilizing and securing supply chains. This focus is associated with increased funding, regulatory initiatives and ongoing technological development in the sector.

Companies involved in mining, refining and related industries — including those with a focus on deep-sea minerals — may encounter fewer operational barriers and greater access to financial resources, potentially encouraging expansion. The shift is intended to support both economic objectives and national security, while influencing the U.S. position in the critical minerals market.

New Legislation Spurs Investment in Critical Minerals

The One Big Beautiful Bill Act, enacted on July 4, provides the most recent example of U.S. efforts to secure critical minerals. The OBBBA included potential funding opportunities at the U.S. Department of Energy and the U.S. Department of Defense.

Section 50403 of the OBBBA amends the DOE loan program, administered under Section 1706 of the Energy Policy Act, to fund traditional energy and critical mineral projects that advance American energy dominance, and appropriates $1 billion to the revised program.

Renamed Energy Dominance Financing, the amended loan program broadens DOE authority to guarantee loans that repower, repurpose or expand existing energy infrastructure — including fossil, nuclear and critical minerals projects.

This means that industry stakeholders should expect increased financial support and reduced barriers to developing critical mineral resources, fostering innovation and growth within the sector. The OBBBA follows Executive Order No. 14285, issued by President Donald Trump on April 24, aimed at promoting the development of offshore critical minerals.[3]

Looking to U.S. waters for critical minerals could also have a positive impact on the U.S. maritime sector, another top priority for the Trump administration. U.S. ports could become centers for importing and refining minerals, while deep-sea mining may create demand for specialized vessels to explore and extract minerals, construct subsea infrastructure and conduct environmental assessments.

Recent technological innovations have included the development of autonomous underwater vehicles and robotic systems that minimize habitat impacts through selective harvesting techniques and more precise navigation. Other technologies focus on closed-loop systems that capture and redeposit sediment near the seafloor, to minimize dispersal and turbidity.

Ongoing research and adaptive management will continue to provide the industry with additional improvements that increasingly mitigate environmental concerns in the future.

Policy Enhancements and Legal Framework

The U.S. Department of the Interior has introduced new policy measures to expedite the exploration and development of critical minerals offshore — resources essential to the nation's energy, technology and defense sectors. These actions aim to minimize bureaucratic obstacles and streamline approval processes to ensure the responsible development of critical minerals.

The legal implications of these policies include reducing unnecessary delays while preserving environmental protections, thus facilitating responsible development that benefits both local communities and the nation.

To enhance efficiency within the offshore minerals program, the Bureau of Ocean Energy Management and the Bureau of Safety and Environmental Enforcement are revising policies across all development stages — from initial exploration to post-lease operations and production.

These updates aim to reduce administrative delays, improve interagency coordination and provide greater certainty for industry actors, while upholding environmental safeguards.

BOEM will speed up leasing by quickly selecting development areas, skipping formal information requests and joint task force formation. Environmental assessments will begin during lease sales, with more detailed reviews deferred if needed.

These changes will cut delays and shorten public comment periods. After a lease is issued, BOEM and BSEE will further streamline permitting by prioritizing offshore critical mineral projects for fast-tracked approval under emergency procedures.

Approval for mapping, testing and site work will be accelerated by reducing paperwork and compliance steps. At the lessee's request, BOEM can combine exploration, testing and mining plans into a single review, to avoid duplication and quicken decisions.

For industry stakeholders, these legal changes mean quicker access to critical minerals and reduced bureaucratic hurdles. This could result in lower operational costs and faster project timelines, enhancing investment appeal.

Deep-Sea Mining in International Waters

Minerals such as copper, nickel, cobalt and manganese are widely regarded as essential for U.S. national security, clean energy initiatives and infrastructure development. These resources are found in significant quantities within polymetallic nodules in regions like the Clarion Clipperton Zone in the Pacific Ocean.

The International Seabed Authority, or ISA, was established in 1994 under the U.N. Convention on the Law of the Sea, or UNCLOS, to organize and control seabed activities on the international seabed.

Despite debating in earnest for over a decade on regulations for deep-sea mining, the ISA has yet to finalize these regulations, leaving those that want to pursue deep-sea mining outside of a country's exclusive economic zone in perpetual limbo.

U.S. companies interested in mining polymetallic nodules outside the jurisdiction of any country's exclusive economic zone have only one avenue to pursue — to secure authorization via the Deep Seabed Hard Minerals Resources Act, or DSHMRA, passed in 1980. This avenue was addressed by the Trump administration's April 24 executive order.

The National Oceanic Atmospheric Administration has been responsible for deep-sea mining governance in the U.S. NOAA is the authorizing government agency under the DSHMRA responsible for developing regulatory frameworks, and for conducting environmental studies through initiatives such as the Deep Ocean Mining Environmental Study project.

The renewed use of the DSHMRA by the Trump administration is grounded in several key congressional findings and policy objectives articulated in the act. The DSHMRA was enacted to address the U.S.' growing need for hard minerals such as nickel, copper, cobalt and manganese, which are found in abundance on the deep seabed and are critical for national industrial needs.

The DSHMRA recognizes that U.S. dependence on foreign sources for these minerals poses risks to national interests and the balance of payments, and that developing domestic and alternative sources is essential for economic and strategic security.

The act also reflects the U.S. position that, pending the conclusion of a comprehensive international law of the sea treaty, there is a need for an interim legal regime to allow U.S. citizens and companies to explore and recover deep-sea minerals, while encouraging the development of necessary technology and protecting the marine environment.

Understanding the reach of the DSHMRA is important because it asserts U.S. jurisdiction

over its citizens and vessels engaged in deep-sea mining, but explicitly disclaims any assertion of sovereignty over the seabed itself, aligning with international law and the principle that these resources are the common heritage of humankind.

While the DSHMRA remains fit for purpose, NOAA's current permitting regulations have not been updated recently, and do not include defined timelines, and thus have historically posed challenges for investment.

But on July 7, NOAA issued a proposed rulemaking for deep seabed mining, which proposes to revise some of the DSHMRA's implementing regulations related to exploration licenses and commercial recovery permit applications. The public comment period remains open through Sept. 5.

Although the proposed changes represent modest progress toward streamlining the application process, and consolidating the license and permit process, many in the industry hope it signals more significant regulatory changes on the horizon.

Impact on Industry

A DSHMRA exploration license grants a U.S. entity exclusive exploration rights in a specific area, but only over other U.S. entities. These domestic rights are not recognized internationally.

U.S. companies could pursue a permit under UNCLOS through the ISA if the U.S. were a treaty member, but because the U.S. has not ratified the treaty, U.S. companies cannot access the formal process at the ISA.

This may create some barriers to accessing deep-sea critical minerals, but it also allows the U.S. to take a lead role for the industry in the wake of the ISA's inability to finalize any regulations.

However, this will depend on the U.S. being able to use the DSHMRA to provide a robust framework — and demonstrating that it works well — in order to attract the necessary investment from industry.

While the DSHMRA, revitalized by the recent executive order, remains a strong legal foundation, NOAA's recent notice of proposed rulemaking raises questions about the rule's timing, intent and scope, and whether further changes will be comprehensive or piecemeal. Affected stakeholders may push for more simplified, consolidated licensing for exploration and construction, to improve efficiency.

The motivations behind these regulatory changes, and the decision to focus on certain issues that the DSHMRA arguably already permitted, suggest that the recent amendments are largely procedural. Moreover, the extent of any significant opposition to these changes, and from whom, will become evident in the comments in the docket, which may affect NOAA's actions.

There are also concerns about whether BOEM and NOAA will fully implement the executive order, and their ability to coordinate requirements, given discrepancies in proposed lease area sizes and environmental analysis protocols.

Nevertheless, the industry will continue to seek legal clarity on regulatory pathways, timelines for future rule changes, and ways in which BOEM could reduce entry barriers, as

companies weigh investment decisions based on process simplicity.

Ultimately, industry readiness and adaptability in response to policy changes — particularly around refining processes — remains an open issue.

U.S. Involvement

The DSHMRA still provides the strongest vehicle for the Trump administration to drive the industry forward, by providing a robust regulatory framework on its own. But some members of Congress have also called for the ISA to adopt regulations for deep-sea mining before the U.S. joins UNCLOS.

On April 29, the House Natural Resources Committee conducted a hearing on the potential of deep-sea mining to expand U.S. mineral production. The hearing addressed the future prospects and current challenges of seabed mining, as well as strategies for positioning the U.S. as a leader in this sector.

Legislation has been introduced on both sides of this issue, including H.R. 663 and 664 to protect the U.S. seabed from mining, and H.R. 4018, to "unleash" exploitation of offshore critical minerals.

Conclusion

Carefully navigating the regulatory framework governing offshore critical mineral mining is vital to increased investment and expanded operations.

If U.S. entities are able to avail themselves of the DSHMRA regulatory regime, the maritime industry could experience a surge in demand for specialized vessels and infrastructure required for deep-sea mining operations.

This demand will drive innovation and technological advancements within the sector, fostering a new era of exploration and resource extraction. But stakeholders should continue to monitor regulatory and policy developments in this space.

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[1] See https://www.usgs.gov/faqs/what-a-critical-mineral.

[2] See https://www.state.gov/releases/office-of-the-spokesperson/2025/07/2025-quad-foreign-ministers-meeting.

[3] See https://www.presidency.ucsb.edu/documents/executive-order-14285-unleashing-americas-offshore-critical-minerals-and-resources.