

119TH CONGRESS
2D SESSION

H. R. 9646

To require the Secretary of the Interior to carry out a quantum-enhanced critical minerals survey, and for other purposes.

IN THE HOUSE OF REPRESENTATIVES

JULY 13, 2026

Mr. HURD of Colorado (for himself and Mr. CARBAJAL) introduced the following bill; which was referred to the Committee on Natural Resources

A BILL

To require the Secretary of the Interior to carry out a quantum-enhanced critical minerals survey, and for other purposes.

1 *Be it enacted by the Senate and House of Representa-*
2 *tives of the United States of America in Congress assembled,*

3 **SECTION 1. SHORT TITLE.**

4 This Act may be cited as the “Quantum-Enhanced
5 Critical Minerals Mapping Act of 2026”.

6 **SEC. 2. DEFINITIONS.**

7 In this Act:

8 (1) **CRITICAL MINERAL.**—The term “critical
9 mineral” has the meaning given to that term in sec-

tion 7002(a) of the Energy Act of 2020 (30 U.S.C. 1606(a)).

(2) EARTH MRI.—The term “Earth MRI” means the Earth Mapping Resources Initiative of the United States Geological Survey.

(3) QUANTUM GRAVITY GRADIOMETRY.—The term “quantum gravity gradiometry” means the use of quantum mechanical systems, including cold-atom interferometry, to measure spatial gradients of gravitational fields for the purpose of detecting subsurface density variations.

(4) RARE EARTH ELEMENT.—The term “rare earth element” means any of the 17 metallic elements consisting of the 15 lanthanides plus scandium and yttrium, which are a special subset of critical minerals.

(5) SECRETARY.—The term “Secretary” means the Secretary of the Interior, acting through the Director of the United States Geological Survey.

SEC. 3. QUANTUM-ENHANCED CRITICAL MINERALS SURVEY.

(a) IN GENERAL.—Not later than 180 days after the date of enactment of this Act, the Secretary shall establish and carry out a program to conduct original quantum-enhanced geophysical surveys to improve upon existing

1 United States Geological Survey data for the discovery
2 and characterization of critical mineral and rare earth ele-
3 ment deposits on or adjacent to Federal lands.

4 (b) SURVEY REQUIREMENTS.—In carrying out the
5 program under subsection (a), the Secretary shall—

6 (1) conduct mobile quantum gravity
7 gradiometry surveys over not fewer than 3 priority
8 critical minerals focus areas identified under the
9 Earth MRI program, with priority given to focus
10 areas in the western rare earth element zones;

11 (2) compare quantum gravity gradiometry data
12 with existing classical geophysical survey data from
13 the same focus areas to quantify detection improve-
14 ments in resolution, depth penetration, and mineral
15 deposit characterization;

16 (3) integrate all survey data into the Earth
17 MRI national minerals database and make such data
18 publicly accessible in a format compatible with exist-
19 ing Earth MRI data platforms;

20 (4) coordinate with the Secretary of Energy,
21 acting through the directors of relevant Department
22 of Energy national laboratories, including the Na-
23 tional Laboratory of the Rockies; and

24 (5) to the maximum extent practicable, carry
25 out surveys under cooperative research and develop-

1 ment agreements with private quantum sensing
2 firms to leverage private sector investment and re-
3 duce Federal costs.

4 (c) STATE COORDINATION.—The Secretary shall con-
5 sult and coordinate with the State Geological Surveys of
6 affected States in selecting survey focus areas and inter-
7 preting survey results.

8 (d) INDUSTRY ACCESS.—Survey data made publicly
9 available under subsection (b)(3) shall be provided to min-
10 ing and mineral exploration companies to facilitate pri-
11 vate-sector investment in domestic critical mineral devel-
12 opment.

13 **SEC. 4. REPORT TO CONGRESS.**

14 (a) IN GENERAL.—Not later than 24 months after
15 the date of enactment of this Act, the Secretary shall sub-
16 mit to the Committee on Natural Resources of the House
17 of Representatives and the Committee on Energy and
18 Natural Resources of the Senate a report on the quantum-
19 enhanced geophysical survey program established under
20 section 3.

21 (b) CONTENTS.—The report required under sub-
22 section (a) shall include—

23 (1) a description of each survey area, the quan-
24 tum gravity gradiometry instruments deployed, and
25 the survey methodologies used;

1 (2) a summary of critical minerals and rare
2 earth elements identified or characterized in each
3 survey area, including estimated deposit locations,
4 depths, and potential economic significance;

5 (3) a quantitative comparison of quantum grav-
6 ity gradiometry results against classical geophysical
7 survey results from the same areas, including
8 metrics for detection resolution, subsurface depth
9 penetration, and cost per unit area surveyed;

10 (4) an assessment of the potential for quantum
11 gravity gradiometry to reduce speculative drilling re-
12 quirements in domestic critical minerals exploration;

13 (5) an analysis of private sector interest in and
14 investment resulting from publicly released survey
15 data;

16 (6) recommendations for scaling quantum-en-
17 hanced geophysical survey capabilities across the
18 Earth MRI program nationally;

19 (7) any legislative or regulatory changes the
20 Secretary recommends to accelerate domestic critical
21 mineral permitting in areas identified by the sur-
22 veys; and

- 1 (8) a cost-benefit analysis comparing the Fed-
- 2 eral investment under this Act with the estimated
- 3 economic value of critical mineral deposits identified.

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