RESPONSES TO NATIONAL ENERGY DOMINANCE COUNCIL (NEDC) MINERAL SUPPLY CHAIN QUESTIONNAIRE

Exploration

1. How would the private sector feel about required submissions of exploration data a drill cores to public databases?
    - Response: While some believe a public database of exploration data could be helpful, there was widespread opposition to requiring exploration data to be made public as this information is proprietary and confidential. Further, exploration requires substantial time and resources, and the careful development and handling of such data is essential to the success of many exploration companies. Requiring release of this data would be disruptive to companies and create additional burdens, result in the loss of competitive advantage, and lead to less exploration. This idea is counter to the existing U.S. mineral tenure system and would conceivably make the data available to the CCP.

      Instead of requiring proprietary exploration data to be shared, the U.S. Government should utilize existing exploration data and core samples (including from the USGS Core Research Center and state geological surveys) available to them while accelerating ongoing mineral mapping efforts by the USGS. Ideally, this data should remain at discretion of the owners to share.

2. Would a public machine learning model estimating reserves be well-received and useful?
    - Response: There was a significant divergence in responses to this question. Those that opposed stated that public machine learning model to estimate reserves would be very risky, inject significant confusion into commodity markets, and not be an appropriate tool for estimating multivariate conditions that exist within a reserve with any useful degree of accuracy. They also urged the federal government to use extreme caution around any policies that may undermine the competitive rationale or competitive advantage for investment. Others indicated that machine learning models could be helpful to interpret mineral resources, calibration of global and regional formation models, as well as mineral endowment studies to then be used by the private sector to improve mineral reserve estimates.

      Still other responses stated that a public machine learning model is not recommended at this time. To be effective, any such

model would need to be trained on an enormous amount of geologic and geophysical data which the USGS is continuing to compile but is nowhere close to being finished. Without a complete and comprehensive data set, Investor confidence in the results of such models (and the domestic mining industry) would be poor. Creating a model now would be premature.

Creating an inaccurate model would also create a significant liability for the mining industry as the calculation and reporting of reserves are highly regulated processes in both the U.S. and Canada. Failure to comply with these disclosure requirements can give rise to significant liability with the regulating body.

Finally, estimating reserves requires a significant amount of geologic and metallurgical interpretation from geological models, mine shape optimizers, and other such specialized tools used jointly, requiring the expertise of qualified individuals reviewing *site-specific* data and economics, with multiple checks in place to ensure the final result is as accurate as possible. Currently, AI lacks the sophistication to make these highly technical and nuanced assessments.

3. Which funding mechanisms would increase exploration?
    - Response: The idea of funding mechanisms to increase domestic mineral exploration received strong support from industry respondents. Capital constraints often create bottlenecks and extend the timeline from exploration to mine production. Further, exploration activities are not guaranteed or revenue generating.

      As such, targeted financial incentives (including tax credits and deductions, direct grants, low-interest financing, equity financing, loan guarantees, elimination of burdensome fees, etc.) are reliable and understood policy mechanisms to incentivize more exploration investment, as they reduce the financial risk for companies undertaking already-risky investments. Other approaches may be considered to reduce fees paid by junior exploration companies (often operating with limited budgets). Examples can be provided upon request.

      In addition to prioritizing exploration, it was suggested that funding for restarts at sites under care and maintenance, brownfield expansions, or re-processing of mine tailings and Abandoned Mine Lands (while in the process of cleanup activities) should also be considered as these sites traditionally

can be restarted and expanded more quickly than other greenfield projects in order to meet more urgent mineral supply chain needs.

Financial tools and mechanisms, if targeted appropriately to avoid unintended consequences, will not only stimulate private-sector exploration activity but also help the U.S. build more resilient and diverse sources of critical minerals, which are essential for clean energy, defense, and high-tech manufacturing. It also sends a strong signal to our allies and adversaries of our nation's commitment to rebuilding domestic mineral supply chains.

4. Are there any other actions government should take to increase successful exploration?
    - Response: A clear and predictable regulatory framework covering exploration through mine development will support increased investments in mineral exploration. This includes:
        i. Improve permitting efficiencies by creating firm timelines for Environmental Assessments and Environmental Impact Statements, establishing clear lead agency coordination, and increased staffing of certain skills areas;
        ii. Prevent duplicative permitting reviews and evaluate existing agency regulations and guidance to create efficiency and transparency in the permitting process; and
        iii. Reduce exposure to litigation by limiting litigation timeframes and pursuing judicial reforms;

        Additionally, actions the federal government should take to increase exploration include:
        iv. Fully map domestic mineral endowment through USGS;
        v. Ensure access to mineralized federal lands for responsible mineral development;
        vi. Expand the use of NEPA categorical exclusions for certain classes of low-risk mineral exploration projects and expand acreage threshold;
        vii. Provide financial support for exploration activities at high potential sites, improving the bankability and valuation of projects; and
        viii. Supporting public/private partnerships to:
            - Fund research to use advanced data analytics on publicly available data sets for increasing the sophistication of exploration targets; and

- Find opportunities to expand and house geologic mapping and data analysis.

Mine Development

1. Which specific actions should we take, from the executive branch and congressional sides, to expedite NEPA and reduce lawsuit cost and time consumption?
    - Response: Respondents nearly universally cited permit timeframes, delays and litigation as impairing investment in domestic projects. A clear and predictable regulatory and judicial framework is needed to support domestic mining projects. Recommendations to improve the current framework are outlined below and relate to (1) permitting efficiencies; (2) judicial reform; and (3) addressing the Rosemont line of litigation.

      Permitting Efficiencies

      i. NEPA Recommendations
        - Agency regulations and policies should clearly articulate the appropriate scope of the effects analysis required by NEPA, as spelled out in Seven County Infrastructure Coalition v. Eagle County, Colorado, 605 U.S. _____, 145 S. Ct. 1497 (2025);
        - Agencies must adhere to new timelines, page limits and other provisions of the Fiscal Responsibility Act;
        - Agencies should expand use of programmatic (generic) environmental impact statements and tiering to expedite permitting;
        - Full implementation of the "One Federal Decision" framework described in Executive Order 13807 to make NEPA more efficient by Require all federal agencies with a role to use a single integrated review process;
        - Agencies must implement and enforce accountability mechanisms to ensure agency adherence to timelines, including cooperating agencies;
        - Use of mechanisms such as the Fixing America's Surface Transportation Act (FAST-41) provisions to speed mining and mineral processing projects;
        - Expanded use of categorical exclusions, especially for certain early-level mineral exploration activities, such as core drilling, trenching, and geophysical surveys with minimal surface disturbance, to speed mining projects;

- Limitations on use of "new information" that appears after public comment on draft documents that is frequently misused to delay projects;
- Expanded use of applicant provided EA and EIS documents and supporting studies to free agency resources for review of, rather than creation of, such materials to speed permitting processes;
- Greater agency reliance on existing data where appropriate, rather than requiring duplicative fieldwork, and acceptance environmental analyses conducted by states or tribes if those processes meet or exceed federal standards; and
- Reform the Federal Register notice process (Specific to DOI)
    a. Reduce delays associated with the NEPA notices required for mining projects (notice of intent to prepare an EIS/scoping, notice of availability of draft EIS, and notice of availability of final EIS) by decoupling the Federal Register notice publication process from the substantive review process and limiting notice reviews and approval to agency heads in the state where a project is located.

ii. Clean Water Act Permitting Recommendations
- Provide additional regulatory certainty through reform of CWA Section 401 to ensure states are not denying state certifications as a delay tactic through considerations of factors not intended by Congress; and
- Provide additional regulatory certainty through reform of CWA Section 404 to limit the Environmental Protection Agency's ability to preemptively or retroactively veto projects.

iii. National Historic Preservation Act Recommendation
- Agencies must establish and adhere to reasonable standards for acceptable level of effort by lead agencies conducting government-to-government consultations under NHPA Section 106 to avoid delays.

iv. Agency Resources
- Agencies must plan for and ensure sufficient staffing and resources for timely reviews; and
- Agencies must incentivize retention of specialists needed to review and approve permit applications,

especially in geographic areas where recruitment and retention are difficult.

Judicial Reform

i. Statute of Limitations
   - The six-year statute of limitations applicable to NEPA undermines investment certainty and must be modified to require challenges to be brought within 120 days.

ii. Standing Requirements
   - Standing requirements to bring suit must be strengthened to require a "direct and tangible harm to the individual" seeking to challenge a decision.

iii. Deterrence of Frivolous Lawsuits
   - Frivolous lawsuits should be deterred through the imposition of costs on litigants challenging projects by requiring posting of a bond upfront, payment of court costs or repayment of lost revenue if their case is not successful to discourage frivolous lawsuits (may require Equal Access to Justice Act revisions).

Rosemont Line of Litigation

i. Passage of the Mining Regulatory Clarity Act
   - Passage of the Mining Regulatory Clarity Act should be prioritized to address the disruptive impacts of the Rosemont decision from the Ninth Circuit Court of Appeals. In 2019, the Appeals Court vacated a plan of operations for the Rosemont copper mine in Arizona because the Forest Service failed to confirm the "validity" of mining claims before it approved the mining plan, upending more than 100 years of Mining Law interpretation and practice and more than 40 years of federal permitting and land management regulations.

2. Which other actions can we take to speed up mine development?
   - Response: Respondents highlighted a number of actions to speed mine development with numerous calls for government financial support (see response to question 3 below) as well as the need for a single government entity with the authority to coordinate mineral policies across the federal government. Respondents suggested the coordinating role could be achieved through the establishment of a permanent Special Assistant and supply-chain office at the Executive Office of the President to

serve as a single point of contact, ensuring consistent implementation and prioritization of nationally significant projects. Others recommended to reestablish a modernized version of the Bureau of Mines.

Other recommendations included prioritizing mine restarts that can come online more quickly than new or even brownfield projects and ensuring that environmental bonding requirements reflect the actual level of disturbance rather than worst-case scenarios. Finally, one respondent highlighted the need to address the regulatory uncertainty created by the ever-changing approach to Sage Grouse conservation that has disrupted mine development in the western U.S. States. The BLM has engaged in three different resource management plan amendments in the last ten years, some of which have included massive mineral withdrawals, making it difficult to plan for mine development with any certainty.

3. Are there any funding shortfalls we should address?
    - Response: Respondents identified a number of areas where government funding would facilitate development of mining projects. Recommendations fell within four primary areas related to government funding support, agency staffing, research and development partnerships and reclamation of abandoned mine sites. Regarding funding, respondents noted a number of funding mechanisms that could incentivize mineral production including grants, low interest loans/loan guarantees, offtake agreements and equity cost-sharing.

      Regarding agency staffing, respondents suggested that understaffing may be addressed by directing revenue from annual maintenance fees for mining claims to fund full-time or temporary agency positions, particularly resource and technical specialists. For R&D, respondents identified the need for funding and partnering (e.g., the Bureau of Mines played a key role in partnering with mining companies to conduct cutting edge research and development. Finally, one company suggested that Congress and relevant agencies leverage Good Samaritan legislation by (1) providing additional federal funding to assist in the reclamation of abandoned mine sites and (2) amending the statute to allow for reprocessing.

4. Do existing mines need any support to expand, go faster, or maintain operations?

- Response: Most responses related to the need for additional permitting efficiencies for mine expansions and were similar to the permitting responses above. Two additional recommendations were to fast-track minor modifications premised on Determinations of NEPA Adequacy and to encourage federal collaboration with state agencies to streamline their permitting processes.

5. What kind of marketplace development or price support would be helpful?
    - Response: While all respondents agreed that market developments or price support could be helpful, there were difference over which mechanisms would be most helpful. Some companies expressed support for tariffs on mineral imports particularly from China or other state-owned enterprises to allow U.S. companies to compete on a level playing field.

      Other supported mechanisms included sourcing requirements, direct production support through the Defense Production Act (to support U.S. mineral processing facilities in addition to U.S. mining operations), a guaranteed offtake quantity and bottom/floor purchase price. One company suggested the establishment of a capped capacity stability structure for certain minerals that could include federal support funds if price is less than a defined sustainable price and producer repayment of surplus funds when price exceeds a defined cap price. Other companies were hesitant to endorse price supports, suggesting that tax incentives, such as the 45X credit, may be a better/less complex option to support mine development.

Processing

1. For major CMs (rare earth elements, antimony, germanium, gallium, bismuth, etc.), what must we do to onshore processing?
    - Response: Traditionally, the upfront cost and permitting of mineral processing facilities has been prohibitive due to regulation, long permitting timeframes and lack of market certainty once in production (price and market manipulation by geopolitical adversaries). That said, there exist significant benefits of collocating mineral extraction and processing processes to help lower cost and reduce supply chain vulnerabilities. As such, the U.S. should absolutely pursue a robust domestic mineral processing supply chain.

Suggestions to support mineral processing projects in the U.S. include:

i. Large-scale centralized processing facilities to reduce costs and improve execution;
ii. Prioritizing the timely commissioning of facilities in key resource regions;
iii. Price supports for primary, secondary (byproduct), and mine tailings mineral processing (including price floors, revolving funds, purchasing and offtake agreements, sourcing requirements);
iv. Investment and production tax credits and government loans for construction of mineral processing facilities, developing innovative technologies, collocating refining, etc.;
v. Permitting reforms for mine development and mineral processing facilities;
vi. Utilization of existing tax credits, including 45X;
vii. Use Defense Production Act (DPA) funds to support U.S. mineral processing facilities in addition to U.S. mining operations;
viii. Employ domestic sourcing requirements and limit issuance of DoD domestic sourcing requirement waivers ;
ix. Re-task DOE National Labs to develop innovative mineral processing technologies and processes to improve the mineral refining process, lower costs, and allow for the widespread deployment of cutting-edge technologies; and
x. Incentivize first-mover and innovative processing technologies and R&D developed by individual companies;

As the U.S. continues to pursue regulatory policies and funding mechanisms to support domestic mineral processing supply chain, utilizing trade deals and strategic partnerships with allied nations can support mineral supply chains in the interim.

2. Which R&D specifically should we support, how much will it cost, and how soon can we expect results?
    - Response: The specific characteristics of individual minerals make this a difficult question to answer with relative certainty. Bottom line, innovation in both technology and modular plant design is critical to improving cost efficiency to be globally competitive.

      Some respondents suggested prioritizing specific minerals to process in order to focus limited federal capital where it will have

the most benefit. Others suggested investments in primary forms of beneficiation such as floatation, gravity separation, magnetic separation, and electrostatic separation to enable the processing of lower quality ore deposits and encourage onshore processing.

Additionally, here are two specific responses that may be useful:

i. Improvements in electrodialysis technology can be expected within 1 to 1.5 years, while longer-term innovations will be commercially viable in approximately 3 years. With government support, demo projects for new technologies could be in the field within a year.

ii. Direct funding of secondary circuits—from bench to commercial scale—tailored to specific feedstocks is essential. Efforts to specifically advance individual flowsheets and reduce the cost gap with PRC production via efficiency and technology gains is vital to facilitate individual projects and re-shore this necessary experience and IP.

For gallium, for example, targeted investment could provide near-term returns to solve onshoring that critical mineral within the next 4 years prior to the end of the term, by helping to derisk developing secondary gallium circuit development at existing facilities…

3. What must we do to ensure commercialization of this research? Public private partnerships? Government-funded pilot plants? Other?
   - Response: To achieve the overall goal of strengthening a robust domestic mineral processing supply chain, the Trump Administration should consider an "all of the above" approach. Ultimately if a private company invests, it will only do so if there is a reasonable expectation of economic returns.

     In addition to public-private partnerships and government funded pilots and demonstration projects, it was suggested that the NEDC establish a consortium of national laboratories, processing experts, mine resource developers, plant operators, and even academia to support the acceleration and scaling of processing technologies to ensure the transition to profitable operations. This will help to de-risk additional private investment and allow private companies operating within this space to better survive the cyclical nature of metal markets. It will also speed

the adoption of such mineral processing technologies in the open market.

4. How can we encourage private-sector investment into processing? (May differ from secondary circuits such as gallium versus entirely novel processes such as rare earths).
    - Response: It is important to recognize that the private sector is already actively investing in processing technologies and processes. That said, there must be an expectation of some financial return (i.e. the economics must work) or else the private sector will not pursue. Additionally, further investment hinges on verification and applicability of new technologies which can be cost prohibitive on a process-by-process basis.

      Mineral supply chain projects have traditionally been vulnerable to inefficient permitting and endless litigation creating indeterminable delays, which in turn, weakens investor confidence. This combined with aggressive price and market manipulation tactics by China and other geopolitical adversaries, make it difficult for significant investments to be made in U.S. mineral processing supply chains. Regulatory certainty and predictability in demand and offtake agreements would significantly benefit companies seeking to make significant investments in U.S. processing capabilities.

      Other specific recommendations include:
        i. Prioritization of technologies at higher technology readiness levels (TRL 8) over earlier-stage concepts (TRL 5) to accelerate meaningful investment;
            - Government support in these areas signals reduced risk and clearer commercialization pathways, making projects more attractive to investors.
        ii. Provide a 100 percent price floor for key defense minerals through DPA or DOE programs;
        iii. Ensure availability of a consistent supply of mineral feedstocks from domestic sources (and when not available, from reliable imported sources); and
        iv. Connect mineral processors with guaranteed offtake agreements.

Workforce

1. Which skillsets and how many workers with each are we lacking to shore up critical mineral demand?

- Response: Our members agreed that the nation faces a significant shortage of skilled workers essential to securing the mineral supply chain, from engineers and geologists to mechanics and instrument technicians. It is estimated that the mining workforce will need to double over the next decade to meet demand.

  There is a growing need for more college-educated workers specializing in mining-related fields. This includes traditional mine employees such as metallurgists, engineers (mining, chemical, mechanical, and electrical), geologists, hydrologists, and bacteriologists. There is also growing demand for workers trained in emerging technologies, including AI, computer science, and geographic information systems (GIS).

  While it is challenging to estimate the exact number of workers needed, this will become clearer as new mines and processing facilities are developed. Respondents said some skill sets are transferrable from other sectors such as oil/gas and construction, but there has been significant attrition in certain skills specific to mining.

2. Which actions should the government take to ensure we have skilled workers over the next 5-10 years? The Mining Schools Act would only provide $10 million, which seems insufficient.
   - Response: Mining school enrollment has dropped significantly; a concerted effort is needed to change the public perception of mining and further promote education on mining in classrooms. Strengthening K–12 STEM education is critical to sparking early interest in mining-related fields. Encouraging student engagement before they reach college will help grow the talent pipeline, which is why increased support for mining schools is so important. Members appreciated efforts to expand apprenticeships and skilled labor training programs to support new entrants, while offering upskilling opportunities for the existing workforce. Skilled labor could also be supported through incentivizing companies to establish workforce development plans, including paid internships, co-op placements, and on-the-job training in partnership with local training centers and industry partners.

     Members recognized that college is a significant investment and suggested establishing regional training hubs, modeled after energy-sector training centers, or international exchange

programs to give students more flexibility in where and how they gain a mining education. Suggestions to incentivize students to consider mining schools included increasing federal scholarship, fellowship, and loan forgiveness opportunities for students pursuing degrees in geology, metallurgy, mining engineering, or related disciplines.

To encourage private sector participation and investment, the government could offer tax credits or other incentives to encourage companies to partner with academic institutions and attract more students to mining majors. Respondents also pointed to programs like Idaho LAUNCH, which provides a tuition stipend for any Idaho high school graduate who enters a trade school.

3. Should we offer expedited green cards and bonuses to foreign engineers who bring trade secrets with them?
    - Response: Most respondents expressed concern that the U.S. currently lacks sufficient mining schools and students enrolled in mining programs to replace the aging workforce. However, they also pointed out that one of our greatest strategic advantages is that many of the world's brightest minds want to live and work in the United States. Foreign engineers, geologists, and scientists, whether they bring trade secrets, are essential to closing workforce gaps and ensuring the continued strength of our critical minerals supply chain.

      Some respondents specified between active mining professionals and mining students, saying that we should incentivize bringing in foreign talent but prioritize training US students, because foreign students may bring their knowledge back to their home country.