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Governor Sean Parnell
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May 24, 2011

The Honorable Steven Chu
Secretary
United States Department of Energy
1000 Independence Avenue, SW
Washington, DC 20585

Re: State of Alaska Comments on Rare Earth Elements and DOE Critical Materials Strategy

Dear Secretary Chu,

Thank you for the opportunity to provide comments in response to the Department of Energy (DOE) Request for Information on rare earth elements (REEs) and critical materials. The State of Alaska's comments are attached for your review. I urge DOE and the federal administration to take action now on the following important steps.

1. The United States Geological Survey (USGS) should partner with the State of Alaska to identify REE deposits in Alaska to build on work that has been previously conducted decades ago by USGS and the Bureau of Mines in Alaska.
2. The EPA and the Army Corps of Engineers should work together to streamline a difficult and time consuming federal permitting process.
3. DOE and Ames Laboratory should work with the University of Alaska (UA) and Alaska mine owners in the research and development of REEs.

In summary, the federal administration needs to focus on "turning dirt" on REE mines. With over 70 potential REE sites, Alaska is in a position to provide significant amounts of REEs to the nation. The federal government simply cannot afford to sit on the sidelines as other countries move aggressively to develop new mines and build a globally competitive research branch.

China currently exports 97 percent of the world's supply of REE's. China has issued a global warning that its REE reserves are diminishing, that supplies are needed for China's internal domestic use, and that countries should find their own supplies (*Deputy Secretary-General, Zhang Anwen, Inner Mongolia Rare Earth Guild*). China plans to slash their REE exports by approximately 35 percent in 2011. The federal administration must move aggressively to develop a domestic supply chain of REE's from new mines to manufacturing existing and new products, such as the magnets used in wind turbines and electric cars.

The Honorable Steven Chu

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Similarly, and perhaps just as important as a domestic supply chain, is the research and development of REEs. The United States is far behind China and other countries in the research and development of REEs and products. China recognized the importance of this area decades ago and still does: "Improve the development and application of rare earth, and change the resource advantage into economic superiority," said President Jiang Zemin.

I believe the University of Alaska would be a capable and productive partner for DOE and Ames Laboratory in the research of rare earth elements. The University of Alaska could participate in the research and development of new methods to create commercial grade rare earth permanent magnets. I understand DOE and Ames Laboratory recently reached an agreement with a rare earth mining company to study the research and development of innovative rare earth processing technologies. DOE should consider a similar agreement with mine owners in Alaska and with the University of Alaska. Please advise whether you believe these opportunities are workable for the University of Alaska.

Thank you for your work on rare earth elements and for the opportunity to comment on the critical REE research and development opportunities the State of Alaska can provide. I look forward to hearing your ideas on how the State of Alaska and DOE can work together for the benefit of Alaska and the nation.

Best regards,



Sean Parnell
Governor

Enclosure

RESPONSE TO DEPARTMENT OF ENERGY'S REQUEST FOR INFORMATION MARCH 22, 2011 -- CRITICAL MINERALS STRATEGY

Institution Name: State of Alaska
Institution Contact: Ed Fogels
Deputy Commissioner
Alaska Department of Natural Resources
550 West Seventh Avenue, Suite 1400
Anchorage, AK 99501
907-269-8431
ed.fogels@alaska.gov

The State of Alaska is pleased to submit the following information in response to the March 22, 2011 Request for Information by the United States Department of Energy, regarding Critical Minerals Strategy. This information is provided by the Alaska Department of Natural Resources and the University of Alaska. We have provided responses to Categories 1, 4, and 7 only.

Alaska is the most under-explored region for mineral deposits in North America, and is considered highly prospective with regard to strategic and critical minerals needed for domestic use. Our vast land base contains over 40 million acres (seven times the size of New Jersey) with indications of high mineral potential, with at least 70 known areas with documented potential to host REE deposits.

Alaska contains one of the most significant REE prospects in the United States: the Bokan Mountain/Dotson Ridge property. The property is currently ranked 15th in North America for total tonnage of contained rare earth metal oxides. However, unlike other U.S. deposits, Bokan Mountain is enriched in yttrium, dysprosium, and critical Heavy Rare Earth Elements, which are essential for the production of permanent magnets. The land position and permitting issues are favorable to mineral development.

Alaska has one of the most sophisticated mine permitting and regulatory systems in the nation. We have six large operating mines, all with exemplary environmental records. In 2010, the value of Alaska's total mineral ore exports was \$1.3 billion, with exports to China, Japan, Canada, Korea, and Spain. Over \$220 million was spent by companies exploring in Alaska.

We are already engaged in advancing Alaska's capacity to contribute REEs for national benefit. We are preparing a first-level study of our 70 known areas, we have initiated measures to reform and streamline our state permitting process, and we are partnering with new entrants to encourage private sector exploration, including at the Bokan Mountain deposit.

Category 1: Critical Material Content

The following Category 1 comments were submitted by the University of Alaska Fairbanks (UAF). The prime contact within UAF is Mark Myers, Vice Chancellor for Research, (907) 474-5837, mdmyers@alaska.edu.

Much of the information was gathered by Dr. Rajive Ganguli, Professor of Mining Engineering in the College of Engineering and Mines, who is leading the Rare Earth Element working group at

UAF. Also included herein is some information provided by Dr. LeAnn Munk at the University of Alaska Anchorage.

The Advanced Materials Group (AMG), in the Institute of Northern Engineering at UAF, has been pursuing rare earth based research on the development of high k dielectrics – yttrium oxide, and strained lattices by cerium doping. On the rare earth alternative research front – AMG has developed suite of solutions for crystal structure engineering by alloying MgO-ZnO as a substitution to gallium based alloys for UV radiation sensing – also a critical substitute for rare earth cerium for a specific absorption wavelength in the range of 320-380nm. Our capability includes state of the art, advanced materials processing techniques like ‘nano second pulsed laser synthesis,’ industry level ‘sputtering’ tool, and whole range of advanced level characterization (SEM, AFM, UV-Vis-NIR). Our research competence draws strength from a proven track record of over 25 publications and a patent on the process. At AMG, we have an Undergraduate Research Competition project based on the Rare Earth Materials Challenge for the National Defense.

In our study on the existing rare earth materials for specific applications in phosphors, white noise (stealth) and RF areas, the rare earth materials are found to have an advantage in their intrinsic 4f-3d electron configurations and electron transitions between those levels. *The average atomic size of the rare earth in the matrix plays the dominant role in determining the application and sensitivity which could be mimicked by non-rare earth substitution by tuning doping concentrations below the percolation limits.* Thus the research on new alternative materials for rare earths narrows down to chemical structural engineering by dynamic non-equilibrium processes like nano/pico second high energy pulsed laser synthesis of materials.

Stealth Technology

Present day laser stealth technology depends heavily on the rare earth oxides. The laser arms consist of two kinds: one is to emit laser to the objects, and then receive the reflective waves, such as laser telemeter, laser-guided apparatus, etc.; the other is the laser directly irradiating the targets. The targets are coated to nullify the laser intensity reflected by the targets in order to make the objects camouflaged. Doped Samarium oxide absorbs the 1.0 -10.5 μm laser thus making an irreplaceable material candidate in the stealth technology. However, infrared-laser- visible multifunctional stealth coatings doped with inorganic semiconductors, whose infrared emissivity was 0.5 - 0.9 at 8-14 μm and laser reflectivity for 1.05 μm was less than 0.4%- which are non-rare earth based can be explored as an alternative to samarium oxide.

Superalloys and Magnets

Neodymium is used as a rare earth dopant in the concentration range of 12-15 percent in NdFeB thin films for achieving superior magnetic properties with $B_r = 12:2 \text{ kG}$, $H_c = 9:9 \text{ kOe}$ and $(BH)_{\text{max}} = 35 \text{ MGOe}$. Such high energy density magnets are a critical enabling component technology in several emerging clean energy applications; most notably permanent magnets for vehicle traction drive motors and large direct-drive wind turbine generators.

The physical phenomenon that manifests in such a high magnetic coercivity is the alignment of Bloch walls associated with the anisotropic crystal order. The higher order cationic vacancies are known to provide the magnetic properties in non-ferromagnetic material systems by selective doping and alloying. By substituting Nd with Lu or Hf in similar concentrations it is possible to achieve similar magnetic properties. Similarly, yttrium in super alloys can be replaced by elements like Cr, or Al to obtain similar materials behavior. Such non-rare earth substitutes (for NdFeB) thin film permanent magnets can very well be implemented in the emerging green technologies for

micro-mechanical systems, micro-electronics, micro-magnetic devices, milli-nano size motors or actuators for higher efficiency, lower power consumption and enhanced agility. For example, yttrium alloyed silicon has been shown and industry adopted technology for strained layer relaxation which in turn could be developed by crystal structure engineering (doping with Ni) as highly coercive magnetic thin films in miniaturized motors for smaller electric vehicles.

Category 4: Research, Education, and Training

For this category, the State of Alaska has expertise both within our Division of Geological and Geophysical Surveys (DGGs), and within the University of Alaska Fairbanks (UAF). Both organizations have significant capacity, and work together.

Both DGGs and UAF have unique capacity in the use of remote sensing. In particular UAF has capacity in hyperspectral and Synthetic Aperture Radar. UAF has capacity for developing new tools and techniques, training experts and providing data. Large-scale projects, involving flying and interpreting airborne geophysical surveys, and conducting geologic mapping, geochemical surveys, and mineral-resource estimates, are typically run by DGGs.

Cooperative strategic materials/rare-earth-element programs will be developed between the DGGs and the University of Alaska, with specific roles defined for each agency, which are complementary and enhance the knowledge of Alaska's resources.

The following Category 4 comments were submitted by the University of Alaska Fairbanks (UAF). The prime contact within UAF is Mark Myers, Vice Chancellor for Research, (907) 474-5837, mdmyers@alaska.edu.

Much of the information was gathered by Dr. Rajive Ganguli, Professor of Mining Engineering in the College of Engineering and Mines who is leading the Rare Earth Element working group at UAF. Also included herein is information provided by Dr. LeAnn Munk at the University of Alaska Anchorage (UAA).

Our capacity on the various aspects of rare earth minerals include exploration, identification, and quantification of resources as well as the extraction and processing. Alaska has not been explored to a great extent for rare earth minerals (REM), despite known occurrences such as Bokan Mountain and Dora Bay and many REM anomalous areas across the state. Therefore, UAF and UAA (Dr. LeeAnn Munk) could contribute towards exploration activities including help quantifying known resources and looking towards geologically relevant areas that may contain REMs. Our expertise (including laboratory instrumentation and specialized software) spans airborne and on-the-ground capabilities including remote sensing, geophysics, and physical/chemical analyses of rocks (at nano/micro/macro levels), water, and secondary minerals that form in the near-surface environment. These capabilities are important to understanding the true nature of every deposit, since the feasibility of a deposit depends not only in the main elements present, but also in their association with other elements. This is especially true for REM given the laws surrounding handling of radio-active material such as thorium and uranium, two radio-active elements commonly found in REM resources. The second part of identification of resources includes their quantification. We have experts in geostatistics, neural networks, support vector machines, and 3D orebody modeling,

who can help quantify the resources. Finally, we also have the GIS capabilities to disseminate our findings.

The environmental footprint and economic viability of a given deposit would greatly depend on selected mining and mineral processing methods. REM are mined primarily using traditional methods (underground and surface), though some have been extracted using in-situ leaching. We have expertise (including laboratory instrumentation and specialized software) in various aspects of mining such as rock and soil mechanics (including permafrost), hydrology (surface and underground), ventilation, mine modeling, systems engineering, and economic evaluation. We also have expertise (including laboratory instrumentation and specialized software) in mineral processing, a key element in all REM resource evaluation. Unless the processing requirements of the REM resources are assessed, the indicated resources may be misleading. The mineral processing expertise also plays a role in exploring *in-situ* leaching possibilities for a deposit. With our expertise, we can also identify major environmental impacts to be expected from mining a deposit.

The environmental signatures of ore bodies are a major tool in the exploration. This is undoubtedly the case for REMs, although to date this area of research has lagged behind due to focus on more traditional metals such as Au, Cu, and Zn, among others. The development of REM deposits will also require an understanding of the potential environmental impacts including changes in water quality. In general rare earth elements (REE) tend to be quite soluble and remain in solution but that will be controlled by physical and chemical aspects of the environment.

Our expertise (including laboratory instrumentation and specialized software) not only includes the utilization of rare earth in microelectronics, but also in the search for rare earth alternatives.

The following Category 4 comments were submitted by the Alaska Department of Natural Resources, Division of Geological and Geophysical Surveys (DGGS). The prime contact within DGGS is Bob Swenson, Director and State Geologist, (907) 451-5001, bob.swenson@alaska.gov.

- **What personnel needs do you anticipate related to rare earths in the next ten years?
From where do you currently hire professionals with expertise in rare earth elements?**

The Alaska Division of Geological and Geophysical Surveys (DGGS) may need up to four new staff members to handle rare earth element (REE) issues in the next ten years. DGGS hires permanent staff through statewide and national level recruitment efforts. Temporary staff members are contracted through the University of Alaska or independent consultants.

- **How would you define “rare earth professional?”**

For the DGGS’ needs, a rare earth professional would need at least a master’s degree-level of knowledge in geology, with specialized training in geochemistry and the geology of ore deposits. A professional must know how to recognize and map host rocks and mineralized areas with the potential to host rare earth elements (REEs) in the field. The person must know how to select proper samples and geochemical-analytical techniques for analyzing REEs, and know how to interpret the resulting data. A rare-earth professional may also have additional expertise in mineralogy and the use of specialized scientific tools necessary for REE-bearing- and associated-

mineral identification and characterization. These tools and skills include using petrographic microscope, scanning electron microscope (SEM), electron microprobe, and instruments using X-Ray diffraction (XRD) and X-Ray fluorescence (XRF) analytical techniques.

- **What is your R&D budget relating to the materials identified as critical in DOE’s “Critical Materials Strategy” (dysprosium, neodymium, europium, yttrium, and indium)?**

Currently the DGGs expects to receive \$500,000 of State funds, over three years starting July 1, 2011, for an REE-specific project. Prior to the start of that program, R&D for the critical materials identified in the RFI is included in the general operating budget of the Mineral Resources Section at the DGGs.

- **What research (material design, material processing, component design, substitutes) do you support?**

The DGGs collects, analyzes, and makes available information on the geological and geophysical framework of Alaska. The DGGs’ ongoing Alaska Airborne Geophysical/Geological Mineral Inventory (AGGMI) program, with an annual State-supported budget of \$800,000, is designed to address the needs of Alaska for creating baseline geologic datasets related to mineral resources. The program first consists of flying airborne geophysical (magnetic, electromagnetic, and radiometric) surveys over areas of Alaska with perceived high mineral potential. These airborne geophysical surveys are then followed up by detailed (1 inch = 1 mile, or more detailed scale) geologic mapping, geochemical sampling, and mineral-resource assessments by the DGGs. The AGGMI program is focused on all non-fuel mineral resources within Alaska mineral districts, which contain various metals/mineral-deposit types (these deposits may contain REE and other critical and strategic metals). Although the AGGMI program is not specifically focused on DOE’s critical materials, in FY12, the DGGs expects to receive a three-year, \$500,000, State-funded REE/Strategic Minerals supplement to the AGGMI program. This supplement will allow the DGGs to expand the program to include: 1) digitally compiling literature data and historic industry data on known REE occurrences and REE sediment anomalies in Alaska, 2) identifying areas in Alaska with the highest potential for containing REE mineralization, and the highest need for new geologic data, and 3) conducting very limited, field-based geochemical sampling in one or two of these high-REE-potential areas to provide new baseline data for the public.

- **What complementary research would be valuable?**

The DGGs research for REE could be expanded to include: 1) flying airborne radiometric geophysical surveys, useful for identify U-Th-REE-(other critical materials) anomalies, over regions of Alaska with the highest potential for REE; 2) conducting geochemical surveys, utilizing modern geochemical-analytical techniques, to delineate anomalous concentrations of REE and other critical materials; 3) conduct geologic mapping to provide a framework for interpreting geophysical and geochemical anomalies; 4) conducting geologic studies to characterize known REE and critical mineral deposits; and 5) making all of this work publically available via the internet on the DGGs web site.

Complementary research on federal lands in Alaska by federal agencies such as the United States Geological Survey, the Bureau of Land Management and the United States Forest Service would be invaluable to assess the potential of Alaska for critical materials. A cooperative program by the DGGs and federal agencies could use a predetermined methodology to make a seamless dataset for users of the Alaska data.

- **What breakthroughs would be most beneficial?**

In Alaska, establishing baseline geologic datasets (geophysics, geologic maps, geologic studies, geochemical surveys, and resource assessments) are the first critical step to evaluating Alaska's mineral-resource potential, and for guiding mineral industry exploration efforts for critical materials and REE.

- **What courses or training programs are offered relating to critical materials?**

DGGs disseminates results of our geologic findings through public talks, posters, abstracts, and publications distributed for free on our web site. The attached DGGs publication on rare-earth elements, Information Circular 61, available at <http://www.dggs.alaska.gov/webpubs/dggs/ic/text/ic061.PDF>, is an example of one way DGGs disseminates information. DGGs has prepared or participated in presenting short courses in the past. A short course regarding critical materials in Alaska could be given in the future, especially if there is a significant amount of new information available. DGGs staff attend national and international conferences and attend short courses when appropriate.

Category 7: Mine and Processing Plant Permitting

The following Category 7 comments were submitted by the Alaska Department of Natural Resources, Office of Project Management and Permitting (OPMP). The prime contact within OPMP is Tom Crafford, Director, (907) 269-8629, tom.crafford@alaska.gov.

- **What are the mine and/or processing plant permitting steps in the United States (on federal, State or private land) or other nations? How long does each step take?**

Assuming that a proposed mining/processing project requires major federal permits (e.g., Clean Water Act Section 404 permit for disturbance to wetlands) or involves significant disturbance to federal lands, the project would be required to undergo an environmental review, probably an Environmental Impact Statement (EIS), under the National Environmental Policy Act (NEPA). Environmental baseline studies needed to fulfill the NEPA EIS requirements typically require about three years. The NEPA process for an EIS typically requires about two to three years and the State and federal agencies work simultaneously on their permit conditions so that the issuance of permits follows within several months of the conclusion of the EIS, assuming the project can be permitted. The combined environmental baseline studies and NEPA EIS process would therefore likely take five to six years. Adherence to this time frame is strongly dependent on the project proponent having a firm vision of their project, i.e., not making changes to the proposed project during the permitting process.

The State of Alaska has its own permitting requirements for major mines, including 1) Reclamation Plan Approval (required for State, federal, or private lands), 2) Plan of Operations Approval (required for State lands), 3) Integrated Waste Management Permit for mine waste storage facilities (required on all land ownerships), 4) Habitat permits for disturbances to fish-bearing waters (required on all land ownerships), 5) Dam Safety Certificate for all mine dam structures, both water dams and tailings dams (required on all land ownerships), and 6) Air Quality Permits (required on all land ownerships). The State's permitting processes dovetail into the federal NEPA process, and typically do not lengthen or delay that process.

- **What wastes are typically generated during the production of rare earth elements? How are they currently managed? How can the waste streams be reduced or eliminated?**

The State of Alaska has substantial experience permitting mining and mineral processing projects, but has not permitted any rare earth element (REE) projects. For a non-REE project, the mine wastes are waste rock from the mining process and tailings from the milling process. These waste materials typically contain metals at levels that require the approval of plans regarding the management, disposal, monitoring, reclamation, and closure of the facilities. Financial assurances are required to guarantee that reclamation and closure can be accomplished if the project operator defaults on its responsibilities to do so.

How the waste streams are managed is very site specific and is strongly dependent on the local meteorology, geography and habitat, as well as the size and type of the mining operation and geological and geochemical characteristics of the waste materials. REE mining/processing projects are likely to be substantially different than sulfide metal mining projects, where mill tailings are often stored behind a dam and underneath a cap of water. REE deposits also often contain appreciable amounts of fissionable (radioactive) elements (e.g., uranium, thorium) that may require special management, monitoring, and closure measures.

Waste streams can be reduced through selective mining practices, e.g., an underground mine is able to more selectively focus on extracting ore and produces less waste rock. Because underground mining is also more expensive per ton of material mined, the ore mined is typically higher grade, and therefore produces less milling waste (tailings) per ton of ore than do the lower grade ores that are typically mined via open pit techniques. However, the style of mining (underground or open pit and variations thereof) is generally determined by the nature of the orebody, i.e., each orebody typically lends itself to a particular mining technique, or narrow set of techniques.

While the State of Alaska does not have experience with REE processing facilities, the State does have strong experience in successfully permitting environmentally sound mining projects. We have some of the most experienced mine permitting staff in the nation within our agencies. Also, the University of Alaska has strong research capacity.

- **For facilities that could produce rare earth elements or other materials as a co-product or byproduct of another mining process, what additional permits are typically necessary?**

Permitting requirements for by-product production of REEs from existing mining projects would also be site specific. They could be very minimal, especially if a REE concentrate were produced and shipped offsite for processing elsewhere and little or no expansion of the project footprint were required. Conversely, if substantial new and different waste products were created that required different waste management practices/facilities and an expansion of the project footprint, then a new EIS or Supplemental EIS and permitting process could again take at least two to three more years.

- **What are the main challenges in obtaining permits?**

The U.S. has received low rankings for federal permitting and subsequent litigation of mineral development. Our experience here in Alaska sheds valuable light on the nature of this problem. Alaska has gone to great lengths to make its permitting system one of the most robust and efficient in the nation, but we can only improve so much without similar improvements the federal side. Permitting and NEPA reform should be pursued, especially with the EPA and USACOE.

Specific recommendations:

- Improve permitting coordination among federal agencies. The State of Alaska has developed a coordinated permitting system that has evolved and worked well over the last 20 years. Our system ensures that all State agencies are working well together throughout the lengthy and complex permitting processes for all large resource development projects in the state. The federal agencies have no analogous system.

Some federal agencies coordinate better than others. The USEPA Region 10 has a coordinator for mining projects, and consequently EPA has reasonably effective and efficient involvement in mining permitting. However, EPA lacks this strong coordination for the other sectors. Also, the other federal agencies do not have any formalized coordination at all.

We recommend that the federal agencies adopt a coordination model similar to Alaska's. A strong federal coordinator would not only ensure that the federal agencies are working well together during permitting, but would help establish an experienced permitting team within the federal agencies. Strong coordination would also help the federal agencies develop new procedures that could make permitting more efficient, such as better synchronization between the EIS process and ACOE 404 permitting.

- Federal overreach. Recently, there have been many examples of federal policies that complicate and unnecessarily burden the permitting process, especially here in Alaska, and in other mining states as well. Examples include:
 - BLM Wildlands initiative could effectively remove the last remaining federal multiple use land in Alaska and other mining states, and create more de-facto wilderness.
 - EPA's CERCLA 108b financial assurance initiative could preempt Alaska's strong mine permitting system, and those of all other mining states (and EPA readily admits that it will not devote the resources to create a comparable system).
 - EPA's use of the Aquatic Resource of National Interest policy in Alaska has stalled two significant projects here recently. The rationale that EPA has used for

designating ARNIs here in Alaska, and elsewhere, would readily apply to just about every water body in the state.

- Endangered Species Act designations are expanding to cover more and more of Alaska. For example, the USFWS recently designated nearly 200,000 square miles of critical habitat for Polar bears—this is an area larger than the state of California.

- **Do transportation costs, distances or regulations play a significant role in commercial competitiveness of rare earth material production?**

If transportation costs and distances were to be a major consideration for a REE project, it would probably be in relation to the movement of fuel, supplies, reagents, etc. to the project site. Since REEs are a relatively high value and low volume commodity, the cost of shipment of the produced REEs would likely not be a critical parameter. Environmental compliance costs (permitting, management, monitoring, reclamation, closure) could contribute substantially to production costs for a project.

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Governor Sean Parnell
STATE OF ALASKA

February 22, 2011

The Honorable Barack Obama
President of the United States
The White House
1600 Pennsylvania Avenue, NW
Washington, DC 20500

Re: Domestic Supply and Production of Rare Earth Elements

Dear Mr. President,

I appreciate your administration's recognition of the vital need to rapidly secure a domestic supply chain of rare earth elements (REE's). China produces approximately 97 percent of the world's REE's, but reduced its export quotas by 40 percent in 2010, and has already announced a further reduction of 11 percent in the first half of 2011. I believe the State of Alaska can be part of a solution for the nation.

First, Alaska has very promising supplies of REE's. My Department of Natural Resources (DNR) has performed a preliminary survey which found that Alaska has more than 70 known REE mineral occurrences. The Bokan Mountain site is one of the largest known REE deposits in North America and has significant deposits of the highly valued "heavy" REE's such as dysprosium. I have proposed funding to the Alaska Legislature for a comprehensive three year project to determine the potential of REE deposits on State lands. This project will include conducting geologic field work and developing Alaska-specific REE mineral deposit models. A copy of the most recent DNR report on REE's in Alaska is attached to this letter.

Federal government lands make up nearly two-thirds of the state, and it is not uncommon for State and federal lands in Alaska to be interspersed. Please consider directing the United States Geological Survey to conduct a similar inventory and geological field work project on federal lands in Alaska, and to work cooperatively with DNR. These two agencies have a long history of working very well together.

Second, as noted by Secretary Chu, the federal mine permitting system in the United States ranks as the least efficient or timely among 25 mining countries, requiring an *average* time frame of seven to 10 years to deliver a permit. This compares to Australia where permits are often issued in one to two years. In order to ensure an effective NEPA process, high ranking managers from federal agencies with decision making authority (particularly from the EPA) need to coordinate early and often with each other, permit applicants, and state agencies.

The Honorable Barack Obama
February 22, 2011
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Third, Alaska can contribute research assets as well. As noted by Secretary Chu, research and development is needed in several areas, including the production and manufacturing processes, and applications for REE products. (China has thousands of scientists and two research centers devoted to REE's.) The University of Alaska's Arctic Region Supercomputing Center already serves a main user of REE's, the Department of Defense. With the ability to solve up to 30 trillion arithmetic calculations per second, the supercomputing center provides a broad range of high performance computer services that could possibly be directed at research related to REE's.

Your Department of Energy and its national laboratory research system is already a leader in REE research. I will ask the University to contact and meet with representatives from the Department of Energy and discuss the possibility of using the arctic supercomputer center for REE research and development.

Finally, I urge you to work with Congress to review the merits of amending existing federal statutes to allow the Department of Energy authority to provide loan guarantees, grants, and tax credits for the general mining and processing of REE's. I also agree with Senator Murkowski and Senator Begich, who wrote Secretary Gates on January 28, 2011, to urge him to study and consider establishing a limited stockpile of REE's.

Please consider my suggestions. Decisive and rapid action now can secure a domestic supply chain of REE's. Our nation can look "North to the Future" to Alaska for solutions on REE's.

Best regards,



Sean Parnell
Governor

cc: The Honorable Dan Sullivan, Commissioner, Alaska Department of Natural Resources
John Katz, Director of Federal/State Relations and Special Counsel, Office of the Governor