

Strategic and Critical Minerals Assessment

FY2014 Request: \$2,500,000

Reference No: 51052

AP/AL: Appropriation

Project Type: Research / Studies / Planning

Category: Natural Resources

Location: Statewide

House District: Statewide (HD 1-40)

Impact House District: Statewide (HD 1-40)

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Estimated Project Dates: 07/01/2013 - 06/30/2018 **Contact Phone:** (907)465-2422

Brief Summary and Statement of Need:

This project provides important geologic data for assessing Alaska’s strategic and critical minerals (SCM) potential. It is needed to help the state address U.S. domestic needs for these essential elements. Many areas of Alaska are geologically favorable for hosting SCMs, but the lack of basic data hinders evaluation of Alaska’s SCM potential. Conducting field work and obtaining relevant geologic data will advance the state’s knowledge of its geologic resources, promote informed state management decisions and encourage mineral industry exploration.

Funding:	<u>FY2014</u>	<u>FY2015</u>	<u>FY2016</u>	<u>FY2017</u>	<u>FY2018</u>	<u>FY2019</u>	<u>Total</u>
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Total:	\$2,500,000	\$0	\$0	\$0	\$0	\$0	\$2,500,000

<input type="checkbox"/> State Match Required	<input type="checkbox"/> One-Time Project	<input type="checkbox"/> Phased - new	<input checked="" type="checkbox"/> Phased - underway	<input type="checkbox"/> On-Going
0% = Minimum State Match % Required		<input type="checkbox"/> Amendment	<input type="checkbox"/> Mental Health Bill	

Operating & Maintenance Costs:

	<u>Amount</u>	<u>Staff</u>
Project Development:	0	0
Ongoing Operating:	0	0
One-Time Startup:	0	0
Totals:	0	0

Prior Funding History / Additional Information:

Project Description/Justification:

WHAT IS THE ISSUE OR PROBLEM TO BE SOLVED?

Strategic and critical minerals (SCMs) are essential for our modern, technology based society. For example, platinum-group elements (PGEs) are extensively used in electronics and catalytic converters for vehicles. Rare earth elements (REEs) are necessary for military and high-technology applications, as well as clean/renewable-energy technologies such as wind turbines, solar panels, and batteries for electric vehicles. Current technology and system designs of U.S. defense systems depend heavily on REEs, for which there is a lack of effective non-REE substitutes.

The current U.S. Geological Survey (USGS) list of SCMs includes REEs, the PGEs, antimony, barium, chromium, cobalt, fluorine, gallium, graphite, indium, niobium, rhenium, tantalum, titanium, tungsten, and yttrium. The U.S. is more than 70 percent dependent on imports for 13 of these 16 elements and elemental groups, and 100 percent dependent on imports for 7. This leaves the U.S. vulnerable to disruptions in the SCM supply chain, particularly from unreliable and adversarial trade partners such as Russia and China.

The DGGs *Strategic and Critical Minerals Assessment* project provides information needed for comprehensively assessing Alaska's statewide SCM potential. Many areas of Alaska are geologically favorable for hosting SCMs, but the lack of basic data statewide hinders evaluation of SCM potential. Alaska has hundreds of known SCM occurrences, and millions of acres of selected or conveyed lands with the potential to contain SCMs, but the mineral-resource potential of these occurrences and lands is poorly understood; there has been no modern, systematic resource evaluation for SCMs in Alaska. The DGGs *Strategic and Critical Minerals Assessment* project is specifically designed to address this data and knowledge gap. By assessing Alaska's potential for SCMs, the State of Alaska will benefit from expanded mineral-industry investment in exploration and development and associated employment, better understand the natural resources of its lands for land-management purposes, and contribute to the nation's need for domestic supplies of these critically important elements.

WHAT IS THE SCOPE OF WORK TO BE PERFORMED?

This 5-year project will determine the potential of state lands for hosting SCM deposits. Planned work by DGGs includes conducting geologic field work throughout Alaska in areas known or suspected to have potential for these minerals, obtaining appropriate supporting data (geophysical surveys, geologic mapping, geochemical analyses, and other scientific data), evaluating currently available and newly collected data, determining Alaska-specific SCM ore-deposit models, communicating the results of our work to the public, and publishing all of the data and results of our studies on the DGGs web site (free access). Up to 8 non-permanent (Geologist and Natural Resource Technician-series) or contract positions are needed to implement this project.

WHAT RESULTS WILL BE ACHIEVED AND/OR PRODUCTS PRODUCED?

Mineral resources comprise a major part of Alaska's economic assets. The location and size of these resources are largely unknown, yet that knowledge is key to orderly development of the state and maintenance of a stable economy. The benefits of a thorough mineral-resource-information database include: 1) Enhancing community and local government economies and revenue opportunities; 2) Stimulating private-sector exploration and competitive development of Alaska's mineral resources; 3) Developing transportation corridors and infrastructures, which requires cost justification based on prior knowledge of resources; and 4) Developing long-term decisions on management of state-interest lands.

Specific products will include airborne geophysical surveys, geologic maps and reports, geochemical datasets, and numerous publications and presentations for public/industry outreach.

WHY IS THIS PROJECT NEEDED NOW – WHAT IS THE IMPACT OF REMAINING STATUS QUO?

The *Strategic and Critical Minerals Assessment* project is needed now to address U.S. domestic needs for these essential elements, which are often unexpectedly subject to supply restrictions. For example, until August 2012, the U.S. had no functional domestic rare earth element (REE) supply chain. The U.S. was nearly 100 percent dependent on imports of REEs and REE-bearing manufactured goods, primarily from China, which controls the REE market. China is rapidly building its high-technology industry to create domestic jobs, and is restricting export of REEs to reduce global competition and to leverage its supplies of REEs to force companies to move to China to have access to REEs. China's future export policies are unpredictable, but they are expected to favor China's domestic interests, needs, and economic development. In the next five years, the expected REE

production from China (and other international sources) is predicted to be insufficient for worldwide demand. This presents national security concerns for the U.S., whose military heavily relies on REE-based technology, and diminishes its ability to be the world's high-technology leader. In recognition of the importance of REEs, in August of 2012, the U.S. Department of Defense contracted a mineralogical and metallurgical study of the Bokan Mountain property in Southeast Alaska, which contains significant heavy-REE reserves.

In addition to REEs, similar reliance on imports and supply-demand imbalances are likely for the other SCMs as well. It takes many years for the mineral industry to explore for, identify, investigate, permit, and develop mineral resources. Without new SCM exploration and discoveries now, the U.S. may have difficulty obtaining the SCMs it needs in the near future. Alaska's statewide potential for hosting other SCM deposits is largely unknown and needs to be assessed.

The present lack of geologic knowledge about Strategic and Critical Minerals in Alaska is a formidable impediment to long-range planning for both the mineral industry and the State of Alaska. The lack of SCM-resource knowledge discourages private-sector investment in Alaska, and instead favors capital allocation to other areas of the world where comprehensive mineral-resource assessments exist or are being actively generated. Major mining companies rely on government-supplied exploration-scale (1:63,360) geological maps, and geophysical and geochemical surveys, to design and implement their exploration programs. Mining companies expect at least this level of effort from any government that seriously desires mineral industry investment. If the industry invests its exploration dollars elsewhere, the state will lose job-generation opportunities and future state revenues from mine production.

Without this project, the State of Alaska will continue to have limited information on SCM resource potential in the state, leading to poor land-management decisions. For example, as the state makes relinquishment decisions in the next few years regarding its federal land over-selections, it may unknowingly relinquish potential revenue-generating land that hosts SCM deposits.

WHAT ALTERNATIVES WERE CONSIDERED TO SOLVE THE ISSUE OR PROBLEM, AND WHY WERE THEY NOT SELECTED?

DGGS considered acquiring hyper spectral remote-sensing (HRS) data, but did not select this alternative for the following reasons: (1) DGGS surveyed industry representatives, who stated HRS would not be as useful to them as the proposed DGGS products; (2) alteration minerals associated with Alaska's mineral deposit types are not readily identified by HRS technology; (3) heavy vegetation cover in most areas renders HRS unusable; and (4) the cost-benefit ratio is not as high as the chosen alternatives.

SPECIFIC SPENDING DETAIL:

<u>LINE ITEM</u>	<u>DOLLAR AMOUNT</u>	<u>DESCRIPTION</u>
Personal Services	\$ 598,475	Partial support for existing permanent staff, and full support for non-permanent employees (per year)
Travel	\$ 31,000	Field work and meetings (per year)
Services	\$ 2,044,050	Field work and contract services; contract staff, geophysical surveys, field logistical services, scientific analyses, misc. contracts (per year)
Commodities	\$ 71,475	Helicopter fuel, field and office supplies (per year) and computers, software, additional office space/furniture (\$8,000 one-time in FY14)
PROJECT TOTAL	\$2,745,000	