Airborne Geological and Geophysical Mineral Inventory **FY2006 Request: $700,000**
Reference No: 6852

AP/AL: Appropriation
Project Type: Planning
Category: Development
Location: Statewide
Contact: Rod Combellick
House District: Statewide (HD 1-40)
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Estimated Project Dates: 07/01/2005 - 06/30/2006

Brief Summary and Statement of Need:
The Airborne Geophysical/Geological Mineral Inventory project seeks to catalyze private-sector mineral development investment. Alaska State lands that: 1) have major economic potential; 2) can be developed in the short term to provide high quality jobs for Alaska; and 3) will provide economic diversification to help offset the loss of Prudhoe Bay oil revenue. Mineral resources comprise a major part of Alaska's economic assets, yet the location and magnitude of these resources are largely unknown. Knowledge of the State's mineral resources is a key to orderly development of the state and maintenance of a stable economy.

Funding:	FY2006	FY2007	FY2008	FY2009	FY2010	FY2011	Total
Gen Fund	$700,000	$700,000	$700,000	$700,000	$700,000	$700,000	$4,200,000
Total:	$700,000	$700,000	$700,000	$700,000	$700,000	$700,000	$4,200,000

☐ State Match Required ☐ One-Time Project ☐ Phased - new ☐ Phased - underway ☑ On-Going
0% = Minimum State Match % Required ☐ Amendment ☐ Mental Health Bill

Operating & Maintenance Costs:

	Amount	Staff
Project Development:	0	0
Ongoing Operating:	0	0
One-Time Startup:	0	
Totals:	0	0

Additional Information / Prior Funding History:
See detailed project description for additional information.

Project Description/Justification:
Prior Funding History and Status:
Started in 1992, the project was originally designed to systematically acquire geophysical, and where necessary, geological data for about 40 million acres of state-owned uplands having high perceived mineral potential. The purpose and goals of this program have not changed. Candidate lands for this project have been identified on the basis of existing geologic knowledge, land ownership, and responses to solicitations for nominations from Alaska's mineral industry and Native regional corporations. To date almost 5.5 million acres of state-owned lands have been surveyed.
Table 1 lists previous appropriations for the Airborne Geophysical/Geological Mineral Inventory project.

Table 1: Previous appropriations

Fiscal year	Amount	Citation
FY05	$200,000	(SLA04/CH150)
FY04	$100,000	(SLA03/CH82)
FY03	$500,000	(SSSLA02/CH1)
FY02	$250,000	(SLA01/CH61)
FY01	$250,000	(SLA00/CH135)
FY00	$400,000	(SLA99/CH2)
FY99	$500,000	(SLA98/CH139)

FY98	$500,000	(SLA97/CH50)
FY97	$600,000	(SLA96/CH123)
FY96	$200,000	(SLA95/CH103)
FY95	$600,000	(SLA94/CH4)
FY94	$750,000	(SLA93/CH79)
FY93	$450,000	(SLA92/CH5)

The project is designed to coordinate the generation of airborne geophysical data with ground-based geologic surveys. The geophysical data are of limited effectiveness unless good geologic data are available to guide analysis and interpretation of the geophysics. If existing geologic data are inadequate, at least one additional year of ground-based field studies is needed to complete a project after geophysical surveying. To date geophysical surveys of some of the highest mineral potential tracts within 17 of 51 candidate areas have been completed (Table 2). During FY04 geologic maps for the Salcha River-Pogo and Livengood survey area were published. Using the FY04 appropriation, updated formats for geophysical maps and digital data were released for Fairbanks, Richardson, Circle, Nyac, Valdez Creek in FY04. A contract is ongoing to produce the same improvements for Nome, Rampart/Manley, Chulitna, and Petersville. The current ground-truth mapping project is in the Council survey area; a geologic map will be released in FY05. The next ground-truth area, to be initiated in 2005, will be Bonnifield. Previously authorized CIP funds are designated to support these geological ground truth activities. Unless additional funds are appropriated to initiate new airborne-geophysical/geological mineral surveys elsewhere, no new high mineral potential tracts will be geophysically surveyed in FY06.

Table 2. Status of work on previous and current geophysical/geological survey areas of mining districts.

Areas	Status
Fairbanks, Nome west, Circle, Rampart/Manley, U. Chulitna, Petersville	Airborne geophysical mapping completed; Ground-truth geological mapping completed
Ruby	Airborne geophysical mapping completed; Geological mapping available
Valdez Creek and Richardson	Airborne geophysical mapping completed; Partial geological map available
Nyac, west Bonnifield, and Broad Pass	Airborne geophysical mapping completed
Fortymile, Livengood, Salcha River/North Pogo, and Iron Creek	Airborne geophysical mapping completed; Scheduled ground-truth geological mapping completed
Council	Airborne geophysical mapping completed; Ground-truth in progress
Goodpaster	Airborne geophysical mapping in progress (will be completed in FY05)

Detailed Project Justification:

Mineral resources comprise a major part of Alaska's economic assets. The location and magnitude of these resources are largely unknown, yet that knowledge is key to orderly development of the State and maintenance of a stable economy. Experienced mineral exploration managers have characterized Alaska's present state of mineral development as analogous to that of the entire group of states west of the Rocky Mountains in the late 1800s. At that time a few major ore bodies had been found and prospectors had located hundreds of prospects but none of that region's scores of subsequent world-class mines had been discovered. Alaska is like that. We, however, have the opportunity, capital, and technology to expedite discovery if we so choose.

Alaskans cannot efficiently manage or develop assets that are unknown and not quantified. The present lack of geologic knowledge is a formidable impediment to long-range planning for both industry and the state. The lack of resource knowledge discourages private-sector investment in Alaska, and instead favors capital allocation to other areas of the world where comprehensive assessments exist or are being actively generated. Major mining companies rely on government-supplied exploration scale (1:63,360) geological, geophysical, and geochemical maps to design and implement their programs. They expect at least this level of effort from any government that seriously desires a mineral industry. Products and applications of a thorough resource information base 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 always requires cost justification based on prior knowledge of resources; and 4) Developing long-term decisions on management of state-interest lands.

The Airborne Geophysical/Geological Mineral Inventory Project is congruent with the Statutory and Legislatively mandated mission of DGGS to: "Conduct geological and geophysical surveys to determine the potential of Alaskan land for production of metals, minerals, [fuels, and geothermal resources]…" (AS 41.08.020). The current yearly Performance Measures for DGGS's mission to "Produce reliable new minerals-related geological and geophysical information" are to complete: "geophysical mineral surveys of 200 square miles" and "minerals-related bedrock geologic mapping of 160 square miles."

This project uses the most effective, practical, and efficient methods that exist for acquiring geologic data. Alternative approaches considered to encourage mineral exploration include the following:

1. Sole reliance on satellite or remote sensing imagery. Rejected because of inability to look beneath extensive ground cover and to provide unambiguous methodology for detecting subsurface mineralization, as well as low resolution. These techniques have recently been investigated by DGGS on other projects, and though useful for many items, do not work well for bedrock mineral exploration in Alaska.
2. Sole reliance on currently available data. Rejected because of general lack and quality of geologic data. Only about 15 percent of Alaska has adequate geological mapping; almost none has detailed geophysical surveys.
3. Sole reliance on ground-based field investigations. Rejected because of protracted time necessary for such an approach (decades) and because it provides no subsurface information. Time and expense is greatly increased and the quality of maps produced without geophysical data is almost always severely limited.
4. Sole reliance on airborne geophysical methods. Rejected because geophysical anomalies alone cannot be interpreted without geological and geochemical control.
5. An integrated approach, with detailed airborne geophysical surveys and ground-based geological/geochemical investigations of high priority areas. This approach allows the inventory to be completed in an acceptable time and to discriminate between barren and resource-prone terranes.

The project has been successful in catalyzing private sector investment and job generation at a level that far surpasses the cost of conducting the surveys. Jobs for the Alaskan public are created both as a direct result of the project's execution and as a result of the knowledge generated during the project about Alaska's mineral resources. During execution of the project immediate jobs are created in the private sector; 93% of a $700,000 CIP allocation goes to the private sector in the form of geophysical, helicopter, logistical, lodging, analytical, and various small contracts. Jobs are also generated in the private sector from the typical increase in the amount of exploration dollars spent and in the number of mining claims staked.

The true economic benefits in terms of job generation or revenue for the State of this project are impossible to predict. Although mineral development is a high-risk enterprise, there is a good probability that several of the prospects identified with the help of data generated by this project will become major mines and thus return the amount of the State's data generation investment a hundred fold. A similar investment in geologic knowledge in 1982 contributed to the ultimate development of the Fort Knox gold mine near Fairbanks. Fort Knox Mine has a workforce of 360, creates an annual total of $107 million in local purchases and creates 312 indirect jobs in the Fairbanks area. About $4.4 million of local property taxes are generated annually by the mine and its employees since 1997. Average residential electricity rates in the area have been reduced by about 7 percent because of the mine. These economic benefits to Fairbanks and Alaska are currently estimated to last 14 to 16 total years. Similar economic benefits for Fairbanks and Delta Junction are expected after the development of Pogo mine.

The budget estimate for this project is based on past Geophysical/Geological Mineral Inventory projects. No new positions are created as a result of this project. DGGS will designate a portion of the CIP funds as a state match for federal funds within the federal State Map National Cooperative Geologic Mapping Program, further increasing the amount of money that goes into the public sector (helicopter contracts and field logistics, etc).

Why is this Project Needed Now:

The Airborne Geophysical/Geological Mineral Inventory Project encourages resource development, creates Alaska jobs, and helps provide revenue to the State and to municipalities. We think this project is the most cost-effective method for State government to increase knowledge that will aid the mining industry and enable planning for resource development planning and management. For the past ten years, the project was funded through CIPs at an average of 0.4 million dollars a year for a total of $5.3 million dollars. This is a strategic and effective investment in a program that aids in identifying mineral resources valued at contributing $10.0 billion to the state's economy for the years 1994-2003 and over $15 million dollars in direct revenue to the State and municipalities for items like mining license fees, royalties and rents in 2002. Over 2800 people were employed in the mineral industry in Alaska in 2002 at an estimated job value of $168 million. Those numbers are expected to increase to 4000 jobs and a value of about $240 million by 2006. It takes years to explore, identify, investigate, permit, and develop mineral resources. Without further exploration and discoveries, the amount of money generated by the mineral industry in the State and the number of jobs will significantly decline.

Products from this project allow the state to look beyond the short-term rise and fall of commodity markets in formulating mineral-resource policies and in responding to related issues, such as land trades, corridor development, and area plans.

Specific Spending Detail:

Contingent upon funding levels, DGGS proposes to conduct airborne geophysical surveys in FY06 in one or more of the areas listed below. Cost of the surveys varies depending on each tract's size, location, and bid responses from geophysical services vendors. In the past, geophysical/geological surveys of single minimal but reasonably sized tracts have required about $400,000 to $500,000 in CIP funds, augmented by Federal Receipts and General Funds from the operating budget. Due to increases in helicopter costs during the past three years, the cost of both the geophysical surveys and the geologic field projects has significantly increased. $700,000 in CIP funds is requested for FY06. Approximately 25 percent of a $700,000 CIP allocation would be designated as a state match for federal funds within the federal State Map National Cooperative Geologic Mapping Program, further increasing the amount of money that goes into the private sector in the manner of helicopter contracts and field logistics. Funding the project at a lower level, such as $200,000, causes a significantly higher cost per square mile of area surveyed, due to fixed costs unrelated to survey area size, and requires a larger percentage proportion of the funds (about 50 percent) designated as state match for federal funds.

Line Item Expenditures:

Personal Services	$32,000	One student intern & partial funding for existing geologist/geophysicist.
Travel	$8,000	Travel/per diem for monitoring survey, releasing data, & geologic field crew
Services	$654,000	Geophysical survey, helicopter, lodging, small miscellaneous contracts
Commodities	$6,000	Plotter paper, misc. field & office supplies, helicopter fuel
Capital Outlay	$0	None.

Areas considered for FY06 include: 1) Fairbanks mining district, including parts of the Boundary and Wolf Creek 2004 burn areas, Interior Alaska, 2) Richardson / Black Mountain area, Interior Alaska, and 3) Kougarok and northern Nome districts, Seward Peninsula. Products resulting from these surveys would include 1:63,360-scale (inch-to-a-mile) 1) aeromagnetic and airborne-electromagnetic maps, 2) bedrock and surficial geologic maps, and 3) various other supporting data compilations, such as geochemistry.

Project Support:

Local communities, Native corporations, private resource industry, Alaska Minerals Commission, Alaska Miners Association, regional borough governments, Department of Commerce and Regional Affairs, and Department of Natural Resources support the project. Three surveys were conducted in cooperation with the Bering Straits Native Corporation and Sitnasuak Village Corporation, Calista Native Corporation and Doyon Native Corporation. As owners of large tracts of land intermingled with state lands, they contributed various combinations of services, private geoscience data files, and funding to support the surveys.

Project Opposition:

None known.