

Oil and Gas Geologic Data for New North Slope Exploration **FY2006 Request: \$145,000**
Targets **Reference No: 39988**

AP/AL: Appropriation **Project Type:** Planning
Category: Development
Location: Statewide **Contact:** Rod Combellick
House District: Statewide (HD 1-40) **Contact Phone:** (907)451-5007
Estimated Project Dates: 07/01/2005 - 06/30/2007

Brief Summary and Statement of Need:

Alaska's North Slope remains the most promising onshore oil and gas province in North America. However, successful new exploration increasingly depends upon high quality geologic data. This project will investigate the petroleum geology across the central and eastern North Slope, evaluating the potential for new exploration targets. The proposed geologic evaluation will improve our understanding of the petroleum system by integrating new geologic information into a regional framework. Reliable new geologic data will encourage exploration capital investment in the State of Alaska, particularly by smaller independent oil and gas companies who rely heavily on our publicly available technical reports.

Funding:	FY2006	FY2007	FY2008	FY2009	FY2010	FY2011	Total
Gen Fund	\$145,000	\$265,000					\$410,000
Total:	\$145,000	\$265,000	\$0	\$0	\$0	\$0	\$410,000

<input type="checkbox"/> State Match Required	<input type="checkbox"/> One-Time Project	<input checked="" type="checkbox"/> Phased - new	<input 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
<u>One-Time Startup:</u>	<u>0</u>	<u>0</u>
Totals:	0	0

Additional Information / Prior Funding History:

This is a new project request.

Project Description/Justification:

INTRODUCTION

Northern Alaska is a world class petroleum province and it is estimated that future drilling will discover at least 36% of the United States' remaining reserves of oil and gas¹. Despite more than 35 years of drilling, the North Slope remains underexplored relative to other sedimentary basins around the world. In order to capitalize on this enormous resource, new exploration will require high quality geologic data. The primary purpose of this project is to acquire a comprehensive new geologic data set that will catalyze new private-sector oil and gas exploration beyond the core Prudhoe Bay area.

All data collected during this project will be publicly available via DGGS technical reports and other peer-reviewed scientific literature. These publications are highly valued by oil companies exploring for oil and gas in northern Alaska, particularly by smaller independents that often lack the proprietary database to effectively explore. Establishment of a more robust knowledge of North Slope geology will provide an incentive to companies seeking to reduce their investment risk. Many foreign governments provide voluminous publicly available geologic data to entice companies to explore for oil and gas resources. Increasing the availability of high-quality data will make the exploration landscape in Alaska more globally competitive and attractive to new companies.

FUTURE EXPLORATION TARGETS

Exploration for new oil and gas resources is fundamentally driven by geologic data. For example, the largest onshore discovery in North America in almost 20 years (Alpine Field) was the result of a novel geological model based on interpretations of new technical data. Despite many nearby wells drilled in previous years, this new type of oil accumulation in northern Alaska awaited a different exploration concept based on improved geologic understanding.

Exploration interest in northern Alaska remains strong, as suggested by aggressive bids totaling \$53.9 million during the recent 2004 lease sale in northeastern NPRA. However, exploration activity could be considerably improved by attracting new companies to invest in Alaska. The future of oil and gas exploration in northern Alaska will depend on high quality geologic data and the timely application of new geologic concepts. The purpose of this project is to collect valuable data and provide a framework to guide these exploration efforts. This project will focus on analyzing important outcrops and constructing geologic models for the depositional history of key stratigraphic intervals. In particular, this work will synthesize widely spaced geologic observations from across the North Slope. This regional perspective is acutely needed and will fill a gap in the publicly available data on the petroleum geology of northern Alaska.

PROJECT PLAN

The project will acquire new geologic data salient to the North Slope petroleum system. Field studies will be phased over two years and focused on integrating new data with existing data collected from the central and eastern North Slope. The project objectives will be accomplished through completion of the following work plan:

- ? Conduct detailed field work to clarify critical stratigraphic relationships
 - o Local geologic mapping
 - o Detailed measured stratigraphic sections
- ? Collect data on reservoir units and evaluate resource potential
 - o Reservoir geometry, quality, and diagenetic history
 - o Rock composition (provenance)
 - o High resolution stratigraphic age control
- ? Analyze oil- and gas-prone source rocks
 - o Source rock distribution and quality
 - o Stratigraphic correlations and age constraints
- ? Interpret and summarize overall geologic evolution of the North Slope sedimentary basin
 - o Construct regional geologic maps and cross sections
 - o Analyze basin-wide structural history (folding and faulting)
 - o Integrate available surface and subsurface data

DGGS MISSION & STATE BENEFITS

The Energy section within DGGS is ideally suited to conduct this project and has led most of the field-based geologic research on the North Slope in the last decade. The proposed project builds on this experience, including a previously authorized CIP project undertaken in the central Brooks Range foothills². However, the new geologic research proposed here represents a new and unique evaluation (both topically and geographically). Phase II of this project (FY07) will complement DGGS Energy section geological mapping in the Mt. Michelson quadrangle (funded by federal receipts and state matching funds). The sharing of logistical resources and equipment between projects has historically proven a very cost-effective strategy for conducting field studies in remote portions of Alaska.

This project is consistent with DGGS' mission to "...conduct geological and geophysical surveys to determine the potential of Alaskan land for production of metals, minerals, fuels, and geothermal resources...³". Furthermore, this study fulfills DGGS' charge to "enhance Alaska's natural resources by collecting, archiving, and distributing the geological information that will catalyze private-sector energy- and mineral resource exploration and support wise land-use decisions⁴". The fundamental geologic data generated in this study will also provide critical unbiased information for State agencies responsible for managing Alaska's petroleum resources.

The reduction in oil-generated revenue has adversely affected Alaska's economy. This project is expected to encourage new exploration, thus accelerating capitalization of the state's petroleum resources and indirectly contributing to future revenue payments to the State of Alaska. Execution of this project will directly benefit the private sector through the employment of Alaska-based consultants. More than 80% of the expenditures in this proposal will be spent in Alaska, benefiting state commerce (a small portion goes to outside laboratories for sample analyses). Potential long-range

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economic benefits of this applied geologic research include the generation of additional incentive for the construction of a gas pipeline.

REFERENCES

- ¹Department of Interior national estimates (studies by the USGS and MMS)
- ²FY2005 CIP "Reservoir Potential for gas in the Brooks Range Foothills" Ref. # 37736
- ³Alaska Statute 41.08.020
- ⁴State of Alaska FY2005 Governor's Operating Budget, DNR component summary

Why is this Project Needed Now:

Alaska is at a crossroads in its history of oil and gas exploration and development. As the petroleum province matures, and infrastructure expands, many smaller independent companies are venturing into Alaska. During this critical transition, this project will serve to encourage these companies by providing a timely, comprehensive data set to help offset the high cost of exploration, and difficulty in training their staff in the geology of the North Slope. The negative impact of not proactively encouraging new exploration is to see companies invest their exploration capital in other countries whose governments are producing high quality, publicly available geologic data.

Specific Spending Detail:

The following budget is based on extensive agency experience in conducting remote field work under logistically challenging conditions.

Line Item Expenditures:

100 Personal Services		
?	Partial funding for existing permanent staff	\$25,000
?	Partial funding for student intern	\$7,500
200 Travel		
?	Per diem for geology field crew	\$2,500
?	Travel to industry meetings to present results and promote North Slope exploration	\$3,500
?	Travel to petroleum geology training by division personnel	\$2,500
300 Services		
?	Helicopter contract (Bell Jet Ranger 206)	\$36,000
?	Fixed-wing charters for personnel and equipment	\$2,500
?	Field lodging contract (Kavik remote field station)	\$12,000
?	Consulting petroleum geologist (expertise in reservoir analysis)	\$10,000
?	Gamma Ray Spectrometer (leasing)	\$3,000
?	Scientific analytical contracts	
	Organic geochemistry	
-	Oil source rock analyses	\$2,000
-	HC extract and source typing	\$1,000
-	Vitrinite thermal maturity	\$1,000
	Reservoir quality	
-	Diagenetic analyses	\$4,000
-	Porosity & permeability	\$1,000
-	Thin sections	\$2,000
	Age data	
-	Micro- and mega-fossil paleontology	\$5,000
-	Ar/Ar geochronology of ash beds	\$2,000
-	U-Pb geochronology of detrital zircon	\$5,000
	Inorganic geochemistry	
-	Trace and major element of mudstone	\$2,500
-	Whole rock paleosol geochemistry	\$1,500
-	Oxygen stable isotope of quartz	\$500
400 Commodities		
?	Helicopter fuel (Jet A)	\$8,000
?	Maps, air photos, digital media storage, sample bags, misc. field and office supplies	\$2,000
?	Portable field computer	\$3,000

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Project Support:

Major and independent oil companies
Oil and gas support industry
Regional Native corporations
Alaska Division of Oil & Gas

Alaska Oil & Gas Conservation Commission
U.S. Bureau of Land Management
U.S. Geological Survey
U.S. Minerals Management Service

Project Opposition:

None Known