

Reservoir Studies for North Slope and Cook Inlet

FY2011 Request: \$3,500,000

Reference No: 49193

AP/AL: Appropriation

Project Type: Research / Studies / Planning

Category: Natural Resources

Location: Statewide

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Estimated Project Dates: 07/01/2010 - 06/30/2013

Brief Summary and Statement of Need:

This request will fund geologic and dynamic reservoir modeling of North Slope and Cook Inlet oil and gas reservoirs, which will be used: 1) for decisions related to tract allocations and equity redeterminations for state royalty revenue; 2) to advance understanding of undeveloped reservoirs; and, 3) for resource use decisions including the amount of North Slope natural gas to use for oil recovery. As an example of the benefits of reservoir modeling, a recent study led to a re-determination of the North Star Unit, and resulted in an additional \$100 million (net present value) in future royalty revenue for the state.

Funding:	<u>FY2011</u>	<u>FY2012</u>	<u>FY2013</u>	<u>FY2014</u>	<u>FY2015</u>	<u>FY2016</u>	<u>Total</u>
Gen Fund	\$3,500,000						\$3,500,000
Total:	\$3,500,000	\$0	\$0	\$0	\$0	\$0	\$3,500,000

<input type="checkbox"/> State Match Required	<input type="checkbox"/> One-Time Project	<input type="checkbox"/> Phased - new	<input type="checkbox"/> Phased - underway	<input checked="" 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

Additional Information / Prior Funding History:

SLA08/CH29 \$ 4,000,000 Ongoing

Project Description/Justification:

The Division of Oil and Gas (DOG) is responsible for managing oil and gas development on state lands. As such, this mandate requires DOG to maximize state revenue by assuring lands are developed in a timely manner. This request will fund geologic and dynamic reservoir modeling of North Slope and Cook Inlet oil and gas reservoirs that serve as the basis for development decisions. Results from these studies will enable the DOG to answer critical questions with respect to the state's oil and gas reserves by providing:

- A basis for decisions related to the use of natural gas to maximize oil recovery prior to delivering gas to markets
- An understanding of oil and gas distribution from North Slope and Cook Inlet reservoirs to make informed decisions when dealing with tract allocations and equity re-determinations for state royalty revenue
- An understanding of undeveloped reservoirs to guide resource management decisions that serve the state's best interests

The funds provided in this project will allow DOG to hire consultants to analyze reservoirs on the North Slope and in Cook Inlet. The nature of resource evaluation requires technical experts to perform state-of-the-art mechanistic and deterministic three-dimensional (3D) studies. A static model is created from thousands to hundreds of thousands of pieces of data. A dynamic reservoir model is created and populated with data that describe the rock and fluid (oil, water and gas) characteristics over the range of pressure and temperature conditions. In addition, the layers of the reservoir are described as thousands of cells with length, width and height dimensions. All of the mathematical fluid and flow relationships are put in the 3D computer models to calculate and match reservoir history. After a history match, the reservoir dynamic model is used to predict future performance and recovery of oil, water and gas. Enhanced oil recovery processes are also included to predict and estimate the impact on recovery. Both the static and dynamic models may be modified to attain a better history match and improve model performance.

The results from predictive model runs are used to calculate where production originates in the reservoir, and under which leases. In this manner, equity in a producing reservoir is established by calculating volumes recovered from each owner's lease and the resulting royalty volumes are determined. Differential lease royalty terms and different mineral estate owners' equity stakes must be accurately determined. On occasion, the state may wish to perform their own model studies to audit the unit operators' work or to evaluate a disagreement on where hydrocarbons are produced and how much is allocated to each equity owner and mineral estate owner.

Oil and gas producers typically conduct these studies for stakeholders, but there are occasions when the stakeholders do not agree or align on technical and commercial issues. It is in the state's interest to perform due diligence studies to assure the state's interest is protected and to verify and validate the producers' work. A recent study disputed a producer's work, resulting in an additional \$100 million in state revenue (net present value).

Resource evaluation efforts on projects such as Alpine Tract Allocation Redetermination, CRU Satellite Tract Allocation, Prudhoe Reservoir Studies, Pt. Thompson Issues (settlement, potential re-leasing, facilities research, etc), and Cook Inlet Gas studies cause variable work load and also often require technical resources not currently available in the Division. The highly specialized and detailed nature of the reservoir model studies requires hiring consultants who routinely do this work and have abundant technical experience. Their expertise often extends to similar reservoirs and they can draw on worldwide experience in addition to have individuals working with state-of-the-art techniques and software.

Why is this Project Needed Now?

Without the funding, the Division of Oil and Gas will have to rely on oil and gas producers' technical models to evaluate the state's position. Often, the parties' interests are not aligned and there is potential for state interests to be subjugated to the producers through their control of the analysis and greater personnel, software, and technical service resources.

Specific Spending Detail:

<u>LINE ITEM</u>	<u>DOLLAR AMOUNT</u>	<u>DESCRIPTION</u>
Travel	\$ 25,000	Travel and per diem to work with contractors
Services	\$ 3,275,000	Contract Services
Commodities	\$ 200,000	Software / Licenses

Project Opposition:

Industry will likely object because it is in their interest to control all aspects of technical and commercial dealings on oil and gas issues with the state.