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## Translating 2D Seismic to New Oil and Gas Resources

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### Summary

Considering the challenging times in the Canadian Oil and Gas industry for the geophysical profession, this talk will highlight the successful and value added application of geophysical processing and interpretation on behalf of a Canadian oil and gas company in Southeast Asia. The work processes will be outlined and the economic value they add will be highlighted throughout the presentation. In addition, the newly identified oil and gas resources will be quantified which, in the future, may trigger the beginning of hydrocarbon independence for that country.

### Introduction

The relevant geology, stratigraphy and structural regimes will be presented as a backdrop to the geophysical reprocessing, mapping and analysis of recently generated prospects over a Laos oil and gas concession. The closest production is from the SinPhaHorn gas field to the west on the Thailand side of the basin. The field was discovered in 1983 and currently produces 90 Mmcf/day. A total of 2600 km of 2D legacy seismic lines have been acquired over the concession area covering 2.9 million acres and have been integrated into the interpretation and mapping.

### Method

Following initial 2D seismic mapping with limited amounts of historical data, additional 1990's seismic data was obtained from the local government. In 2015 modern processing techniques and innovative field survey reconstructions including crooked line geometry, advanced noise attenuation, manual first break picks, advanced tomography, pre-stack time migration and spectral balancing were then applied to the dataset to delineate earlier identified prospects. As a result of this, the 1990's seismic data could then be utilized to map the area.

This updated mapping will be shown as well as the value it has added in terms prospect delineation, subsurface image improvement, risk reduction and cost savings in lieu of having to re-acquire the 2D seismic again in the field. The project economics will be discussed as a result of an independent engineering assessment which required the input of the seismic mapping, geological reservoir parameters, engineering production estimates, and oil and gas prices in the area.

### Examples

These methods were applied to the four newly mapped prospects which range from 1500 to 2500 metres in depth. One of the results of the reprocessing effort is shown below and compared to the original subsurface image (Figures 1 and 2).

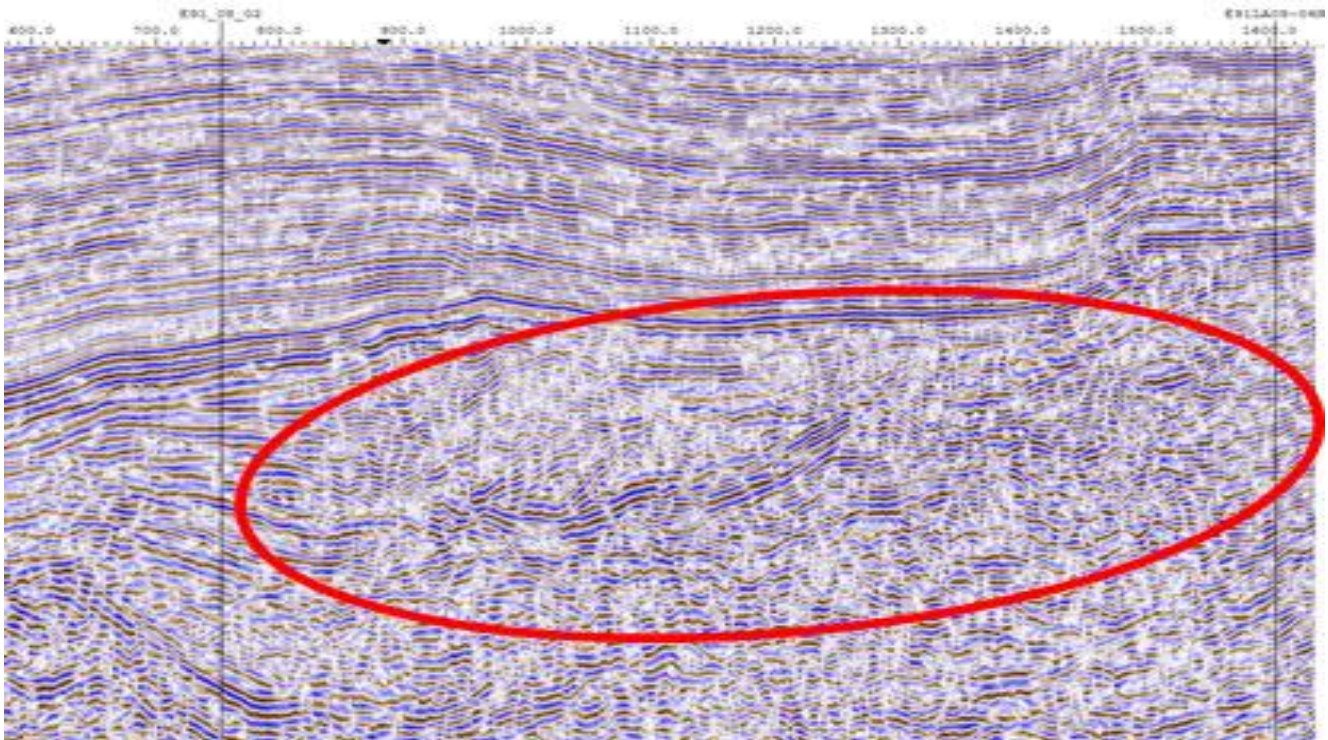


Figure 1: Historical 1990's processed data used in previous interpretations; red oval indicating zone of interest.

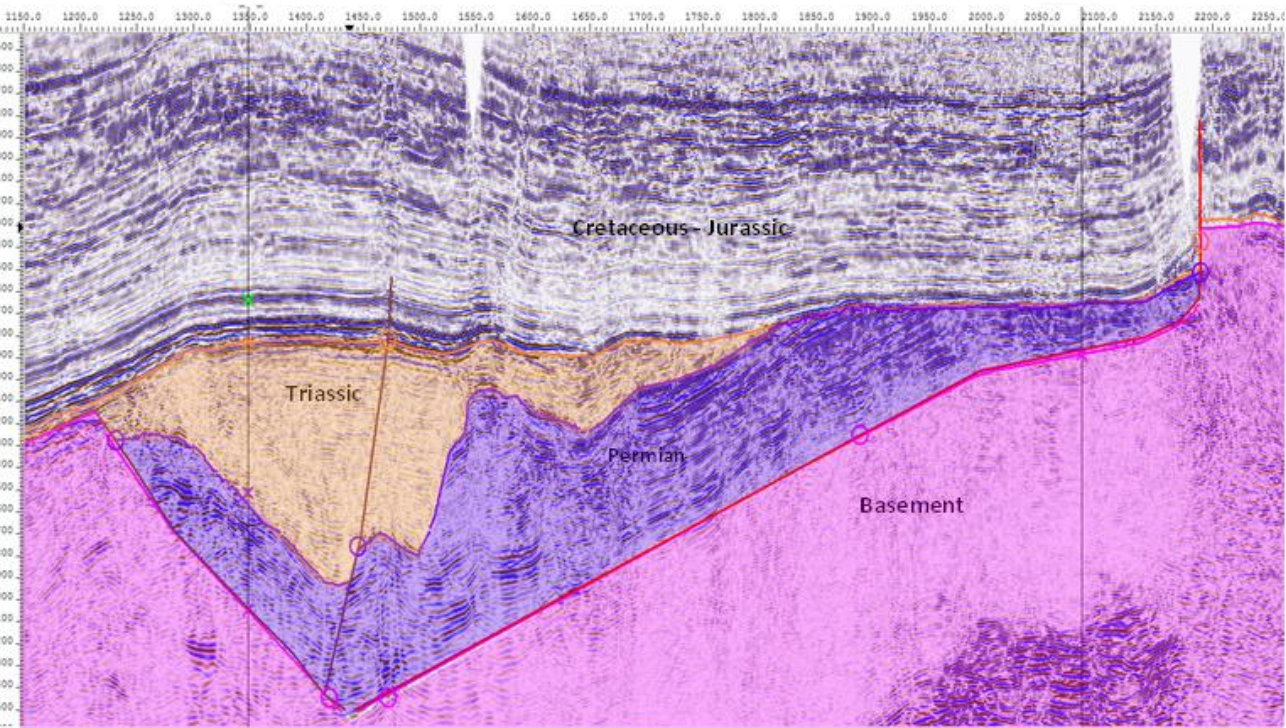


Figure 2: Interpreted 2015 reprocessed data highlighting improved subsurface imaging in the zone of interest.

## Conclusions

These innovative reprocessing techniques and mapping resulted in improved prospect delineation, subsurface image improvement, drilling risk reduction and significant cost savings to the company since the 2-D seismic didn't have to be re-acquired. In addition, four new prospects were added to the company resource inventory (36 Tcf, P50 Risked) and two new geological models were created for the area. If hydrocarbons are discovered in Laos, it will be the first commercial oil and gas production in the country.

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