Interpretation Report Relating to the Purchase of Line FLT-4X

EL379

Kotaneelee Anticline

Northwest Territories

NORCEN ENERGY RESOURCES LTD.

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INTRODUCTION

This report details the interpretation of approximately 9.8 kilometers of 2D seismic data adjacent to Exploration License 379, Kotaneelee Anticline Northwest Territories (enclosure 1). This exploration license was granted to Norcen Energy Resources Ltd. effective April 10, 1996. The data was purchased to allow Norcen the ability to tie the F-08 La Biche exploration well to seismic data traded with Husky Oil and to a 3-D survey which Norcen had acquired over Exploration License 379. The data was purchased from BFR Geophysical Consultants Ltd. of Calgary, Alberta. The line formed one portion of a larger speculative survey.

1. Seismic acquisition parameters

ACQUISITION

Project	Fort Liard
Date Shot	12 August 1996
Shot By	Geco Prakla
Shot For	BFR Geophysical Consultants
Party Number	1267

SOURCE

Source Type	Dynamite
Charge Size	14 kg
Charge Depth	18m
Source Array	Single Holes
Source Interval	90m

RECIEVERS

Geophone Type	Oyo 10 Hz.
Geophone Array	6 over 15m
Group Interval	15m

INSTRUMENTS

Recording System	I/O System II
Recording Format	SEG D

Gain Type		Fixed 36db
Record Length		5 sec
Sample Interval		2 ms
Number of Channels		400
Lo cut Filter	3 Hz.	
Hi cut Filter		135 Hz
Notch Filter	Out	

SPREAD

T1.....	.....T200	.	T201.....	.....T400
3000m	15m	SP	15m	30000m

2. Processing Sequence

DEMUX

SEG-D Trace Sequential format, 2 msecs sample interval

GEOMETRIES

Green Mountain Geoscribe

GAIN RECOVERY

Spherical divergence correction
1/t*v**2, trace/trace equalization

ELEVATION STATICS

DRM Refraction Statics
Datum elevation 1250m
Replacement velocity 4000 m/sec

DECONVOLUTION

Surface consistent spiking deconvolution
120 ms operator length, 0.1% pre-whitening
Design gate
0250-3000 msecs @ 15m
1300-3000 msecs @ 3000m

FILTER

Spectral Balancing Filter, 10-14-60-70 Hz

ITERATE:

REFLECTION STATICS
Maximum power automatic statics
Horizon keyed, 40 msecs max shift
VELOCITY ANALYSIS
Interactive velocity analysis
CDP interval <100

CDP TRIM STATICS

Max shift =8 msecs

NMO/MUTE/STACK

All offsets

POST STACK

Band pass filter- 12-16-50-60
Time Variant Scaling - 5 gates
FD Migration using 90% of smooth nmo Velocity

PLOT

Create CGM+ plot file

3. Interpretation

Seismic line FLT-4X is the only available seismic tie to the La Biche F-08 exploration well available to Norcen (enclosure 2). Utilizing a synthetic seismogram generated from a sonic log recorded in the F-08 well it is possible to establish a seismic pick on the Nahanni carbonates, the prime regional reservoir horizon (enclosure 3). In addition a number of other seismic markers within the Besa River shale section can also be identified.

The interpretation of line FLT-4X was also constrained by utilizing surface geological mapping (enclosure 4) performed under contract for Norcen Energy Resources Limited, and a regional Bouger gravity map obtained from open file reports (enclosure 5). The surface geology map when combined with the seismic

profile clearly shows the relationship of outcropping strata to surface relief. The breached La Biche anticline expcses easily eroded shales of the Lower Mississippian Besa River formation in the core. To the east more indurated strata of the Mattson and Fantasque Formations form prominent scarps. Further to the east the Cretaceous Garbutt Formation forms a low relief eroded ridge. These units can be followed in the subsurface on the seismic line. It is observed that the Fantasque Formation is a relatively thin unit which shows thinning to the east in the subsurface. Similarly the Mattson is also observed to form a thinning wedge to the east with a series of sub-parallel reflectors.

From the synthetic seismogram it is apparent that the first significant reflector in the subsurface is produced by a package of sandstone's at around 1350m KB in the F-08 well (green seismic marker). Above this intra-Carboniferous maker to the east, within the shales of the Besa River, a lowstand wedge is interpreted (marked in yellow). In addition thinning of the interval between the green marker and inferred base of the Mattson Formation is seen. Below the green marker to the top of the Mattson Formation most of the observed units thicken to the east indicating a period of basin inversion within the Carboniferous. The Besa River section shows clear evidence of low angle thrust faults with bedding parallel detachments. All of the faults show limited lateral displacement but may verge either westward or eastward.

In the deeper section the Nahanni carbonates are interpreted to be stacked by a series of imbricate thrust faults at the F-08 location, which gives rise to a tight anticlinal fold which is responsible for hydrocarbon entrapment at the well. Beyond the well location to the east the Mattson dips steeply to the east. Deeper reflector below the Mattson are difficult to interpret and their stratigraphy is unknown. One prominent marker (pink marker) can be seen to diverge from the Mattson to the east and may lie below the level of detachment of the thrust imbricates at the F-08 well.

The presence of a prominent high below the F-08 well and a deep basin fill of low density sandstone's and shales to the east is also observed in the gravity field (enclosure 5). The seismic clearly indicates that the Nahanni plunges from around 1.4 seconds TWT at the F-08 well to around 2.8 seconds TWT in the east over a distance of less than 10 kilometers.