2009 Galilee Energy 2D Seismic Survey

ATP799P

Queensland, Australia

Data Interpretation Report

P. W. Spraggon

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2009 Galilee Energy 2D Seismic Survey

CONTENTS

1. PREAMBLE

MBA Petroleum Consultants was contracted by Galilee Energy Limited to interpret data recorded by the 2009 Galilee Energy Seismic Survey in ATP799P of western Queensland. The interpretation was carried out by Peter Spraggon.

2. INTRODUCTION

Galilee Energy contracted Terrex Seismic Australia to record 144.8km of 2-D seismic data in Galilee's 100% owned tenement ATP799P in western Queensland, between the towns of Aramac and Hughenden.

Terrex Seismic Australia has submitted a field report separately (Rea, 2009)

A Field Representative supervisory report has been prepared by Tony Cheshire of SCG (Cheshire, 2009) and submitted separately.

3. DIGITAL DATA PROCESSING

Data processing was carried by Quantum Geo-Services (APAC) Pte Ltd in Quantum's Singapore processing centre.

Supervision of data processing parameters was carried out by Peter Spraggon of MBA Petroleum Consultants.

All data were archived in DVD format.

A data processing report has been prepared by Daryn Voss (Voss, 2009) and submitted separately.

4. DATA USED

a. Seismic

A data listing can be found in Appendix 1.

Lines for which data are available in SEG-Y format are shown on all maps with shotpoint annotation; other lines are shown with pale grey tracks.

Data spacing is very large and only regional correlations could be made.

b. Wells

There are four wells in the immediate vicinity of the area in which the survey was recorded. These wells are Brookwood-1, Thunderbolt-1, Towerhill-1 and the recently completed Galilee Energy Limited’s Dunrossie-1 (Galilee Energy Limited’s Dotswood-1 had just spudded at the time of this interpretation and, as no results were available, data have not been included).

5. DATUM

Seismic Reference Datum used was 200m a.m.s.l. in keeping with previously recorded regional surveys.

Note that the decision was taken to preserve the surface profile on both SEG-Y files and other format files. To this end, processing was carried out using a datum of +400m (a.m.s.l.). Galilee Energy 2009 data were reduced during interpretation from +400m to the regional +200m by application of a replacement velocity of 2650m/s.

6. DATA LIMITS

Galilee Energy Limited requested that interpretation be constrained to an area enclosed by a polygon with limits extending 10km outside ATP799P.

Data from Brookwood-1 well were used in interpretation but the data were then stripped out by the limiting polygon.

7. SURFACE ELEVATION

Surface elevations (a.m.s.l.) were input from available sources and gridded and contoured in the Petrosys mapping package.

Available data included surveyor's data from the 2009 Galilee Energy Seismic Survey, GLs at wells and selected data from older surveys.

A ground level map has been included here as Enclosure 1. Note that this map has not been correlated with government topographical maps and hence creeks, rivers and ridges are either not shown or their presence is only indicated as they cross seismic lines.

8. TIME PICKING

A single deep event has been correlated and mapped. The initial point for interpretation was the top of the Permian section in Towerhill-1 well. This stratigraphic pick lies at 1049.4m (3443' KB).

The event has been picked on a peak on SEG-Y normal data and lies very close to the top of the Permian section. The picked event most likely corresponds to the first significant coal in Towerhill-1 at 1065.6m (3496' KB).

In Enclosure 5, the picked event is shown in bright pink. At Dunrossie-1, the picked event corresponds with the second but stronger of two peaks.

The ground surface trace was also picked (mid-green colour in Enclosure 5) as this is the reference surface for stacking velocities.

9. FAULTS

As the survey was regional in nature and spacing of new and old lines was in excess of ten kilometres, no fault correlations were attempted. No significant faults generally break the Permian Coal picked event within the mapped area.

An anomalous break does occur on line 2009-GEL-05 at station 1647. This has been reviewed and appears to be real. As throw is only about 25ms, contouring (using a 20ms contour interval) has been drawn through this location.

10. TIME MAPPING

The Top Permian coal event was picked using Kingdom SMT software on all available lines with data in SEG-Y format.

Time data were exported from Kingdom into Petrosys where mapping was carried out. As the grid is regional, a grid cell size of 500m X 500m was used.

The Beryl Ridge (to the west of ATP799P) appears to run north-south. However, because of the line spacing in ATP799P, no discernible trends were able to be observed and hence computer-generated grids and contours were accepted.

The two-way time map to the Near Top of Permian Coal is presented as Enclosure 2.

11. TIME INTERVAL MAPPING

A Time Interval mapping grid was produced by gridding in Petrosys of the two-way time interval ‘Surface Elevation to Top Permian Coal event’. The resultant grid is very similar to that of the two-way time map to the Top Permian Coal event and, although it is used in the preparation of depth maps, is not presented here.

12. VELOCITY PICKING

a. Seismic

Stacking velocities (referenced to a floating datum at ground surface) were used to calculate (by integration of time-V_{rms} pairs) the interval velocity between the surface and the Top Permian Coal event.

b. Wells

Velocities from surface to Top Permian Coal were computed at wells (including Dunrossie-1, but excluding Dotswood-1).

13. VELOCITY MAPPING

Velocities from seismic and well data sets were input to Petrosys. Because of the inherent

chatter in stacking velocities, gridding was carried out using a coarse grid size of 2500m X 2500m.
The resultant grid was then re-sampled to 500m X 500m to match the grid used in time mapping. It should be noted that these velocities are all interval velocities from surface to Top Permian Coal event.
Interval velocities computed from stacking velocities are not absolute but the data obtained give a good representation of velocity trends. The velocity grid produced was corrected to the wells by the application of a regional trend to tie the wells.
An Interval Velocity map from Ground Surface to Near Top Permian Coal is included as Enclosure 3.

14. ISOPACH MAPPING

Isopachs were produced by multiplication of the Time Interval grid by the Interval Velocity grid. These isopach grid values were then adjusted to generate depth grids.

15. DEPTH MAPPING

Depth maps were produced by subtraction of the Surface Elevation grid from the Surface Elevation to Top Permian Coal event isopach grid and then transposing to the required datum. Enclosure 4 shows Depth to Near Top Permian Coal below the Seismic Reference Datum of +200m (a.m.s.l.).

16. CONCLUSIONS AND RECOMMENDATIONS

The primary aim of this survey was to gather data in an area which had been by-passed by previous explorers.
Galilee Energy Limited set out to gather a regional grid of modern 2-D seismic data and drill two exploration/stratigraphic wells to evaluate the acreage.
Because of time constraints, the locations of the wells had to be selected before acquisition and interpretation of data from this survey. Both locations have been found to be suitable for stratigraphic evaluation with no evidence of faulting or anomalous features at the locations. Part of line 2009-GEL-01 showing Dunrossie-1 well is shown in Enclosure 5.
Dotswood-1 is currently suspended for weather reasons. No recommendations are proposed herein pending completion of the drilling and evaluation of Dotswood-1.

REFERENCES

Cheshire, Tony (2009)	Galilee Energy Limited 2009 Muttaburra 2D Seismic Survey, PPL799P
Rea, T (2009)	Galilee Energy Muttaburra 2009 2D Seismic Survey, Operations Report, October 2009
Voss, Daryn (2009)	2009 Galilee Energy Seismic Survey, ATP799P, Final Processing Report

ENCLOSURES

Enclosure 1	Ground Surface Elevation
Enclosure 2	Near Top Permian Coal, Two-Way Time
Enclosure 3	Interval Velocity, Surface to Near Top Permian Coal
Enclosure 4	Near Top Permian Coal, Depth below SRD
Enclosure 5	Line 2009-GEL-01 (part) with Dunrossie-1 well

APPENDICES

1. Data available

   Note: Line names shown in italics indicate line locations outside the limit of contouring.

   a. Coordinates and SEG-Y format data

2009-GEL-01	2009-GEL-02	2009-GEL-03
2009-GEL-04	2009-GEL-05	*81BEL-10*
81BEL-11	*81BEL-12*	*81BEL-14*
81BEL-16	*81BEL-18*	81BEL-23
81BEL-24	81BEL-26	81BEL-28
81BEL-9	*AN88-1*	*AN88-2*
AN88-3	*AN88-4*	CAR82-11
CAR82-9	L81-1 (Part)	*L81-10B*
L81-14	L81-16 (Part)	*L81-1A*
L81-4	W80A-11	*W80A-13 (Part)*
W80A-15 (Part)	*W80A-22*	W80A-3 (Part)
W80A-6A	W80A-6A_PART2	*W80A-6_PART4*
W80A-7	W80A-9	

   b. Coordinates only

CAR82-23	*HOG80-5*	HOG80-7
L81-6	L81-8	*W80A-1*
W80A-16	*W80A-18*	*W80A-20*

2. Velocity data

   Stacking velocity tables are not included here.

   They have been included on the DVD containing all data.

ATP799P/ATP529P 100K

200109M E
250000M E
300000M E
343169M E
7519000M N
7500000M N
7550000M N
7496927M N
22 00 00S
22 30 00S
144 30 00E
145 00 00E

ATP 743P
ATP 529P
ATP 799P
ATP 799P
ATP 799P
ATP 813P
ATP 529P
ATP 578P

Towerhill-1
KB=299m

Dunrossie-1
KB=249m

Dotswood-1
KB=242m

Thunderbolt-1
KB = 232m

Brookwood-1
KB=227.4m

MBA PETROLEUM CONSULTANTS

GALILEE ENERGY LIMITED

ATP 799P

Ground Surface Elevation

P. W. Spraggon	Datum: Mean Sea Level	
December 2009	C.I. 10m	Enclosure 1

ATP799P/ATP529P 100K

200 10MM E
250000M E
300000M E
343 16MM E
7019000M N
7000000M N
7550000M N
7500000M N
7496927M N
22 00 00S
22 30 00S
144 30 00E
145 00 00E

ATP 743P
ATP 529P
ATP 799P
ATP 799P
ATP 813P
ATP 529P
ATP 578P

Towerhill-1
Dunrossie-1
Dotswood-1
Thunderbolt-1
Brookwood-1

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ATP 799P
Near Top Permian Coal
Two-Way Time

P. W. Spraggon	Datum: SRO = +200m	
December 2009	C.I. 20ms	Enclosure 2