Possible Oil & Gas Prospects in Great South Land Minerals (GSLM) License Area (SEL 13/98) in Tasmanian Onshore Basin

Dr. Suleyman Turgut - Oct, 2007

A number of possible oil & gas prospects are mapped in the GSLM's license area on onshore Tasmanian basin which could be tested by exploration drilling. These prospects are briefly described below.

I. Bellevue Prospect

This prospect is located in the centre western part of the license area and defined by seismic lines TBO2b-BQ, TBO2-BZ and TBO1-TD. Silurian and Ordovician horizones show symmetric anticlinal characteristics partly faulted on the flanks. As such anticlinal structuration on Silurian and Ordovician strata took place during the Devonian and lower Carboniferous tectonic periods. However, structural definition of the prospect is limited to seismic line TBO2b-BQ only and there is no north-south evaluation of the structural feature due to lack of seismic data in that direction. But, existing regional gravity and residual gravity mapping of the region reveal an ellipsoidal structural feature that coincides with the seismic structural anomaly, thus supporting the seismic structural evidence of the prospect. Regional Permian unconformity which is quite ubiqutous in the area has truncated part of the Silurian strata on the top and hence upper structuration. However this truncation doesn't affect Ordovician and Silurian structural potential of the Prospect. The Permian unconformity is identified as a regional flat erosional surface in general, perturbed slightly by the later regional tectonic activities in the area.

This Prospect could be tested by a 3500 m deep exploration drill hole that could reveal Silurian and Ordovician prospectivity of the anticline present in the Prospect. Primary targets would be Silurian sequences which contain good reservoir sands and Ordovician sediments which are mainly shallow marine platform carbonates which could contain good reservoirs characteristics due to extensive fracturing and diagenesis caused by karstification. Silurian and Ordovician sequences also contain mature source rocks that could have generated commercial quantities of hydrocarbones in the Prospect area to fill the potential reservoirs.

II. Bracknell Prospect

This prospect is located on the northeast part of the license area (SEL 13/98) where a northwest to southeast trending Tertiary Subbasin was formed on the Jurassic age dolerites causing them to subside under the Tertiary basin filling. The Tertiary sequences are not prospective on their own, due to the lack of mature source rocks and appreciable structuration. But, a very distinct NW-SE trending fault bound structural trap is formed beneath the Tertiary basin at the level of Jurassic dolerites which could be quite prospective provided Permian sequences consisting of thick shales and sandstones underlie the Jurassic dolorite which is distinctly visible on the reflection seismic sections studied.

Permian sequences consist of good reservoir and mature source rocks which have proven their oil generating potential in the live oil seeps found in the cracks and fisures of overlying dolerites found in the quaries near the city of Hobart. As such, it is also thought that the Jurassic dolerites could be good reservoirs containing oil due to the extensive fracturing and

breakage caused by the faulting and compression related to the Tertiary tectonizm which formed this prospect.

A well that will test this prospect will be drilled into the Jurassic dolerites and underlying Permian sequences, consisting of reservoirs and mature source rocks, at an approximate depth of about 1800m.

III. Thunderbolt Prospect

This prospect is located on the centre western part of the license area near the major western fold and thrust belt of the island, identified by several reflection seismic sections shot in the area. These seismic sections clearly show major westerly directed thrusting and imbricated thrust sheets. Thrusting means a very complicated structuration for hydrocarbon entrapment in this prospect area. Complicated as it may be with respect to its subsurface structuration, visibly good, broad and large asymmetrical thrust domes that could be described as large thrust anticlinal folds have develped in the prospect area that could be considered as good traps for hydrocarbon accumulation and entrapment.

These thrust anticlines could be tested by a 3500m deep exploration well that could penetrate into Silurian clastic sequences and Ordovician carbonate suites along with the overlying Permian sequences. Permian and Silurian sequences and Ordovician suites could hold potential for hydrocarbon accumulations in this prospect.

IV. Tunbridge Prospect (Butler Rise)

This prospect is located in the centre eastern part of the license area and is identified by a seismic line running in east-west direction. Therefore, its prospectivity is limited by the limited seismic coverage of the area. However, available seismic data show that eastern half of the prospect shows better potential with respect to its western half where strike slip faulting has caused major uplift and breach of potential traps in this part of the prospect. Thus, airial exposure of the possible traps in this part of the prospect could have been leaked out to the surface, causing deterioration of the trap fill. As such, trap efficiency has been lost on the western part of the prospect area. However, its eastern half shows a fault baund structural trap with about 10 to 20ms closure that could provide hydrocarbon entrapment and accumulation, in a limited amount.

Eastern part of Tunbridge prospect near the negative flower structure forming strikre slip fault could be tested by a 1800 to 2000m deep well. Potential hydrocarbon bearing zone in this prospect being the Permian clastic sequences underlying the Jurassic dolerites, an 1800m to 2000m deep exploration well could test prospectivity of all the Permian sequences here.

If one tries to grade these four prospects from one to four, Bracknell would be 1, Bellevue 2nd, Thunderbolt 3rd and Tunbridge would be 4th.

However, it is advised that additional seismic data acquision and mapping is recommended for these potential prospects and other suggested prospects for further maturation of these prospects before drilling.

Dr. Suleyman Turgut
Geophysicist

GREAT SOUTHLAND MINERALS LTD

LEAD/PROSPECT DEFINITION

Bellevue Anticline

The structure identified underlying the Bellevue Tier in central Tasmania is a NW plunging, faulted anticline. The structure is defined by seismic lines TB01-PB, TB01-TD, TB01-TI and by TB02b-BQ, TB02b-BZ and TB02b-AA1 (last three lines acquired in early 2007).

The structure is approximately 6 km (19685 ft) wide and at least 15 km (49212 ft) long, plunging at approximately 5° towards the NW. The structure is probably truncated by a late Tertiary compressional fault running along the SE shore of Lake Echo, its extent towards the NW is not known (**Figure 1 and 2**). The anticline was produced by folding of the Eldon and Gordon Group sequences during the Middle Devonian Tabberabberan Orogeny. The structure is a faulted anticline with possible hydrocarbon traps in both the hanging wall and footwalls (**Figure 8, 9, 10 and 11**).

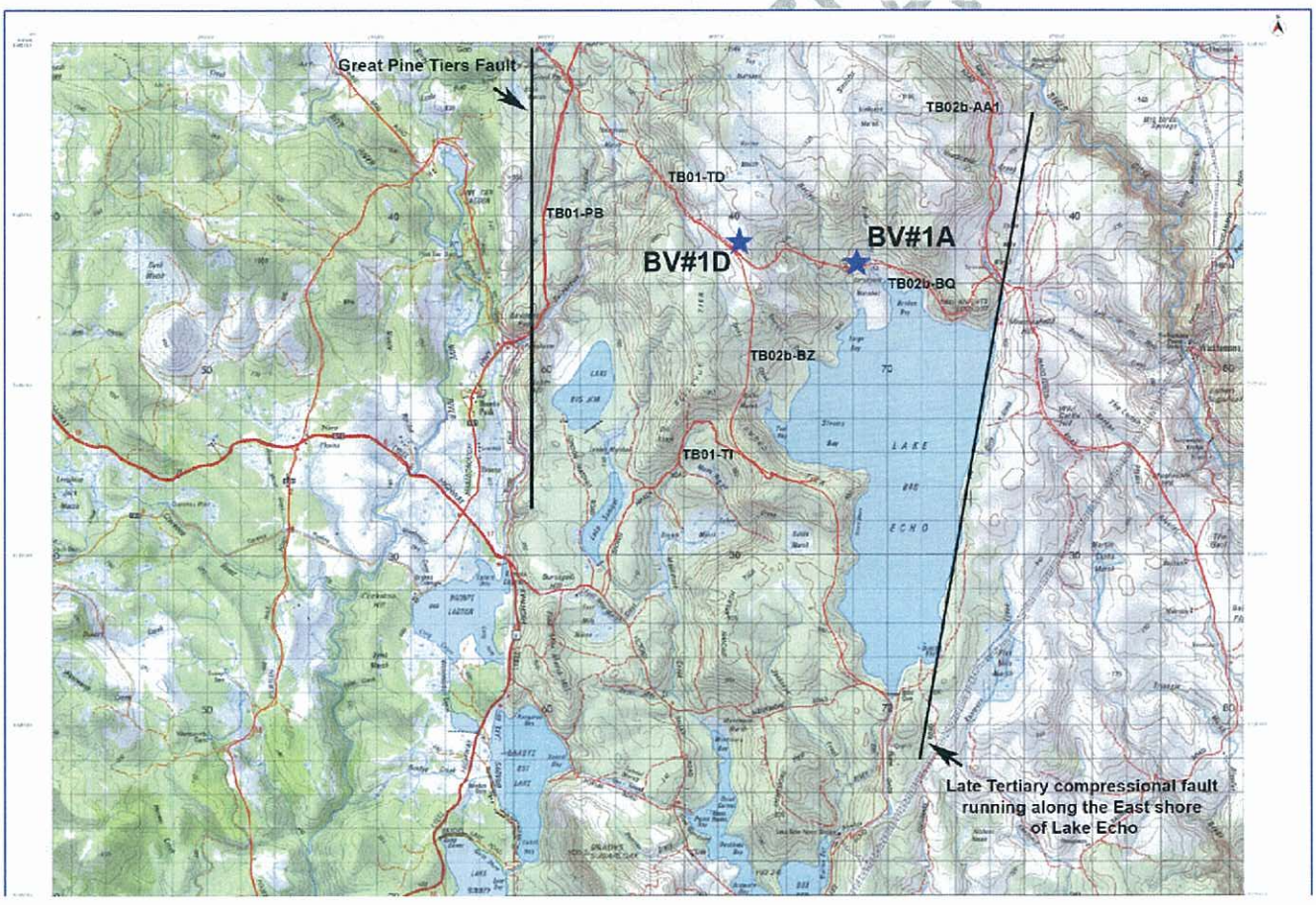

Figure 1: Topography Map - Bellevue Anticline.

Location of the optimal drill site based on the conjunction of TWT Maps for the Permian and Ordovician Reservoirs

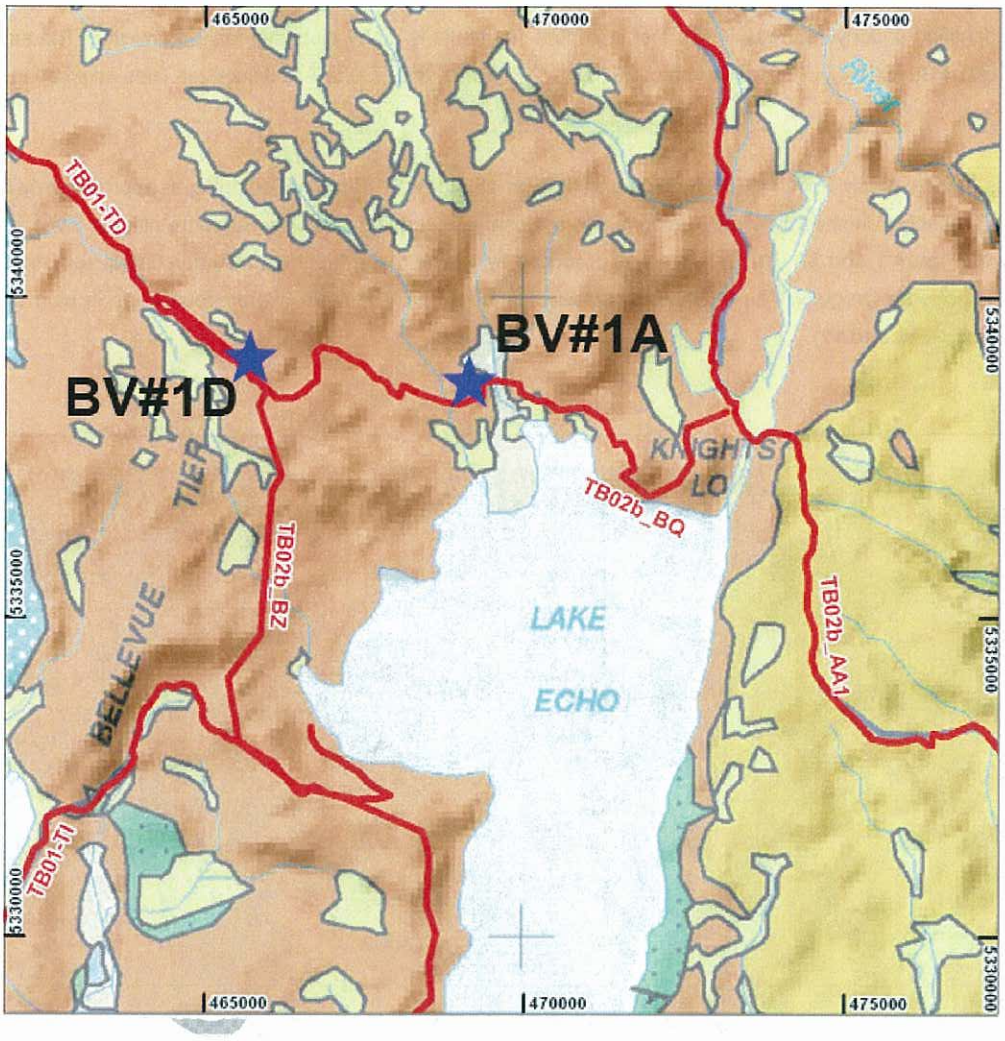

Figure 2: DEM Geology for the Bellevue Area (Dolerite outcropping in orange)

The gravity data is presented in terms of AMG66 zone 55 coordinates and AHD. **Figure 3** presents raw Bouguer anomalies (as observed, corrected and reduced), and **Figure 4** shows residual Bouguer anomalies (after removal of crustal trends using the method of Leaman & Richardson, 1989 and Roach et al, 1994).

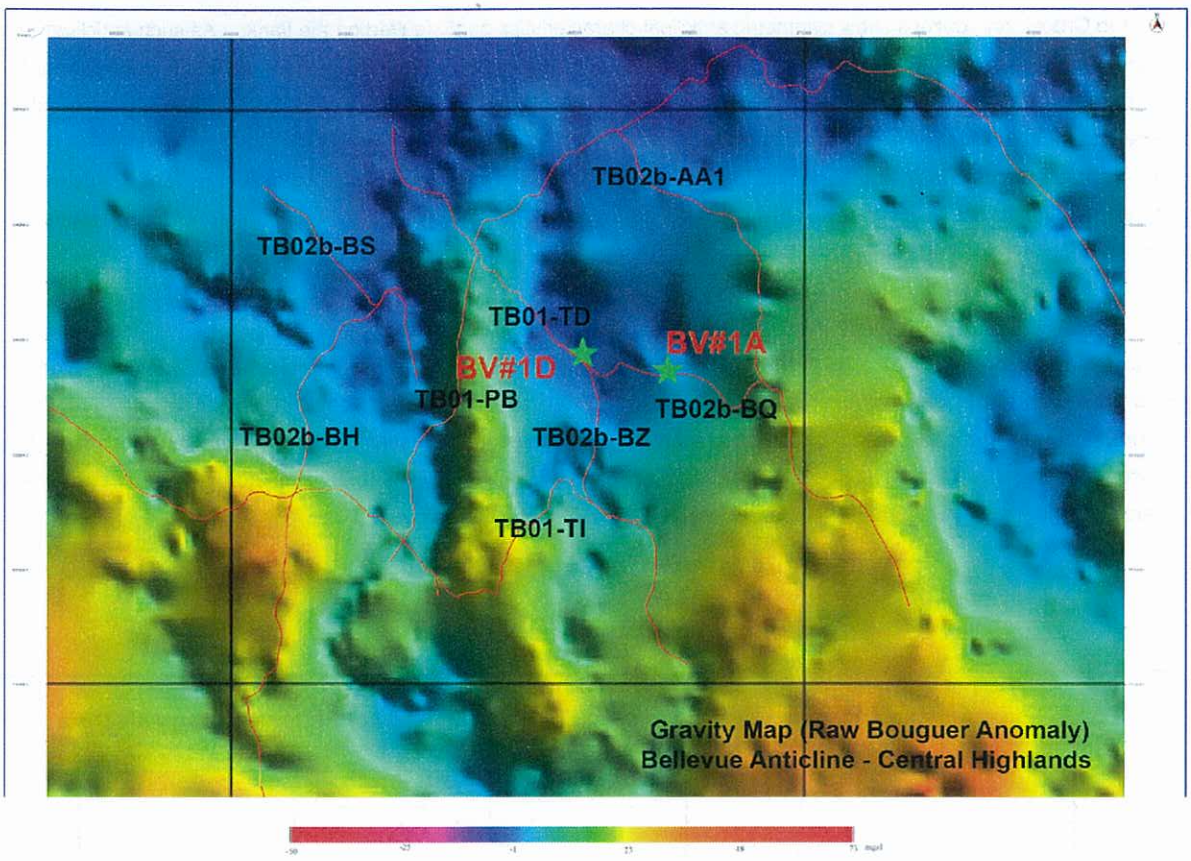

Figure 3: Gravity Map (Raw Bouguer Anomaly), Bellevue Structure - Central Highlands

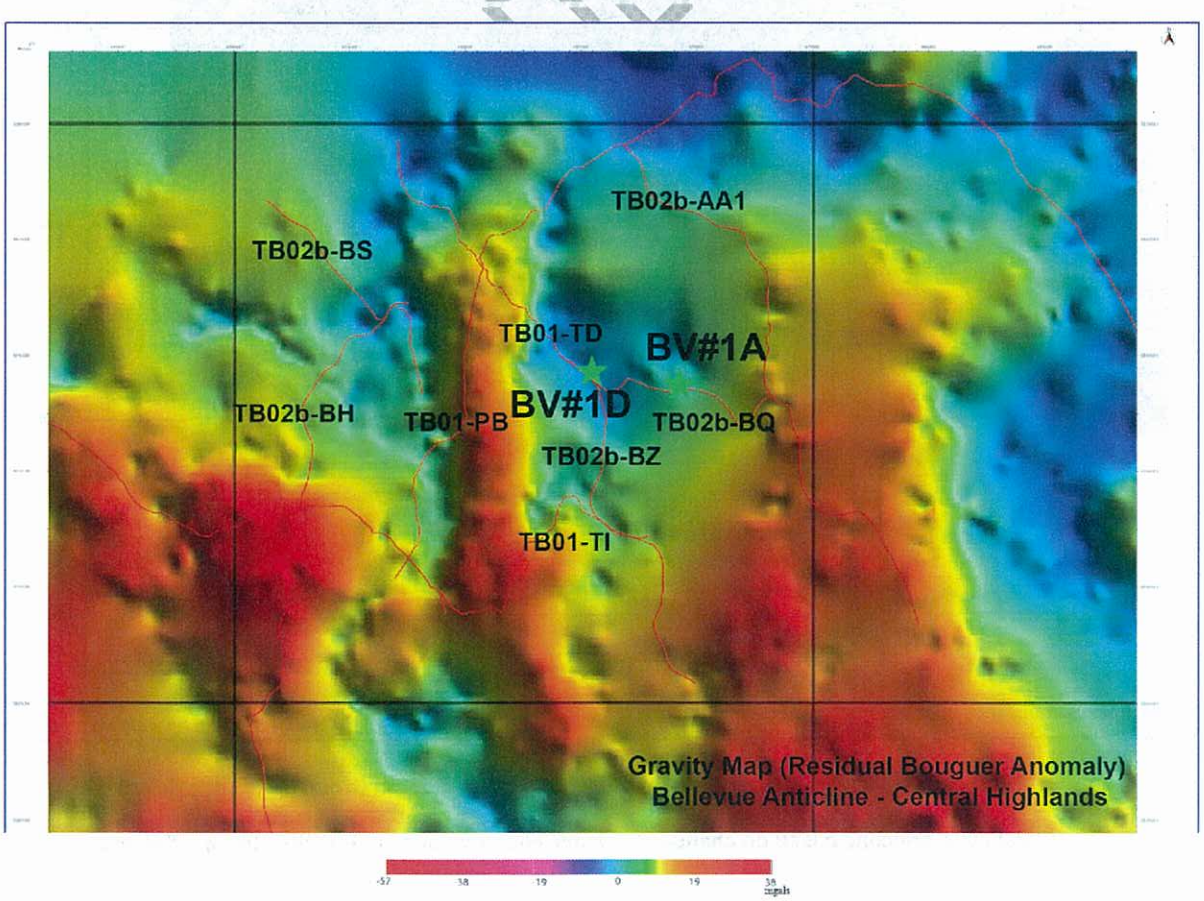

Figure 4: Gravity Map (Residual Bouguer Anomaly), Bellevue Structure - Central Highlands

Silurian and Ordovician horizons show symmetric anticlinal characteristics partly faulted on the flanks. As such anticlinal structuration on prospect is limited to seismic line TBO2b-BQ only and there is no north-south evaluation of the structural feature due to lack of seismic data in that direction. But, existing regional gravity and residual gravity mapping (Figure 3 & 4) of the region reveal an ellipsoidal structural feature that coincides with the seismic structural anomaly, thus supporting the seismic structural evidence of the prospect. The regional Permian unconformity has truncated part of the Silurio-Devonian strata on the top and on upper structure, however this truncation does not affect Ordovician and Silurian structural potential of the prospect. The Permian Unconformity is identified as a regional erosional surface in general changing slightly in the later regional tectonic activities.

This prospect could be tested by a 3500 m deep exploration drill hole that could reveal Silurian and Ordovician prospectivity of the anticline present in the prospect. Primary targets would be Silurian sequences which contain sandstones and Ordovician sediments which are mainly shallow marine platform carbonates which could contain good reservoir characteristics by comparison with Ordovician sequences elsewhere in Tasmania. Silurian and Ordovician sequences also contain mature source rocks that could have generated commercial quantities of hydrocarbons in the prospect area to fill the potential reservoirs.

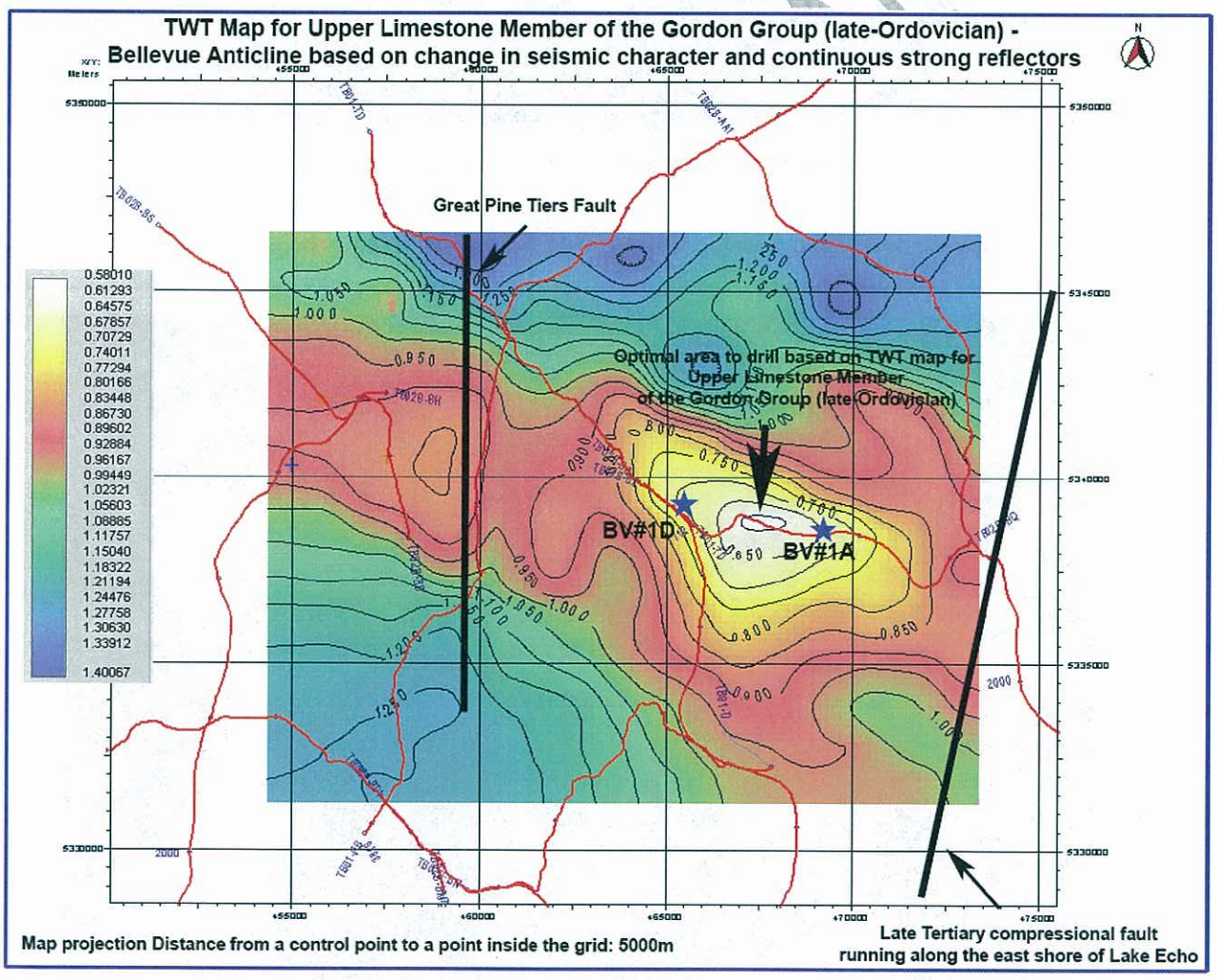

Figure 5: TWT Map for Upper Limestone Member of the Gordon Group (Late Ordovician) -

Bellevue Anticline based on change in seismic character and continuous strong reflectors

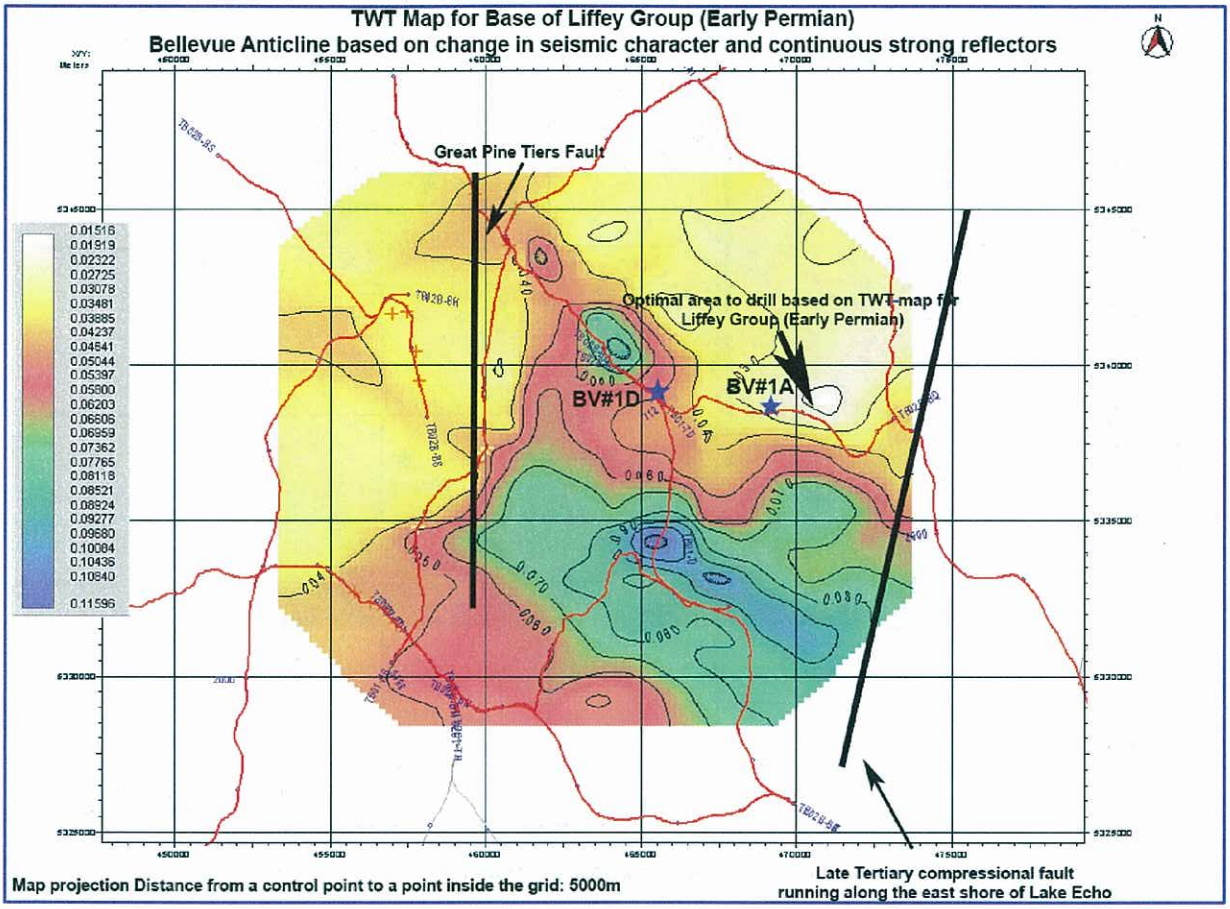

Figure 6: TWT Map for Liffey Group (Early Permian) -

Bellevue Anticline based on change in seismic character and continuous strong reflectors

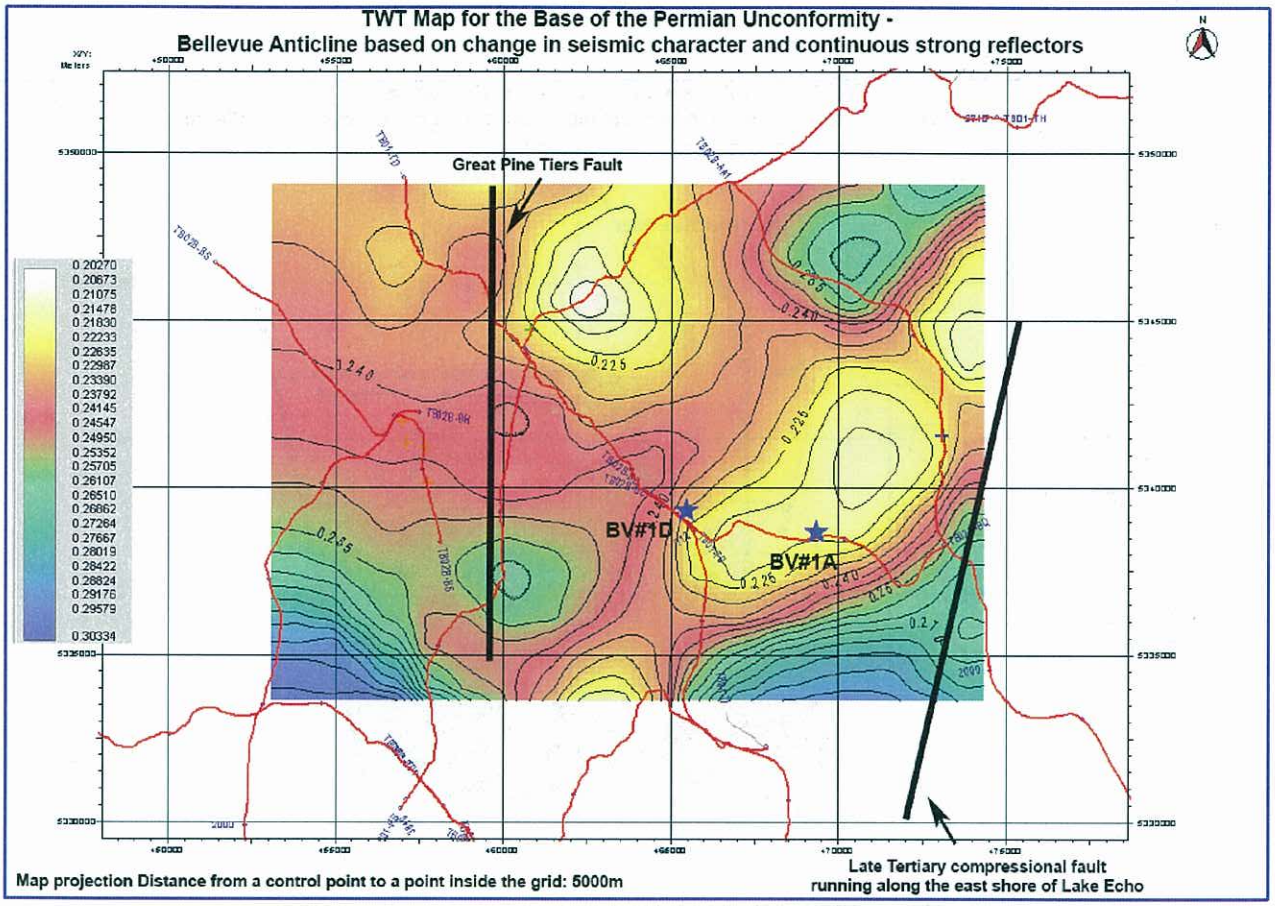

Figure 7: TWT Map for Base of Permian Unconformity -

Bellevue Anticline based on change in seismic character and continuous strong reflectors

The optimal area for drill site based on a conjunction of two TWT maps, one for the top of the Upper Limestone of the Gordon Group (Late Ordovician), and the other one for the base of the Liffey Group (Early Permian). The area is chosen because of its up-dip location, i.e. crest of reservoir structures identified on **Figure 8 (TB02b-BQ)** should be at a shallower depth here. Area indicated allows for the optimal positioning of the rig with respect to geological, logistical and operational considerations.

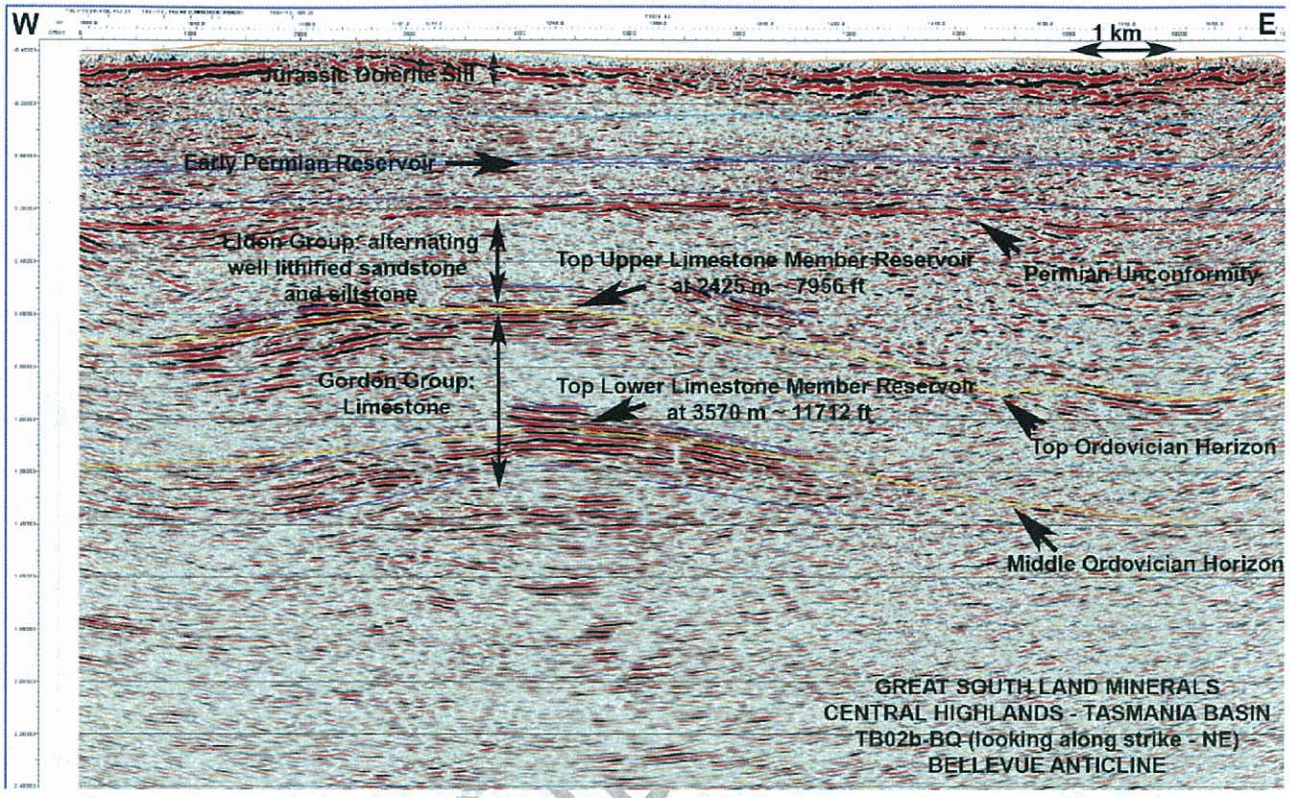

Figure 8: TB02b-BQ (looking along strike - NE)

The Bellevue structure consists of large anticlinal and fault structures both within the Wurawina and Parmeener Supergroups. The Parmeener Supergroup (including dolerite) extends to 0.2sec below surface (about 1200 metres). Key reservoirs at Belleveu include the Early Permian Liffey Group sandstones at approximately 820 metres, and the Upper and Lower Ordovician limestones of the Gordon Group, particularly vuggy porosity horizons and reef and near reef facies at 2425 metres.

The Gordon Group is likely to be karst, immediately beneath the base of the Permian Unconformity, rotated fault blocks of Gordon Limestone are present in the same are, or alternatively, fracture porosity is likely to be found within these rocks within the intensely fractured thrust zones. Palaeo-karst reservoirs are likely to be found where the Gordon Limestone was sub-aerially exposed before Parmeener Supergroup deposition.

The majority of previous studies report the Parmeener Supergroup as flat-lying with steep dips only occurring in the vecinity of faults. They also generally agree that the sequence has been affected by at least two major phases of faulting. The first occurring either prior to or concomitant with the intrusion of dolerite in the Early Jurassic and resulting in normal, reverse and strike-slip movement, and the second in the Tertiary resulting in down to the east, normal faulting.

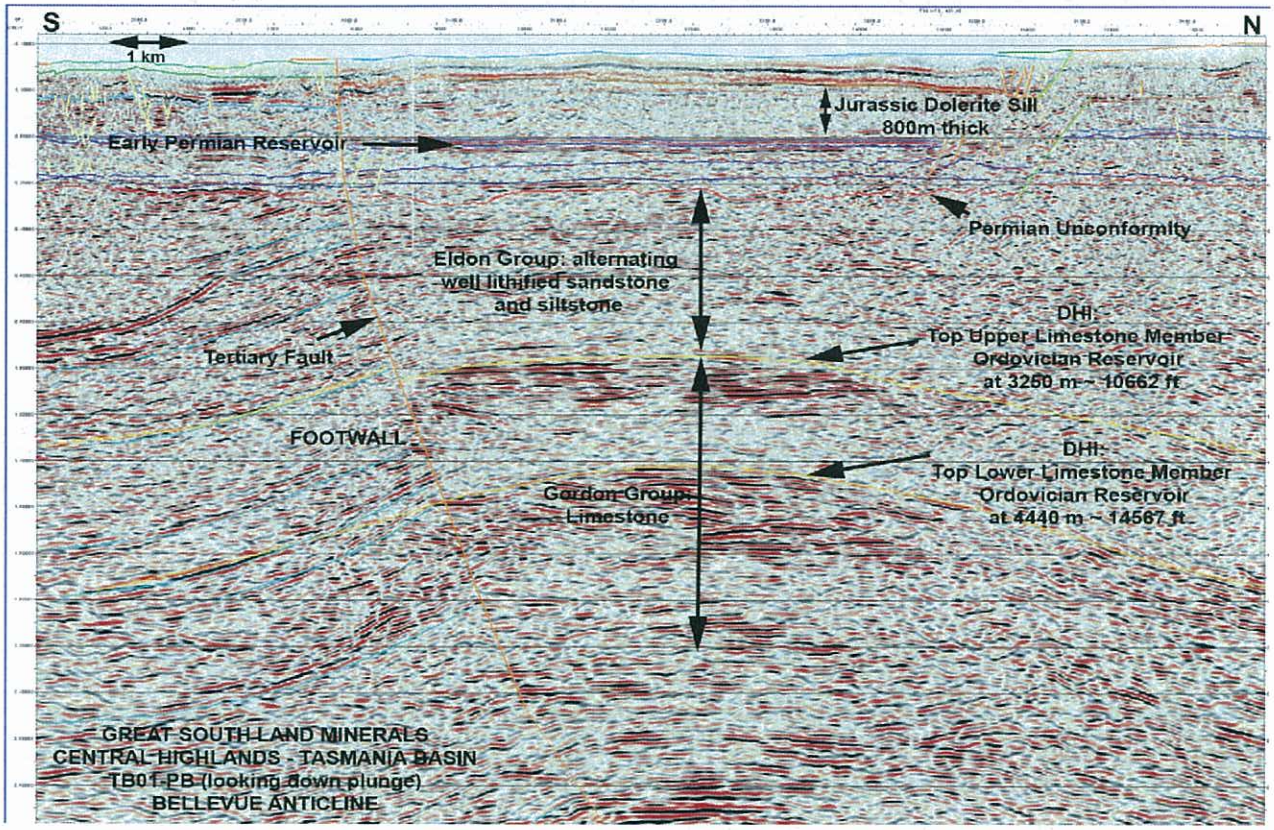

Figure 9: Seismic cross-section of the Bellevue Anticline on TB01-PB (looking down plunge - NW)

Possible Direct Hydrocarbon Indicators (DHI's) or bright spots are observed on TB01-PB (looking down plunge - NW) at approximately 1 and 1.4 seconds (TWT), assuming a seismic velocity of 5000 m/s for the Eldon and Gordon Groups, these traps lie approximately 3250 m (10662 ft) and 4440 m (14567 ft) below the surface.

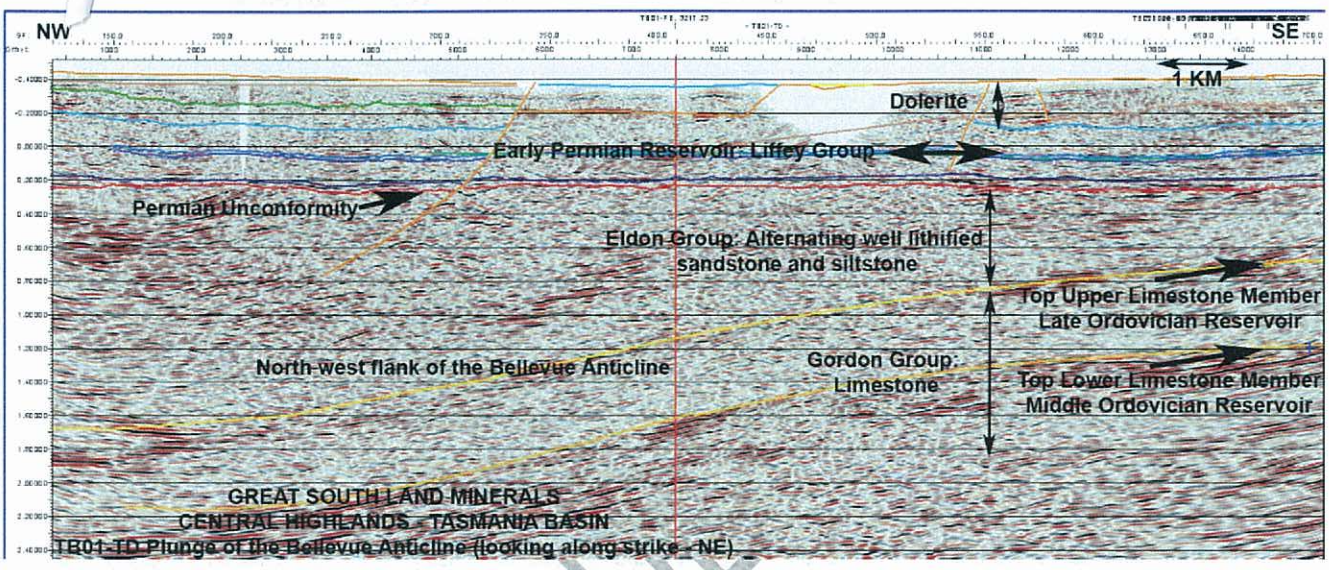

Figure 10: TB01-TD, plunge of the Bellevue Anticline (looking along strike - NE)

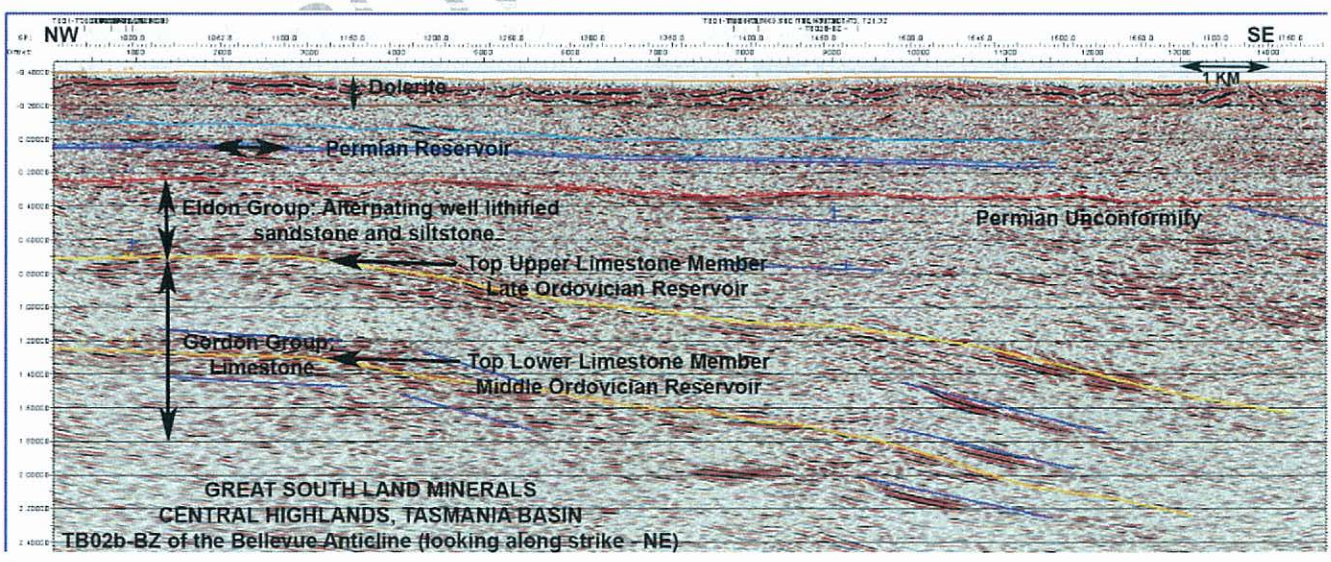

Figure 11: TB02b BZ, plunge of the Bellevue Anticline (looking along strike - NE)

DRILL HOLE:	**BV #1A**	
	4- way closure defined by TB02b-BQ, TB01-TD, TB01-PB and TB02b-BZ.	
LOCATION:	469 830 mE; 5 338 600mN	
STRUCTURE:	Primary Target - Hanging wall anticline - 2 targets based on DHI's, Secondary Target: Footwall	
RESERVOIRS:	Triassic Unit, Permian Formations, Reefal Limestone and vuggy porosity in Upper and Lower Limestone Member of the Ordovician Gordon Group	
Triassic Reservoir:	Unit 2	Depth ~300 m (984ft)
		Pay zone ~ 25m (82ft) ; Porosity ~10%
Permian Reservoirs:	Unit 1	Depth ~ 400 m (1312ft)
		Pay zone ~ 10m (32ft); Porosity ~10%
	Palmer & Garcia Sandstone	Depth 550 m (1804 ft) & 650m (2132ft)
		Pay zone ~ 3 m (9.8ft); Porosity ~10%
	Liffey Group	Depth ~ 820 m (2690 ft)
		Pay zone ~ 30 m (98 ft), Porosity ~10%
Silurian-Devonian Reservoir:	Crotty Quartzite	Depth 2200 m (7218 ft)
		Pay zone ~ 20 m (66 ft), Porosity ~ 10%
Ordovician Reservoirs (Gordon Group):		
Upper Limestone Member	Depth ~ 2425 m (7956 ft) (Calculated using an average seismic velocity of 5000m/s for the Formations encountered)	
	Length ~ 15000 m (49 212 ft), Width of closure ~ 6000 m (19 685 ft) @ *max thickness of horizontal reflectors.*	
	Pay zone: 250 m (820 ft) @ *max thickness of horizontal reflectors,* Porosity ~8%	
Lower Limestone Member:	Depth ~ 3570 m (11712 ft) (Calculated using an average seismic velocity of 5000m/s for the Formations encountered)	
	Length ~ 15000 m (49 212 ft), Width of closure ~ 6000 m (19 685 ft) @ *max thickness of horizontal reflectors.*	
	Pay zone: 250 m (820 ft) @ *max thickness of horizontal reflectors,* Porosity ~8%	
SEAL:	Eldon Group (Silurio-Devonian shales), Jurassic dolerite	
SOURCE:	Permian (Liffey Group, Quamby Formation), Gordon Group (Ordovician Limestone),	
FAULTS:	Pre-Middle Jurassic, early and late Tertiary movement pose some risk to the integrity of the reservoir.	
Reservoir Volume as US Barrels (BOE)	**283 million barrels (P90)**	
(Monte Carlo calculation of potential,	**620 million barrels (P50)**	
undiscovered prospective resources)	**1256 million barrels (P10)**	

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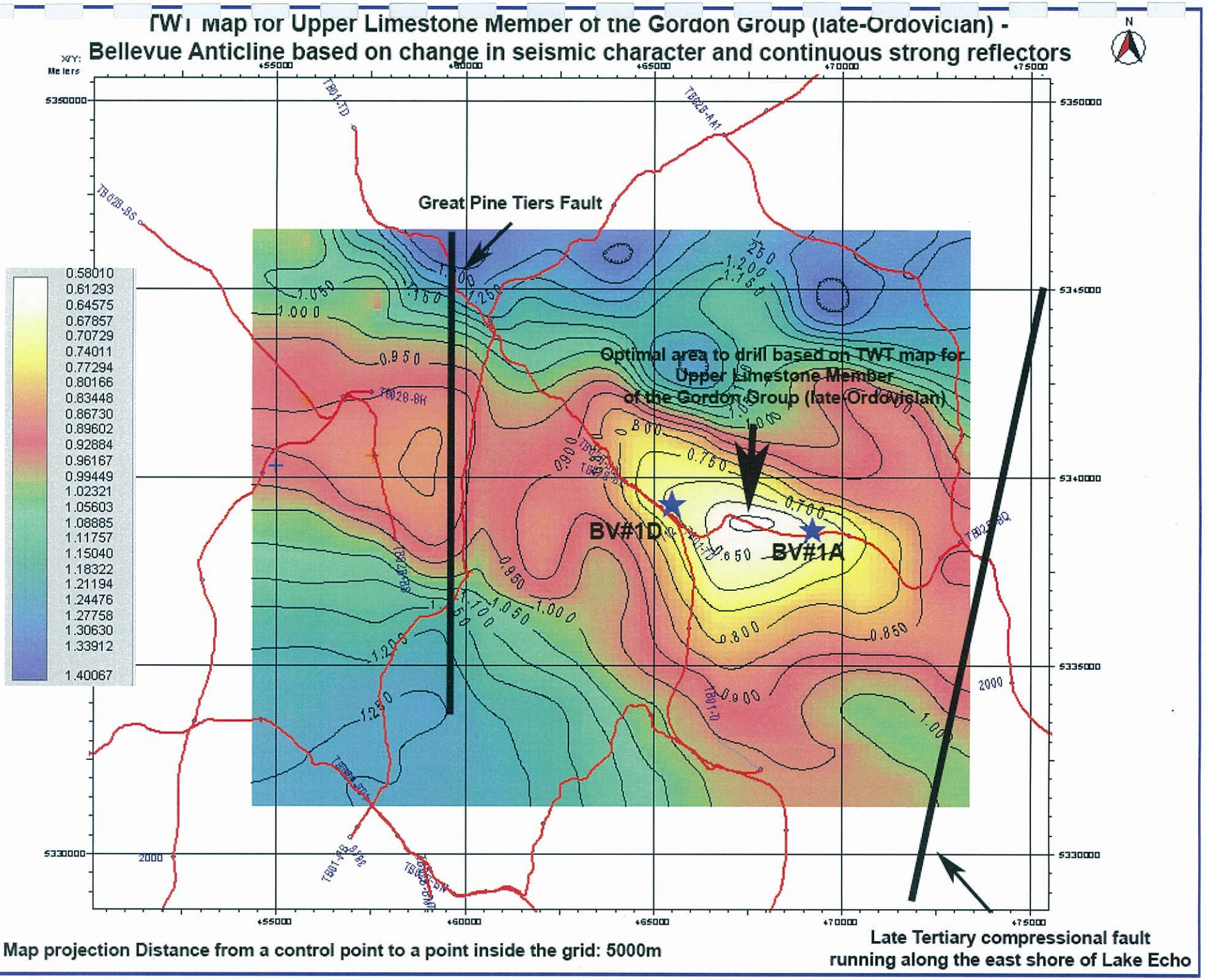
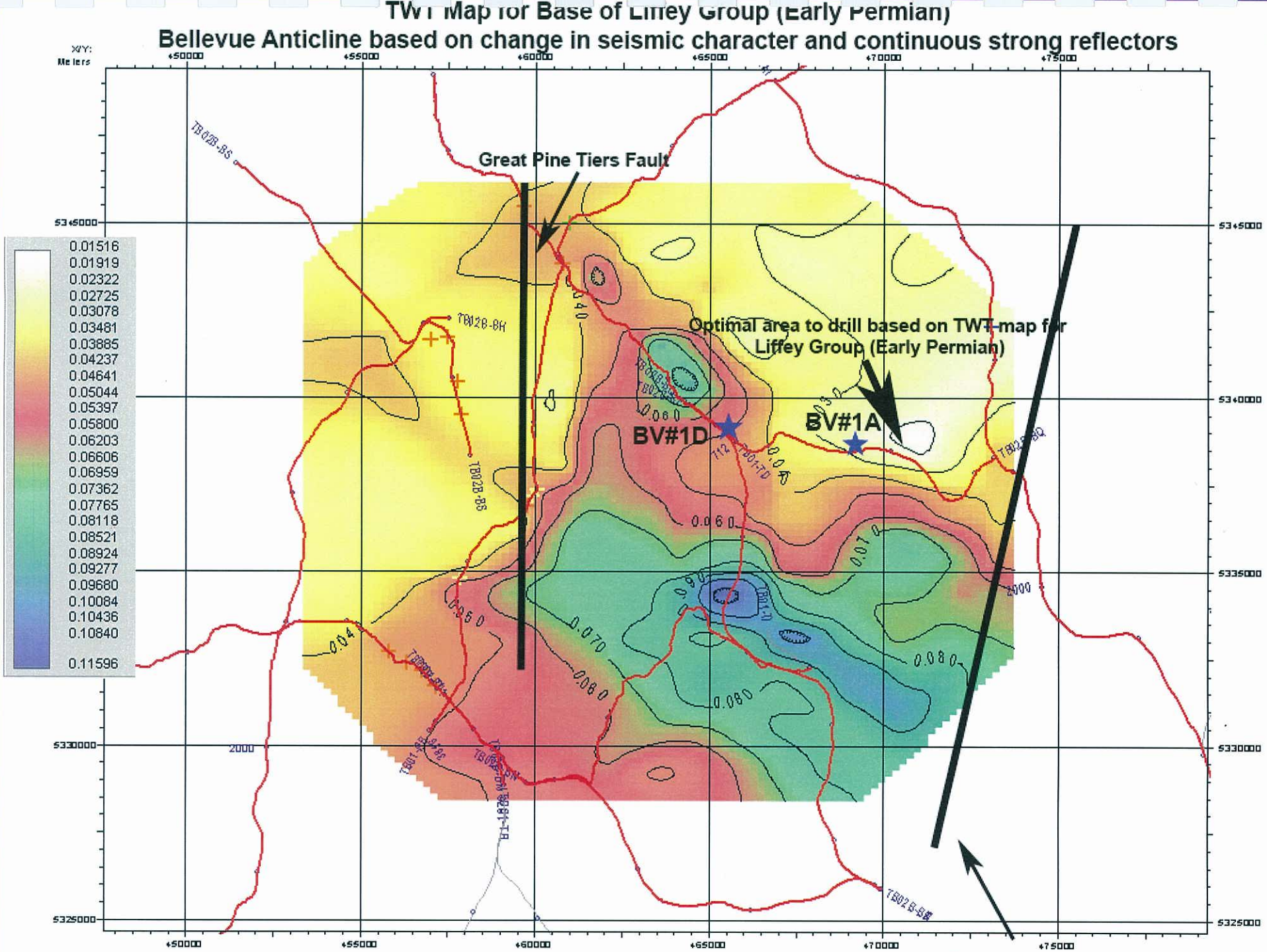
TWT Map for Upper Limestone Member of the Gordon Group (late-Ordovician) - Bellevue Anticline based on change in seismic character and continuous strong reflectors



Map projection Distance from a control point to a point inside the grid: 5000m

TWT Map for Base of Liffey Group (Early Permian)

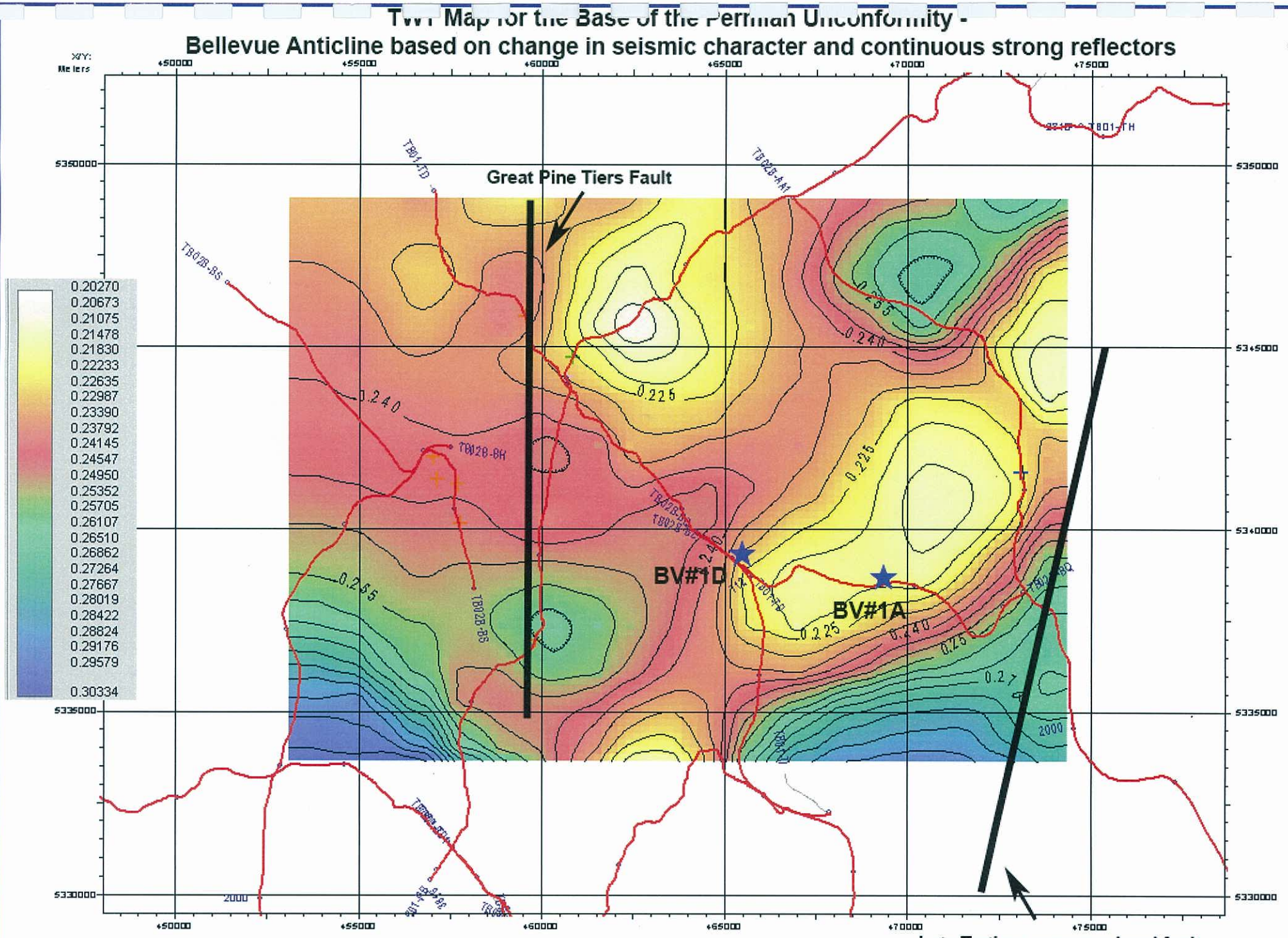
Bellevue Anticline based on change in seismic character and continuous strong reflectors



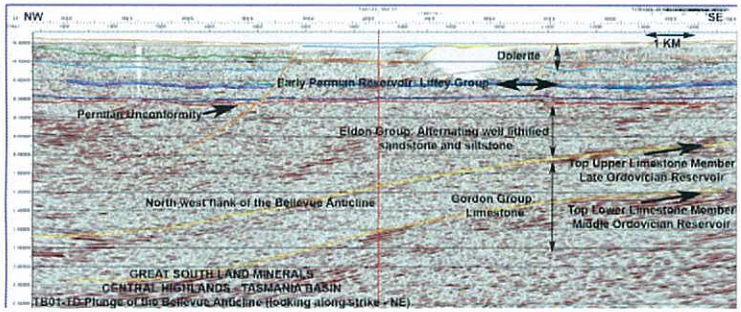
Map projection Distance from a control point to a point inside the grid: 5000m

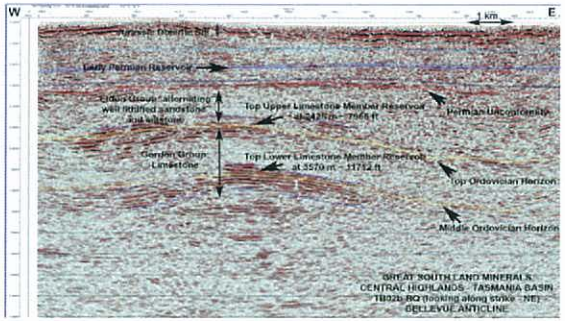
Late Tertiary compressional fault running along the east shore of Lake Echo

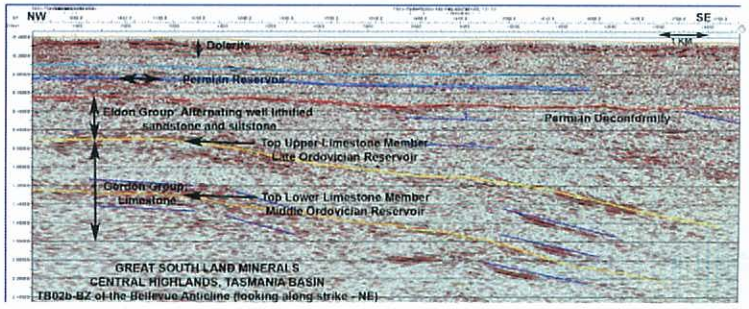
TWT Map for the Base of the Permian Unconformity -
Bellevue Anticline based on change in seismic character and continuous strong reflectors

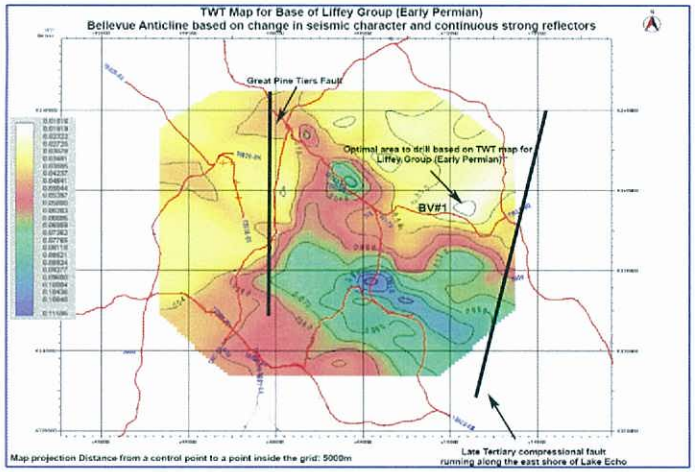


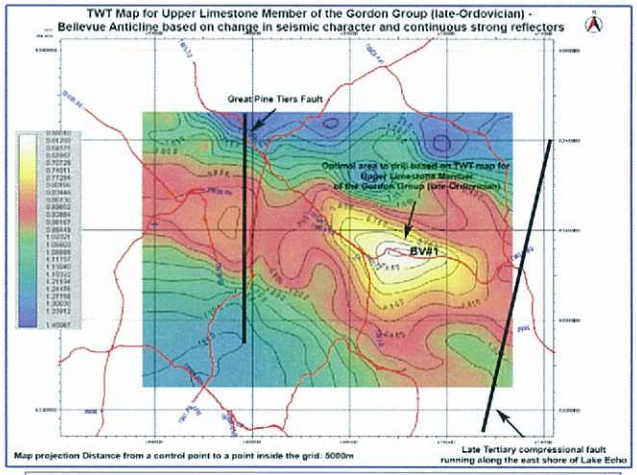
Map projection Distance from a control point to a point inside the grid: 5000m


NW
SE
1 KM
Dolerite
Early Permian Reservoir: Liffey Group
Permian Unconformity
Eldon Group: Alternating well lithified sandstone and siltstone
Top Upper Limestone Member Late Ordovician Reservoir
North-West flank of the Bellevue Anticline
Gordon Group: Limestone
Top Lower Limestone Member Middle Ordovician Reservoir
GREAT SOUTH LAND MINERALS
CENTRAL HIGHLANDS - TASMANIA BASIN
TB01-TD Plunge of the Bellevue Anticline (looking along strike - NE)


W
E
1 km
Jurassic Dolerite Sill
Early Permian Reservoir
Eldon Group: Alternating well lithified sandstone and siltstone
Top Upper Limestone Member Reservoir at 3437m - 11274 ft
Permian Unconformity
Gordon Group: Limestone
Top Lower Limestone Member Reservoir at 3570 m - 11714 ft
Top Ordovician Horizon
Middle Ordovician Horizon
GREAT SOUTH LAND MINERALS
CENTRAL HIGHLANDS - TASMANIA BASIN
TB02b-BQ (looking along strike - NE)
BELLEVUE ANTICLINE


NW
SE
1 KM
Dolerite
Permian Reservoir
Eldon Group: Alternating well lithified sandstone and siltstone
Permian Unconformity
Top Upper Limestone Member Late Ordovician Reservoir
Gordon Group: Limestone
Top Lower Limestone Member Middle Ordovician Reservoir
GREAT SOUTH LAND MINERALS
CENTRAL HIGHLANDS, TASMANIA BASIN
TB02b-BZ of the Bellevue Anticline (looking along strike - NE)


TWT Map for Base of Liffey Group (Early Permian)
Bellevue Anticline based on change in seismic character and continuous strong reflectors
Great Pine Tiers Fault
Optimal area to drill based on TWT map for Liffey Group (Early Permian)
BV#1
Map projection Distance from a control point to a point inside the grid: 5000m
Late Tertiary compressional fault running along the east shore of Lake Echo


TWT Map for Upper Limestone Member of the Gordon Group (late-Ordovician) -
Bellevue Anticline based on change in seismic character and continuous strong reflectors
Great Pine Tiers Fault
Optimal area to drill based on TWT map for Upper Limestone Member of the Gordon Group (late-Ordovician)
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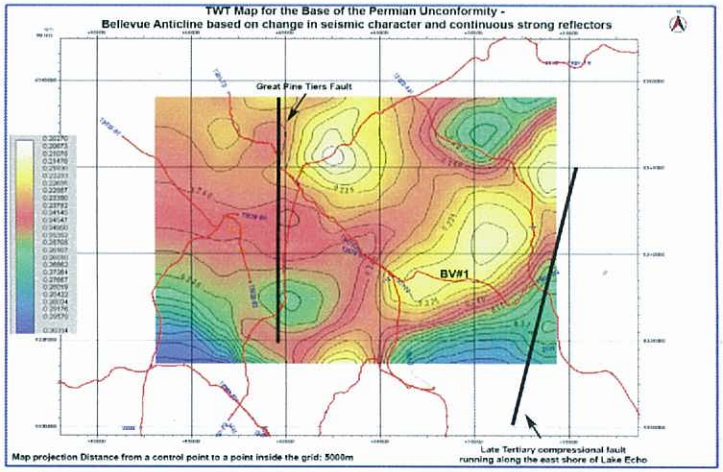
Late Tertiary compressional fault running along the east shore of Lake Echo


TWT Map for the Base of the Permian Unconformity -
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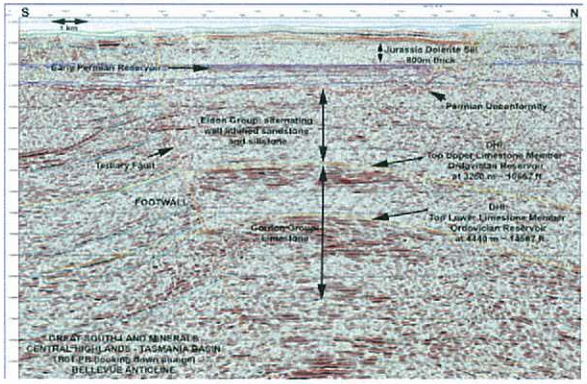
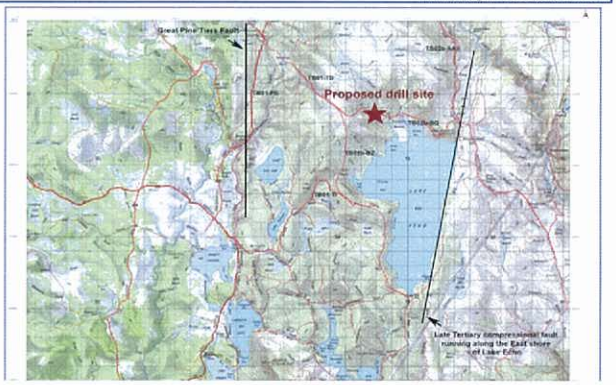
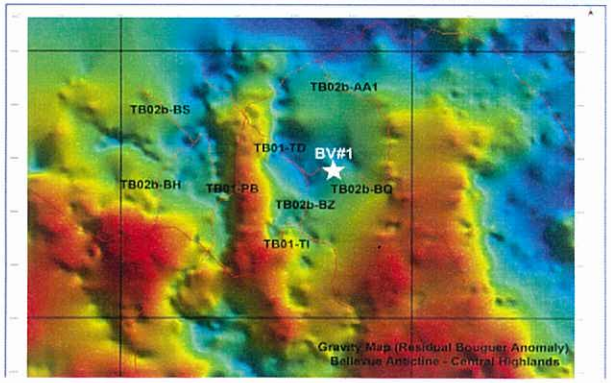

S
N
Jurassic Dolerite Sill
800m thick
Early Permian Reservoir
Permian Unconformity
Eldon Group: alternating well lithified sandstone and siltstone
Tertiary Fault
DRI
Top Upper Limestone Member Ordovician Reservoir at 3200 m - 10647 ft
FOOTWALL
Gordon Group: Limestone
DRI
Top Lower Limestone Member Ordovician Reservoir at 4440 m - 14567 ft
GREAT SOUTH LAND MINERALS
CENTRAL HIGHLANDS - TASMANIA BASIN
BELLEVUE ANTICLINE


Great Pine Tiers Fault
Proposed drill site
Late Tertiary compressional fault running along the East shore of Lake Echo


TB02b-AA1
TB02b-BS
TB01-TD
BV#1
TB02b-BH
TB01-PB
TB02b-BQ
TB02b-BZ
TB01-TI
Gravity Map (Residual Bouguer Anomaly)
Bellevue Anticline - Central Highlands