

2008

SEL 13/98 Annual Report



Great South Land
Minerals Limited

Great South Land Minerals
August 2008

GREAT SOUTH LAND MINERALS LTD
ANNUAL REPORT 2008

VOLUME 1 OF 5

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GREAT SOUTH LAND MINERALS ANNUAL REPORT 2007-2008

EXECUTIVE SUMMARY

GREAT SOUTH LAND MINERALS (GSLM) has, in the last year, focused on the interpretation, consolidation and re-appraisal of our 2007 and older 2D seismic and integrating these data with gravity data (acquired by SOLO GEOPHYSICS in 2007) and with geological data. Reinterpretation of these data and the application of Monte Carlo modeling has led to the identification, study and volumetric appraisal of 17 leads and prospects. A reappraisal of the source rock potential of onshore Tasmania has been carried out. Comparative studies with analogous basins in Australia and elsewhere have also been made. Lead and prospect masais have been constructed and suitable well site locations identified. The well sites have been prioritized on the basis of prospectivity and estimated volume of prospective undiscovered petroleum. Numerous geological, engineering, societal and environmental studies have been conducted on these sites. Eagle nesting sites have to be avoided during exploration activity. Close liaison with eagle experts plus a helicopter-based, eagle nest survey have allowed GSLM eventually to locate a geologically and ecologically suitable drill site near Lake Echo. Detailed engineering, emergency, hydrogeological, environmental and geological plans have been completed for our planned initial site near Lake Echo and legal agreements signed with the landowner (GUNNS Ltd). A contract has been signed and payment for mobilization made to HUNT ENERGY, a leading petroleum drilling company based in Adelaide.

Bellevue #1 will be drilled near Lake Echo, to a depth of 2750m, once approvals have been obtained from Mineral Resources Tasmania. A further 6 wells are envisaged for 2008-2009 as well as acquisition, processing and interpretation of a further 500km of seismic lines.

TERREX SEISMIC conducted 271 line kilometres of VIBROSEIS 2D seismic in 2007. These data were processed by FUGRO in Perth. Further processing was carried out by FUGRO SEISMIC IMAGING in 2007 including AVO analyses of bright spots and flat spots on the Thunderbolt and Bellevue structures. The seismic data were analysed and interpreted in-house, using KINGDOM seismic interpretation software and cross sections and two way time maps were prepared. Down-hole seismic velocities obtained previously by GSLM at GSLM's Bruny Island and Hunterston stratigraphic well sites, were used to calculate depths to identified geological horizons and lithostratigraphic columns constructed. Suitable sites were identified using newly acquired gravity surveys of the Central Highlands and a subsequent combined geophysical/geological study by LEAMAN GEOPHYSICS. Refinements and discussions of the seismic interpretations were made over the 07/08 year by very experienced external consultants including Trent Spry and Brian Diamond of RPS ENERGY (Perth), Suleyman Turgut (Istanbul) and by Ekal Ltd (Melbourne). Subsequently, volumetric calculations of undiscovered prospective resource were carried out on the structures using standard petroleum industry programs utilising Monte Carlo probability techniques. These data were used to rank the structures. The Bellevue and Thunderbolt sites were eventually ranked as number 1 and 2 as they are on very large structures and test both the Gondwanan and Larapintine petroleum systems. The Bracknell, Butlers Rise, Interlaken, Cressy, Stockwell, Hunterston, Hummocky Hills, Scotts Tier, Lonnvale #2, Nile River, Macquarie River, Derwent Bridge, Quamby and Steppes are smaller, mainly fault-controlled structures and test the Gondwanan petroleum system.

A study on fault smear was initiated which shows the likelihood that most faults in these Gondwanan structures would have been sealed by shale smear both during charging and subsequently.

Geologically, economically and geophysically ranked well sites were then investigated for cultural, logistic and environmental suitability.

The Bellevue structure has been prioritized because of its size and prospectivity. Several sites have been identified on the basis of Two Way Time maps and initial on ground reconnaissance. However, a helicopter based survey of eagle nests commissioned by GSLM led to the exclusion of three geological promising sites just to the north of Lake Echo. Subsequent work has shown a site to the west of the northern shore of Lake Echo, to be geologically, logistically, culturally and environmentally suitable.

In addition to eagle-nest studies the following studies have been carried out at various potential well sites by numerous Tasmania-based consultants. These are:

Hydrogeology (by Leaman Geophysics)

Acoustic studies on the Hunt Energy 3 rig in South Australia (by Pieru Terts)

Acoustic studies on the Spaulding top-hole rig (by Bill Butler)

Acoustic studies on individual sites (by Terts and Butler)

Threatened Species (Phil Barker of VIPAC)

Forest Practices Plans and/or Special Values Assessment (Brian French, Chris Barry and Tony Stonjeck)

Cultural and European Heritage (Parry Kostoglou of ARCTAS)

Aboriginal Heritage (Rocky Sainty)

Environmental Management Plans (by Shane Bartel)

Rig inspection and drilling systems (by MODUSPEC)

In addition, certification was obtained from the Tasmanian Fire Service, public liability and well control insurance arranged, well control and first aid certificates of all drilling crew copied and full landowner agreements negotiated and obtained. Drilling Plans, Operations Plans and Emergency Response Plans for each well site were produced in-house by GSLM drilling manager Duncan New. Minor studies on basin comparisons, iodine in surface waters as geochemical indicators of petroleum leakage along the Tamar Lineament and seismic imaging of the Tamar lineament have also been carried out.

GSLM has commissioned GERALD SPAULDING DRILLING to drill the top hole of Bellevue #1 to a depth of 300m. At the time of writing the Hunt Energy Drill rig has been dismantled and is arriving in Tasmania. Subject to MRT approval, we expect to commence drilling operations in September 2008.

Clive Burrett, Chairman and Chief Geologist, GSLM and Empire Energy.

Proposed Exploration Plan 2008-2009

Subject to MRT permissions and final landowner approval, the company will be spudding Bellevue #1 in September 2008.

The total cost of Bellevue #1 is estimated to be in excess of \$5million.

It is planned to then move the Hunt Energy rig to Thunderbolt #1 to the east of the Florentine Valley.

Another 4 wells are planned for early 2009 but drilling will depend on the results of wells 1 and 2.

In addition 5 million dollars of additional seismic lines are planned for the 08/09 summer.

The total budget for SEL 13/98 is planned to be \$45 million in 2008/9.

September – October 08

Spud and drill Bellevue #1 Reports for Thunderbolt and other well sites. Write and compile well completion report.

October- November 08

Spud and drill Thunderbolt#1 Plan seismic.

December – January 08/09

Assess results from Bellevue and Thunderbolt, Spud well number 3. Plan seismic.

February –March 09

Well number 4 Seismic program

March-April

Well number 5, Seismic program.

April-May 09

Well number 6 Processing and interpretation of seismic.

May-June 09

Well number 7

June –July 09

Well number 8

Geophysics

Geophysics

-Gravity



Gridding of Gravity Data

October 2007

Prepared by: Jo Zantuck (B. Geom)

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Introduction

A combined GPS and gravity survey was carried out during April and early May 2007 in the Tasmanian Central Highlands, principally around the Lake Echo region. The survey was conducted by Brian Rau and assistants of Solo Geophysics & Co (Solo Geophysics 2007), supervised by Leaman Geophysics, on behalf of Great South Land Minerals.

Existing gravity measurements in the area were unfortunately limited and insufficient for the gravity data to be usefully integrated with seismic acquisition data collected by GSLM in the same area. The purpose of the survey was to remedy this situation. Unfortunately, due to the nature of the terrain and the survey equipment used, a regular grid of sample points was not possible. Measurements were mainly made on existing tracks, causing the final data to contain some gaps.

Final data from the survey was supplied to Dr. David Leaman of Leaman Geophysics and Dr. Bob Richardson of Mineral Resources Tasmania.

Dr David Leaman supplied GSLM with a Completion Report and interpreted gravity maps for the Central Highlands region, based on both Bouguer Anomaly and Residual Bouguer Anomaly measurements and illuminated from the north-east (Leaman 2007).

MRT provided GSLM with gravity measurement points (Bouguer Anomaly and Residual Bouguer Anomaly) from the State Gravity Database (incorporating the 2007 Solo Geophysics data), limited, of course, to the data which GSLM is entitled to access.

It was then necessary for GSLM to create gravity maps from the state-wide point datasets supplied by MRT.

Methodology

The following methodology was applied for both the Bouguer Anomaly and Residual Bouguer Anomaly gravity datasets:

The XYZ (Easting, Northing, Gravity) data obtained from MRT was plotted and used to interpolate a gravity surface. SURFER software was used. A Kriging algorithm with a specified cell size of 100m and the other default parameters was used for the interpolation.

The resulting grid was exported from SURFER in ASCII XYZ format.

The grid was imported into ER Mapper. A 'spectrum' colour range was applied - (ranging from hot pink at the lower end of the scale, through blue, green, yellow and red at the high end). The colour inflection (or change) points were defined by a 'histogram equalise' algorithm which caused a similar number of cells to be assigned each colour.

It was necessary to define a subset of the original grid (trimming off the edges) before it was coloured, since artificially high or low values at the edges tended to skew the results.

Sun shading was applied to the coloured surface. A vertical sun angle of 45 degrees was used and four datasets were produced with illumination from the north-east, north-west, south-east and south-west respectively.

Datasets were then exported from ER Mapper in ECW format, so they could be opened in both MapInfo (GIS software) and Kingdom Suite (seismic interpretation software) and overlaid with other data such as seismic acquisition data points, geology, topography and potential drill sites. See Results section, Figures 1- 12.

Results

See following pages.

Figure 1. Residual Bouguer Anomaly - Tasmania - (Illuminated from the northeast)
with Tasmanian towns, GSLM seismic lines and GSLM proposed drill sites

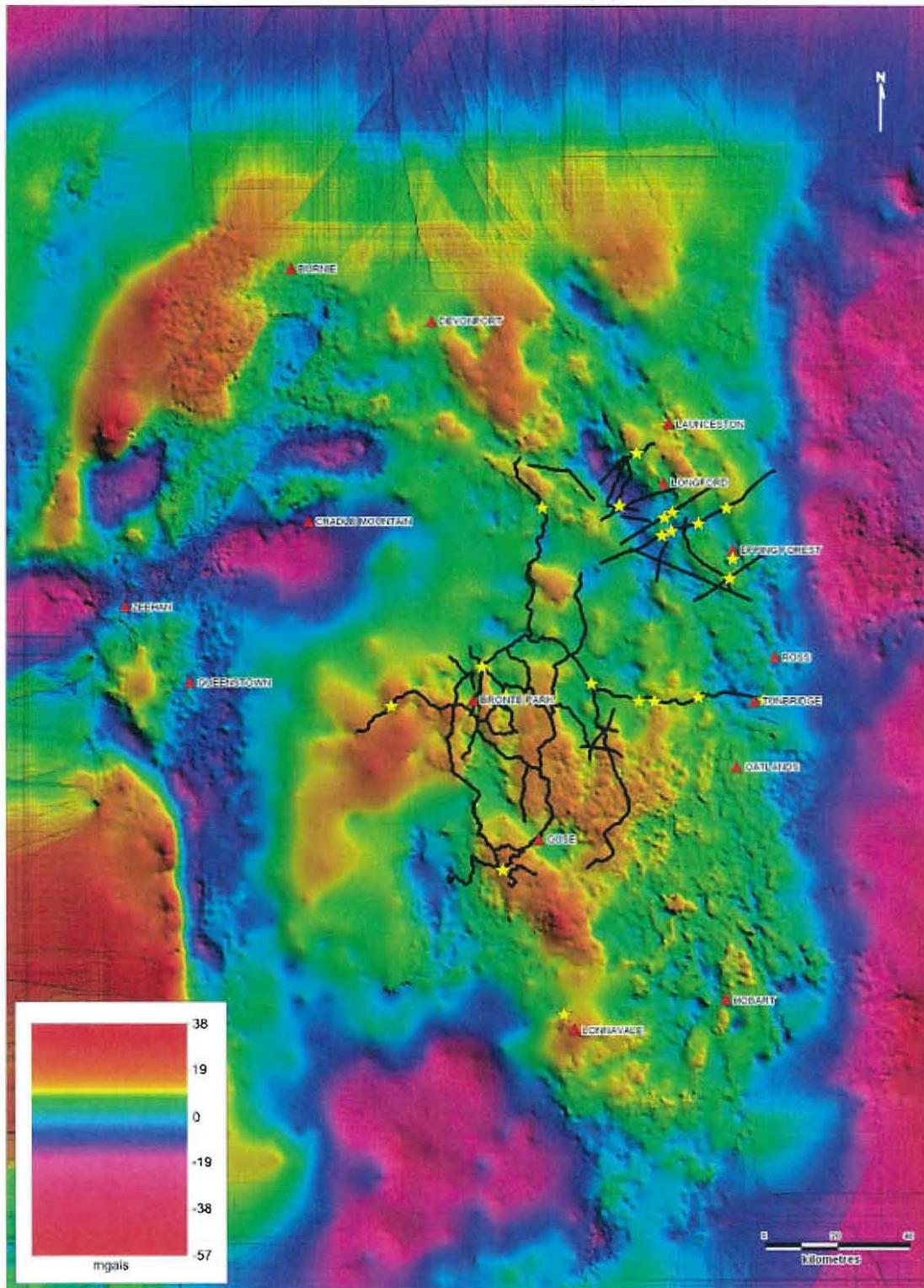


Figure 4. Residual Bouguer Anomaly - Tasmania - (Illuminated from the northwest)
with Tasmanian towns, GSLM seismic lines and GSLM proposed drill sites

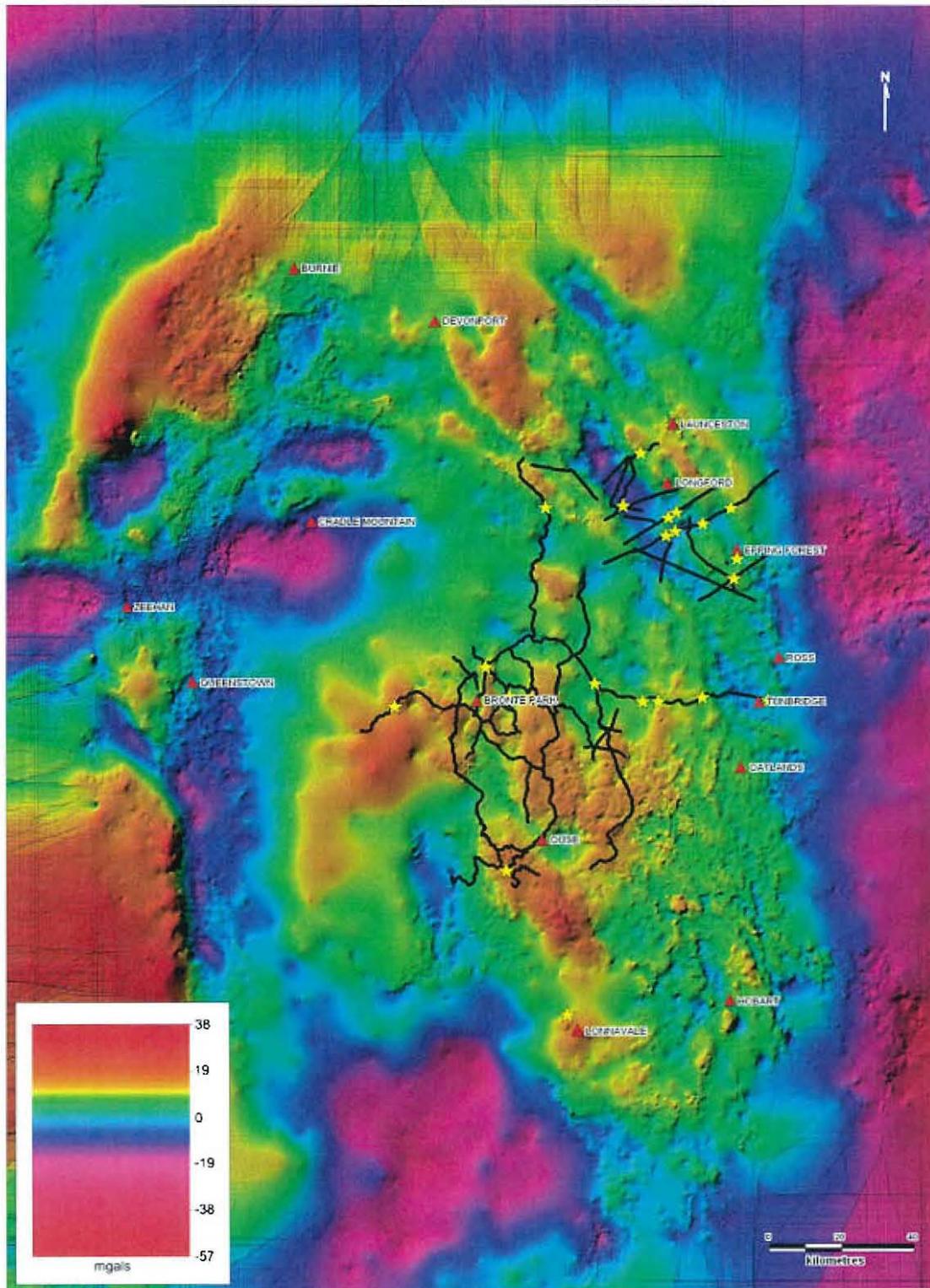


Figure 5. Bouguer Anomaly - Tasmania - (Illuminated from the northeast)
with Tasmanian towns, GSLM seismic lines and GSLM proposed drill sites

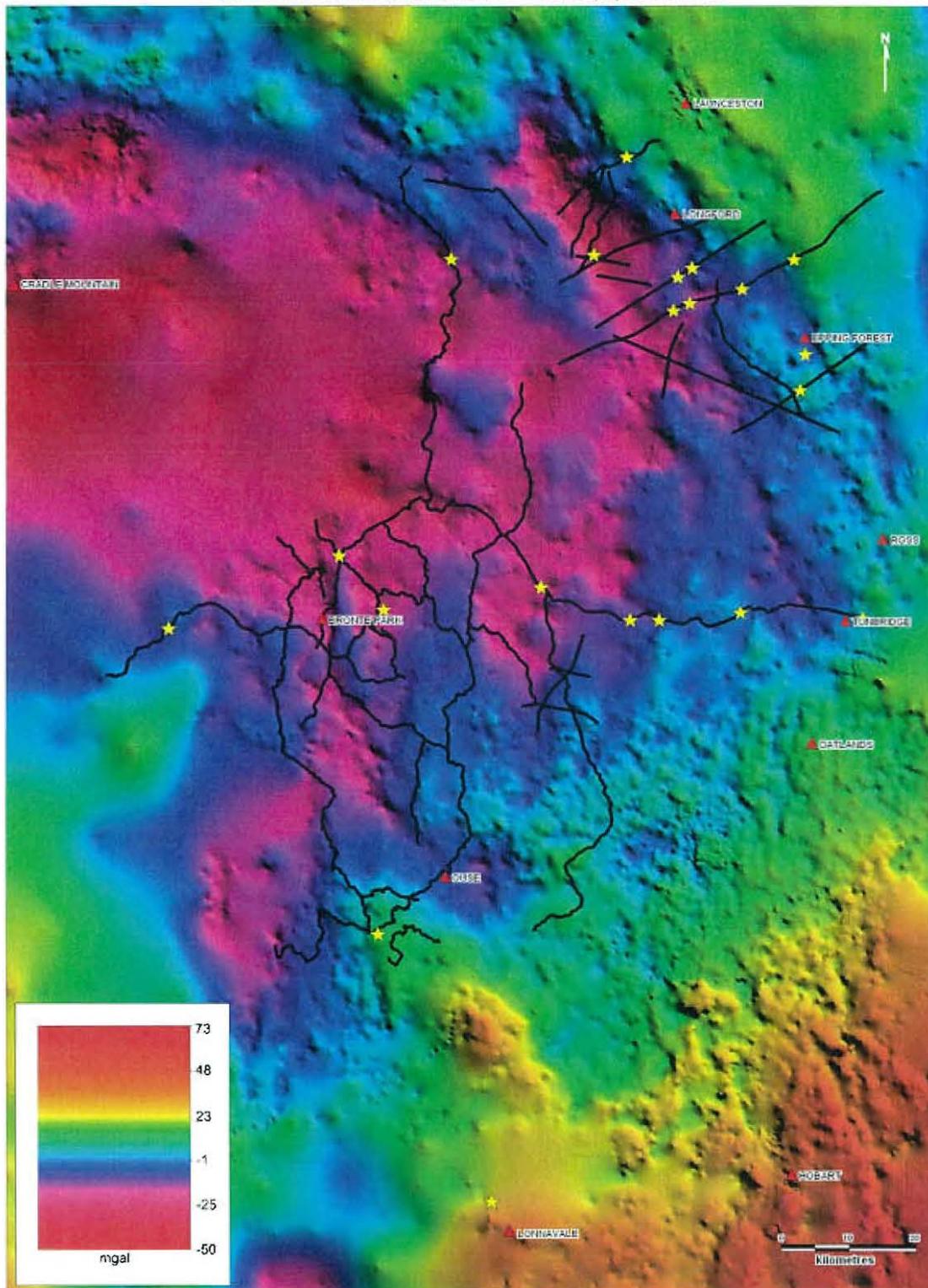


Figure 6. Bouguer Anomaly - Tasmania - (Illuminated from the southeast)
with Tasmanian towns, GSLM seismic lines and GSLM proposed drill sites

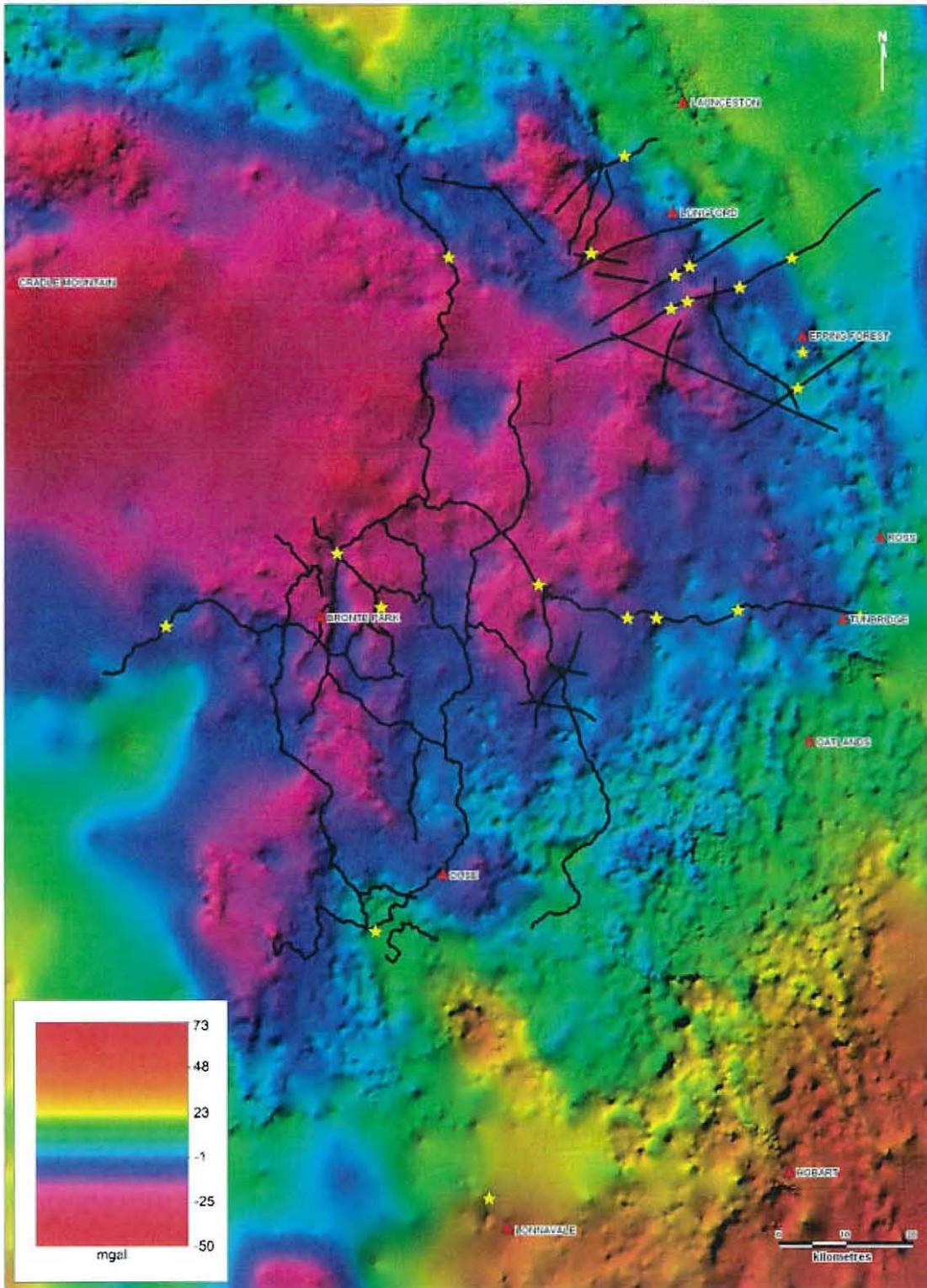


Figure 7. Bouguer Anomaly - Tasmania - (Illuminated from the southwest)
with Tasmanian towns, GSLM seismic lines and GSLM proposed drill sites

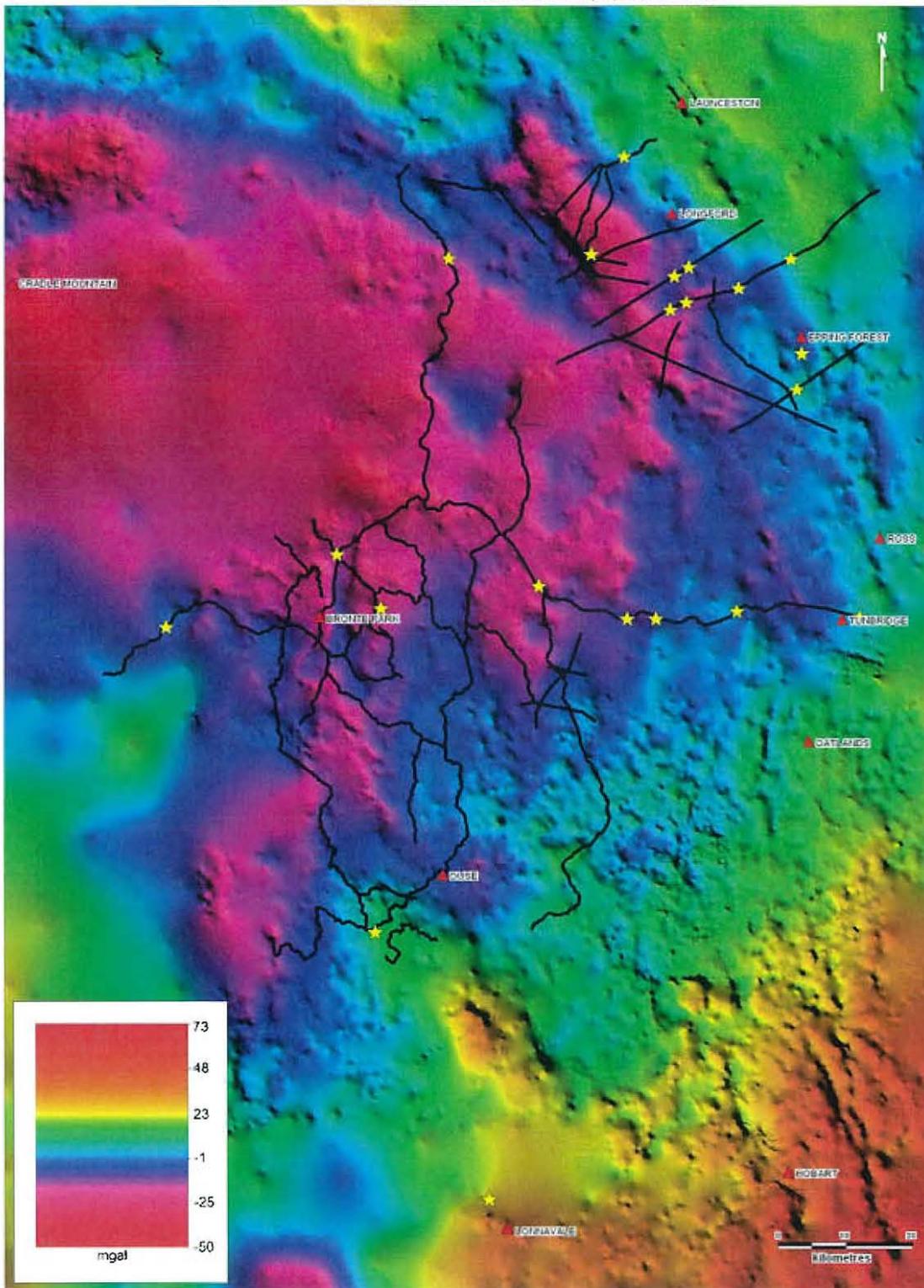


Figure 9. Residual Bouguer Anomaly - Central Highlands - (Illuminated from the northeast)
with Tasmanian towns, GSLM seismic lines and GSLM proposed drill sites

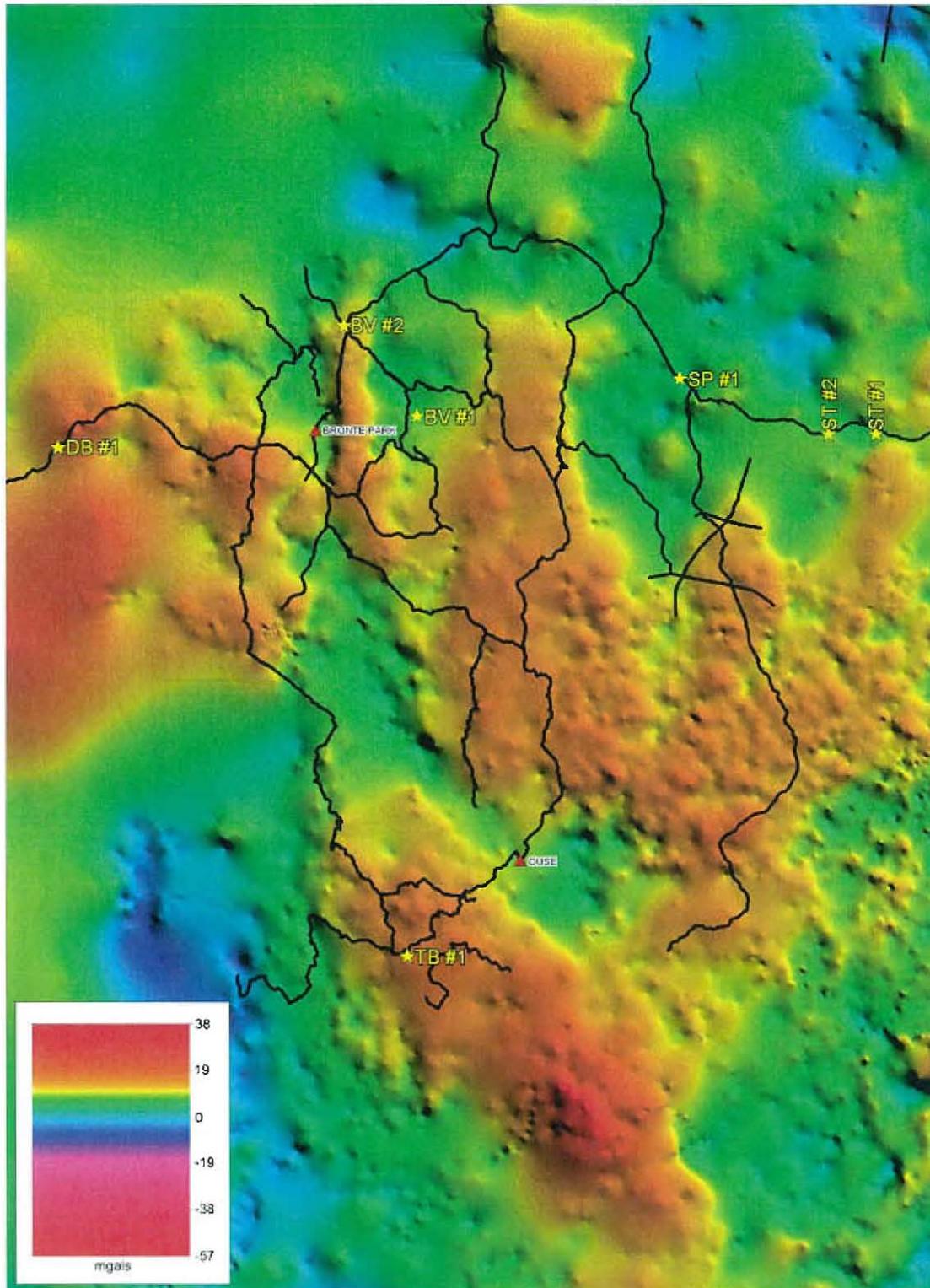


Figure 10. Bouguer Anomaly - Central Highlands - (Illuminated from the northeast)
with Tasmanian towns, GSLM seismic lines and GSLM proposed drill sites

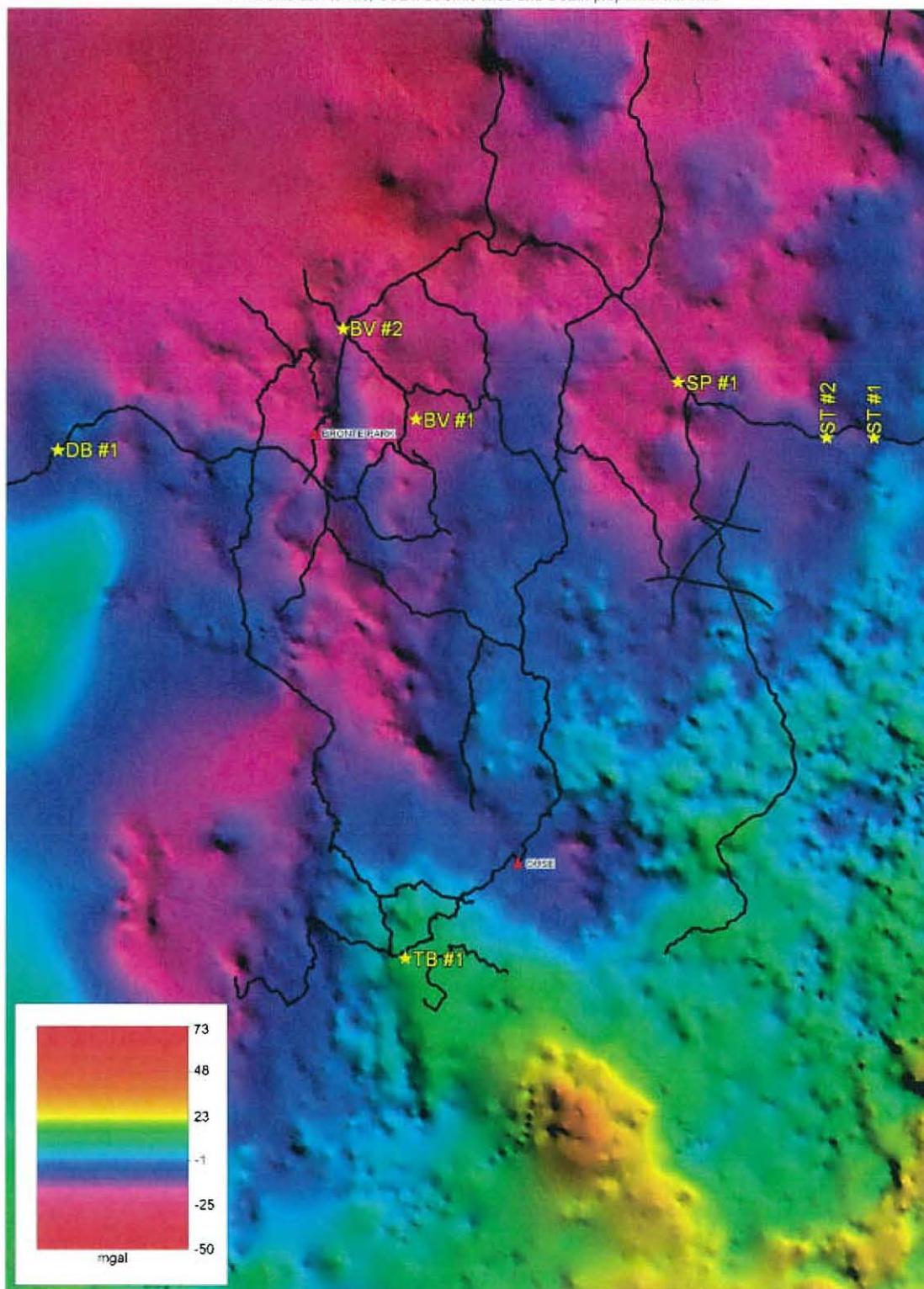


Figure 11. Residual Bouguer Anomaly - Midlands - (Illuminated from the northeast)
with Tasmanian towns, GSLM seismic lines and GSLM proposed drill sites

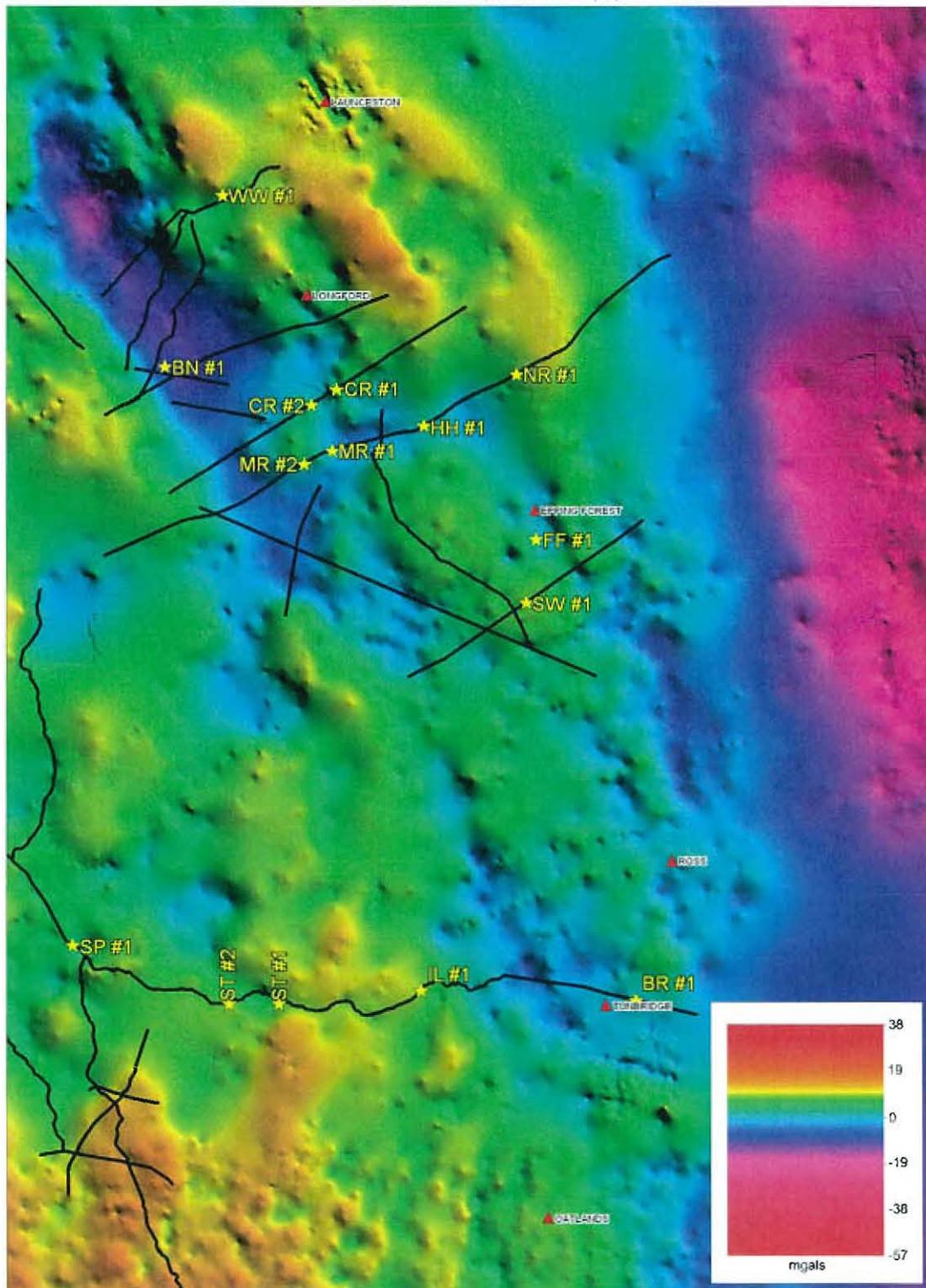
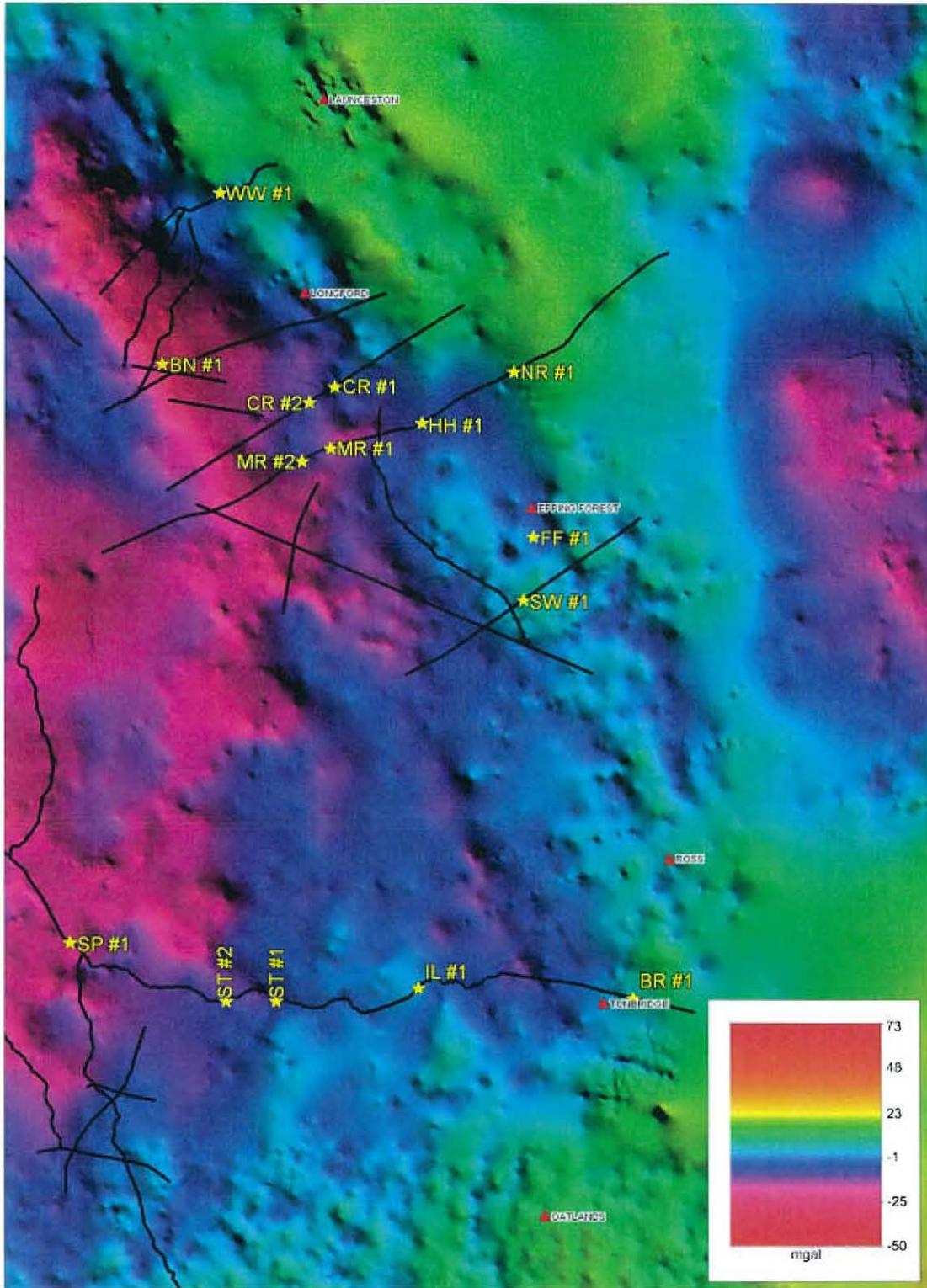


Figure 12. Bouguer Anomaly - Midlands - (Illuminated from the northeast)
with Tasmanian towns, GSLM seismic lines and GSLM proposed drill sites



Discussion/Conclusions

The Kriging method used to create the gravity grid in SURFER is complex, with many of the parameters able to be adjusted to fine tune the result. The default parameters were used for this data and deemed to produce a consistently acceptable result across the entire area.

The results were compared with Dr David Leaman's interpolation for the Central Highlands as well as an older state gravity map as check for gross errors. None were found.

The Kriging algorithm produced some artefacts in the final grids. These artefacts appear as a series of straight ledge-like shapes, particularly in areas where there are a limited number of input data points.

The choice of cell size was difficult given that the distance between data points varied significantly throughout the dataset. A value of 100m was chosen as being a good average. A smaller cell size than 100m may have been appropriate in certain areas and produced a smoother looking grid when viewed close-up, however, in areas of wide distribution of data points, a very fine cell size gives the appearance of much higher precision in the data than is actually the case.

Of course, a better result could always be obtained with the addition of more gravity measurements spaced a in a regular grid pattern.

Applying a colour range across a state-wide dataset naturally means that local variations will not be so apparent since they are small variations in terms of the entire dataset. For a more detailed examination of local variations in gravity, a subset of the state-wide data should be taken and the methodology outlined previously applied to this subset.

References

Leaman, D.E., 2007. Completion Report, Gravity Survey, Central Plateau Area, Tasmania, SEL 13/98. Report for Great South Land Minerals Ltd, by Leaman Geophysics, July.

Solo Geophysics, 2007. Gravity Survey, Central Highlands Areas, Tasmania. Report for Great South Land Minerals Ltd, by Solo Geophysics, June.

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COMPLETION REPORT

GRAVITY SURVEY CENTRAL PLATEAU AREA TASMANIA SEL 13/98

for

GREAT SOUTH LAND MINERALS LIMITED

by

Dr D E LEAMAN

July 2, 2007

INTRODUCTION

Great South Land Minerals Limited holds exploration licence SEL 13/98 which covers much of central Tasmania, including the broad and undeveloped plateau region.

Gravity data coverage in the region has been extremely variable in spacing and reliability. Large parts of the area north and west of Bothwell; approx 480 000 mE, 5310 000 mN, contained regional stations with spacings of 5 to 7 km. Some road traverses offered higher density. No reliable interpretation of structures between land surface and perhaps 3 km depth is possible with such data and many deductions and inferences based on regional surface geological data may be misleading. See comments in Leaman, 2007.

Since GSLM intended to acquire some additional seismic data and to drill some wells it was considered desirable to obtain other data sets which can offer broader and integrated coverage and so resolve some of the inevitable ambiguities posed in such a green-fields area in which target units and structures are complex and concealed, and presently un-drilled.

The present survey was undertaken in order to remedy these observational limitations and to allow a more comprehensive integration of extant and newly acquired seismic data.

Gravity data have been acquired along any accessible vehicular routes in central Tasmania. A more regular station spacing is an ideal not practically nor economically feasible in central Tasmania and could only be achieved with extensive use of helicopters or walking. The new survey represents a basic infill on readily accessible routes with negligible hand carriage of equipment and no use of helicopters. The nominal spacing has been reduced to less than 1.5 to 2 km across the entire area surveyed with along traverse spacings of 0.5 to 1 km. Some gaps persist where large areas lack any access – such as lakes or reserves.

The survey was undertaken between March and late May, 2007 by Solo Geophysics based in Adelaide, South Australia, and was supervised by Leaman Geophysics.

THE SURVEY

The survey operation was completed with crew (Brian Rau - principal, Todd Sandercock and George Gamtcheff as assistants) as a combined GPS and gravity survey.

The equipment used included a Leica 1200 dual frequency RTK base station for survey control, a Garmin GPS 60 for roving observations tied with a 4W/25W UHF 467.075 MHz radio link. Optical survey support required Sokisha B1 theodolite and 5 m staff.

The resolution of the basic GPS survey component was better than 5 cm horizontally and 3 cm vertically. When observations might lead to errors in excess of 5 cm they were not recorded.

Gravity observations were complete with La Coste & Romberg meter G556 with calibration factors of 1.01388 to 1.01390 for the meter range required. The most recent check calibration was undertaken in November 2005.

The ultimate gravity base for the survey was the National Tie Station at Hobart Airport but, due to construction activities which limited access and re-occupation, a temporary airport base was established outside the buildings and then linked to a new base at Mt Pleasant radio telescope nearby where the base was located at survey mark 9699.9160 RMI (535 927mE, 5260 737 mN, 73 m AHD). This station was then used to anchor the survey and provide control observations. Observed gravity at Mt Pleasant is 980436.97 mgal (Isogal65) or 980423.76 (Isogal84).

A secondary base network was then established linking Bothwell, Steppes, Tarraleah, Ouse, Miena and Bronte Park. The control for this linkage was at Bronte Park: station 100032, Isogal65 of 980209.52 mgal, 457 742.78 mE, 5334 623.73 mN near the junction of Marlborough and Lyell Highways.

Elevation control was based on State survey marks linked to the RTK GPS control station. The fundamental tie and reference was bench mark ST1084 (Bronte Park): 457 774.071 mE, 5331114.96 mN, 677.67 m AHD. Several subsidiary elevation reference points about 5 to 10 km apart were then established across the region.

Several problems were encountered during the survey which limited its coverage and rate of progress. Such problems included locked gates, gates with locks which did not function, restricted access to some private land, deer shooting and refused access at such times, tree falls, eroded tracks and difficulty in tracing land owners.

Much of the access used was relatively new and related to forest activities, both by private forest companies and Forestry Tasmania. Working limitations and the numerous key requirements were often a problem in such areas although no access was denied. Such problems, however, lead to inefficiencies in planning access and work sequences and cost much time.

Downtime due to weather was, fortunately, minimal given the general elevation and exposure of the area.

Total stations observed, 1895.

All gravity observations were taken at ground level and drift corrected using loop corrections followed by correction for tides. Bouguer reductions have been computed by Solo Geophysics using a density of 2.67 t/m³ and then terrain corrected to a radius of at least 19 km by Leaman Geophysics. The terrain corrections are considered minima and any differences reflect map scales and resolution, or fine details of topographic irregularities very close to the meter. The

latter were not described. Terrain corrections are typically less than 0.6 mgal but some exceed 3 mgal.

The density used allows consistent merging with the Tasmanian gravity data base and the reduced data are fully compatible with that data base. With the exception of some terrain corrections, especially those in excess of 0.4 mgal, the new reduced data has a precision better than 0.01 mgal in Bouguer anomaly. Stations with large terrain corrections, or in difficult to assess locations near the meter, may only have a precision better than 0.05 to 0.1 mgal depending upon the particular topographic feature. No special or local slope surveys were undertaken to define or resolve such problems since there is no justification. The data thus accumulated into the State data base is, in general, of much better quality than any other elements already incorporated. This is a high quality data set acquired in difficult terrain.

All data verification and checking was undertaken by David Leaman of Leaman Geophysics and reviewed and inserted in the official data base by Robert Richardson of Mineral Resources Tasmania.

New data, as acquired during the survey reported here, have been blended with the State Gravity Data Base and basic plots provided in image form. All data are presented in terms of AMG66 zone 55 coordinates and AHD.

The two images provided present raw Bouguer anomalies (as observed, corrected and reduced), and residual Bouguer anomalies (after removal of crustal trends using the method of Leaman & Richardson, 1989 and Roach *et al*, 1994).

Both data bases (raw Bouguer, residual Bouguer) have been supplied to Great South Land Minerals Limited in digital form for practical use, interpretation and plotting in any form required.

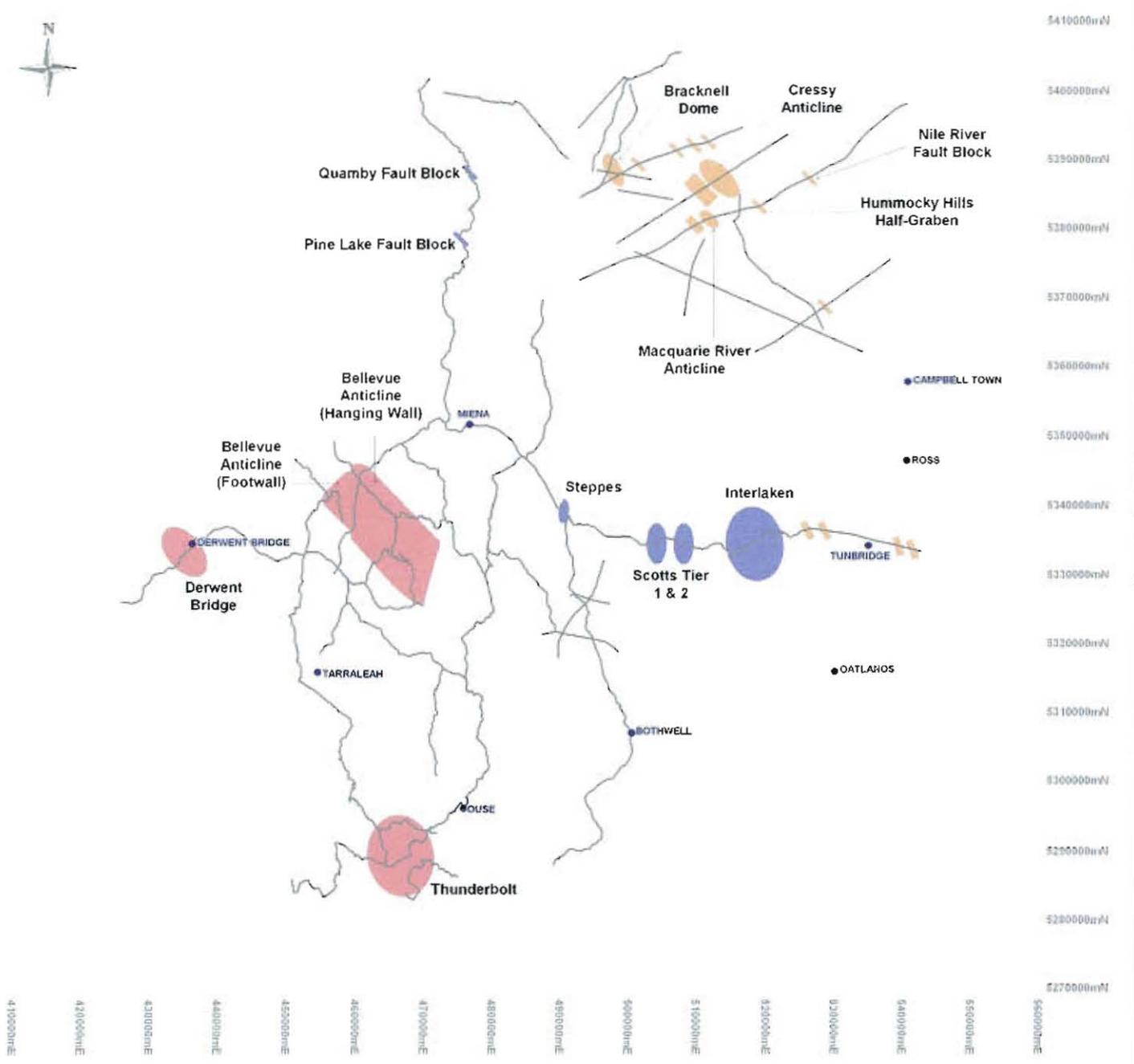
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- Leaman, D.E., 2007. An integrated interpretation of seismic, gravity and magnetic data (as available in December, 2006), central Tasmania. SEL, 13/98. Report for Great South Land Minerals Ltd, by Leaman Geophysics, January.
- Leaman, D. E., & Richardson, R. G., 1989. Production of a residual gravity field map for Tasmania and some implications. *Exploration Geophysics*, 20, 180-184.
- Roach, M.J., Richardson, R.G., & Leaman, D.E., 1994. Comparison of regional-residual separation techniques for gravity surveys. *Exploration Geophysics*, 24, 779-784.

Report prepared on behalf of Leaman Geophysics by



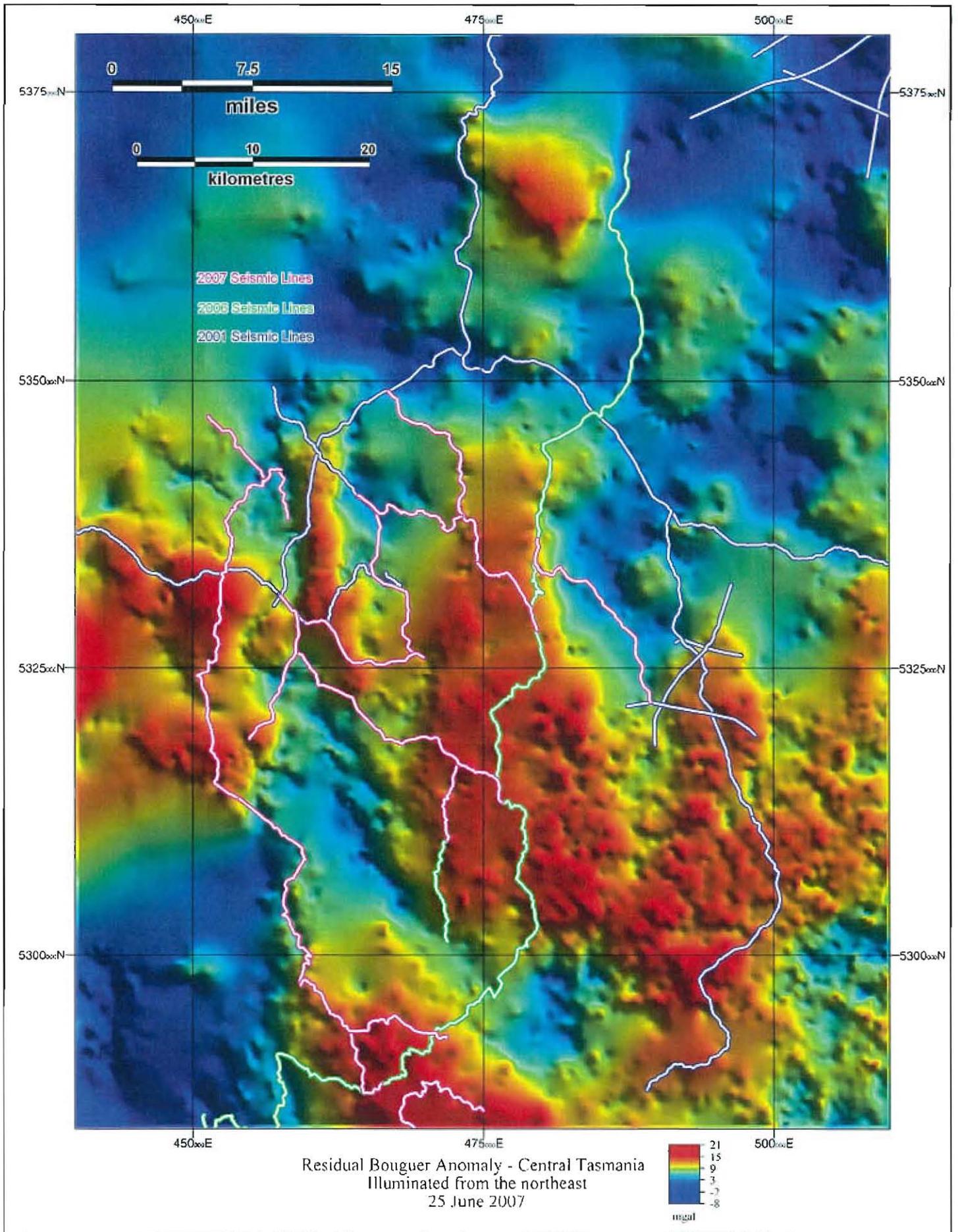
Dr. D. E. Leaman
July 2, 2007

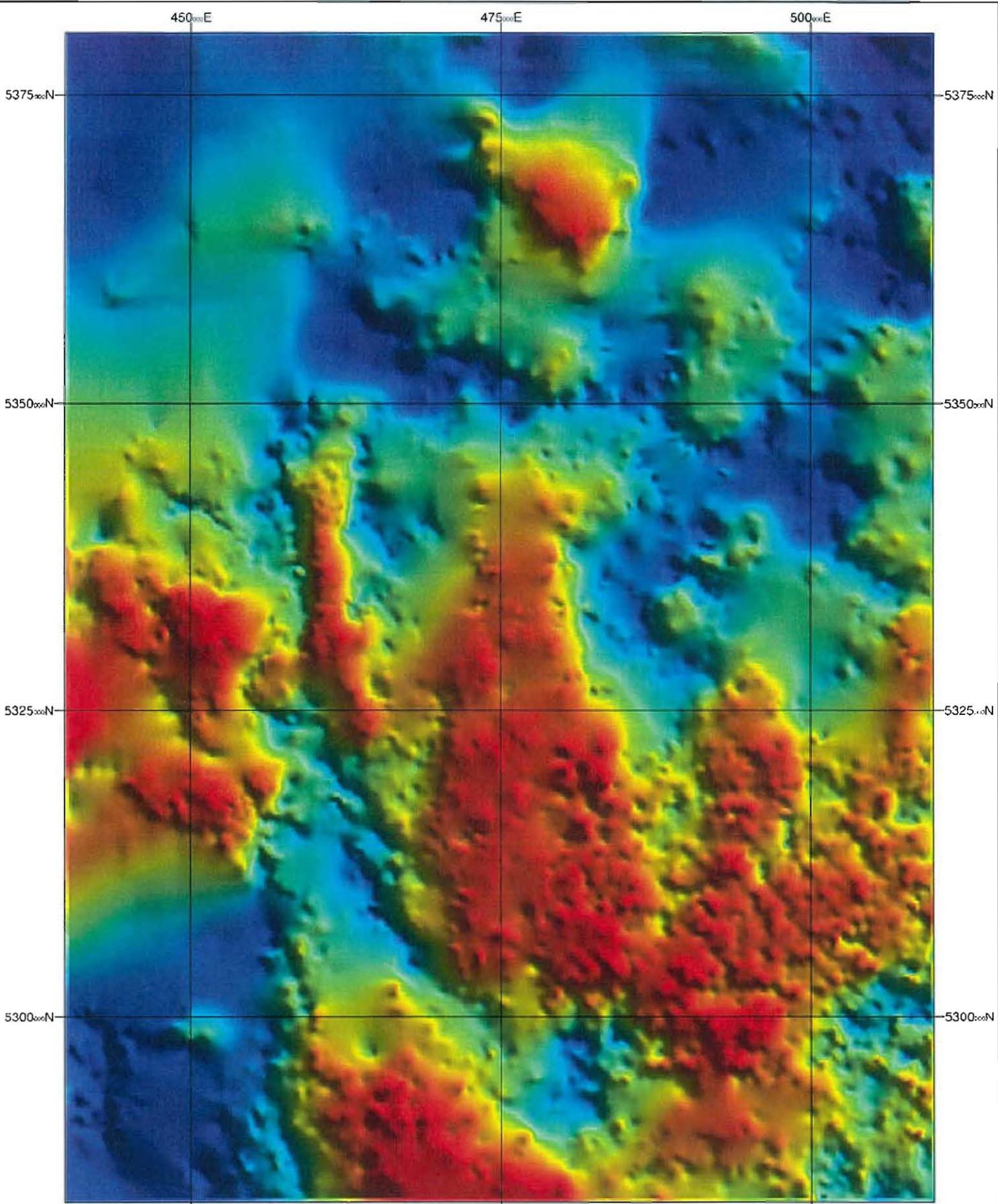


Prospects and Leads February 2008

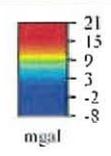
LEGEND

-  Pre-Tasmania Basin (Tabberabberan) Anticlinal Traps
-  Earliest Jurassic (Pre-Dolerite) Anticlinal Traps
-  Earliest Jurassic (Pre-Dolerite) Fault Block Traps
-  Early Tertiary (Post Dolerite) Anticlines and Domes
-  Early Tertiary (Post Dolerite) Fault Block Traps
-  GSLM Seismic Lines





Residual Bouguer Anomaly - Central Tasmania
Illuminated from the northeast
25 June 2007



mdata\00\mmap\pds\gsm2007\bronte_resid_25jun2007.alg

SOLO GEOPHYSICS & CO.

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GRAVITY SURVEY CENTRAL HIGHLANDS AREAS, TASMANIA
for
GREAT SOUTHLAND MINERALS
199 Macquarie Street, HOBART
Period from February to May 2007



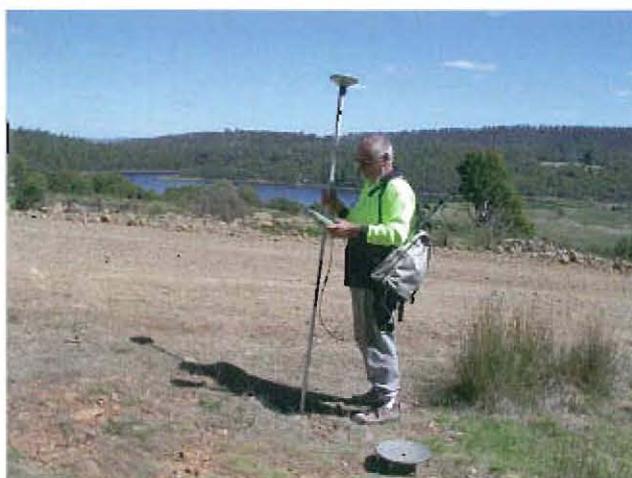


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- **GRAVITY CONTROLS**
- **GPS CONTROLS**
- **SURVEY AREA**
- **ON DISC PHOTOS AND DATA FILES**

The Crew:

A combined GPS and gravity survey was carried out during the months of April to early May by surveyors Brian Rau , Todd Sandercock and George Gamtcheff of Solo Geophysics & Co.



GPS EQUIPMENT:

Leica 1200 dual frequency RTK for survey applications
Garmin GPS60 for local activities
Radio Link 4W/25W UHF 467.075MHz frequency
Equipment owned by Solo and maintained and upgraded by manufacturer.
RTK survey resolution was better than 0.05m for horizontal and vertical measurements as satellite availability was usually resolved better than 0.03m. The data is not recorded when a vertical error of 0.05m is exceeded. Tasmania satellite availability limits useful survey periods in dense vegetation.

RTK-Base station:



GPS radio repeater to fill in difficult RTK communication areas.



Rover:



GRAVITY METER:

LaCoste & Romberg Model G #556



Meter calibration table:

Calibration table for conversion from instrument divisions to milligals for Tasmanian surveys.

Instrument Range	Value in milligals	Factor for interval
3700	3749.18	1.01388
3800	3850.57	1.01390

Equipment owned by Solo and maintained by manufacture to specification.
Instrument returned from routine service to Austin Texas November 2005.
Meter daily variations closely follow Longmans tidal calculations.

Time Zone:

The survey commenced in February during daylight saving and EST daylight saving times were used until 12th April. Normal EST was used again from 6th May until end of survey. Tidal changes are calculated by Longman formulae on UTM time plus 10 hours.

OPTICAL LEVEL and 5m staff:

In areas of dense cover where RTK GPS unable to resolve a solution for an accurate elevation, levels were carried optically from the nearest GPS elevation.

Sokisha B1 engineers optical level used.



GRAVITY SURVEY CONTROL STATIONS:

Mt. Pleasant GRAVITY BASE HOBART:

(Tie from radio telescope base to a new airport base, as could not locate old airport bases due to terminal reconstruction)



Main control base site location:



Gravity Hut: as seen in background, meter on marker.



Ground marker located:

Gravity Base (on plaque) 9699.9160 RM1 (file ID is 199699.916)

Value Isogal65 980436.970 mGals

Value Isogal84 980423.706 mGals

AMG66 Zone55 535927E 5260737N (ht approx 73m by Garmin GPS)

Gravity tie Mount Pleasant to Airport:

CLIENT: Great Southland Minerals

AREA: Hobart, Tasmania

GRID: Hobart Base Tie

MKPEAST =xxxxxx.xx MKPNORTH=xxxxxx.xx

BASE # 01;GRAVITY:9802093.800;EAST=xxxxxx ;NORTH=xxxxxx :Bronte house

BASE # 02;GRAVITY:9802095.200;EAST=457742 ;NORTH=5334623 :Bronte

BASE # 08;GRAVITY:9804369.700;EAST=535927 ;NORTH=5260737 :radio telescope

BASE # 09;GRAVITY:9804483.100;EAST=541258 ;NORTH=5256804 :airport car park

LAST BASE

LOOP:02;METER:556;DATE:090207;OPERATOR:B.

LINE L

LINE L

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000000.00 000000009. 3961.40 I111 000.00 42 0.041 09 3961.44
541258.00 5256804.00 3961.40 1112 ***.** 42 0.041 900001 3961.44 980448.31 airport
541258.00 5256804.00 3961.40 1124 ***.** 42 0.036 900001 3961.44 980448.31 airport
535927.00 5260737.00 3950.22 1301 ***.** 42 0.007 900017 3950.23 980436.97 telescope
541258.00 5256804.00 3961.40 1321 ***.** 42 0.002 900001 3961.40 980448.30 airport
535927.00 5260737.00 3950.23 1344 ***.** 42 -.007 900017 3950.22 980436.97 telescope
541258.00 5256804.00 3961.41 1402 ***.** 42 -.012 900001 3961.40 980448.31 airport
999999.99 000000009. 3961.41 1403 000.00 42 -.012 09 3961.40

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New Hobart Airport Base:



Meter location viewed north on new control station east end Hobart airport car park (outside terminal security and if less than 7 minutes no parking fee required)



Airport new base close up:

Value: Isogal65 980448.310 mGals

Location: AGD66 Zone55 541258E 5256804N Elevn 9.00m approx. by Garmin GPS

BASE CONTROLS CENTRAL HIGHLANDS:



Solo Base 100032 East side Bronte Park

(tied to Hobart control)

ID 900014/100032 AMG66 Zone55 457742.78E 5334623.73N 676.00m

Isogal65 980209.52 mGals ObsGrav

CLIENT: Great Southland Minerals

AREA: Hobart

GRID: Highland Bases

BASE # 01;GRAVITY:9802093.800;EAST=xxxxxx ;NORTH=xxxxxxx :Bronte house

BASE # 02;GRAVITY:9802095.200;EAST=457742 ;NORTH=5334623 :Bronte

BASE # 08;GRAVITY:9804369.700;EAST=535927;NORTH=5260737 :radio telescope

BASE # 09;GRAVITY:9804483.100;EAST=541258;NORTH=5256804 :airport car park

LAST BASE

LOOP:01;METER:556;DATE:070207;OPERATOR:B.RAU

LINE Line

000000.00	000000009.3961.46	1152	000.00	40	-.015	09	3961.44	
541258.00	5256804.00	3961.46	1152	***.**	40	-.015	900001	3961.44 980448.31 airport c/pk
514752.00	5297743.00	3866.49	1321	***.**	40	-.014	900003	3866.48 980352.03 Melton Mobray
500531.00	5307366.00	3827.27	1352	***.**	40	-.013	900004	3827.26 980312.28 Bothwell
494750.00	5320911.00	3784.16	1416	***.**	40	-.011	900005	3784.15 980268.55 Waddamana T/O
491236.00	5338613.00	3691.66	1443	***.**	40	-.010	900006	3691.65 980174.78 Steps T/O
485143.94	5346832.79	3668.49	1503	918.88	40	-.009	900007	3668.48 980151.29 Open area
492842.35	5344155.67	3648.30	1526	945.36	40	-.009	900008	3648.29 980130.83 Gate Flintstone
473136.82	5352174.04	3629.65	1557	1056.34	40	-.011	900009	3629.64 980111.92 Great Lakes Hotel
472625.89	5361169.62	3628.43	1618	1053.72	40	-.012	900010	3628.42 980110.69 Liawanie
457742.78	5334623.73	3725.94	1724	676.00	40	-.022	900011	3725.92 980209.52 Bronte
457592.57	5331275.16	3730.07	1736	674.23	40	-.022	900012	3730.05 980213.71 ST7614 RM3
455248.00	5316734.00	3800.87	1806	***.**	40	-.028	900013	3800.84 980285.49 Tungatina Mem
459655.00	5308224.00	3833.40	1828	***.**	40	-.035	900014	3833.36 980318.45 Wayatinah Assem
471957.00	5301222.00	3845.04	1850	***.**	40	-.038	900015	3845.00 980330.25 Strickland T/O
475968.00	5296295.00	3878.59	1905	***.**	40	-.042	900016	3878.55 980364.26 Ouse hydrant
500531.00	5307366.00	3827.34	1945	***.**	40	-.054	900004	3827.29 980312.30 Bothwell
514752.00	5297743.00	3866.57	2007	***.**	40	-.057	900003	3866.51 980352.06 Melton Mobray

541258.00 5256804.00 3961.52 2118 ***.** 40 -.071 900001 3961.45 980448.31 airport car park
999999.99 00000009. 3961.52 2119 000.00 40 -.071 09 3961.45

Elevations are RTK surveyed stations, others are Garmin GPS no RTK

Format, east,north,meter reading scale divs, time, elevn, julian day, tidal corn, ID, meter tidal corn,
obs gravity Isogal65

Bronte Park rear of cabin#3 gravity base



Base 100001

Solo cabin#3 local all weather gravity station tied to Bronte Base.

Value Isogal65 980209.38 mGals



**Meter visible in rear doorway, cabin "3 Australia", location Bronte Park village,
third cabin north side from entrance.**

GPS SURVEY CONTROL STATIONS:

Bronte Park Area:



Main Base station ST1084

Location on small rocky knoll 250m east of intersection of (Bronte Park turn off and Derwent Bridge) the Lyell and Marlborough Highways and adjacent and north of turn off to Bronte Lagoon.



**Main Base station ST1084 with Bronte Lagoon in background.
Coordinates GDA94 Zone 55:**

Main Base station ST1084 contd.

DEPARTMENT OF PRIMARY INDUSTRIES, WATER AND ENVIRONMENT
INFORMATION AND LAND SERVICES DIVISION

Survey Control Site Summary

Site	ST 1084				
<hr/>					
Horizontal Information for	ST 1084				
South Latitude	East Longitude	Zone	Easting	Northing	Convergence
42 10 09.5719	146 29 24.4778	55	457886.079	5331297.680	-0 20 32.2480
Datum	Geocentric Datum of Aust 1994				
Survey Class	Class A				
Order	First				
Job Details	DPIWE S527 S527				
<hr/>					
Vertical Information for	ST 1084				
Height	677.67				
Datum	Aust Height Datum (Tas) 1983				
Survey Class	Third order levelling				
Order	Third Order Differential				
Job Details	DPIWE L0975				
<hr/>					
Mark Details for	ST 1084				
Description	Stainless steel pin in rock with bronze GPS plaque. Replaces original brass Lands disc.				

ST1084 Coordinates: from above pages of survey notes

All current survey records are based on GDA94 datum that is the WGS84 GPS datum currently in world wide use.

GDA94	lat 42 10 09.5719S	long 146 29 24.4778E
MGA94 Zone 55	457886.079E	5331297.680N
Elevation	677.67m	

These controls were used for local grid bases establishment, and transformed to AGD66 AMG66 Zone 55 values using the Tasmanian AGD66 transformation.

Main Base station ST1084 contd.

Site	ST 1084				
<hr/>					
Horizontal Information for		ST 1084			
South Latitude	East Longitude	Zone	Easting	Northing	Convergence
42 10 14.9472	146 29 19.5594	55	457774.071	5331114.960	-0 20 35.5855
Datum	Australian Geodetic Datum 1966				
Survey Class	GPS				
Order	Third				
Job Details	DPIW S721T_66 S721T				
<hr/>					
Vertical Information for		ST 1084			
Height	677.67				
Datum	Aust Height Datum (Tas) 1983				
Survey Class	Third order levelling				
Order	Third Order Differential				
Job Details	DPIW L0975				

AGD66 lat 42 10 14.9472S long 146 29 19.5594E
AMG66 Zone 55 457774.071E 5331114.960N
Elevation 677.67m

The standard AUSLIG N separation tables were used with all RTK GPS calculations in this area in Tasmania. The geoid files were compiled by Leica proprietary software and installed in the base and roving GPS units to give real time ortho metric solutions (AHD) in the nominated AGD66 transformation.

RTK GPS CONTROL STATIONS contd.

Miena: SPM7607RM3

DEPARTMENT OF PRIMARY INDUSTRIES, WATER AND ENVIRONMENT
INFORMATION AND LAND SERVICES DIVISION

Site	SPM 7607 RM3				
<hr/>					
Horizontal Information for		SPM 7607 RM3			
South Latitude	East Longitude	Zone	Easting	Northing	Convergence
41 58 46.6131	146 40 36.3603	55	473222.033	5352436.599	-0 12 58.3239
Datum	Geocentric Datum of Aust 1994				
Survey Class	Class B				
Order	Second				
Job Details	DPIW S706BT94 S706BT				
<hr/>					
Vertical Information for		SPM 7607 RM3			
Height	1059.167				
Datum	Aust Height Datum (Tas) 1983				
Survey Class	Third order levelling				
Order	Third Order Differential				
Job Details	LPW				
<hr/>					
Mark Details for		SPM 7607 RM3			
Description	Brass Lands disc grouted in rock.				
Locality	On north side of Marlborough Road, adjacent to its junction with the Lake Highway and opposite the motel.				

Site	SPM 7607 RM3				
<hr/>					
Horizontal Information for		SPM 7607 RM3			
South Latitude	East Longitude	Zone	Easting	Northing	Convergence
41 58 52.0020	146 40 31.4617	55	473109.837	5352253.788	-0 13 01.6231
Datum	Australian Geodetic Datum 1966				
Survey Class	GPS				
Order	Third				
Job Details	DPIW S706BT66 S706BT				
<hr/>					
Vertical Information for		SPM 7607 RM3			
Height	1059.167				
Datum	Aust Height Datum (Tas) 1983				
Survey Class	Third order levelling				
Order	Third Order Differential				
Job Details	LPW				
<hr/>					
Mark Details for		SPM 7607 RM3			
Description	Brass Lands disc grouted in rock.				
Locality	On north side of Marlborough Road, adjacent to its junction with the Lake Highway and opposite the motel.				

RTK GPS CONTROL STATIONS contd.
Liawanie: SPM700 survey control site summary

**DEPARTMENT OF PRIMARY INDUSTRIES, WATER AND ENVIRONMENT INFORMATION
AND LAND SERVICES DIVISION**

Site	SPM 9700				
<hr/>					
Horizontal Information for		SPM 9700			
South Latitude	East Longitude	Zone	Easting	Northing	Convergence
41 53 49.5241	146 40 16.4176	55	472727.968	5361597.396	-0 13 10.3950
Datum		Geocentric Datum of Aust 1994			
Survey Class		Class B			
Order		Second			
Job Details		DPIW S706BT94 S706BT			
<hr/>					
Vertical Information for		SPM 9700			
Height		1058.425			
Datum		Aust Height Datum (Tas) 1983			
Survey Class		Satellite - GPS			
Order		Third			
Job Details		DPIW S706BT66 S706BT			
<hr/>					
Mark Details for		SPM 9700			
Description		Bronze SPM disc in rock.			
Locality		Approximately 200m north of the junction of the road to Lake Augusta and the Lake Highway, Liawanie.			
<hr/>					
Site	SPM 9700				
<hr/>					
Horizontal Information for		SPM 9700			
South Latitude	East Longitude	Zone	Easting	Northing	Convergence
41 53 54.9154	146 40 11.5247	55	472615.767	5361414.540	-0 13 13.6856
Datum		Australian Geodetic Datum 1966			
Survey Class		GPS			
Order		Third			
Job Details		DPIW S706BT66 S706BT			
<hr/>					
Vertical Information for		SPM 9700			
Height		1058.425			
Datum		Aust Height Datum (Tas) 1983			
Survey Class		Satellite - GPS			
Order		Third			
Job Details		DPIW S706BT66 S706BT			
<hr/>					
Mark Details for		SPM 9700			
Description		Bronze SPM disc in rock.			
Locality		Approximately 200m north of the junction of the road to Lake Augusta and the Lake Highway, Liawanie.			

RTK GPS CONTROL STATIONS contd.
Waddamana: SPM10620

Site	SPM 10620					
<hr/>						
Horizontal Information for		SPM 10620				
South Latitude	East Longitude	Zone	Easting	Northing	Convergence	
42 07 34.4357	146 44 47.1677	55	479041.936	5336177.104	-0 10 12.2993	
Datum		Geocentric Datum of Aust 1994				
Survey Class		Class B				
Order		Second				
Job Details		DPIW S706BtM94 S706				
<hr/>						
Vertical Information for		SPM 10620				
Height		572.66				
Datum		Aust Height Datum (Tas) 1983				
Survey Class		Satellite - GPS				
Order		Third				
Job Details		DPIW S706BtM66 S706				
<hr/>						
Mark Details for		SPM 10620				
Description		Bronze SPM disc in concrete slab.				
Locality		At entrance gate to Waddamana Power Museum, Waddamana.				
<hr/>						
Site Access for		SPM 10620				
Access By		Two wheel drive				
<hr/>						
Site	SPM 10620					
<hr/>						
Horizontal Information for		SPM 10620				
South Latitude	East Longitude	Zone	Easting	Northing	Convergence	
42 07 39.8213	146 44 42.2610	55	478929.700	5335994.424	-0 10 15.6084	
Datum		Australian Geodetic Datum 1966				
Survey Class		GPS				
Order		Third				
Job Details		DPIW S706BtM66 S706				
<hr/>						
Vertical Information for		SPM 10620				
Height		572.66				
Datum		Aust Height Datum (Tas) 1983				
Survey Class		Satellite - GPS				
Order		Third				
Job Details		DPIW S706BtM66 S706				
<hr/>						
Mark Details for		SPM 10620				
Description		Bronze SPM disc in concrete slab.				
Locality		At entrance gate to Waddamana Power Museum, Waddamana.				
<hr/>						

ADDITIONAL SOLO MAIN RTK GPS CONTROL SITES:

Bellevue Tier



GDA94 42 08 12.69336S 146 34 19.08544E Ell Ht. 1051.694m
MGA94 Zone55 464515.556E 5334756.949N Ortho Ht. 1052.105m
Local Grid: AGD66 42 08 18.07104S 146 34 14.18042E 1073.427 E Ht.
Control: RTK tie from ST1084 at 677.67m to gain radio link coverage over area.

Access: Turn off to site from Lyell Highway near Bronte Park via dirt Victoria Valley Road signposted. Take next T junction north on east side of London Lakes and follow signed forestry boards to Bellevue Tier and the radio tower on its summit. Marker is steel picket in ground and surrounded by ring of stones.

Brady's Sugarloaf GPS Base:



SoloBST:

AMG66 Zone55 462357.98E 5319897.27N 1007.401m (AHD83)
AGD66 42 16 19.48466S 146 32 36.72783E

Access via dirt track from west side of Dee village to summit of Brady's Sugarloaf and radio tower. Base on north side of track before towers, see photo.

ADDITIONAL SOLO SECONDARY RTK GPS CONTROL SITES:
(relocate by simple GPS as easily found.)

Liawanie area:

Sololw1:

WGS84 41 53 47.72371S 146 40 20.517N EHt. 1057.08
AMG66 Zone55 472710.284E 5361470.46N orth Ht 1056.58

Sololw2: west of main road, track access

WGS84 41 54 24.95786S 146 40 18.27078N EI Ht 1052.21
AMG66 Zone55 472662.89E 360321.937N orth ht. 1051.74m

Lake Echo north: East side of Marlborough Highway, south Miena.

soloE3

WGS84 42 00 06.58679S 146 36 58.65149N EI Ht. 1022.19m
AMG66 Zone55 468111.18E 5349766.67N orth Ht. 1021.695m

SoloE4: canal Macclesfield property, locked gate access.

WGS84 42 03 44.47175S 146 40 47.45921N EI Ht. 916.56m
AMG66 Zone55 473399.855E 5343068.429N 916.57m

SoloE5: inside Macclesfield locked gate, and via Echo Lake locked gate.
WGS84 42 07 28.67117S 146 41 33.79026N El Ht. 924.82m
AMG66 Zone55 474489.51E 5336157.64N orth Ht. 925.114

Lake Echo: by Lake Echo boundary locked gate, jump fence OK to station.
WGS84 42 09 47.81072S 146 44 09.67078N El Ht.769.248m
AGD66 478081.77E 5331878.26N orth Ht. 769.75m

Arthurs Flume Rd.: via Poatina HEC locked gate, Todd canal.
SoloFlm1
WGS84 41 59 36.48525S 146 49 22.03016N El Ht 1071.57
AMG66 Zone 55 485210.048E 5350751.06N ortho ht. 1071.35m

Poatina Highway:solophwy main road, west side clearing
WGS84 41 55 26.54386S 146 51 13.38015N El ht 1147.82m
AMG66 Zone55 487758.73E 5358464.33N ortho ht. 1147.47m

Arthur's Lake: (soloals) public access track, logging area
WGS84 42 03 10.71334S 146 54 53.48169N El Ht. 945.25m
AMG66 Zone55 492842.36E 5344155.66N 945.35m

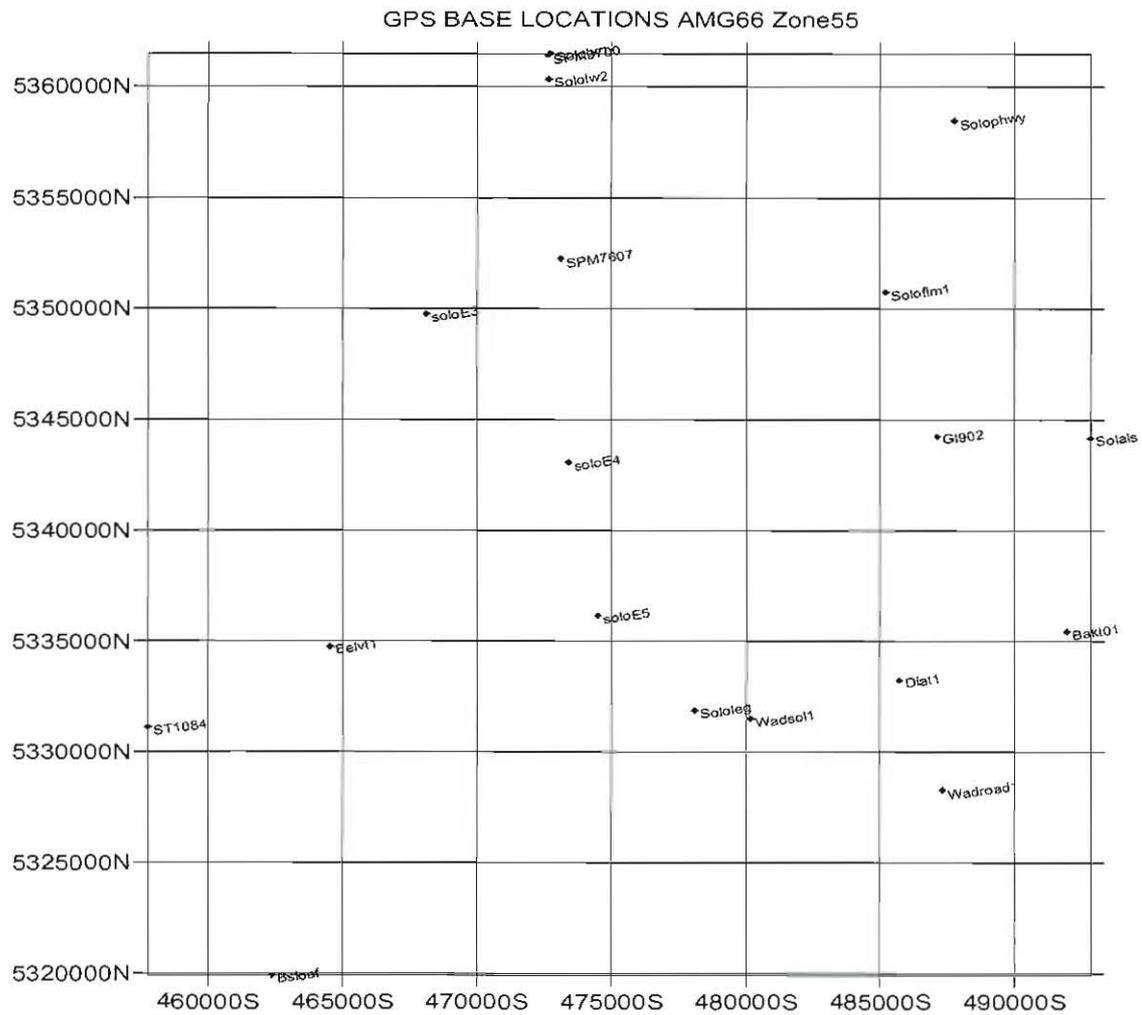
Ripple: Great Lakes highway west side.
(GL902) WGS84 42 03 07.80252S 146 50 45.13004N E Ht. 888.648
AGD66 487133.67E 5344237.46N O Ht. 888.68

Bakers Tier: (bakt01) via locked gate and Forestry Tasmania master key.
WGS84 42 07 53.09591S 146 54 14.31348N EHt 933.251
AMG66 Zone 55 491951.846E 5335445.565N orth Ht. 933.662

Waddamana area:
ZigZag: Corner of steep zig-zag road section, inside fence line.
wadsol1:991000
WGS84 42 09 59.92689S 146 45 39.66844N El Ht 696.449
AMG66 Zone 55 480147.89E 5331510.66N O ht. 696.99

Diatier1: via locked gate and Forestry Tasmania master key.
WGS84 42 09 04.24513S 146 49 42.78962N E Ht. 833.649
AMG66 Zone55 485722.77E 5333241.42N O Ht. 834.14m

WadRoad1: main dirt road, by fence.
WGS84 42 11 45.2394S 146 50 52.5375N E Ht. 638.420m
AMG66 Zone55 487332.353E 5328279.044m O Ht. 639.164m



Distribution of RTK-GPS control stations for this survey area to accommodate radio communications over high ground and river gorges.

SURVEY AREA CENTRAL HIGHLANDS:

SURVEY REPORT:

The survey crew based themselves at Bronte Park Village being central access to the survey areas and convenience of access to high ground for RTK GPS control.

The cabin was self contained and provided convenience for meal preparation and work space. Food was brought from Hobart originally and some extras supplied from Ouse as no food supplies were available in the local area. Local meals at the dining room were taken on some occasions when arriving back late from a long survey day.

Gravity control was carried to Bronte Park from Hobart airport after re-establishing a station from Mount Pleasant to Hobart. Additional controls were made in fringe areas for the survey and tied to previous control stations, see listings and photos

A local all weather gravity base was established in the back porch of Cabin 3 Bronte Park to cater for changes in weather. This base was occupied for all survey readings in addition to the external Bronte base control located by a fence just south of the village on the Marlborough Highway.

GPS survey controls were acquired via internet from the State data base and initially GPS base ST1084 at Bronte Park was used. Later new controls were occupied or created as needed in more remote locations further north. Data base listed survey controls were not numerous or easily accessible in the survey area and Solo established additional bases of convenience when the RTK radio repeater could no longer be useful in areas of steep terrain.

General road access in the area was good, and surveying nearby to a highway required caution and use of safety clothing and warning lights on survey vehicle.

All access from the roads and tracks in this area was locked with the exception of tracks to authorised lake fishing spots. This was a result of deer shooting in the highlands that commenced on 13th March and ended the 17th of June. The locks restrict poachers accessing these properties however they are still frequent in these areas and safety is of concern when working in timbered areas. Property owners would also refuse access when additional shooters were culling, fearing some incident may occur outside of their control.

Gunns Limited and Forestry Tasmania were the principal controllers of logging tracks in this area with the addition of some more private logging firms on private lands where additional keys were required. Master keys opened all non private lands and were of convenience to the survey.

Locating private owners and acquiring keys was an additional chore to be arranged at the convenience of the land owner if they were agreeable to the land entry without any signed paperwork.

The survey was planned to four areas by the consultant and progress was made in this direction. Areas of dense timber reduced data acquisition by limiting satellite visibility

and these were not acquired due to extra delays required. Fallen timber on logging tracks prevented some additional access as these were too large to clear from the track.



Locked boom and cable gates were the other restriction, and were also on private logging tracks.



These were a problem when on Forrest tracks then continuing onto private land with additional locks preventing continued access.

A break in this survey to the west coast area during the good weather lost the momentum to gain access to some difficult areas requiring data infill. On return deer culling was in progress and it was not possible to get into some of these areas late in the season.

Outstanding infill Areas above Lake Echo:

An area requiring infill is the "Top Marsh", owners unknown, area above Serpentine Road, a Gunn's logging track. No easy access into this area is available and it is too large to walk. Southern access may be possible before and near to eastern boom gate on Serpentine logging road, and via small track with obstructions to prevent access.

The east side of the Ouse River valley on "Macclesfield" property needs some careful access to cleared areas.

Part of "Lake Echo" property on east side of Macclesfield also has access to this east side area by walking access only across steep gullies.

"The Spring" also has access to this area on the eastern side of the river.

"The Ripple" property on Lake Highway access after deer season.

"Half Moon Marsh" private land south of Bellevue Tier.

Final Data:

Final data was supplied to consultant Dr. David Leaman of Leaman Geophysics and Bob Richardson at Department of Primary Industries and Resources Tasmania.

Data records on disc.

DATA ACQUISITION:

Control Data:

- All raw GPS survey controls are acquired in GDA94 datum (WGS84) and transformed in real time to survey grid references to AMG66 Zone 55 using the Tasmanian AGD66 transformation and geoid files.
- All map presentation is AMG66 zone 55 datum.
- All time references for gravity are EST, or UTM plus 10 hours after May 5th.
- All height references are AHD

RTK GPS Base stations:

- See base locations

Gravity Base station:

- See base location.

GPS Surveys:

- A map shows extent of the proposed survey area in the central highlands.
- Main roads, minor roads, forest logging tracks, and private property tracks were accessed at 500m intervals for data records.
- Topography in the area ranged from 600m to 1100m and required accessing numerous suitable high areas for the radio GPS link.
- The base RTK GPS was set to automatic on three day cycles between battery changes to give more time to the survey.
- Additional RTK coverage was gained by a mobile radio repeater link.
- Some overhanging dense foliage areas on roads were levelled by optical level due to poor satellite coverage.
- The survey crew were equipped with reflective clothing and a vehicle with flashing beacons for advance traffic warning of survey crew when on roads and tracks.
- No incidents or accidents occurred during this survey period.

Optical Levelling :

- Used when GPS levels were not available due to dense cover and poor satellite availability.
- Levelled from nearest valid RTK GPS elevation
- GPS horizontal positioning still accurate for station location.
- GPS positioning at each gravity station was recorded in the GPS memory in GDA94 datum as raw data in addition to real time display in AMG66 zone55.
- This data was then transformed again to the required datum and transferred to a memory card for computer access.
- Format was Station ID, Easting, Northing, Elevation, and satellite elevation position error to 0.05m
- Elevations not available by RTK GPS were calculated from optical level data using standard back site fore sight method from known to unknown height and transferred to the GPS digital record.

Gravity Survey:

- Gravity stations occupied were located by RTK GPS in real time in the appropriate datum at approximately 500m station intervals along all accessed tracks unless interrupted by lack of satellite access.
- All field stations were given a unique six figure ID commencing with 100000
- The first two digits identified RTK GPS base station.
- This was reduced to a four digit number by request, the last survey number being 1901 for government data base records.
- Readings were taken in loops from a single control station at Bronte Park, the loop duration dependent on access and terrain elevation.



- All meter readings were observed at ground level along roads and tracks.
- Additional delays occurred when some periods of seismic activity predominated.
- The extended period of fine weather this year was exceptional and aided survey progress.

GPS Data Processing:

- Each survey station was given a unique six digit ID.
- RTK GPS positioning at each gravity station was recorded in the GPS memory in GDA94 datum as raw data in addition to the real time transformed display in AMG66 zone55.
- Final AHD elevations were derived by using a standard ellipsoid to geoid file produced for the local area from Auslig tables.
- This transformed survey data was then downloaded to a memory card for computer access.
- Format was Station ID, Easting, Northing, Elevation, and satellite elevation position error to 0.05m
- No additional post processing was required when using this data set format.

Optical levelling Processing:

- Elevations calculated from nearest valid RTK GPS tie station used.
- Elevations not available by RTK GPS were then calculated from optical level data using standard back site fore sight method from known GPS to unknown height
- These calculated elevation values were entered into the GPS data file.

Gravity Data Processing:

- All gravity stations were given a unique six digit ID
- Gravity data was recorded in loops from a control station, the field measurement being a relative gravity measurement referenced to the base station control.
- Bronte house base and an additional tie to Bronte base station each day was used for data control. Regional tie points were used for drift checks.
- Gravity data was recorded at each station in instrument divisions.
- The time of measurement was recorded in EST daylight saving until April 12th and EST from May 5th to end of survey.
- All tidal corrections referenced UTM plus 10 hours.
- A Solo program combined the common GPS point ID to the gravity station point ID as these were stored in two separate instruments.
- This data set was then processed to produce a tidal corrected data set of instrument readings to check repeatability of stations before further processing.
- Longmans' formulae was used for the calculation of tidal changes at the local time and location.

An example of a combined data set before processing is as follows:

```

CLIENT: Great Southland Minerals
AREA: Bronte Park Tasmania
GRID: Brontie Park
BASE # 01;GRAVITY:9802094.100;EAST=xxxxxx ;NORTH=xxxxxxx : Bronte house
BASE # 02;GRAVITY:9802095.600;EAST=xxxxxx ;NORTH=xxxxxxx : Bronte Base
BASE # 08;GRAVITY:9804370.200;EAST=xxxxxx ;NORTH=xxxxxxx : Hobart Obs
BASE # 09;GRAVITY:9804483.500;EAST=xxxxxx ;NORTH=xxxxxxx : Hobart AP CPk
LAST BASE
LOOP:47;METER:556;DATE:030407;OPERATOR:B.RAU
LINE L
LINE L
000000.00 000000001. 3725.68 723 000.00 93 -.084 01 3725.60      \Bronte house base station
***** ** ***** ** 3725.68 724 *** ** 93 -.086 100001 3725.59
***** ** ***** ** 3725.68 800 *** ** 93 -.086 100001 3725.59
457742.78 5334623.73 3725.84 807 676.00 93 -.086 100032 3725.75      \a check base, Bronte
487544.01 5359066.92 3609.41 950 1168.28 93 -.054 191270 3609.36      \field stations
487412.88 5359814.51 3607.36 957 1174.94 93 -.047 191271 3607.31
487255.13 5360475.73 3610.15 1004 1157.50 93 -.047 191272 3610.10
487246.92 5361264.51 3610.41 1015 1154.21 93 -.040 191273 3610.37
486972.57 5361812.25 3605.96 1021 1177.79 93 -.040 191274 3605.92
486624.66 5362398.19 3603.11 1028 1183.74 93 -.032 191275 3603.08
486307.79 5362997.80 3608.38 1046 1150.31 93 -.025 191276 3608.35
Format:
east, north, meter value, time, elevation, julian date, tidal correction, station ID, tidal corrected meter value.
Note no GPS location for Bronte house inside base.

```

- This final data set was processed to produce the following example result.
- This includes instrument drift at base, daily drift, latitude and Bouguer calculation.
- The Observed 65 value is a drift corrected tie to a base station with a recorded AGSO Isogal65 value.
- The final calculations are derived by the standard AGSO Isogal65 formulae.

pegID	AMGEst	AMG-Nth	Latitude	Longitude	Elvn	Observed	Theoretical	D2.20	D2.30	D2.40	D2.50	D2.67
100001	0.00	0.00	0.000000	0.000000	0.00	980209.40	978049.00	2160.40	2160.40	2160.40	2160.40	2160.40
100001	0.00	0.00	0.000000	0.000000	0.00	980209.40	978049.00	2160.40	2160.40	2160.40	2160.40	2160.40
100032	457742.78	5334623.73	-42.139217	146.488642	676.00	980209.56	980371.62	-15.77	-18.60	-21.44	-24.27	-29.09
191270	487544.01	5359066.92	-41.920108	146.849786	1168.28	980091.58	980351.95	-7.56	-12.45	-17.35	-22.25	-30.57
191271	487412.88	5359814.51	-41.913373	146.848220	1174.94	980089.51	980351.35	-7.59	-12.51	-17.44	-22.36	-30.73
191272	487255.13	5360475.73	-41.907415	146.846332	1157.50	980092.33	980350.82	-8.00	-12.85	-17.70	-22.56	-30.80
191273	487246.92	5361264.51	-41.900310	146.846250	1154.21	980092.61	980350.18	-7.80	-12.64	-17.48	-22.31	-30.54
191274	486972.57	5361812.25	-41.895373	146.842955	1177.79	980088.10	980349.74	-6.77	-11.70	-16.64	-21.58	-29.97
191275	486624.66	5362398.19	-41.890089	146.838774	1183.74	980085.22	980349.26	-7.88	-12.85	-17.81	-22.77	-31.20
191276	486307.79	5362997.80	-41.884683	146.834969	1150.31	980090.56	980348.78	-9.29	-14.11	-18.93	-23.75	-31.95

- Only a single Bouguer density of 2.67 gms/cc was required to be calculated and terrain corrections for this survey are by consultant Dr. David Leahman.
- Final consultant format is then

pegID	AMGEst	AMG-Nth	Elvn	D2.67	Tcn	2.67Tcn
1270	487544.01	5359066.92	1168.28	-30.57	0.35	-30.22
1271	487412.88	5359814.51	1174.94	-30.73	0.36	-30.37
1272	487255.13	5360475.73	1157.50	-30.80	0.37	-30.43
1273	487246.92	5361264.51	1154.21	-30.54	0.34	-30.20
1274	486972.57	5361812.25	1177.79	-29.97	0.38	-29.59
1275	486624.66	5362398.19	1183.74	-31.20	0.43	-30.77
1276	486307.79	5362997.80	1150.31	-31.95	0.65	-31.30

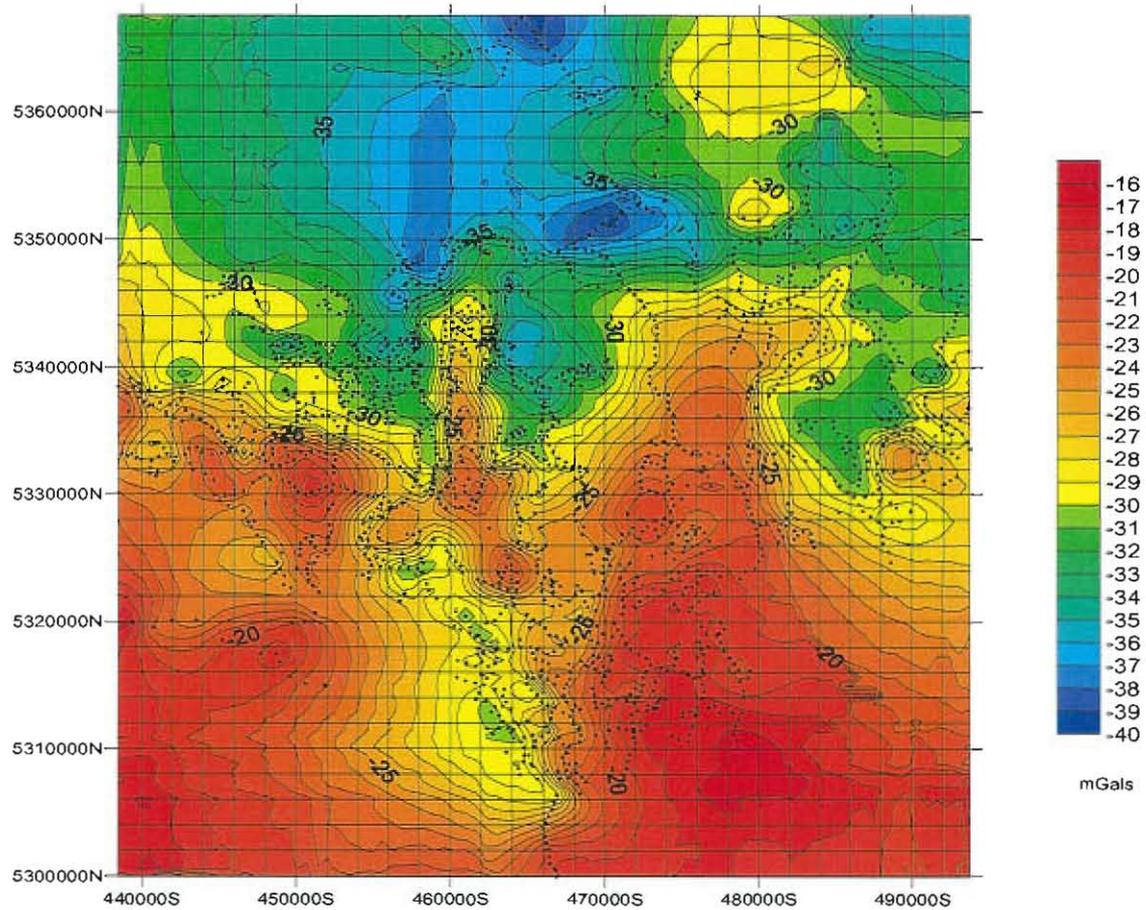
- Final archive data format for government files is then

CLIENT: Great Southland Minerals
 AREA: Bronte Park Tasmania
 AMG66 ZONE=55
 Meter: Lacoste G556 CALIB.FACTOR Interval= 1.01367
 Observed values are drift corrected in Isogal65 mGals
 Operator: Solo Geophysics April 2007

pegID	AMGEst	AMG-Nth	Elvn	Observed	TCn
1270	487544.01	5359066.92	1168.28	980091.58	0.35
1271	487412.88	5359814.51	1174.94	980089.51	0.36
1272	487255.13	5360475.73	1157.50	980092.33	0.37
1273	487246.92	5361264.51	1154.21	980092.61	0.34
1274	486972.57	5361812.25	1177.79	980088.10	0.38
1275	486624.66	5362398.19	1183.74	980085.22	0.43
1276	486307.79	5362997.80	1150.31	980090.56	0.65

Gravity contour map, coordinates AMG66 Zone55

Highland Gravity Survey 2.67gms/cc terrain corrected May 2007



Regional Gravity Ties February 2007:

CLIENT: Great Southland Minerals

AREA: Hobart

GRID: Highland Bases

BASE # 01;GRAVITY:9802093.800;EAST=xxxxxx ;NORTH=xxxxxxx :Bronte house
 BASE # 02;GRAVITY:9802095.200;EAST=457742 ;NORTH=5334623 :Bronte
 BASE # 08;GRAVITY:9804369.700;EAST=535927;NORTH=5260737 :radio telescope
 BASE # 09;GRAVITY:9804483.100;EAST=541258;NORTH=5256804 :airport car park
 LAST BASE

LOOP:01;METER:556;DATE:070207;OPERATOR:B.RAU

LINE Line

LINE L

000000.00	000000009.	3961.46	1152	000.00	40	-0.15	09	3961.44	
541258.00	5256804.00	3961.46	1152	***.**	40	-0.15	900001	3961.44	980448.31 airport c/pk
514752.00	5297743.00	3866.49	1321	***.**	40	-0.14	900003	3866.48	980352.03 Melton Mobray
500531.00	5307366.00	3827.27	1352	***.**	40	-0.13	900004	3827.26	980312.28 Bothwell
494750.00	5320911.00	3784.16	1416	***.**	40	-0.11	900005	3784.15	980268.55 Waddamana T/O
491236.00	5338613.00	3691.66	1443	***.**	40	-0.10	900006	3691.65	980174.78 Stepps T/O
485143.94	5346832.79	3668.49	1503	918.88	40	-0.09	900007	3668.48	980151.29 Open area
492842.35	5344155.67	3648.30	1526	945.36	40	-0.09	900008	3648.29	980130.83 Gate Flintstone
473136.82	5352174.04	3629.65	1557	1056.34	40	-0.11	900009	3629.64	980111.92 Great Lakes Hotel
472625.89	5361169.62	3628.43	1618	1053.72	40	-0.12	900010	3628.42	980110.69 Liawanie
457742.78	5334623.73	3725.94	1724	676.00	40	-0.22	900011	3725.92	980209.52 Bronte
457592.57	5331275.16	3730.07	1736	674.23	40	-0.22	900012	3730.05	980213.71 ST7614 RM3
455248.00	5316734.00	3800.87	1806	***.**	40	-0.28	900013	3800.84	980285.49 Tungatina Mem
459655.00	5308224.00	3833.40	1828	***.**	40	-0.35	900014	3833.36	980318.45 Wayatinah Assem
471957.00	5301222.00	3845.04	1850	***.**	40	-0.38	900015	3845.00	980330.25 Strickland T/O
475968.00	5296295.00	3878.59	1905	***.**	40	-0.42	900016	3878.55	980364.26 Ouse hydrant
500531.00	5307366.00	3827.34	1945	***.**	40	-0.54	900004	3827.29	980312.30 Bothwell
514752.00	5297743.00	3866.57	2007	***.**	40	-0.57	900003	3866.51	980352.06 Melton Mobray
541258.00	5256804.00	3961.52	2118	***.**	40	-0.71	900001	3961.45	980448.31 airport car park
999999.99	000000009.	3961.52	2119	000.00	40	-0.71	09	3961.45	

Elevations are from Leica RTK surveyed stations, others are Garmin GPS no RTK



Hobart airport:



Melton Mobray:

Bothwell:

Waddamana T/Off



Steps:



Poatina T/Off



Gate: Flintstone



Great Lakes Hotel:



Liawanie: Lake Augusta T/Off



Bronte Park



Bronte Park Hwy T/Off ST7614



Tungatina Memorial:



Wayatinah Assembly Point:



Strickland T/Off



Ouse:



Geophysics

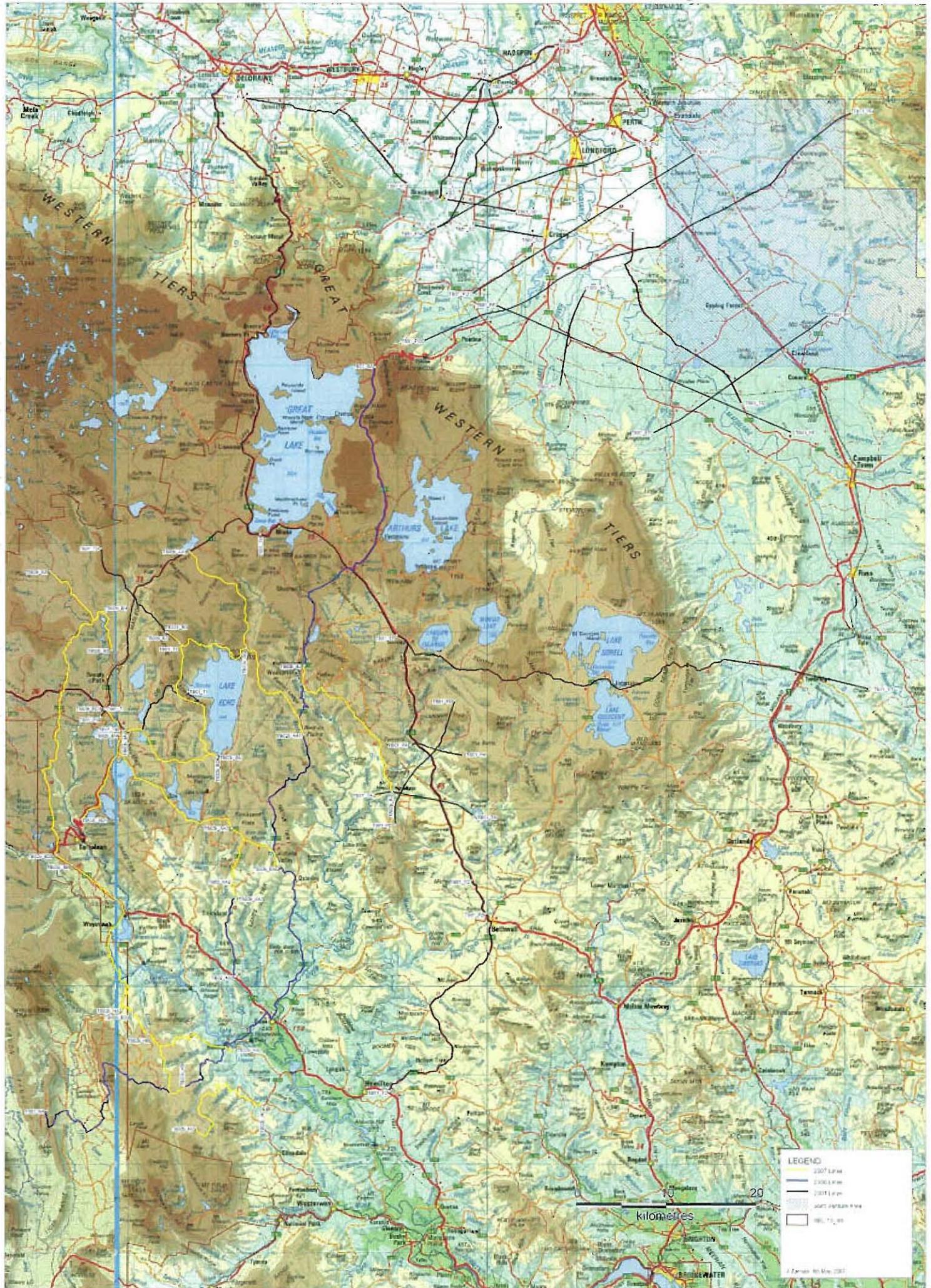
-Seismic

-Acquisition

-Interpretation

-Processing

Great South Land Minerals - Seismic Survey Lines



RECORDING PARAMETERS/GSLM

Vibroseis Source

Acquisition Type:	Sercel 388 - 24 Bit Telemetry System
Energy Source:	3 x Input-Output 42,000lb Peak Force 6x6 Truck mounted Vibrators Online
Vibrator Point Interval:	20 metres
Vibrator Array:	15 m Pad-Pad / No Moveups
Vibrator Array Location:	Centred on Station Pegs (Centred at SP 100)
Receivers:	12 x 10 Hz SM24 Geophones / Group
Receiver Interval:	20 metres
Receiver Array:	20 metres (12 phones with 1.67m phone spacing)
Receiver Array Location:	Centred between Stations (Centered at SP 100.5)
Sweep Length:	12 sec Sweeps
Number of Sweeps:	2 x 12 second sweeps / VP
Sweep Type:	Monosweep
Sweep Frequencies:	6-140 HZ
Sweep Taper:	200 msec Taper
Sweep Energy per Km:	1200 sec/km or 800 sec/km (see GSLM)
Sweep Control:	Pelton Advance 2 Model 5
Accelerometers:	Pelton M5 High Performance
Similarity System:	Pelton VIBRA-SIG
Peak Force:	44,000 lbs
Hold Down Weight:	44,200 lbs
Vibrator Drive Level:	Force Control On - 80% Peak Force
Phase Lock:	Ground Force Phase Lock
No. of Channels:	300 Channels
Spread Geometry:	Symmetric Split Spread
Maximum Offset:	2990 - 10 - 0 - 10 - 2990 metres
Fold:	150 Fold with 10m CDP interval
Record Length:	6.0 seconds
Correlation Sample Rate:	2 milliseconds
Written to Tape S.R.:	2 milliseconds
Output Data Format:	SEG D



**GREAT SOUTH LAND MINERALS
2007 MIENA HIGHLANDS
2D SEISMIC SURVEY**



OPERATIONS REPORT

MARCH - MAY 2007

BY

D.T. REA

OF

**TERREX SEISMIC
U2 / 37 HOWSON WAY
BIBRA LAKE
WESTERN AUSTRALIA 6163**



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1.0 INTRODUCTION

Terrex Seismic was contracted by G.S.L.M to conduct the Miena Highlands 2D Seismic Survey in Tasmania. The crew mobilised on the 28th of March to Miena from the Zeehan Zinc prospect. Testing and acquisition commenced on the same day and the program was completed on the 3rd of May 2007.

1.1 GEOGRAPHICAL AREA

The **Miena Highlands** are situated in the central west highlands of Tasmania. Miena is located 140 kms southwest of Launceston in the vicinity of the Great Lake.

Lines consist of TB02b – AA1, BJ, AA2, BN, BD1, BM, BZ, BQ, HA, HB, HC, BS and BD2.

Line length changes were made throughout the program with some shortened and some lengthened to compensate for tie-ins to existing lines and prevent duplication of data.

Changes: TB02B-AA2: 2250.5 – 1776.5

TB02B-BN: 1810.5 – 1153.5

TB02B-BD2: 2892.5 – 1530.5

Total Area: Miena Highlands - 270.760 kms



Line conditions in the Miena Highlands

1.2 WEATHER

Throughout the acquisition period, the weather was predominantly dry and cool although 20.5 hours of downtime was recorded due to wet weather.

1.3 LOGISTICS

All recording equipment and vehicles were mobilised from Zeehan in western Tasmania by Terrex personnel.

Access to the lines was via local roads, recording lines and farm tracks.

Accommodation and meals for Terrex personnel and traffic controllers was provided by the Great Lakes Hotel at Miena, The Lodge at Miena, the Tiger Hut at Liaweenie and the Bronte Park Village at Bronte Park.

Fuel for all vehicles was supplied by Great Lakes Service Station in Miena, Bronte Park Shop at the Bronte Park Village and the B.P Service Station in Ouse.

All other logistics were supported out of Terrex Seismic Perth Office.



Hemi 44 Vibrators in operation



2.0 SURVEYING

2.1 RANGING / CHAINING / SURVEYING

Line chaining and survey for the entire program were completed by Dynamic Satellite Surveys personnel from Yeppoon in Queensland.

2.2 LINE CLEARING

Line clearing was provided by local operators, contracted directly to G.S.L.M.

2.3 PERMITTING

Permitting was carried out by Great South Land Minerals Limited.



3.0 RECORDING / PROCESSING

GENERAL SURVEY DETAILS

Survey: SEL 13/98 and SEL 29/2005
Project Code:
Surface area:
Receiver Lines: 18 Lines, 20 Metre interval, 334.910 km.
Source Lines: 18 Lines, 20 Metre interval, 334.910 km.

3.1 RECORDING PARAMETERS

Vibroseis Source

Acquisition Type: Sercel 388 - 24 Bit Telemetry System
Energy Source: 3 x Input-Output 42,000lb Peak Force
6x6 Truck mounted Vibrators Online
Vibrator Point Interval: 20 metres
Vibrator Array: 15 m Pad-Pad / No Moveups
Vibrator Array Location: Centred on Station Pegs (Centred at SP 100)

Receivers: 12 x 10 Hz SM24 Geophones / Group
Receiver Interval: 20 metres
Receiver Array: 20 metres (12 phones with 1.67m phone spacing)
Receiver Array Location: Centred between Stations (Centered at SP 100.5)

Sweep Length: 12 sec Sweeps or 8 sec Sweeps (see GSLM)
Number of Sweeps: 2 x 12 second sweeps / VP
Or 2 x 8 second sweeps / VP (see GSLM)
Sweep Type: Monosweep
Sweep Frequencies: 6-140 HZ
Sweep Taper: 200 msec Taper
Sweep Energy per Km: 1200 sec/km or 800 sec/km (see GSLM)

Sweep Control: Pelton Advance 2 Model 5
Accelerometers: Pelton M5 High Performance
Similarity System: Pelton VIBRA-SIG
Peak Force: 44,000 lbs
Hold Down Weight: 44,200 lbs
Vibrator Drive Level: Force Control On - 80% Peak Force
Phase Lock: Ground Force Phase Lock

No. of Channels: 300 Channels
Spread Geometry: Symmetric Split Spread
Maximum Offset: 2990 - 10 - 0 - 10 - 2990 metres

Fold: 150 Fold with 10m CDP interval
Record Length: 6.0 seconds
Correlation Sample Rate: 2 milliseconds
Written to Tape S.R.: 2 milliseconds
Output Data Format: SEG D



3.2 RECORDING

Traffic management formed a large part of daily operations on the Miena Highlands prospect with most lines being surveyed along the road verge. A total of 13 personnel in 7 vehicles were used to control the traffic around the work site which also dictated the operational hours of the acquisition crew with no personnel to be working on the roads outside daylight hours.

Security was also an issue on the prospect with three line batteries and PSU boxes stolen on the 7th April and all tools from the vibrator service truck stolen on the night of the 13th despite having a full time security guard on site.

Line TB02B-AA1

Acquisition commenced on line TB02B-AA1 at station 1000.5 on the 28th March 2007 after the crew mobilised from Zeehan that same day and spread layout was completed. Production was completed on line AA1 on the 1st April at station 2470.5, a total of 29.40 kilometres recorded including 100 skipped VP's due to proximity of dwellings, road culverts etc.

Line TB02B-BJ

Acquisition commenced on line TB02B-BJ at station 895.5 on the 2nd April 2007 and was completed two days later at station 1970.5, a total of 21.50 kilometres recorded including 3 skipped VP's due to proximity of dwellings, road culverts etc.

Line TB02B-AA2

Acquisition commenced on line TB02B-AA2 at station 2250.5 on the 4th April 2007 and was completed the following day at station 1776.5, a total of 9.48 kilometres recorded including 7 skipped VP's due to proximity of dwellings, road culverts etc.

Line TB02B-BN

Acquisition commenced on line TB02B-BN at station 1810.5 on the 5th April 2007 and was completed the following day at station 1153.5, a total of 13.14 kilometres recorded including 2 skipped VP's due to proximity of dwellings, road culverts etc.

Line TB02B-BD1

Acquisition commenced on line TB02B-BD1 at station 1746.5 on the 6th April 2007 and was completed two days later at station 1000.5, a total of 14.92 kilometres recorded including 10 skipped VP's due to proximity of dwellings, road culverts etc.

Line TB02B-BM

Acquisition commenced on line TB02B-BM at station 1000.5 on the 8th April 2007 and was completed on the 12th April at station 2395.5, a total of 27.90 kilometres recorded including 40 skipped VP's due to proximity of dwellings, road culverts etc.

Line TB02B-BZ

Acquisition commenced on line TB02B-BZ at station 1914.5 on the 12th April 2007 but was delayed due to logging operations on the line. The line crew recorded line BQ then returned to line BZ on the 15th April to complete acquisition. Recording was completed on the 16th April at station 950.5, a total of 19.28 kilometres recorded including 2 skipped VP's due to proximity of dwellings, road culverts etc.

Line TB02B-BQ

Acquisition commenced on line TB02B-BQ at station 995.5 on the 13th April 2007 and was completed the following day at station 1634.5, a total of 12.78 kilometres recorded including 40 skipped VP's due to proximity of dwellings, road culverts etc.

Line TB02B-HA

Acquisition commenced on line TB02B-HA at station 1000.5 on the 17th April 2007 and was completed two days later at station 1900.5, a total of 18.0 kilometres recorded including 11 skipped VP's due to proximity of dwellings, road culverts etc.

Line TB02B-HB

Acquisition commenced on line TB02B-HB at station 1000.5 on the 19th April 2007 and was completed the following day at station 1503.5, a total of 10.06 kilometres recorded including 4 skipped VP's due to proximity of dwellings, road culverts etc.

Line TB02B-HC

Acquisition commenced on line TB02B-HC at station 1900.5 on the 20th April 2007 and was completed two days later at station 1015.5, a total of 17.70 kilometres recorded including 6 skipped VP's due to proximity of dwellings, road culverts etc.

Line TB02B-BS

Acquisition commenced on line TB02B-BS at station 1725.5 on the 23rd April 2007 and was completed two days later at station 1011.5, a total of 14.28 kilometres recorded including 5 skipped VP's due to proximity of dwellings, road culverts etc.

Line TB02B-BH

Acquisition commenced on line TB02B-BH at station 2855.5 on the 25th April 2007 and was completed three days later at station 1000.5, a total of 37.10 kilometres recorded including 35 skipped VP's due to proximity of dwellings, road culverts etc.



Typical line conditions in the Miena Highlands

Line TB02B-BD2

Acquisition commenced on line TB02B-BD2 at station 2791.5 on the 28th April 2007, this line was merged with line BH, first production VP was recorded with full spread due to 9 overlap with line BH. Line BD2 was completed on the 3rd May 2007 at station 1530.5, a total of 25.22 kilometres recorded including 110 skipped VP's due to proximity of dwellings, road culverts etc. One day of production was lost during the acquisition of line BD2 due to an incident involving the security personnel on site. A police investigation meant that no production was possible on the 1st May. For more detail concerning this incident please refer to the HSE End of contract Report. The completion of line BD2 represented the end of the Miena Highlands contract with a total of 270.76 recorded. The line crew packed all equipment on the 4th May and mobilised to Queenstown to complete the Zeehan Zinc program.

3.3 PROCESSING

All data 'A' class recording tapes were sent to Fugro Seismic Imaging, 69 Outram Street, West Perth for processing.

All 'B' class recording tapes were given to on-site client representatives to be returned to Hobart.

Seismic Lines - Central Highlands and Thunderbolt Regions





APPENDIX A

EQUIPMENT SPECIFICATIONS

RECORDING EQUIPMENT

SERCEL 388 - 24 Bit 3D Seismic Data Acquisition System

Sun Monitor and Sun Sparc 5 Computer

- ❖ OYO DFM 480 Plotter, UPS, LIM
- ❖ One (1) Sercel Real Time APM - Sweep Correlator
- ❖ Two (2) Fujitsu 3490 Tape Drives

- One Hundred (100) SU6 Telemetry units (600 Channels)
- Two Hundred (200) 3 T/O Seismic Cables (600 Channels)
- Sixteen (16) Sercel PSUs and Four (4) Sercel CSUs
- Six (6) CSU Patch Cables
- Twenty (20) Battery case power Cords
- Forty (40) Batteries for SU6 Units
- One (1) Sercel Handheld Cable Testers
- Four (4) Sercel Battery Chargers

Pelton Vibra Sig Real Time Similarity System

One (1) 10 metre 6 DB Boost High Gain Antenna on Recording Truck

Sensor SM24 10Hz High Specification Geophones

One Thousand (1000) Geophone strings with 6 ph/group
(500 Channels with 12 phones/group)

One (1) Sensor SMT100 Geophone Tester

Note: Terrex Seismic warrants that 90% of equipment will be used in field and up to 10% may be undergoing repair and maintenance.

SOURCE EQUIPMENT

- ❖ Four (4) HEMI 44 6x6 Truck mounted Vibrators
Peak force is 44,000lbs per Vibe and
Hold-Down weight is 44,200lbs per Vibe

- ❖ Four (4) Pelton Advance 2 Model 5 Vibrator Control Electronics
One (1) Pelton Encoder Sweep Generator for Recorder
Three (3) operating Online and One (1) on Standby
Electronics are capable of Trade Marked Varisweep

APPENDIX B

VEHICLE EQUIPMENT LIST

#	VEHICLE	USED FOR	REGISTRATION
1	Land Cruiser 100 Series	Front Crew	1BWF 930
2	Land Cruiser 100 Series	Back Crew	1BYK 183
3	Land Cruiser 100 Series	Vibe Crew	1CCL 562
4	Land Cruiser Tray Back	T/Shooter	302-JCO
5	Land Cruiser Troop Carrier	Ambulance	1FCZ 129
6	Land Cruiser Tray Back	Cable Truck	1CET 468
7	Land Cruiser Tray Back	Cable Truck	1BSJ 242
8	Land Cruiser Tray Back	Line Boss	1BRJ 753
9	Land Cruiser Tray Back	Jug Ute	1BHD 550
10	Land Cruiser Tray Back	Jug Ute	1BEK 496
11	Nissan Tray Back	Mechanics Ute	176 JNA
12	Nissan Tray Back	Supply	175 JNA
20	International Paystar	Vibrator	372 JCN (QLD)
21	International Paystar	Vibrator	373 JCN (QLD)
22	International Paystar	Vibrator	374 JCN (QLD)
23	International Paystar	Vibrator	375 JCN (QLD)
24	International Paystar	Vibrator	376 JCN (QLD)
25	Isuzu FTS 700	Service Truck	1ALU 225
26	Izusu	Mechanics Workshop	1CCC 561
27	Izusu STF	Recorder(386)	1CAA 534
28	International Paystar	Spread Truck	626-JAH
29	International Paystar	Spread Truck	371 JCN



Road work – Miena Highlands



APPENDIX C

TAPE LISTING

MIENA HIGHLANDS - TAPE LISTING

Tape #	Line #	First FFD	Last FFD	First VP	Last VP	Date Recorded	Comments
16A	TE02B-AA1	2620	2670	1000.5	1260.5	29-Mar-07	3 Vibes 3 Sweeps, Omit # 2662, 2616
17A	TE02B-AA1	2870	3096	1257.5	1473.5	29-Mar-07	Omit # 2882, 3033, 3007, 3008, 3009, 3010, 3011
18A	TE02B-AA1	3097	3320	1474.5	1794.5	30-Mar-07	Skp # 1578.5-1661.5, 1699.5-1971.5, 1770.5-1776.5, 1787.5-1791.5
19A	TE02B-AA1	3321	3516	1795.5	1993.5	31-Mar-07	Skp # 1908.5-1812.5, 1815.5-1817.5, Omit #3353-3369, 3442-3444
20A	TE02B-AA1	3517	3740	1994.5	2217.5	31-Mar-07	
21A	TE02B-AA1	3741	3924	2216.5	2401.5	1-Apr-07	
22A	TE02B-AA1	3925	3943	2402.5	2470.5	1-Apr-07	Line TE02B-AA1 - Completed
23A	TE02B-BJ	3954	4217	895.5	1119.5	2-Apr-07	HIGH VOLTAGE POWER LINES (50 Hz) ALONG LINE
24A	TE02B-BJ	4218	4447	1119.5	1350.5	2-Apr-07	Skp # 1154.5-1163.5
25A	TE02B-BJ	4448	4671	1351.5	1573.5	2-Apr-07	Omit # 4515.5
25A	TE02B-BJ	4672	4901	1574.5	1604.5	3-Apr-07	Skp # 1661.5
27A	TE02B-BJ	4902	5067	1605.5	1970.5	3-Apr-07	Line TE02B-BJ - Completed
28A	TE02B-AA2	5068	5311	2250.5	2607.5	4-Apr-07	
29A	TE02B-AA2	5312	5536	2806.5	1778.5	5-Apr-07	Skp # 1632.5-1797.5, 1793.5, TE02B-AA2 Complete
30A	TE02B-BN	5537	5760	1610.5	1557.5	5-Apr-07	
31A	TE02B-BN	5761	6004	1556.5	1341.5	5-Apr-07	Skp # 1485.5, 1486.5
32A	TE02B-BN	6005	6192	1340.5	1163.5	5-Apr-07	TE02B-BN Complete
33A	TE02B-BD1	6193	6430	1246.5	1810.5	7-Apr-07	Skp # 1859.5-1687.5, Dead Inacc 1373.5 (Bridge)
34A	TE02B-BD1	6431	6568	1518.5	1262.5	7-Apr-07	Skp # 1377.5-1373.5, 1302.5-1311.5
35A	TE02B-BD1	6569	6854	1261.5	1050.5	8-Apr-07	
36A	TE02B-BD1	6855	6945	1009.5	1000.5	8-Apr-07	TE02B-BD1 Complete
37A	TE02B-BM	6946	7183	1000.5	1236.5	9-Apr-07	Omit # 7133
38A	TE02B-BM	7184	7413	1237.5	1488.5	9-Apr-07	2 Vib - 3 Sweep # 1258.5-1274.5
39A	TE02B-BM	7414	7657	1487.5	1707.5	9-Apr-07	Skp # 1515.5-1529.5, Omit # 7456, 2 vib - 3 sweep # 1605.5-1612.5
							Skp # 1687.5-1689.5, 2 vib - 3 sweep # 1702.5-1707.5
							2 vib - 3 sweep # 1708.5-1712.5, Omit # 7686-7692, Skp # 1773.5-1781.5
							2 vib - 3 sweep # 1756.5-1812.5
41A	TE02B-BM	7858	8091	1944.5	2174.5	11-Apr-07	Skp # 2021.5-2022.5, 2023.5-2030.5
42A	TE02B-BJ	8092	8310	2175.5	2392.5	11-Apr-07	Skp # 2254.5-2255.5 TE02B-BM Complete
43A	TE02B-BZ	1	237	1914.5	1679.5	12-Apr-07	Omit # 122, BZ data continues on Tape 47A
44A	TE02B-BQ	238	461	953.5	1238.5	13-Apr-07	
45A	TE02B-BQ	462	705	1239.5	1464.5	13-Apr-07	Skp # 1304.5-1305.5, 2 vib - 3 sweep # 1305.5-1310.5, Omit # 673
							Trace 1304.5-1308.5 Dead for bridge work
46A	TE02B-BQ	706	874	1465.5	1534.5	14-Apr-07	Skp # 1631.5 TE02B-BQ Complete
47A	TE02B-BZ	238	415	1578.5	1501.5	15-Apr-07	2 vib - 3 sweep # 1678.5-1644.5, 1691.5-1665.5
48A	TE02B-BZ	416	639	1500.5	1278.5	15-Apr-07	Omit # 611
49A	TE02B-BZ	640	859	1277.5	1046.5	15-Apr-07	Skp # 1224.5-1223.5
50A	TE02B-BZ	870	955	1045.5	950.5	15-Apr-07	TE02B-BZ Complete
51A	TE02B-HA	956	1209	1000.5	1217.5	17-Apr-07	Skp # 1057.5, 1108.5, 1107.5, 1147.5, 1155.5, 1240.5, Omit # 1117, 1169
52A	TE02B-HA	1210	1433	1248.5	1471.5	17-Apr-07	
53A	TE02B-HA	1434	1663	1472.5	1701.5	18-Apr-07	
54A	TE02B-HA	1664	1857	1702.5	1906.5	18-Apr-07	Skp # 1767.5-1789.5, 1864.5-1856.5 TE02B-HA Complete
55A	TE02B-HB	1858	2101	1900.5	1246.5	19-Apr-07	Skp # 1225.5, 1240.5-1241.5
55A	TE02B-HB	2102	2265	1247.5	1431.5	19-Apr-07	Skp # 1412.5
57A	TE02B-HB	2266	2357	1432.5	1603.5	20-Apr-07	TE02B-HB Complete
58A	TE02B-HC	2358	2585	1600.5	1863.5	20-Apr-07	2 vib - 3 sweeps 1717.5-1700.5
59A	TE02B-HC	2586	2825	1862.5	1432.5	21-Apr-07	Skp # 1633.5
60A	TE02B-HC	2826	3049	1431.5	1208.5	21-Apr-07	2 vib - 3 sweeps 1335.5-1319.5, 1305.5-1208.5, Skp # 1307.5, Omit # 2950
61A	TE02B-HC	3050	3280	1207.5	1018.5	22-Apr-07	2 vib - 3 sweeps 1297.5-1015.5, Skp # 1110.5-1109.5, Omit # 3142-3154
							Skp # 1040.5, TE02B-HC Complete
62A	TE02B-BS	3281	3440	1725.5	1520.5	23-Apr-07	2 Vib - 3 sweeps 1723.5-1528.5
63A	TE02B-BS	3441	3678	1527.5	1296.5	24-Apr-07	2 Vib - 3 sweeps 1627.5-1296.5, Skp # 1467.5-1466.5, # 1214 Dead 5m
64A	TE02B-BS	3679	3872	1295.5	1099.5	24-Apr-07	3 vib - 3 sweeps 1290.5-1215.5, Skp # 1215.5-1213.5, 2 V 3 S 1215.5-1165.5
65A	TE02B-BS	3873	3960	1098.5	7011.5	25-Apr-07	2 Vib - 3 sweeps 1013.5-1011.5, TE02B-BS Complete
66A	TE02B-BH	3961	4198	2655.5	2512.5	25-Apr-07	02810 & 2730 Dead, Skp # 2811.5-2809.5, Skp # 2730.5-2728.5
67A	TE02B-BH	4199	4428	2511.5	2378.5	26-Apr-07	Skp # 2322.5-2321.5, Skp # 2435.5-2434.5
68A	TE02B-BH	4429	4656	2377.5	2148.5	26-Apr-07	# 2186 Dead, 2 Vib - 3 sweeps 2355.5-2333.5
69A	TE02B-BH	4659	4882	2147.5	1913.5	26-Apr-07	Skp # 2046.5-2040.5, Skp # 1852.5-1811.5, Skp # 1986.5-1936.5
70A	TE02B-BH	4883	5112	1912.5	1681.5	27-Apr-07	2 Vib - 3 Sweeps 1839.5-1796.5, Skp # 1725.5-1725.5
71A	TE02B-BH	5113	5336	1680.5	1453.5	27-Apr-07	Skp # 1632.5-1631.5, Skp # 1459.5-1468.5
72A	TE02B-BH	5337	5566	1452.5	1223.5	28-Apr-07	# 1161 Dead, # 1116 Dead
73A	TE02B-BH	5567	5781	1222.5	1000.5	28-Apr-07	Skp # 1187.5-1195.5, Skp # 1162.5-1158.5, Skp # 1116.5-1115.5
							TE02B-BH Complete
74A	TE02B-BD2	5782	6019	2791.5	2554.5	28-Apr-07	
75A	TE02B-BD2	6020	6237	2553.5	2252.5	29-Apr-07	# 2514.5 - 50Hz from power ctn, Omit # 6134-6136, # 2281 Dead, # 2224 Dead
							Skp # 2368.5 - 2279.5 - Underground noise, Omit # 6297-6210
76A	TE02B-BD2	6238	6465	2251.5	2008.5	2-May-07	Skp # 2232.5-2222.5, Skp # 2143.5, Skp # 2073.5-2072.5, # 1825 Dead
77A	TE02B-BD2	6466	6690	2007.5	1781.5	2-May-07	Skp # 185.5-6-1853.5, 1970.5, Omit # 5006
78A	TE02B-BC2	6691	6890	1780.5	1660.5	3-May-07	Skp # 1752.5
79A	TE02B-BD2	6891	6939	1579.5	1650.5	3-May-07	Skp # 1564.5 TE02B-BD2 Complete

APPENDIX D

HSE POLICY and OH&S STANDARDS

- Site specific inductions / daily toolbox meetings / weekly safety meetings
 - Monthly Section head meetings
 - Personal protective equipment
 - Traffic Management Safety
 - VHF / UHF / HF communications
 - Vehicle emergency equipment
 - Random drug and alcohol tests



Typical road conditions faced by line crew in the Highlands



TERREX SEISMIC HEALTH, SAFETY AND ENVIRONMENT POLICY

Terrex Seismic is an Exploration Contractor involved in Seismic Acquisition to the Oil, Gas and Mineral Industries.

Our Commitments

- To provide a safe, healthy and injury free workplace for our employees, contractors and the general public.
- Assisting all of our employees and contractors to meet their HSE obligations.
- Establish and implement an HSE Management System and Operational Plans at all levels of the Company.
- Education and training of all of our Employees in HSE Systems, Procedures, Risk Assessment and Risk Minimization.
- Ongoing evaluation and modification of all of our HSE Management Systems, Procedures and Plans in order to ensure a consistent improvement in the establishment of a safe, healthy and environmentally sound workplace.
- Ensure all of our HSE Systems are in accordance with the relevant legislation and requirements of Clients and Government Bodies.

Our Goal

- To achieve a workplace where the targets of zero injuries, equipment damage and environmental incidents are attained.

Our Systems

- Management shall provide a visible, personal involvement in all aspects of HSE, and through their actions create a culture that facilitates employee HSE involvement. Management shall make available the appropriate resources to carry out all manner of HSE.
- Policies and objectives shall be initiated, defined, communicated and revised at all organizational levels.
- Organizational responsibilities shall be defined and the necessary resources provided to achieve HSE objectives
- Management shall continuously evaluate the HSE risks to the employees, clients and environment. Comprehensive risk assessment provides the necessary information in order to take action to reduce the risk to our operations.
- HSE shall be integrated in the design, development and delivery of all services. This includes planning for existing operations, managing change and developing emergency response measures.

Each employee has a personal responsibility to comply with this policy and contribute towards its implementation. Management holds the responsibility to communicate the requirements of this policy to all our employees, contractors and visitors and to involve them in its implementation.

Breach of this policy will be taken very seriously and may involve disciplinary action.

Stephen P. C. Tobin



APPENDIX E

END OF CONTRACT HSE SUMMARY



Health Safety & Environment End of Contract Summary Tasmania Basin 2D

19th Mar- 7th May 2007

Client	Great South Land Minerals Ltd	HSE Advisor	Ray Auckram
Location	Tasmanian West Coast Highland Lakes Region	Combined Personnel	43
Camp Site	Heemskirk Motel Cecil Motel Treasure Is. Caravan Park Silver Hills Motel Great Lake Hotel Tigers Accom. "Simmons" The Lodge Motel Bronte Park Highland Village	BAC Tests Conducted	105
Camp Location	Zeehan Queenstown Miena	Preliminary Drug Tests Conducted	1
Sub-Contractors	DSS	Standard Operating Procedure Revisions	

Summary:

- 19/03/2007: Crew mobilised to Zeehan and Queenstown.
- 20/03/2007: Remainder of crew arrive in Zeehan.
Lay out spread; commence trouble shooting and production (@30 shots completed).
Induction for new hires.
- 21/03/2007: Traffic Control Incident see Meet&Reports tab
- 23/03/2007: Vibrator Hydraulic Hose Incident see Meet&Reports tab
- 25/03/2007: Safety Meeting SOP Reversing Vehicles see Meet&Reports tab
- 27/03/2007: Complete production TB02b-2A
Pack up spread.
- 28/03/2007: Camp move. Breath Testing
Lay out spread on TB02b-AAL, commence production.
Mitchell Roll Eye Injury Incident see Meet&Reports tab
- 30/03/2007: Andrew Pepper Fall Incident see Meet&Reports tab
- 31/03/2007: Steve Zimmerman Gate Incident see Meet&Reports tab
- 01/04/2007: Induction for new hires.
- 02/04/2007: Induction for new hires.
- 03/04/2007: Induction for new hires.
- 04/04/2007: Induction for new hires.
Ulm Shutearth Incident see Meet&Reports tab
- 06/04/2007: Induction for new hires.
- 11/04/2007: Standby for cattle mustering.
- 16/04/2007: Ray Clayton Vehicle Tip Over Incident see Meet&Reports tab
- 19/04/2007: Induction for new hire.
- 20/04/2007: Induction for new hire.
- 21/04/2007: Camp move to Droate Park
- 22/04/2007: Scott Fodan Rash Incident see Meet&Reports tab
- 28/04/2007: Induction for new hire.
- 29/04/2007: Induction for new hire.
- 30/04/2007: Induction for new hires.
- 01/05/2007: Darren Spinks Assault Incident see Meet&Reports tab
- 04/05/2007: Camp move to Zeehan via overnight stay in Queenstown
- 07/05/2007: EOC

Report compiled by:

Safety Statistics

Terrex Seismic Man-hours	20,580
Sub-Contractor Man-hours	1,212
Fatalities	0
LTI's	0
MTI's	0
Days since last MTI/LTI	67
First Aid Incidents	3
Incident / Accident Reports	8
Work Days Lost	7
Hazard Identification Reports	6
Training Hours	51
Tool Box / Safety Meeting Man-hours	359
Audits / Inspections	457
Drills	1
Land Spills (< 5 litres)	1

Medical Statistics

Clinic Attendance	
Rational	1
Eye Infections, Injuries	1
Fractures	
GIT: Diarrhoea, Nausea, Vomiting	1
Headaches	2
Back	1
Misc	1
Muscle/Skeletal Soft Tissue Injury, Sprain/Strain	3
Skin Conditions: Rash, Fungal Infection	4
Colds, Influenza type symptoms	6
Throat Infection, Tonsillitis	
Wound Care: Lacerations, Detergents, Suture removal	2
TOTAL	22



APPENDIX F

PERSONNEL - CREW LIST

Positon	Name
Crew Manager	Darren Rea
Crew Manager	Jon Turner
HSE Advisor	Raymond Auckram
Observer	Peter Wakeham
Cable / Geophone Repair	Scott Fadian
Vibe Tech	Colin Sharman
Vibe Op (1)	Dean Kingston
Vibe Op (2)	Allan Tuite
Vibe Op (3)	Craig Walters
Vibe Op (4)	June Harland
Line Boss	Daryn Bishoff
T/Shooter	Bryan Ngatai
Line Crew	Francis Alcala
Line Crew	Peter Bell
Line Crew	Charles Glen
Line Crew	Zaac Chase
Line Crew	Eileen Collom
Line Crew	Daniel Dowling
Line Crew	Simon McCollin
Line Crew	Greg McLeod
Line Crew	Mitchell Roll
Line Crew	Dion Watty
Line Crew	Andrew Moody
Line Crew	Lliam Shutfleworth
Line Crew	Madeleine Mitchell
Line Crew	Steve Zimmerman
Line Crew	Simon Shields
Line Crew	Darren Spinks



PERSONNEL - CREW NUMBERS

Positon	Numbers
Crew Manager	1
HSE Advisor	1
Observer	1
Cable / Geophone Repair	1
Vibe Tech	1
Vibe Op	4
Line Boss	1
T/Shooter	1
Line Crew	16



APPENDIX G

DAILY REPORTS



**Terrex Seismic
Daily Report**

Client.....
Survey Name.....
Area.....
State.....

GSLM
Tasmania Basin Survey
Zeehan
Tasmania

Party Manager.....
Client Rep.....
Weather.....
DATE.....

CREW 401
Jon Turner
Dago Gonzalez
Fino
26-Nov-07

Line #	Stn	End	Total Stns	Skips	Vp's	Kms	TOTALS
TB02B-AA1	1000.5	1015.5	16	0	16	0.30	Vp's... 16 Skips... 0 Kms... 0.30
							Cum. Total Skips... 0 Cum. Total Vp's... 16 Cum. Total Kms... 0.3000 Total Km's Remaining... 420.7000

HOURS		Recording	Down Time	Troubleshoot	Day Charge Hrs
Recording	0.3				11.7
Reorder Move					Cum. Day Charge Hrs (Job)...
Line Change					Standby Hrs...
Detail/Forum					Down Standby Hrs (Job)...
Prep. Move	6.5				Total Day Incl from Charge Hrs
QC Sketch	0.5				Cum. Total Charge Hrs (Job)...
Travel	9.6				12.0
Layout Spread	3.8				12.0
Follow Spread					
Washes Standby					
Reposition					
Cum. Mobilization					
Layout					
Follow					
Washes					
Reposition					
Cum. Mobilization					

Line	Station #		Tot		Pickup		Station #		Tot	
	Start	End	Stations	Time	Line	Time	Stations	Time	Stations	Time
TB02B-AA1	1000	1420	421							

Line crew mobilized from Zeehan to Miema today, arrived 12:45pm, 2 vans arrived on site at 15:30pm, traveled to the field and commenced production.
Line crew layed 420 channels today along tracks used for logging, many logging trucks, this will slow production with only single line in most places. We will get all the track to allow trucks to pass.

LTE= 0 MET= 0 PAC= 0 Total Stations: 421 Total Stations: 0

EXTRA PERSONNEL		EXTRA VEHICLES	
1 Security Guard		1	
Charge Day...	1	Charge Day...	1
Cum. Charge Days (Job)	1	Cum. Charge Days (Job)	1

TRAFFIC MANAGEMENT Recording Crew		TRAFFIC MANAGEMENT Survey Crew	
Supervisor with Vehicle	1	Supervisor with Vehicle	1
2 Non Crews with Vehicle	5	2 Non Crew with Vehicle	1
Charge Day...	1.0	Charge Day...	1.0
Cum. Charge Days (Job)	1.0	Cum. Charge Days (Job)	1.0

COMMENTS:
Crew Manager: _____



**Terrex Seismic
Daily Report**

Client.....	GSLM	Party Manager.....	ONEW 401
Survey Name.....	Texasmas Basin Survey	Client Rep.....	Jon Turner
Area.....	Mexico - Highlands	Weather.....	Diego Gonzalez
State.....	Texas	DATE.....	Fri 28-Mar-07

Line #	Stn	Stn	Total Stns	Skips	Vp's	Kms	TOTAL
TB02B-AA1	1915.5	1938.5	323	0	332	6.46	Vp's... 332 Skips... 0 Kms... 6.46
							Cum. Total Skips... 0 Cum. Total Vp's... 332 Cum. Total Kms... 67609 Total Stn's Remaining... 433,269

HOURS		Downtime		Day Charge Hrs	
Recording...	6.5	Troubleshoot...	0.4	Day Charge Hrs.....	10.0
Recorder Hrs....	0.7	Reorder.....		Cum. Day Charge Hrs (Job)...	21.7
Line Change.....		Wait.....	1.5	Standby Hrs.....	0.3
Downs/Terrain...		W/ out Spread...		Cum. Standby Hrs (Job)...	0.8
Wait on Log Trucks...	1.0	Other.....		Total Day End Hour Charge Hrs	12.2
QC Spread.....	0.5			Cum. Total Charge Hrs (Job)...	22.1
Travel.....	1.0				
Layout Spread....					
Pickup Spread....		Towman/Induction...	0.3		
Weather Standby...		Total Downtime...	1.9		
Mislocation.....					
Cum. Mislocation...		Cum. Downtime (Job)...	1.9		

COMMENTS:	Layout		Pickup			
	Line	Station #	Tot	Line	Station #	Tot
Continued production, 6,740hrs Sbl recording with 2 Vibes, 3 sweeps for most of today, final 2 vibes arrived 3:20pm 3 extra personnel onto crew today, 1 PM, 1 cable repair and 1 campy. Many log trucks today, single lane road which means frequent production delays.	TB02B-AA1	1421	1700	TB02B-AA1	1000	1175
			200			175
Total Crew - 27, 23 in the field Bad Equipment - Cable 0, Phones 0.						

LTJs = 0 MTJs = 0 FACs = 0 Total Stations = 260 Total Stations = 178

EXTRA PERSONNEL		EXTRA VEHICLES	
1 Security Guard		1	
Charge Day....	1	Charge Day....	1
Cum. Charge Days (Job)	2	Cum. Charge Days (Job)	2

TRAFFIC MANAGEMENT Recording Crew		TRAFFIC MANAGEMENT Survey Crew	
Supervisor with Vehicle	2 Man Crew with Vehicle	Supervisor with Vehicle	2 Man Crew with Vehicle
1	6	1	1
Charge Day....	1.0	Charge Day....	1.0
Cum. Charge Days (Job)	1.0	Cum. Charge Days (Job)	14.0

COMMENTS: _____
Crew Manager _____



**Terrex Seismic
Daily Report**

Client..... GSLM
 Survey Name... Tasmania Basin Survey
 Area..... Miama - Highlands
 SIA#..... Tasmania

CREW 409
 Party Manager... Jon Turner
 Cost Rep..... Diego Gonzalez
 Weather..... Overcast / Rain
 DATE..... 03-Mar-07

Line #	Stn	Stn	Total Stns	Skips	V/s	Kms	TOTALS
TB02B-AA1	1339.5	3577.5	229	0	229	4.76	V/s... 229 Skips... 0 Kms... 4.76
							Cum. Total Skips... 0 Cum. Total V/s... 579 Cum. Total Kms... 11,8400 Total Kms Remaining... 450,4000

HOURS		Round Trip...	Down Time -	Troubled Loc...	Other...	Day Charge Hrs...
Rewind Move...	4.2			0.1		7.3
Line Change...						Cum. Day Charge Hrs (Job)... 29.2
Downs/Terrain...	1.3					Standby Hrs... 3.8
Wet on Log Trucks...						Cum. Standby Hrs (Job)... 4.8
GC Spread...	0.8					Total Day/Int'l Non Charge Hrs... 11.5
Trawl...	0.7					Cum. Total Charge Hrs (Job)... 33.7
Layout Spread...						Cum. Comp. T/V's (Job)... 2.0
Pickup Spread...						
Weather Standby...	3.5					
Hoist/Setup...						
Cum. Hoist/Setup...						

COMMENTS:
 Continued production 4.76 km/s
 Inclement weather for most of the day today, production between showers of rain.
 Vibes completed to low load rated bridge, long detour so Miama, stopped in camp overnight.
 Most wet weather clothing for crew arrived today, more will be required.

Total Crew - 27, 23 in the field.
 Bad Equipment - Cable 2, Phanas 1

Line	Station #			Tot	Line	Station #			Tot
	1701	1821	121			TB02B-AA1	1176	1425	
TB02B-AA1	1701	1821	121		TB02B-AA1	1176	1425	250	
Total Stations:				121	Total Stations:				250

EXTRA PERSONNEL		EXTRA VEHICLES	
1 Security Guard		1	
Charge Day... 1		Charge Day... 1	
Cum. Charge Days (Job) 3		Cum. Charge Days (Job) 3	
TRAFFIC MANAGEMENT Response Crew		TRAFFIC MANAGEMENT Survey Crew	
Supervisor with Vehicle 1	2 Man Crews with Vehicle 6	Supervisor with Vehicle 1	3 Man Crew with Vehicle 1
Charge Day... 1.0		Charge Day... 1.0	
Cum. Charge Days (Job) 3.0		Cum. Charge Days (Job) 15.0	
COMMENTS:		COMMENTS:	
Crew Manager: _____			



**Terrex Solimic
Daily Report**

Client.....
Survey Name.....
Area.....
State.....

GSLM
Tasmania Basin Survey
Miena - Highroads
Tasmania

Party Manager.....
Client Rep.....
Weather.....
DATE.....

CREW 431
Jon Turner
Diego Gonzalez
Fero
31-Mar-07

Line #	Sta	Sta	Total Stns	Skips	Vp's	Kms	TOTALS
T8020-AA1	1578.5	1933.5	410	100	316	0.32	Vp's... 316 Skips... 100 Kms... 0.32
							Cum. Total Skips... 100 Cum. Total Vp's... 824 Cum. Total Kms... 17.8600 Total Km's Remaining... 58.6400

HOURS		Summary	Down Time
Recorder Move	0.9	6.1	Troubleshoot
Line Change			Recorder
Distours/Transfer	3.1		Vibes
Wet on Log Trucks			W/ on Speed
QC Speed			Other
Travel	1.3		
Layout Speed			
Poling Speed			Taxiboy/Introduction
Weather Standby			Total Down Time
Mobilization			
Cum. Mobilization			Cum. Down Time (Job)
		Day Charge Hrs	31.0
		Cum. Day Charge Hrs (Job)	44.2
		Standby Hrs	0.3
		Cum. Standby Hrs (Job)	4.8
		Total Day/Stand Hrs Charge Hrs	12.5
		Cum. Total Charge Hrs (Job)	46.0
			48.2

COMMENTS:
Continued production, 0.32 kms.
Many skips today due to on above ground, concrete canal and some wet ground.
Vibes completed the detour around the load rated bridges this morning and production commenced at 10:00am.
Vibes damaged a landholders gate today, RM made temporary repairs with new gate to be installed Monday.

Total Crew - 21, 23 in the field.
Bad Equipment - Cable 3, Phones 3

Line	Layout		Pickup	
	Station #	Tot	Line	Station #
T8020-AA1	1922	2260	430	T8020-AA1
				1420
				1935
				410
Total Stations:		430	Total Stations:	
			410	

EXTRA PERSONNEL		EXTRA VEHICLES	
1 Security Guard		1	
Charge Day	1	Charge Day	1
Cum. Charge Days (Job)	4	Cum. Charge Days (Job)	4
TRAFFIC MANAGEMENT Recording Crew		TRAFFIC MANAGEMENT Survey Crew	
Supervisor with Vehicle	1	Supervisor with Vehicle	1
2 Man Crew with Vehicle	5	2 Man Crew with Vehicle	1
Charge Day	1.0	Charge Day	1.0
Cum. Charge Days (Job)	4.0	Cum. Charge Days (Job)	16.0
COMMENTS:		COMMENTS:	
Crew Manager: _____			



**Terrex Seismic
Daily Report**

CREW 401

Client: GBLM
Survey Name: Tasmania Basin Survey
Area: Mann - Highlands
State: Tasmania

Party Manager: Jon Turner
Client Rep: Diego Gonzalez
Weather: Fine
DATE: 01-Apr-07

Line #	Stn	Stn	Total Stns	Skips	Vp's	Kms	TOTALS
TB02B-AA1	1994.5	2470.5	477	0	477	8.54	Vp's... 477 Skips... 0 Kms... 8.54
							Cum. Total Skips... 100 Cum. Total Vp's... 1371 Cum. Total Kms... 79.4007 Total Km's remaining... 566.0600

HOURS		Down Time	
Recording	2.8	Troubleshoot	0.2
Recorder Move	0.7	Records	
Line Change		Vols	0.3
Default/Format		W/ on Spread	
Wait on log Trucks		CRW	
QC Spread	1.1		
Travel	1.8		
Layout Spread		Day Charge Hrs	11.4
Setup Spread		Cum. Day Charge Hrs (Job)	52.6
Polup Spread		Standby Hrs	9.8
Weather Standby		Cum. Standby Hrs (Job)	5.1
Rebaseline		Total Day/Week Charge Hrs	12.2
Cum. Mobilization		Cum. Total Charge Hrs (Job)	57.7
		Cum. Down Time (Job)	2.7

COMMENTS:	Layout			Replay		
	Line	Station #	Total	Line	Station #	Total
Continued production, 0.54 kms. A good days production today, line AA1 completed. Vibe downtime today was due to no electrical problem, repaired by vib tech, all vibers Operational PFI and client started new lines for next today	TB02B-AA1	2251	2470	TB02B-AA1	1630	3320
	TB02B-BA1	876	1089			485

Total Crew = 27, 23 in the field.
Bad Equipment = Cable 3, Phones 3

L1%: 0	M1%: 0	FA%: 0	Total Stations:	425	Total Stations:	485
EXTRA PERSONNEL		EXTRA VEHICLES				
1 Security Guard		1				
Charge Day...	1	Charge Day...	1			
Cum. Charge Days (Job)	5	Cum. Charge Days (Job)	5			

TRAFFIC MANAGEMENT Roadside Crew		TRAFFIC MANAGEMENT Survey Crew	
Supervisor with Vehicle	1 Man Crew with Vehicle	Supervisor with Vehicle	2 Man Crew with Vehicle
1	5	1	1
Charge Day...	1.0	Charge Day...	1.0
Cum. Charge Days (Job)	5.0	Cum. Charge Days (Job)	17.0

COMMENTS: _____

Crew Manager: _____



Terrex Seismic Daily Report

Client: GSKM
 Survey Name: Tasmania Basin Survey
 Area: Miena - Highlands
 State: Tasmania

CREW 401
 Party Manager: Darren Roe
 Client Rep: Diego Gonzalez
 Weather: Phe
 DATE: 03-Apr-17

Line #	Stn	End	Total Stns	Skips	Vp's	Kms	TOTALS
TD02B-BI	895.5	1351.5	454	2	465	9.30	Vp's... 488 Skips... 2 Kms... 9.30
							Cum. Total Skips... 1071 Cum. Total Vp's... 1252 Cum. Total Kms... 23,7000 Total Km's Remaining... 558,7000

HOURS		Recording	7.3	Down Time			
	Ready Hrs	0.8		Timelapse	0.3		
	Line Change	1.0		Recorder			
	Delivery/Transfer			Vp's			
	Use of Lay Tracks	0.7		W / in Spread			
	QC Spread	0.3		Other			
	Trawl	1.5					Day Charge Hrs... 12.4 Cum. Day Charge Hrs (Job)... 84.2 Standby Hrs... 6.3 Cum. Standby Hrs (Job)... 5.4 Total Day End Run Charge Hrs... 12.2 Cum. Total Charge Hrs (Job)... 59.6
	Layout Spread			Telemetry/Infection	0.1		
	Setup Spread			Total Down Time	0.2		
	Wearout Standby			Cum. Down Time (Job)	2.5		72.6
	Rep-Station						
	Cum. Rep-Station						

COMMENTS:

Continued production, 0.20 kms
 A good days production today, line BJ started with Waddamana hit negotiated without incident and minimal delay.
 Jon Turner and Glen Charles left crew today
 PM in Ouse to check on survey crew and traffic controllers

Layout	Line	Station #	Tel	Line	Station #	Tot		
	TD02B-BJ	1090	1005	518	TD02B-AA1	2031	2470	140
				1	TD02B-BJ	855	1200	200

Total Crew - 27, 23 in the field
 Bad Equipment - Cable 1, Phones 2

LTI= 0	MTI= 0	SAG= 0	Total Stations: 1	517	Total Stations: 448
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EXTRA PERSONNEL		EXTRA VEHICLES	
1 Security Guard		1	
Charge Day... 1		Charge Day... 1	
Cum. Charge Days (Job) 5		Cum. Charge Days (Job) 6	

TRAFFIC MANAGEMENT Resording Crew		TRAFFIC MANAGEMENT Survey Crew	
Supervisor with Vehicle	2 Man Crews with Vehicle	Supervisor with Vehicle	2 Man Crew with Vehicle
:	0	1	1
Charge Day... 1.0		Charge Day... 1.0	
Cum. Charge Days (Job) 5.0		Cum. Charge Days (Job) 14.0	

COMMENTS:

Crew Manager _____



TerraX Seismic
Daily Report

Client: GGLM
Survey Name: Tasmania Basin Survey
Area: Miena - Highlands
State: Tasmania

Crew #01
Party Manager: Darren Hea
Client Rep: Diego Gonzalez
Weather: Fvg
DATE: 03-Apr-07

Line #	Stn	Stn	Total Shot	Skips	Vp's	Kms	TOTALS
T802b-BD	1862.5	1970.5	609	1	502	12.18	VPA... 608 Skips... 1 Kms... 12.18
							Cum. Total Skips... 103 Cum. Total Vp's... 1717 Cum. Total Kms... 28.0802 Total Hrs's Remaining... 508.5900

HOURS		Down Time -	
Recording...	3.1	Truck/Mech...	0.3
Recorder Move...	0.8	Recorder...	
Line Charge...		Wagon...	0.1
Detrip/Trip...		W/ on Spread...	
Wagon Log Trucks...		Other...	
Inv. Test/QC Spread...	0.3		
Travel...	1.3		
Layout Spread...		Testbox/Induction...	0.3
Recep Spread...		Total Down Time...	0.4
Weather Standby...			
Hotel Standby...			
Cum. Mobilization...		Cum. Down Time (Job)...	2.0
		Day Charge Hrs...	31.5
		Cum. Day Charge Hrs (Job)...	71.7
		Standby Hrs...	0.3
		Cum. Standby Hrs (Job)...	6.7
		Total Day/Standby Charge Hrs...	32.2
		Cum. Total Charge Hrs (Job)...	31.4
			34.6

COMMENTS:

Continued production on line B1, 12.18 km's.
Minimal delays with only total traffic encountered
P.M. to field to check on production and sound AA2
1 hour into the crew started to replace Glen Charles

Line # T802b-B1 completed.

Layout			Pickup		
Line	Station #	Tot	Line	Station #	Tot
T802b-B1	1855	1976	356		
T802b-AA2	2250	2142	104	T802-B1	1200
					1770
					577
					0

Total Crew - 27, 23 in the field.
Bad Equipment - Cable 1, Phones 1

LTin	0	MTin	0	Face	0	Total Stations	470	Total Stations	577
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EXTRA PERSONNEL		EXTRA VEHICLES	
1 Security Guard		1	
Charge Day...	1	Charge Day...	1
Cum. Charge Days (Job)	7	Cum. Charge Days (Job)	7

TRAFFIC MANAGEMENT Recording Crew		TRAFFIC MANAGEMENT Survey Crew	
Supervisor with Vehicle	1	Supervisor with Vehicle	1
2 Men Crews with Vehicle	3	2 Men Crews with Vehicle	1
Charge Day...	1.0	Charge Day...	1.0
Cum. Charge Days (Job)...	7.0	Cum. Charge Days (Job)...	19.0

COMMENTS:

Crew Manager: _____



**Terrex Seismic
Daily Report**

Client..... GGLM
 Survey Name..... Tasmania Down Survey
 Area..... Mena - Hylmark
 State..... Tasmania

CREW 401
 Party Manager..... Darren Rao
 Client Rep..... Greg Gehring
 Weather..... Fine
 DATE..... 04-Apr-07

Line #	Sta	Stn	Total Sta	Slips	Up's	Time	TOTALS
T802b-AA2	2250.5	1917.5	323	0	334	6.66	VP's... 134 Slips... 0 Misc... 0.50 Cum. Total Slips... 103 Cum. Total Up's... 1101 Cum. Total Misc... 87.5400 Total Km's Remaining... 531.9200

HOURS		Recorded	Down Time
	Recorder Move	5.0	0.7
	Line Change	0.6	0.7
	Battery/Fuel	2.9	0.7
	Work on Log Trucks		0.7
	Inst. test/QC Spread	0.5	0.7
	Trawl	2.7	0.7
	Layout Spread		0.7
	Pickup Spread		0.7
	Weather Standby		0.7
	Relocation		0.7
	Cum. Relocation		0.7
	Day Charge Hrs		18.5
	Cum. Day Charge Hrs (Job)		87.2
	Standby Hrs		0.7
	Cum. Standby Hrs (Job)		6.0
	Total Day Incl Non Charge Hrs		12.5
	Cum. Total Charge Hrs (Job)		97.2

COMMENTS:
 Line change from T802b-B3 to T802b-AA2
 TIC armed on crew and indicated and put on line
 H.S.E to field to view crew
 Peter O'Donnell left crew
 P.M to field to view operations

 Total Crew = 27, 23 in the field
 Bad Equipment - Cable 1, Phones 1

Layout Line	Station #		Tot	Pickup		Tot
	Line	Station #		Line	Station #	
T802-AA2	2145	1778	371	T802-BJ	1779	184
T802-BN	1810	1792	31	T802-AA2	2250	170

LTIC: 0 MTIC: 0 PAC: 0 Total Stations: 402 Total Stations: 264

EXTRA PERSONNEL		EXTRA VEHICLES	
1 Security Guard		1	
Charge Day... 1		Charge Day... 1	
Cum. Charge Days (Job) 8		Cum. Charge Days (Job) 8	

TRAFFIC MANAGEMENT Recording Crew		TRAFFIC MANAGEMENT Survey Crew	
Supervisor with Vehicle	2 Man Crews with Vehicle	Supervisor with Vehicle	2 Man Crew with Vehicle
1	6	1	1
Charge Day... 1.0		Charge Day... 1.0	
Cum. Charge Days (Job)... 5.0		Cum. Charge Days (Job)... 20.0	

COMMENTS:
 Crew Manager _____



**Terrasx Systems
Daily Report**

Client:
Survey Name:
Area:
State:

GSLM
Tasmania Basin Survey
Miena - Highlands
Tasmania

Party Manager:
Client Rep:
Weather:
Date:

CREW 401
Daren Rea
Diego Gonzalez
Fire
05-Apr-07

Line #	Stn	Stn	Total Stns	Skips	Vp's	Kms	TOTALS
TB02b-BN	1499.5	1153.5	338	2	33	8.70	VF... 398 Skips... 2
TE02b-RD1	1746.5	1602.5	84	0	65	1.30	Kms... 8.00
							Cum. Total Skips... 312
							Cum. Total Vp's... 3348
							Cum. Total Kms... 24,5400
							Total Km's Remaining... 514,9200

HOURS		Down Time	
Recoiling....	6.0	Troubleshooting....	0.8
Recoiler Move....	4.5	Records....	
Line Change....	0.6	Vibes....	0.4
Detour/Terrain....		W/ on Spread....	
W/ on Log Trucks....		Other....	
Instr. test/C. Spread....	0.6		
Travel....	2.2		
		Day Charge Hrs....	10.8
		Cum. Day Charge Hrs (Job)...	109.8
		Standby Hrs....	0.3
		Cum. Standby Hrs (Job)...	4.6
		Total Day/Job Non Charge Hrs...	15.3
		Cum. Total Charge Hrs (Job)...	125.4
		Cum. Down Time (Job)....	4.6
			133.0

COMMENTS:
Line change from TB02b-BN to TBC0b-BD1
Line TB02b-BN completed
M.S.E to field to view crew
P.M. to field to view operations

Two client reps to field to view operation

Total Crew - 27, 23 in the field
Bad Equipment - Cable 1, Phones 1

Line	Station #	Tel		Pickup		Station #	Tgt
		Line	Line	Line	Line		
TB02-BN	1262	1153	110	TB02-BN	1604	1153	S11
TB02-RD1	1746	1355	350				0

LTR= 0 MTM= 0 FAC= 0 Total Stations: 450 Total Stations: 511

EXTRA PERSONNEL		EXTRA VEHICLES	
1 Security Guard		1	
Charge Day....	1	Charge Day....	1
Cum. Charge Days (Job)	10	Cum. Charge Days (Job)	10

TRAFFIC MANAGEMENT Recording Crew		TRAFFIC MANAGEMENT Survey Crew	
Supervisor with Vehicle	2 Man Crews with Vehicle	Supervisor with Vehicle	2 Man Crew with Vehicle
1	5	1	1
Charge Day....	1.0	Charge Day....	1.0
Cum. Charge Days (Job)...	10.0	Cum. Charge Days (Job)...	22.0

COMMENTS: Crew Manager



**Terrex Seismic
Daily Report**

Client: G8LM
 Survey Name: Tasmania Basin Survey
 Area: Miera - Highlands
 State: Tasmania

CREW 401
 Crew Manager: Diego Cordoba
 Client Rep: Fico
 DATE: 07-Apr-07

Line #	Sta	Str	Total Strs	Stops	Vp's	Rms	TOTALS
TB02-001	1081.5	1256.5	414	10	404	2.29	Vp's... 404 Stops... 10 Rms... 2.29
							Cum. Total Stops... 112 Cum. Total Vp's... 3551 Cum. Total Rms... 52.9200 Total Work Remaining... 595.5460

HOURS	Recording	Down Time	Troubleshoot	Day Charge Hrs
	6.9			10.2
	0.5			170.0
				0.1
				6.0
				16.5
				126.8
				132.4

COMMENTS:
 Continue production on TB02b
 Police from Bethwell requested to patrol our work area due to speeding public
 H.S.E. to field to view crew
 E.M. to field to view operations
 Low daily hours due to most lines being brought forward because of Easter solution.
 Client reps to field to view operation.
 L.O.S due to the theft of three batteries off line - batteries and boxes retrieved at an evening and layed out the following morning.
 Total Crew - 27, 23 in the field.
 Bad Equipment - Cable, 1, Phones 1

Layout Line	Station #	Tot	Pickup Line	Station #	Tot
TB02-001	1085	1084	TB02-001	1776	1435
		331			341

LTW	MTW	FAC	Total Stations
0	0	0	331

EXTRA PERSONNEL	EXTRA VEHICLES
1 Security Guard	1
Charge Day... 1	Charge Day... 1
Cum. Charge Days (Job) 11	Cum. Charge Days (Job) 11

TRAFFIC MANAGEMENT Recording Crew	TRAFFIC MANAGEMENT Survey Crew
Supervisor with Vehicle 1	Supervisor with Vehicle 1
2 Man Crews with Vehicle 6	2 Man Crews with Vehicle 1
Charge Day... 1.0	Charge Day... 1.0
Cum. Charge Days (Job) 11.0	Cum. Charge Days (Job) 22.0

COMMENTS: Crew Manager _____



**Terrex Systems
Daily Report**

Client..... GGLM
 Survey Name..... Tasmania Basin Survey
 Area..... Miena - Highlands
 State..... TASMANIA

CREW 401
 Party Manager..... Darren Roe
 Client Rep..... Diego Gonzalez
 Worksheet..... Pire
 DATE..... 11-Apr-07

Line #	Stn	Stn	Total Stns	Skips	Vg's	Kms	TOTALS
T8826-BM	2035.5	2242.5	213	0	213	4.26	Vg's... 213 Skips... 0 Kms... 4.26 Cum. Total Skips... 160 Cum. Total Vg's... 5199 Cum. Total Kms... 113.0200 Total Km's Remaining... 426.4400

HOURS		Recording	Down Time	Troubleshoot	Other	Day Charge Hrs
Recorder Move		0.3		0.2		6.8
Line Change						Cum. Day Charge Hrs (Job) 162.2
Delays/Terrain						Standby Hrs... 8.3
Wait on Log Trucks		0.1				Cum. Standby Hrs (Job) 13.1
Int. Backup Spread		1.1				Total Day/Int Men Charge Hrs 12.4
Travel		1.0				Cum. Total Charge Hrs (Job) 175.2
W/ on Spread						Cum. Down Time (Job) 6.0
Layout Spread		0.5				
Podup Spread						
Standby		5.8				
Mobilisation						
Cum. Mobilisation						

COMMENTS:

Standby due to local farmer driving cattle down the road in the middle of the spread to a set of sleep yards to be sent to the sales. He was contacted on the right of the 10th by myself on behalf of GGLM under the instruction of Jo Zaretski and offered compensation to delay by a day but declined the offer due to time restrictions.

Production continued on T8826 - BM at 1.20pm
 Crew Manager in field log vehicle prep and recording crew

Total Crew - 27, 23 in the field.
 Bad Equipment - Cable 2, Phones 2

Layout	Station #	Tot	Pickup	Station #	Tot
T8826-BM	2224	2315	171	T8826-BM	1548
			0	2026	216
					0
Total Stations :			171	Total Stations:	
				216	

EXTRA PERSONNEL		EXTRA VEHICLES	
1 Security Guard		1	
Charge Day... 1		Charge Day... 1	
Cum. Charge Days (Job) 16		Cum. Charge Days (Job) 16	

TRAFFIC MANAGEMENT Recording Crew		TRAFFIC MANAGEMENT Survey Crew	
Supervisor with Vehicle	1	Supervisor with Vehicle	1
2 Man Crews with Vehicle	6	2 Man Crew with Vehicle	1
Charge Day... 1.0		Charge Day... 1.0	
Cum. Charge Days (Job) 15.0		Cum. Charge Days (Job) 27.0	

COMMENTS:

Crew Manager: _____



**Terrex Systems
Daily Report**

Client..... GSLM
 Survey Name... Yearwinds Basin Survey
 Area..... Micon - HighWinds
 State..... Tasmania

CREW 491
 Party Manager... Darren Ren
 Client Rep..... Diego Gonzalez
 Worksheet..... Fnc
 DATE..... 14-Apr-07

Line #	Sub	Sta	Total Stns	Skips	Vp's	Kms	TOTALS
Y6016-BQ	1372.5	1634.5	313	1	362	6.20	VP's... 312 Skips... 1 Kms... 6.20
							Cum. Total Skips... 165 Cum. Total Vp's... 4136 Cum. Total Kms... 120.4690 Total Kms Remaining... 458.0000

HOURE	Recording	Down Time	Truck/Tractor	Day Charge Hrs
	Recording... 4.0		Truck/Tractor... 0.4	Day Charge Hrs... 21.3
	Recorder Hrs... 0.9		Excavator... 0.0	Cum. Day Charge Hrs (Job)... 194.8
	Line Charge... 2.6		Vibes... 0.0	Standby Hrs... 0.3
	Detector/Tran... 0.0		W/ on Spread... 0.0	Cum. Standby Hrs (Job)... 14.0
	W/ on Log Trucks... 0.0		Other... 0.0	Total Day/Int Men Charge Hrs... 12.2
	Int. test/QC Spread... 0.3		Testbox/Introducer... 0.3	Total Day/Int Men Charge Hrs... 210.6
	Travel... 1.7		Total Down Time... 0.4	Cum. Total Charge Hrs (Job)... 210.6
	W/ on Spread... 0.0		Cum. Down Time (Job)... 6.0	
	Reject Spread... 0.0			
	Setup Spread... 0.0			
	Standby... 0.0			
	Relocations... 0.0			
	Cum. Mobilization... 0.0			

COMMENTS:	Layout		Pickup				
	Lot	Status #	Tot	Qty	Station #	Tot	
Overnight theft of all tools and spare parts out of service truck - locks forced and equipment stolen, Vibes and Recorder left untouched - Police notified.	TB020-BQ	1514	1534	120	TB020-BQ	1150	1834
Production completed on TB02-BQ	TB020-BZ	1528	1548	282			0
Earthmoving contractor called in to repair low level bridge							
Equipment transferred back to reassemble production on TB02 - BZ							
Crew Manager to field to view damage to service truck and view production							
Client rep to field.							
Total Crew - 27, 23 in the field							
Bad Equipment - Cable 2, Phones 2							
	LT#	MT#	FA#	Total Stations		Total Stations	
	0	0	0	402		404	

EXTRA PERSONNEL		EXTRA VEHICLES	
1 Security Guard		1	
Charge Day... 1		Charge Day... 1	
Cum. Charge Days (Job) 18		Cum. Charge Days (Job) 18	

TRAFFIC MANAGEMENT Recording Crew		TRAFFIC MANAGEMENT Survey Crew	
Supervisor with Vehicle	2 Man Crews with Vehicle	Supervisor with Vehicle	2 Man Crews with Vehicle
1	6	1	1
Charge Day... 1.0		Charge Day... 1.0	
Cum. Charge Days (Job) 18.0		Cum. Charge Days (Job) 18.0	

COMMENTS: _____

Crew Manager _____



**Terrex Helimic
Daily Report**

Client: (SLL)
Survey Name: Tasmania Basin Survey
Area: Meira - Highpress
Site: Tathra

CREW 484
Party Manager: Darren Pies
Client Rep: Diego Gonzalez
Weather: Fine
DATE: 15-Apr-07

Line #	Stn	Stn	Total Stns	Slips	Vp's	Kms	TOTAL
T802b-BZ	1678.5	1371.5	305	0	246	6.92	VP's... 246 Slips... 0 Kms... 6.92
							Cum. Total Slips... 165 Cum. Total Vp's... 6432 Cum. Total Kms... 140,2600 Total Kms Remaining... 447,0000

HOURS		Recording	Down Time	Toolbox	Standby	
Recorder Move	1.1			Recorder	0.8	
Line Change				Vibes	0.4	
Delays/Terrain				W/ on Spread		
Wk on Log Trench	0.2			CCW		
Test test/QC Spread	0.1					
Typed	1.3					
W/ on Spread	0.5					
Layout Spread	0.1					
Pickup Spread	0.2			Toolbox/Induction	0.2	
Standby				Total Down Time	1.2	
Refrigerator						
Cum. Helicopter				Cum. Down Time (Job)	0.1	
					Day Charge Kms	10.7
					Cum. Day Charge Kms (Job)	207.5
					Standby Hrs	0.3
					Cum. Standby Hrs (Job)	14.3
					Total Day Incl Run Charge Hrs	11.2
					Cum. Total Charge Hrs (Job)	211.8
					Cum. Total Charge Hrs (Job)	210.8

COMMENTS:
 Production continued on T802-BZ
 Client rep to field
 Site Controller's Steve Timmins interviewed Colin Sharma and myself over theft of equip.
 Downtime on Vibes due to 2 pad radior rods shearing
 Downtime on recorder due to system lock-up, reset and continued production
 2 Vibes x 5 sweeps = 1078.5 - 1544.5 (35 Vp's)
 = 1301.5 - 1565.5 (27 Vp's)
 = 1410.5 - 1443.5 (33 Vp's)
 Total Crew - 22, 23 in the field.
 Bad Equipment - Cable 2, Phones 2

Line	Station #	Tot	Line	Station #	Tot
T802b-BZ	1645	1072	T802b-BZ	1625	1499
		473			329
		0			0
Total Stations:		473	Total Stations:		329

EXTRA PERSONNEL		EXTRA VEHICLES	
1 Security Guard		1	
Charge Day... 1		Charge Day... 1	
Cum. Charge Days (Job) 19		Cum. Charge Days (Job) 19	

TRAFFIC MANAGEMENT Recording Crew		TRAFFIC MANAGEMENT Survey Crew	
Supervisor with Vehicle 1	2 Man Crews with Vehicle 5	Supervisor with Vehicle 0	2 Man Crew with Vehicle 1
Charge Day... 1.0		Charge Day... 1.0	
Cum. Charge Days (Job) 10.0		Cum. Charge Days (Job) 31.0	

COMMENTS:
 Crew Manager _____



Terrax Seismic
Daily Report

Client..... GSLM
Survey Name... Tasmans Basin Survey
Area..... Maca - Highlands
State..... Tasmania

CREW 404
Party Manager... Darren Ross
Client Rep..... Diego Gonzalez
Weather..... Fine
DATE..... 16-Apr-07

Line #	Sta	Sta	Total Sta	Stops	Vp's	Kms	TOTALS
TB02b-BZ	1522.5	530.5	203	2	301	2.65	Vp's... 381 Stops... 2 Kms... 7.68
							Cum. Total Stops... 167 Cum. Total Vp's... 5821 Cum. Total Kms... 248,0480 Total Km's Remaining... 441.4200

HOURS		Down Time	
Recording...	0.2	Tractorhook...	0.1
Recorder Move...	0.6	Rotation...	
Line Change...	2.3	Vib...	
Detours/Terrain...		W / on Spread...	
Wstr on Log Trucks...		Down...	
Inst. test/QC Spread...	0.4		
Travel...	1.7		
W / on Spread...			
Layout Spread...	0.7	Toolbox/Involving...	0.3
House Spread...		Total Down Time...	0.1
Standby...			
High Voltage...			
Cum. Mobility...		Cum. Down Time (Job)...	2.2
		Day Charge Hrs.....	11.6
		Cum. Day Charge Hrs (Job)...	219.1
		Standby Hrs.....	0.3
		Cum. Standby Hrs (Job)...	14.0
		Total Day/Total Non Charge Hrs...	32.0
		Cum. Total Charge Hrs (Job)...	231.7
		Cum. Total Charge Hrs (Job)...	242.8

COMMENTS:
Production continued on TB02-BZ
Client rep to field
Spread slated to be moved down to TB02-HH
Crew manager to field
Crew member to Lounceston to purchase tools to replace stolen equipment

Hire vet. INMANS in Skye's vet accident - 1 staff member taken to Lounceston hospital for observation.

Total Crew - 27, 23 in the field
Bad Equipment - Cable 1, Phoenix 2

Line	Station		Tot	Pickup		Station	Tot
	Line	Station		Line	Station		
TB02b-BZ	1071	050	121	TB02b-BZ	1408	050	548
TB02b-HH	1020	1105	105				0
Total Stations :			228	Total Stations:			548

LTC= 0 NTL= 0 FAC= 0 Total Stations : 228 Total Stations: 548

EXTRA PERSONNEL		EXTRA VEHICLES	
1 Security Guard		1	
Charge Day...	1	Charge Day...	1
Cum. Charge Days (Job)	20	Cum. Charge Days (Job)	20

TRAFFIC MANAGEMENT Responding Crew		TRAFFIC MANAGEMENT Survey Crew	
Supervisor with Vehicle	1	Supervisor with Vehicle	0
2 Man Crew with Vehicle	5	2 Man Crew with Vehicle	1
Charge Day....	1.0	Charge Day....	1.0
Cum. Charge Days (Job)...	30.0	Cum. Charge Days (Job)...	12.0
COMMENTS:		COMMENTS:	

Crew Manager _____



**Terrex Seismic
Daily Report**

Client: BSLM
 Survey Name: Tasmania Basin Survey
 Area: Meina - Highlands
 State: Tasmania
 Party Manager: Deuren Ros
 Client Rep: Diego Gonzalez
 Weather: Fine
 DATE: 18-Apr-07

Line #	Sta	Sta	Total Dist	Stops	Vp's	Kms	TOTALS
TB02b-HA	1365.5	1717.5	404	0	404	0.08	Vp's... 404 Stops... 0 Kms... 8.08
							Cum. Total Stops... 171 Cum. Total Vp's... 7528 Cum. Total Kms... 161.2500 Total Km's Remaining... 477.2000

HOURS		Recording...	0.4	Downy Time -	Truck/Sheet...	
		Reorder Files...	0.5		Reorder...	
		Line Change...			Vib...	
		Detours/Faults...			W/ on Spread...	
		W/ on Log Trucks...			Down...	
		Loss. test/QC Spread...	0.2			
		Travel...	3.0			
		W/ on Spread...				Day Change Hrs... 10.2
		Layout Spread...				Cum. Day Change Hrs (Job)... 243.5
		Pickup Spread...				Standby Hrs... 2.0
		Sandby...	1.7		Toolbox/Injection...	0.3
		Hydration...			Total Down Time...	0.0
		Cum. Mobilization...			Cum. Down Time (Job)...	8.4
						Cum. Total Charge Hrs (Job)... 267.7

COMMENTS:
 Daily Production 2.08 Km
 Production continued on TB02-HA
 Client rep to field
 H.S.E to field
 Crew member to Launceston to pick up parts
 Have been advised that forestry dozers are moving into operational area in preparation
 To build fire breaks for a burn off programme.
 Total Crew - 27, 23 in the field.
 Used Equipment - Cable 4, Phones 2

Layout	Station #		Tot	Pickup		Station #	Tot
	Line	Station #		Line	Station #		
TB02b-HA	1593	1839	317	TB02b-HA	1150	1549	359
			0				0

UTIs: 0 MTR: 0 PAC: 0 Total Stations: 317 Total Stations: 399

EXTRA PERSONNEL		EXTRA VEHICLES	
1 Security Guard		1	
Charge Day...	1	Charge Day...	1
Cum. Charge Days (Job)	22	Cum. Charge Days (Job)	22

TRAFFIC MANAGEMENT Recording Crew		TRAFFIC MANAGEMENT Survey Crew	
Supervisor with Vehicle	2 Man Crews with Vehicle	Supervisor with Vehicle	2 Man Crews with Vehicle
1	6	0	0
Demobilized - 17/4/07			
Charge Day...	1.0	Charge Day...	1.0
Cum. Charge Days (Job)	22.0	Cum. Charge Days (Job)	22.0

COMMENTS:
 Crew Manager _____



**Terrex Seismic
Daily Report**

Client.....
Survey Name.....
Area.....
Site.....

GSLH
Yasawa Basin Survey
Mina - Highlands
Tasmania

Party Manager.....
Client Rep.....
Weather.....
DATE.....

CREW 401
Damon Rea
Diego Gonzalez
Finn
10-Apr-07

Line #	Stn	Stn	Total Stns	Skips	Vp's	Yms	TOYALS
YB02B-HA	1712.5	1500.5	189	5	104	370	Vp's... 439 Stops... 0 Yms... 8.02
TB02B-HB	1020.5	1257.5	258	3	256	514	
							Cum. Total Skips... 161 Cum. Total Vp's... 2007 Cum. Total Yms... 171.1809 Total Km's Remaining... 410.2000

HOURS		Recording	7.1	Down Time		Toolbox	0.4	Day Charge Hrs	11.0
	Recorder Move	0.0				Records		Cum. Day Charge Hrs (Job)	183.3
	Line Change	1.0				VDS		Standby Hrs	6.3
	Decont/Termis					W/ on Special		Cum. Standby Hrs (Job)	17.2
	W/ on Log Trucks					Other		Total Day Incl from Charge Hrs	12.5
	Inst. test/QC Spread	0.3						Cum. Total Charge Hrs (Job)	270.5
	Travel	2.9						Cum. Total Charge Hrs (Job)	280.2
	W/ on Spread								
	Layout Spread								
	Accep Spread								
	Dancey								
	Mobilisation								
	Cum. Mobilisation								

COMMENTS:
 Daily Production 8.02 Km
 Production continued on TB02-HA
 Line TB02B-HA Completed
 Production commenced on TB02-HB
 Crew member to Launceston to pick up parts and vehicle.
 Check rep to field

 Total Crew - 27, 23 in the field.
 Bad Equipment - Cable 1, Phono 3

Line	Station #	Tot	Pickup				
			Line	Station #	Tot		
TB02B-HB	1000	1903	503	TB02B-HA	1550	1900	350
			0	TB02B-HB	1903	1097	97

LTG:	0	MTG:	0	FAC:	0	Total Stations:	503	Total Stns:	447
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EXTRA PERSONNEL		EXTRA VEHICLES	
1 Security Guard		1	
Charge Day...	1	Charge Day...	1
Cum. Charge Days (Job)	23	Cum. Charge Days (Job)	23

TRAFFIC MANAGEMENT Recording Crew		TRAFFIC MANAGEMENT Survey Crew	
Supervisor with Vehicle	2 Man Crews with Vehicle	Supervisor with Vehicle	2 Man Crew with Vehicle
1	0	0	0
		Demobil - 17/4/07	
Charge Day...	1.0	Charge Day...	1.0
Cum. Charge Days (Job)	23.0	Cum. Charge Days (Job)	32.0

COMMENTS:
 Crew Manager _____



**Terrex Seismic
Daily Report**

Client.....
Survey Name.....
Area.....
State.....

GBLAA
Tasmania Basin Survey
Minto - Highlands
Tasmania

Party Manager.....
Client Rep.....
Weather.....
DATE.....

CRW 401
Daren Rie
Olego Gonzalez
Fire
29-Apr-07

Line #	Stn	Stn	Total Stns	Skips	Vp's	Kms	TOTALS
T602B-HB	1259.5	1529.5	286	1	245	4.52	Vp's... 402 Skips... 1 Kms... 8.06
T602B-HC	1923.5	1744.5	157	0	157	3.14	
							Cum. Total Skips... 182
							Cum. Total Vp's... 8400
							Cum. Total Kms... 179.2460
							Total Km's Remaining... 438.2200

HOURS		Reporting	Down Time	Troubleshoot	Accidents	W / on Spread	Other	DAY Charge Hrs
Reporting	6.3			0.2				11.7
Retainer Hrs	0.5							Cum. Day Charge Hrs (Job) 266.6
Line Change	1.1							Standby Hrs... 6.3
Disturb/Terrain								Cum. Standby Hrs (Job) 17.6
Wait on Log Trucks								Total Day/Total Hrs Charge Hrs 12.2
Inst. cap/QC Spread	0.5							Cum. Total Charge Hrs (Job) 282.8
Travel	2.0							282.4
W / on Spread	0.2							
Layout Spread								
Setup Spread								
Standby								
Relocation								
Cum. Mobilization								
								Cum. Down Time (Job) 0.0

COMMENTS:	Layset			Pickup			
	Line	Station #	Tot	Line	Station #	Tot	
Daily Production 0.85 Hrs	T602B-HC	1907	1563	337	T602B-HB	1098	1503
Production continued on T602B-HB			0				405
Line T602B-HB Completed							0
Production commenced on T602B-HC							
Crew member to Leunceston to deliver vehicle for repair.							
Client rep to field							
Total Crew - 27, 23 in the field.							
Bad Equipment - Cable 1, Phones 3							
LTI= 0	MTI= 0	POCC= 0	Total Stations: 337	Total Stations: 405			

EXTRA PERSONNEL		EXTRA VEHICLES	
1 Security Guard		1	
Charge Day... 1		Charge Day... 1	
Cum. Charge Days (Job) 24		Cum. Charge Days (Job) 24	

TRAFFIC MANAGEMENT Recording Crew		TRAFFIC MANAGEMENT Survey Crew	
Supervisor with Vehicle	2 Man Crews with Vehicle	Supervisor with Vehicle	2 Man Crew with Vehicle
1	0	0	0
Charge Day... 1.8		Charge Day... 1.8	
Cum. Charge Days (Job) 34.6		Cum. Charge Days (Job) 32.0	

COMMENTS: _____
Crew Manager _____



**Terrex Seismic
Daily Report**

Client: GSM
Survey Name: Tasmanian Basin Survey
Area: Mena - Highlands
State: Tasmania

CREW 401
Crew Manager: Darren Puse
Crew Contact: Puse
DATE: 21-Apr-07

Line #	Stn	Stn	Total Stns	Ships	Vy's	Kms	TOTALS
TB026-HC	17435	13195	421	1	424	8.50	Vy's... 424 Ships... 1 Kms... 8.50
							Crew Total Ships... 102 Crew Total Vy's... 2833 Crew Total Kms... 107,7400 Total Km's Recorded... 401,7200

HOURS		Reasoning	Down Time	Trucks/Trucks	Other	Day Charge Hrs
Record of VY's	1.0	1.0		0.1		12.1
Line Change						227.2
Delays/Traffic						0.3
W/ on Log Trucks						17.8
Inst. test/QC Spread	0.4					12.5
Travel	3.1					294.0
W/ on Spread						304.0
Layout Spread						
Pickup Spread						
Standby						
Production						
Cum. Navigation						
		Cum. Down Time (Job)	9.1			

COMMENTS:
Daily Production: 8.6 Km
Production continued on TB026-HC
Crew manager to field to deliver vibrator (vibrator and check on production)
Final end accommodation at Bronze Park
Crew rests field

Total Crew - 27, 23 in the field.
Dad Equipment - Cable 5, Phases 3

Layout Line	Station #	Tot	Pickup				
			Line	Station #	Tot		
TB026-HC	1562	1075	487	TB026-HC	1930	1473	421
			0				0
		Total Stations:	487			Total Stations:	421

EXTRA PERSONNEL		EXTRA VEHICLES	
1 Security Guard		1	
Charge Day... 1		Charge Day... 1	
Cum. Charge Days (Job) 25		Cum. Charge Days (Job) 25	

TRAFFIC MANAGEMENT Recording Crew		TRAFFIC MANAGEMENT Survey Crew	
Supervisor with Vehicle	2 Man Crews with Vehicle	Supervisor with Vehicle	2 Man Crews with Vehicle
1	6	5	0
Charge Day... 1.0		Charge Day... 4.0	
Cum. Charge Days (Job) 25.0		Cum. Charge Days (Job) 33.0	

COMMENTS:
Crew Manager: _____



**Terrex Seismic
Daily Report**

Client: OELM
 Survey Name: Tasmania Bath Survey
 Area: Miena - Highlands
 State: Tasmania

CRUX 481
 Party Manager: Darren Rea
 Client Rep: Diego Gonzalez
 Weather: Fca
 DATE: 23-Apr-07

Line #	Sta	Sta	Total Stns	Skips	Vp's	Hex	TOTALS
TB02B-05	1725.5	1677.5	49	0	49	0.00	Vp's... 49 Skips... 0 Hex... 0.00
							Cum. Total Skips... 358 Cum. Total Vp's... 5150 Cum. Total Hex... 194.7000 Total Km's Remaining... 394.0000

Hours	Recording	Down Time	Toolbox	Recorder	W/ on Spread	Day Charge
	1.0			2.5		2.0
	5.0					204.5
	0.3					0.3
	2.0					18.4
			0.3			11.7
			2.5			374.9
		13.2				328.0

COMMENTS:
 Daily Production: 0.98 Km
 Line crew continued picking up spread on TB02B-05 - Transported equipment and began laying spread on TB02B-06
 Downtime for Vibs due to VIB tech checking and servicing VIB breaks before the move to the new line - Also an hour in Ocho replacing Vibs, Recorder and Service truck.
 VIB with broken spring transported to Launceston for spring repairs
 Two TIC crew members resigned and left project end of the day.
 Total Crew - 27, 23 in the field
 Bad Equipment - Cable 1, Phones 2

Line	Station #	Tot	Pickup				
			Line	Station #	Tot		
TB02B-05	1518	1208	411	TB02B-06	1278	1015	283
			0				0
Total Stations:			411	Total Stations:			283

EXTRA PERSONNEL		EXTRA VEHICLES	
1 Security Guard		1	
Charge Day... 1		Charge Day... 1	
Cum. Charge Days (Job) 27		Cum. Charge Days (Job) 27	

TRAFFIC MANAGEMENT Recording Crew		TRAFFIC MANAGEMENT Survey Crew	
Supervisor with Vehicle 1	2 Man Crews with Vehicle 6	Supervisor with Vehicle 0	2 Man Crew with Vehicle 0
Charge Day... 1.0		Charge Day... 1.0	
Cum. Charge Days (Job) 27.0		Cum. Charge Days (Job) 22.0	

Crew Manager: _____



**Terrex Seismic
Daily Report**

Client: GSLM
Survey Name: Tasmania Basin Survey
Area: Miena - Highlands
State: Tasmania

Party Manager:
Client Rep:
Weather:
DATE:

CREW 401
Damen Rea
Diego Gonzalez
Overcast / Cold
24-Apr-07

Line #	Stn	Stn	Total Stns	Skips	Vp's	Kms	TOTALS
TB02b-BS	1475.5	1281.5	365	2	284	7.72	Vp's... 284 Skips... 2 Kms... 7.72
							Cum. Total Skips... 350 Cum. Total Vp's... 9904 Cum. Total Km's... 302.5360 Total Km's Remaining... 356.9560

HOURS		Recording	Down Time	Time	Charge
Recording	0.1				
Raster/Reel	0.0				
Line Change				Time/Reel	0.4
Debris/Term				Reel/Time	1.4
W/c on Lag Trucks				W/c on Spread	
Inst. test/QC Spread	0.1			Other	
Travel	0.7			Carry Move	
W/c on Spread				Day Charge Hrs	20.1
Layout Spread				Cum. Day Charge Hrs (Job)	308.6
Index Spread				Standby Hrs	0.7
Security				Cum. Standby Hrs (Job)	15.7
Rest/Reel				Total Day Incl. Hrs Charge Hrs	32.2
Cum. Mobilization				Cum. Total Charge Hrs (Job)	325.3
				Cum. Down Time (Job)	15.0

COMMENTS:
Daily Production: 7.72 Kms
Production began on TB02b-BS
Crew Manager to field
Client rep to field
We wish broken spring returned to field late in the afternoon
3 Vibs - 3 Sweeps (1475.5 - 1281.5)

Total Crew - 27, 23 in the field.
Bad Equipment - Cable 1, Phono 2

Layout	Station #		For	Pickup	Station #		Tot
	Line	Station #			Line	Station #	
YB02b-BS	1207	1011	196	TB02b-BS	1225	1451	274
			0				0

1.7%	0	MTIE	0	FAC	0	Total Stations:	165	Total Stations:	274
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EXTRA PERSONNEL		EXTRA VEHICLES	
1 Security Guard		1	
Charge Day...	1	Charge Day...	1
Cum. Charge Days (Job)	26	Cum. Charge Days (Job)	26

TRAFFIC MANAGEMENT Recording Crew		TRAFFIC MANAGEMENT Survey Crew	
Supervisor with Vehicle	1	Supervisor with Vehicle	0
2 Man Crews with Vehicle	5	2 Man Crew with Vehicle	0
Charge Day...	1.0	Charge Day...	1.0
Cum. Charge Days (Job)	28.0	Cum. Charge Days (Job)	33.0

COMMENTS:
Crew Manager: _____



**Torrex Seismic
Daily Report**

Client..... **GSLM**
 Survey Name..... **Tasmania Basin Survey**
 Area..... **Mount - Highlands**
 State..... **Tasmania**

CREW 401
 Party Manager..... **Darren Rex**
 Client Rep..... **Ego Gonzalez**
 Weather..... **Overcast / Cold**
 DATE..... **25-Apr-07**

Line #	Stn	Stn	Total Stns	Stops	Vp/s	Time	TOTALS
TB02b-BE	1990.5	1011.5	279	3	276	5.58	YF... 479 SOPS... 9
TB02b-BH	2435.5	2547.5	209	6	203	4.18	Run... 9.76
							Cum. Total Stops... 192 Cum. Total Vp/s... 10647 Cum. Total Hrs... 212.2650 Total Hrs Remaining... 377.2000

HOURS		Recording...	5.8	Down Time -	Troubleshoot...	0.1	Day Charge Hrs...	11.6
		Recorder Move...	0.3		Recorder...		Cum. Day Charge Hrs (Job)...	212.2
		Line Change...	1.4		W / on Spread...		Standby Hrs...	9.3
		Down/Terrain...	0.2		W / on Spread...		Cum. Standby Hrs (Job)...	19.0
		Wait on Log Trucks...			W / on Spread...		Total Day Incl Non Charge Hrs	12.0
		Inst. Fault/OC Spread...	0.4		Down...		Cum. Total Charge Hrs (Job)...	137.2
		Trend...	0.8		Camp Move...		Cum. Total Time (Job)...	252.2
		W / on Spread...						
		Layout Spread...			Yeastbox/Induction...	0.3		
		Pickup Spread...			Total Down Time...	0.1		
		Standby...			Cum. Down Time (Job)...	15.1		
		Mobilisation...						
		Cum. Mobilisation...						

COMMENTS:
 Daily Production 9.76 Km
 Production commenced on TB02b-BE
 Crew Manager to field
 Shift up to field
 Line TB02b-BE completed
 Line change to TB02b-BH and production commenced

 2 Vics - 3 @weeps (1212.5 - 1155.5) Broken prod rods
 2 Vics - 3 @weeps (1513.5 - 1011.5) Electronic problem

 Total Crew - 27, 23 in the field
 Bad Equipment - Cable 1, Phone 2

Layout Line	Station #	Total	Pickup Line	Station #	TOT
TB02b-BH	2355	2377	478		
			0		
TB02b-BE	1450	1011	439		
			2655	2025	30
Total Stations:		470	Total Stations:		492

EXTRA PERSONNEL		EXTRA VEHICLES	
1 Security Guard		1	
Charge Day...	1	Charge Day...	1
Cum. Charge Days (Job)	20	Cum. Charge Days (Job)	20

TRAFFIC MANAGEMENT Recordlog Crew		TRAFFIC MANAGEMENT Survey Crew	
Supervisor with Vehicle	1	Supervisor with Vehicle	0
2 Man Crews with Vehicle	5	2 Man Crew with Vehicle	0
		Dismised = 17/4/07	
Charge Day...	1.0	Charge Day...	3.0
Cum. Charge Days (Job)	18.0	Cum. Charge Days (Job)	22.0

COMMENTS:
 Crew Manager: _____



**Terrex Seismic
Daily Report**

CREW 401

Client..... GBUA
 Survey Name..... Tasmania South Survey
 Area..... Miena - Highlands
 State..... Tasmanian

Party Manager..... Darren Ross
 Client Rep..... Diego Gonzalez
 Ventrat..... Onecast / Cold
 DATE..... 26-Apr-07

Line #	Sta	Sta	Total Stns	Skips	Vp/s	Kms	TOTALS
TB02B-BH	2446.5	2065.5	502	4	570	11.64	SPS... 570 Skips... 4 Kms... 11.64
							Cum. Total Skips... 303 Cum. Total Vp/s... 16521 Cum. Total Kms... 325.0600 Total Kms Remaining... 368.3400

HOURS		Recording	Down Time	Troubleshoot	Other	Charge
Recorder Move	1.0			0.2		
Line Change						
Geours/Terms						
W/o on Log Trucks						
Trac test/QC Spread	0.4					
Time	0.6					
W/o on Spread						
Layout Spread						
Phone Spread						
Standby						
Habitatior						
Cum. Mobilisation						
						Day Charge Hrs... 11.2 Cum. Day Charge Hrs (Job)... 329.4 Standby Hrs... 0.3 Cum. Standby Hrs (Job)... 16.3 Total Day 2 Incl Hrs Charge Hrs... 11.7 Cum. Total Charge Hrs (Job)... 340.7 Cum. Down Time (Job)... 15.2

COMMENTS:
 Daily Production: 11.64 Km
 Production continued on TB02B-BH
 Crew Manager to Zeehan to inspect line
 Client rep to field
 2 Vics - 3 Sweeps (2355.5 - 2353.5)
 Total Crew - 27, 23 in the field.
 Bad Equipment - Cable 1, Phonsa 2

Line	Layout		Tot	Line	Pickup		Tot
	Station #	Station #			Station #	Station #	
TB02B-BH	2076	1778	597	TB02B-BH	2024	2221	603
			0				0
LTS: 0		ATS: 0		FACC: 0		Total Stations: 597	
						Total Stations: 603	

EXTRA PERSONNEL		EXTRA VEHICLES	
1 Security Guard		2	
Charge Day... 1		Charge Day... 1	
Cum. Charge Days (Job) 30		Cum. Charge Days (Job) 31	

TRAFFIC MANAGEMENT Receiving Crew		TRAFFIC MANAGEMENT Survey Crew	
Supervisor with Vehicle	2 Man Crews with Vehicle	Supervisor with Vehicle	2 Man Crews with Vehicle
1	5	0	9
Dorobed - 17/4/07			
Charge Day... 1.0		Charge Day... 1.0	
Cum. Charge Days (Job) 30.0		Cum. Charge Days (Job) 31.0	

COMMENTS:
 Crew Manager _____



**Terrex Seismic
Daily Report**

Client..... GSLM
 Survey Name... Tasmanian Basin Survey
 Area..... Miena - Highlands
 State..... Tasmania

Crew # 401
 Party Manager... Darren Rea
 Client Rep..... Diego Gonzalez
 Weather..... Overcast / Cold
 DATE..... 27-Apr-07

Line #	SPH	STM	Total Spgs	Skips	Vp's	Kms	TOTALS
T9020-04	2864.5	1485.5	600	15	585	12.00	VP's... 585 Skips... 15 Kms... 12.00
							Cum. Total Skips... 210 Cum. Total Vp's... 11296 Cum. Total Kms... 235.0000 Total Km's Remaining... 351.5500

HOURS		Recording	Down Time	Totals	
		Recording ... 9.2		Troubleshoot ... 0.2	
		Recorder Move ... 0.8		Recorder ...	
		Line Change ...		Vib ... 0.2	
		Edison/Terrain ...		W / on Spread ...	
		W / on Lag Tracks ... 0.1		Other ...	
		Int. test/QC Spread ... 0.7		Comp Move ...	Day Change Hrs... 21.8
		Travel ... 0.3			Cum. Day Charge Hrs (Job) ... 345.2
		W / on Spread ...			Standby Hrs... 0.3
		Light Spread ...			Cum. Standby Hrs (Job) ... 19.6
		Power Spread ...	Tieback/Induction ... 0.3		Total Day End Man Charge Hrs... 12.5
		Ecology ...	Total Down Time ... 0.6		Cum. Total Charge Hrs (Job) ... 100.0
		Mobilization ...			
		Cum. Mobilization ...	Cum. Down Time (Job) ... 15.0		377.4

COMMENTS:
 Daily Production: 12.00 Kms
 Production continued on T9020-BH
 Two crew members off site
 Client rep to field
 HSE to field
 HSE to Burwood to pick up personal
 2 Vans - 3 Sweeps (1830 S - 1760 S) Hydraulic Problem
 Total Crew - 27, 23 in the field.
 Bad Equipment - Cable 1, Phones 2

Layout	Stations #	Tot	Pickers	Station #	Tot
Line			Line		
T9020-BH	1778	1270	503	T9020-BH	2220
			0		1855
					507
					0
Total Stations:		503	Total Stations:		507

EXTRA PERSONNEL		EXTRA VEHICLES	
1 Standby Guard		1	
Charge Day... 1		Charge Day... 1	
Cum. Charge Days (Job) 31		Cum. Charge Days (Job) 31	

TRAFFIC MANAGEMENT Recording Crew		TRAFFIC MANAGEMENT Survey Crew	
Supervisor with Vehicle	2 Man Crews with Vehicle	Supervisor with vehicle	2 Man Crew with Vehicle
1	5	0	0
Charge Day... 1.0		Charge Day... 1.0	
Cum. Charge Days (Job) 31.0		Cum. Charge Days (Job) 32.0	

COMMENTS:
 Crew Manager: _____



**Terrex Seismic
Daily Report**

Client:
Survey Name:
Area:
State:

GSUN
Tasmania Basin Survey
Minau - Highlands
Tasmania

Party Manager:
Client Rep:
Weather:
DATE:

CREW 401
Dillon Rea
Diogo Gonzalez
Owenast / Cole
28-Apr-07

Line #	Sta	Sta	Total Sta	Skips	Vp's	Kms	TOTALS
TB02b-01	1464.5	1000.5	464	10	454	9.28	Vp's... 487 Skips... 10 Kms... 9.94
TB02b-002	2791.5	2790.5	31	0	31	0.66	

(NOTE: VP 1100.5 (TB02b-01) is the same point as VP 2872.5 on TB02b-002 (SOL).
These lines are merged and Ad 150 HOOP is maintained across both.
No Roll Off, No Roll On.

Cum. Total Skips... 230
Cum. Total Vp's... 11033
Cum. Total Kms... 215.0400
Total Km's Remaining...

(NOTE: VP 1000.5 TB02b-01 (SOL) is the same point as VP 2792.5 on TB02b-002.
Station 441 TB02b-01 is equivalent to Station 2810 TB02b-002.
These lines are merged and Ad 150 FCOP is maintained across both.
No Roll Off, No Roll On.

HOUS	Recording	Setup Time	Transfer	Reco	Vib	W/ on Spread	Other	Camp Move	Day Charge Hrs	Cum. Day Charge Hrs (Job)	Standby Hrs	Cum. Standby Hrs (Job)	Tools/Incl Non Charge Hrs	Total Day/Incl Non Charge Hrs	Cum. Total Charge Hrs (Job)	Cum. Total Charge Hrs (Stat)
	7.2		0.2						11.5	152.7	0.0	10.0	12.0	272.8	284.4	

COMMENTS:
Daily Production 9.94 Km
Production code used on TB02b-01
Two crew members on site
Client rep in field
HSE in field
Complete production on TB02b-01
Begin production on TB02b-002

Total Crew - 27, 23 in the field
Bad Equipment - Cable 1, Phones 2

Layer	Line	Station #	Tot	Filesp	Line	Station #	Tot
	TB02b-01	1275	1060	275	TB02b-01	1552	1170
	TB02b-002	2782	2600	182			0

LT= 0 MT= 0 FAC= 0 Total Stations: 487 Total Stations: 482

EXTRA PERSONNEL		EXTRA VEHICLES	
1 Security Guard		1	
Charge Day... 1		Charge Day... 1	
Cum. Charge Days (Job) 32		Cum. Charge Days (Job) 32	

TRAFFIC MANAGEMENT Recording Crew		TRAFFIC MANAGEMENT Survey Crew	
Supervisor with Vehicle 1	2 Man Crews with Vehicle 5	Supervisor with Vehicle 0	2 Man Crews with Vehicle 0
Charge Day... 1.0		Charge Day... 1.0	
Cum. Charge Days (Job) 32.0		Cum. Charge Days (Job) 32.0	

COMMENTS:
Crew Manager _____



**Terrex Seismic
Daily Report**

Client.....
Survey Name.....
Area.....
State.....

GS&M
Tasmania Basin Survey
Miena - HighRoads
Tasmania

Party Manager.....
Client Rep.....
Weather.....
DATE.....

CREW 409
Darren Rea
Diego Gonzalez
Chaitoshi / Dick
28-Apr-07

Line #	Sta	End	Total Stns	Stkys	Vy's	Kms	TOTALS
YB02b-0D2	2752.5	2832.5	215	0	226	4.52	VP's... 226 Stkys... 0 Kms... 4.52
							Cum. Total Stkys... 328 Cum. Total VP's... 13919 Cum. Total Kms... 2523500 Total Kms Remaining... 222.1028

HOURS		Recorded	Down Time	Total	Other	Cumulative
Recorded	3.5					
Revised	0.7					
Line Charge				0.1		
Details/Terrain						
Wait on Log Trucks						
Inst. Setup/Spread	0.5					
Trend	1.1					
W/ on Spread						
Layspread						
Setup Spread						
Standby	4.5					
Relocation						
Cum. Relocation						
				0.1		
				0.1		
				35.8		
						4.1
						358.8
						4.6
						24.7
						31.8
						383.5
						400.4

COMMENTS	Daily Production	4.52 Km	Lapset			Pickup				
			Line	Station #	Tot	Line	Station #	Tot		
Production continued on YB02b-0D2			YB02b-0D2	2520	2824	215	YB02b-0D2	1152	1000	199
Crew Manager to Field						0	YB02b-0D2	2702	2892	100
Client rep to field										
HSE to field										
Standby due to heavy fog and cloud cover enveloping the mountain range										
Safety concerns with having vehicles and personnel on road - Visibility < 100 meters										
Spot until run out of surveyed line										
Total Crew - 27, 23 in the field										
Bad Equipment - Cable 1, Phones 2										
LTI= 0	MTI= 0	FAC= 0	Total Stations	215	Total Stalls	260				

EXTRA PERSONNEL		EXTRA VEHICLES	
1 Security Guard		1	
Charge Day...	1	Charge Day...	1
Cum. Charge Days (Job)	33	Cum. Charge Days (Job)	33

TRAFFIC MANAGEMENT Recording Crew		TRAFFIC MANAGEMENT Survey Crew	
Supervisor with Vehicle	1	Supervisor with Vehicle	0
2 Man Crews with Vehicle	6	2 Man Crew with Vehicle	1
Charge Day...	1.0	Charge Day...	1.0
Cum. Charge Days (Job)	22.0	Cum. Charge Days (Job)	23.0
COMMENTS:		COMMENTS:	

Crew Manager _____



**Tenrex Solario
Daily Report**

Client.....
Survey Name.....
Area.....
State.....

GSLM
Tetamala Basin Survey
Misses - Highlands
Tasmania

Party Manager.....
Crew Rep.....
Weather.....
DATE.....

CREW 481
Darrin Ross
Diego Gonzalez
Overcast / Cold
30 Age-07

Line #	Stn	Stk	Total Stns	Skips	Vp's	Kms	TOTALS
YB02B-602	2532.5	2417.5	115	0	116	2.26	Vp's... 116 Skips... 0 Kms... 2.26
							Cum. Total Skips... 228 Cum. Total Vp's... 32007 Cum. Total Kms... 252.7200 Total Km's Remaining... 316.7400

HOURS		Recording...	2.8	Down Time -			
	Recorder Hrs...	0.4		Troubleshoot...			
	Line Charge...			Recorder...	0.3		
	Driver/Terrain...			Vp's...	5.3		
	W/ in Log Trucks...			W/ in Spool...			
	Inst. (M/C) Spool...	0.7		Other...			
	Time...	1.4		Comp. Mch...			Day Charge Hrs... 5.8
	W/ in Spool...	1.1					Cum. Day Charge Hrs (Job)... 364.8
	Log Spool...						Standby Hrs... 6.6
	Pickup Spool...			Tripbox/Induction...	0.3		Cum. Standby Hrs (Job)... 20.7
	Standby...	6.7		Total Down Time...	0.6		Total Day/Inst. Hrs Charge Hrs... 12.4
	Habitat...						Cum. Total Charge Hrs (Job)... 325.3
	Cum. Habitats...			Cum. Down Time (Job)...	16.5		412.5

COMMENTS:	Qty	Production	2.35	Km	Layout		Pickup		Tot				
					Line	Station #	Line	Station #					
Production continued on TB02b-602						TB02b-602	2282	2218	165	TB02b-602	2601	2481	210
Crew Manager to Field									0				0
Crew to field													
HSE to field													
Standby due to wiring on survey draw to calibrate equipment and get sufficient lead													
For recording crew to commence operations													
Total Crew - 27, 23 in the field													
Bad Equipment - Cable 1, #1 Jones 1													
	LTP	0	MTP	0	FAC	0	Total Stations:	165		Total Stations:	210		

EXTRA PERSONNEL		EXTRA VEHICLES	
1 Security Guard			
Charge Day...	1	Charge Day...	1
Cum. Charge Days (Job)	34	Cum. Charge Days (Job)	34

TRAFFIC MANAGEMENT Recording Crew		TRAFFIC MANAGEMENT Survey Crew	
Supervisor with Vehicle	1	Supervisor with Vehicle	0
2 Man Crew with Vehicle	5	2 Man Crew with Vehicle	1
Charge Day...	1.0	Charge Day...	1.0
Cum. Charge Days (Job)	34.0	Cum. Charge Days (Job)	34.0

COMMENTS:
Crew Manager



**Torrex Seismic
Daily Report**

Client: S&P
Survey Name: Tazewell 64th Survey
Area: Milena - Highlands
State: Tasmania

CREW 481
Party Manager: Darren Rea
Client Rep: Diego Gonzalez
Weather: Overcast / Cool
DATE: 31-May-07

Line #	Stn	Stn	Total Stns	Skips	Vp's	Kms	TOTALS
				0	0	0.00	Vp's... 0 Skips... 0 Kms... 0.00
							Cum. Total Skips... 226 Cum. Total Vp's... 22037 Cum. Total Kms... 232.7200 Total Km's Remaining... 330.2400

HOURS		Down Time		Totals	
Recording		Trailer Work		Day Charge Hrs	0.0
Reorder Hrs		Reorder		Cum. Day Charge Hrs (Job)	364.8
Line Change		W / on Spread		Standby Hrs	0.3
Downs/Turns		Other		Cum. Standby Hrs (Job)	31.0
W / on Log Trucks		Camp Move		Total Day Non Charge Hrs	0.3
Inst. Test/QC Spread				Cum. Total Charge Hrs (Job)	305.6
Trawl				Cum. Total Charge Hrs (Job)	413.1
W / on Spread					
Laptop Spread		Toolbox/Inspection	0.3		
Pickup Spread		Total Down Time	0.0		
Standby					
Habitat					
Cum. Mobilization		Cum. Down Time (Job)	16.8		

COMMENTS:
Daily Production: 0.00 Km
Production continues on TE020-BD2 suspended by Tasmania Police to investigate an Assault on a Torrex employee, Reorder Vibration and Service truck related in same scene. HSE to field Crew Manager to field
Total Crew = 27, 23 in the field.
Bad Equipment - Cable 1, Phones 1

Line	Station #	Tot	Pickup		Station #	Tot
			Line	Station #		
		0				0
		0				0

LTI= 0 MTE= 0 FAC= 0 Total Stations: 0 Total Stations: 0

EXTRA PERSONNEL		EXTRA VEHICLES	
1 Security Guard		1	
Prof. Security in field x 5			
Charge Day... 1		Charge Day... 1	
Cum. Charge Days (Job) 34		Cum. Charge Days (Job) 24	

TRAFFIC MANAGEMENT Reorder Crew		TRAFFIC MANAGEMENT Survey Crew	
Supervisor with Vehicle	2 Man Crews with Vehicle	Supervisor with Vehicle	2 Man Crew with Vehicle
1	5	0	1
Charge Day... 1.0		Charge Day... 1.0	
Cum. Charge Days (Job) 35.0		Cum. Charge Days (Job) 35.0	

COMMENTS:
Crew Manager _____



**Terrex Seismic
Daily Report**

Client: GSELM
 Survey Name: Tascara Basin Survey
 Area: Mirna - Highlands
 Date: Tamarico

CREW 401
 Party Manager: Duran Piza
 CRAT. Rep.: Diego Gonzalez
 Weather: Overcast / Cold
 DATE: 02-04-07

Line #	Sta	Sta	Total Sta	Slips	Vp's	Kms	TOTALS
T302b-002	246.5	1552.5	45	104	31	9.00	Vp's... 361 Slips... 104 Kms... 8.30
							Cum. Total Slips... 332 Cum. Total Vp's... 12398 Cum. Total Kms... 261.8100 Total Kms Remaining... 327-4400

HOURS		Record MS	Down Time	Troubleshoot	Day Charge (Hrs)
Record MS	3.4	3.4			21.0
Reconnect Hrs	1.3				376.5
Line Change					0.3
Down/Turnin				0.2	31.3
Wait on Log Truck	0.3				13.4
Int. Inst/QC Spread	0.8				497.8
Tire	1.7				455.5
W / on Spread	2.4				
Axlet Spread					
Pickup Spread				0.2	
Standby				0.2	
Modification					
Cum. Modification				1.67	
					Cum. Total Charge Hrs (24h)

COMMENTS:
 Daily Production: 9.30 Km
 Production continued on T302b-002
 60 stn stop due to underground pipes along verge of the road 1368.5 - 2279.5
 11 stn stop past the 6th turn 2232.5 - 2232.5
 HSE to field
 Crew Manager to field
 5 Security personnel in the field carrying vehicles and patrolling line.
 Total Crew = 27, 23 in the field.
 Bad Equipment - Cable 1, Phones 1

Layout Line	Station #	Tot	Pickup Line	Station #	Tot
T302b-002	2217	1750	458	T302b-002	2460
			0	2108	372
					0
Total Stations:		458	Total Stations:		372

EXTRA PERSONNEL		EXTRA VEHICLES	
1 Security Guard		1	
Prof. Security in field x 5			
Charge Day...	1	Charge Day...	1
Cum. Charge Days (Job)	34	Cum. Charge Days (Job)	34

TRAFFIC MANAGEMENT Recording Crew		TRAFFIC MANAGEMENT Survey Crew	
Supervisor with Vehicle	1	Supervisor with Vehicle	0
2 Man Crew with Vehicle	5	2 Man Crew with Vehicle	1
Charge Day...	1.0	Charge Day...	3.0
Cum. Charge Days (Job)	36.0	Cum. Charge Days (Job)	36.0

COMMENTS:
 Crew Manager: _____



**Terrex Solutions
Daily Report**

Client: Survey Name:
Area: State:

GELN
Tasmania Basin Survey
Miena - Highlands
Tasmania

Party Manager:
Client Rep:
Weather:
DATE:

GNSS 491
Damen Res
Diego Gonzalez
Overcast / Cold
03-May-97

Line #	Stn	Stn	Total Gns	Slips	Vp's	Kms	TOTALS
TB02b-802	1851.5	1630.5	471	6	415	8.42	Vp's... 415 Slips... 6 Kms... 8.42
							Cum. Total Slips... 338 Cum. Total Vp's... 32813 Cum. Total Kms... 270,4400 Total Kms Remaining... 289,6300

HOURS	Recording	Down Time	Troubleshoot	Day Charge Hrs
Recording	6.8		0.1	11.5
Recorder Move	0.6			388.0
Line Change				0.3
Delays/Terrain				31.6
Wk on log Truck				12.0
W/ on Spread	0.4			419.6
Travel	7.1			437.5
W/ on Spread				
Layout Spread				
Patrol Spread	1.6			
Standby				
HSB/ISSAN				
Cum. Mobilization				
Down Time		14.9		
Troubleshoot			0.1	
Recorder				
Wk on Spread				
Cover				
Camp Move				
Toolbox/Inspection			0.3	
Total Down Time		0.2		
Cum. Down Time (Hrs)		14.9		

COMMENTS:
 Daily Production: 8.42 Km
 Production continues on TB02b-802
 TB02b-802 Complete
 Miena Highlands section Completed
 HSB to field
 Crew Manager to field
 Client rep to field
 5 Security personnel in the field care taking vehicles and patrolling line.
 Total Crew - 27, 23 in the field
 Bad Equipment - Cable 1, Phones 2

Line	Station #	Tot	Use	Station #	Tot
TB02b-502	1750	1630	220	TB02b-802	2107
			0		1830
					471
					0

ITEM	Q	UNIT	D	FAC	Q	Total Stations	Total Stations
EXTRA PERSONNEL						220	477
1 Security Guard							
Prof. Security in field x 5							
Charge Day...	1					1	
Cum. Charge Days (Job)	34					34	
EXTRA VEHICLES							
1							
Charge Day...	1					1	
Cum. Charge Days (Job)	34					34	

TRAFFIC MANAGEMENT Recording Crew	TRAFFIC MANAGEMENT Survey Crew
Supervisor with Vehicle	Supervisor with Vehicle
1	0
2 Man Crews with Vehicle	2 Man Crew with Vehicle
5	1
Charge Day...	Charge Day...
1.0	1.0
Cum. Charge Days (Job)	Cum. Charge Days (Job)
37.0	37.0

COMMENTS:
 Crew Manager: _____



**Terrex Seismic
Daily Report**

Client: GGLM
Survey Name: Taranaki Basin Survey
Area: Mico - Highlands
State: Taranaki

Party Manager: Darren Raa
Client Rep: Diego Gonzalez
Weather: Overcast / Cold
DATE: 04-May-07

CREW 491
Darren Raa
Diego Gonzalez
Overcast / Cold
04-May-07

Line #	Stn	Stn	Total Stns	Skips	V/s	Kms	TOTALS
						0.00	VP's... 0 Skips... 0 Kms... 0.00
							Cum. Total Skips... 330 Cum. Total V/s... 12213 Cum. Total Kms... 170.4400 Total Km's Remaining... 339.0100

HOURS		Recording	Down Time	Trailblazer	Day Charge Hrs
		Recorder Hrs...		Recorder...	164.7
		Line Charge... 3.4		V/S...	6.3
		Delays/Terms...		W/ on Spread...	31.9
		Wait on Log Trucks...		Other...	9.8
		Inet. test/QC Spread...		Camp Move...	430.0
		Travel... 2.3			462.6
		W/ on Spread...		Toolbox/Induction... 0.3	
		Layout Spread...		Total Down Time... 0.0	
		Pickup Spread... 3.5		Cum. Down Time (Job) ... 16.9	
		Standby...			
		Hub/Service...			
		Cum. Hub/Service...			

COMMENTS:
Daily Production: 0.00 Km
Line crew travelled to line and continued pulling up spread on TB028-BD2
Move to Queenstown - Max speed 60 km ph - (Heavy rain, blowing winds, Poor visibility)
Full spread included full spread skid and load on transport truck
5 Security personnel in the field care taking vehicles and patrolling line
Total Crew - 27, 22 in the field.
Bad Equipment - Cable 1, Phoenix 2

Layoff			Pickup		
Line	Station #	Tot	Line	Station #	Tot
		0	TB028-BD2	1529	1530
		0			0
Total Stations:		0	Total Stations:		09

EXTRA PERSONNEL		EXTRA VEHICLES	
1 Security Guard		1	
Prof. Security in field x 5			
Charge Day... 1		Charge Day... 1	
Cum. Charge Days (Job) 34		Cum. Charge Days (Job) 34	

TRAFFIC MANAGEMENT Recording Crew		TRAFFIC MANAGEMENT Survey Crew	
Supervisor with Vehicle	1	Supervisor with Vehicle	0
3 Man Crews with Vehicle	5	2 Man Crew with Vehicle	1
Charge Day... 1.0		Charge Day... 1.0	
Cum. Charge Days (Job) 34.0		Cum. Charge Days (Job) 33.0	

COMMENTS:
Crew Manager: _____



**Terrex Seismic
Daily Report**

CREW 401

Client..... GSLM
Survey Name... Tatumda Basin Survey
Area..... Zeehan
State..... Tasmania

Party Manager... Jan Turner
Client Rep..... Diego Gonzalez
Weather..... Fine
DATE..... 05-May-07

Line #	Sta	Stn	Total Stns	Skips	Vp's	Kms	TOTALS
TSN70-20	1600.5	1549.5	02	2	00	1.64	Vp's... 00 Skips... 2 Kms... 1.64
							Cum. Total Skips... 200 Cum. Total Vp's... 2051 Cum. Total Kms... 54.2200

HOURS		Down Time -	
Recording...	1.2	Troubleshoot...	0.3
Asst'dr Move...		Reamer...	
Proposal Change...	1.0	Wet...	
Density/Term...		W/ on Speed...	
W.O.S...	1.8	Other...	
IG Spread...	0.4		
Travel...	0.7		
Other...	3.5		
Layout Spread...	4.0		
Pickup Spread...		Tow Bar/Inclusion...	0.2
Weather Standby...		Total Down Time...	0.3
Hot Station...			
Cum. Hot Station...		Cum. Down Time (Job)...	0.2
		Day Charge Hrs...	10.0
		Cum. Day Charge Hrs (Job)...	79.0
		Standby Hrs...	0.3
		Cum. Standby Hrs (Job)...	11.2
		Total Day/Total Man. Charge Hrs...	11.5
		Cum. Total Charge Hrs (Job)...	90.0
			117.0

COMMENTS:
 Production km's 1.64
 Line move from Queenstown to Zeehan
 Load line vehicles from spread transport
 Lay spread on TBO2b-2B
 Other = Spout handover and river crossing under extraction from Pass from Zeehan Zinc
 Two Vibs arrived Zeehan late afternoon 4/5
 The last two arrived midday 5/5/07
 First shot taken at 3:10 pm
 Total Crew #'s: 27, 20 personnel in the field
 Bad Equipment: Cable - 2, Phones - 1

Layout Line	Station #	Tot	Pickup Line	Station #	Tot
TBO2b-2B	1600	1314	288		0

LTC=	0	NTIX=	0	FAC=	0	Total Stations: 288	Total Stations: 0
------	---	-------	---	------	---	---------------------	-------------------

EXTRA PERSONNEL		EXTRA VEHICLES	
1 Security Guard		1	
Charge Day...	1	Charge Day...	1
Cum. Charge Days (Job)...	8	Cum. Charge Days (Job)...	8

TRAFFIC MANAGEMENT Recording Crew		TRAFFIC MANAGEMENT Survey Crew	
Supervisor with Vehicle	2 Man Crews with Vehicle	Supervisor with Vehicle	2 Man Crew with Vehicle
1	6	1	1
Charge Day...	1.0	Charge Day...	
Cum. Charge Days (Job)...	9.0	Cum. Charge Days (Job)...	6.0

COMMENTS:
 Crew Manager _____



**Terrex Seismic
Daily Report**

Client: OSLM
Survey Name: Tasmania Basin Survey
Area: Zeehan
State: Tasmania

CREW 401
Party Manager: Jon Turner
Chief Rep: Diego Gonzalez
Weather: Fine
DATE: 06-May-07

Line #	Sta	Sta	Total Blks	Skips	Vp's	Kms	TOTALS
TB020-2B	1518.5	1391.5	133	6	218	2.55	Vp's... 249 Skips... 8 Kms... 2.55
Sta 1350.7 - 1375.5 = 155 are skip for swamp Please note VPS calculated at 10 meter intervals							Cum. Total Skips... 214 Cum. Total Vps... 3200 Cum. Total Kms... 57,2380

HOUS	Recorded	Down Time	Troubleshoot	Report	W / on Spread	Other	Day Charge Hrs
	0.1		0.2	0.1			5.6
							Cum. Day Charge Hrs (Job) 32.2
							Standby Hrs 2.1
							Cum. Standby Hrs (Job) 13.3
							Total Day Incl Non Charge Hrs 15.0
							Cum. Total Charge Hrs (Job) 162.5
							Cum. Total Time (Job) 120.0

COMMENTS:
 Production total 2.55
 Continued production on TB020-2B
 Continuing downpours delayed production
 Zeehan personnel aided Terrex personnel with hand carry section - Very thick rain forest
 Retrieval crew followed Vias down Marrapass track
 Half station Vio points where integrated into production to increase fold coverage
 Two Vias started to Burne by Barry Walsh
 Total Crew #s: 27, 23 personnel in the field
 Bad Equipment: Colds - 4, Phones - 0

Layout Line	Station #	Yel	Pickup	Loss	Station #	Tot
TB020-2B	1310	1150	150			0
Total Startings		150			0	

TYPE	Q	MTT	D	FAC	B	Total Startings	Total Stations
						150	0

EXTRA PERSONNEL	EXTRA VEHICLES
1 Security Guard	1
Charge Day... 1	Charge Day... 1
Cum. Charge Days (Job) 8	Cum. Charge Days (Job) 5

TRAFFIC MANAGEMENT Recording Crew	TRAFFIC MANAGEMENT Survey Crew
Supervisor with Vehicle 1	Supervisor with Vehicle 1
2 Man Crews with Vehicle 5	2 Man Crew with Vehicle 1
Charge Day... 3.0	Charge Day... 0.0
Cum. Charge Days (Job) 10.0	Cum. Charge Days (Job) 0.0

COMMENTS: Crew Manager _____



**Terrex Solaris
Daily Report**

Client: GELM
 Survey Name: Teimank Basin Survey
 Area: Zashan
 State: Teimank

GREW 491
 Party Manager: Jon Turner
 Client Rep: Diego Gonzalez
 Weather: Wet
 DATE: 07-May-07

Line #	Stn	Stn	Total Stns	Slips	Vp's	HMA	TOTALS
TB02b-2B	1235	1180	25	6	149	1.50	VP's... 148 Slips... 6 Kms... 1.50
<p>Please note VP's calculated at 10 meter intervals</p>							
							Cum. Total Stns... 220 Cum. Total Vp's... 3049 Cum. Total Kms... 56.3205

HOURS		Recording...	2.3	Down Time -	Toolbox/Toolbox...	
		Recycle Move...			Recycle...	
		Project Change...			W/ on Spread...	0.1
		Detour/Turn...			Over...	
		W.O.S...				
		QC Spread...	0.5			
		Travel...	1.0			
		Other...	0.5			
		Layout Spread...				
		Setup Spread...	2.0		Toolbox/Toolbox...	0.5
		Washer Stand...			Tool Down Time...	0.1
		Relocate...				
		Cum. Fabricate...			Cum. Down Time (Job)	0.6
						140.7
						Day Charge Hrs... 11.7 Cum. Day Charge Hrs (Job)... 100.3 Standby Hrs... 9.3 Cum. Standby Hrs (Job)... 13.6 Total Day/Job Charge Hrs... 11.7 Cum. Total Charge Hrs (Job)... 114.3

COMMENTS:	Layout Line	Station #	Tot	Midcup Line	Station #	Tot
Production limit: 1.5	TB02b-2B		0	TB02b-2B	1000	440
Continued production on TB02b-2B						
TB02b-2B completed						
Zashan Zink personnel aided Terrex personnel with hand carry section - Very slick rain forest						
Security personnel hit sec - not required						
Half station Mb points where re-registered into production to increase fo's coverage.						
ISSUE / Zashan Zink program completed						
3 rd Vio and 1 spread truck floated to Bunko by Barry Webb						
Total Crew #s: 27, 23 personnel in the field						
Bad Equipment: Cable - 1, Phones - 0						
LTI= 0	MTI= 0	FAC= 0	Total Stations: 0	Total Stations: 440		

EXTRA PERSONNEL		EXTRA VEHICLES	
1 Security Guard		1	
Charge Day... 1		Charge Day... 1	
Cum. Charge Days (Job) 2		Cum. Charge Days (Job) 2	

TRAFFIC MANAGEMENT Reconing Crew		TRAFFIC MANAGEMENT Survey Crew	
Supervisor with Vehicle	2 Man Crew with Vehicle	Supervisor with Vehicle	2 Man Crew with Vehicle
1	2	1	2
Charge Day... 1.0		Charge Day... 1.0	
Cum. Charge Days (Job) 1.0		Cum. Charge Days (Job) 1.0	

COMMENTS:
 Crew Manager: _____



**Tarox Seismic
Daily Report**

Client.....
Survey Name.....
Area.....
Date.....

GSEM
Tremors Basin Survey
Zachon
Tennessee

Party Manager.....
Client Rep.....
Well No.....
DATE.....

CREW 401
Jan Turner
Dago Gonzalez
VAC
08-May-07

Line #	Stn	Stn	Total Stns	Skips	Vp's	Wrs	TOTALS
							Vp's... 0
							Skips... 0
							Wrs... 0.00
							Cum. Total Skips... 214
							Cum. Total Vp's... 3200
							Cum. Total Wrs... 547.200

HOURS		Down Time		Time/Sheet		Totals	
Recording.....		Travel.....		Truck Sheet.....		Day Charge Hrs.....	32.0
Recorder Move.....		Other..... 10.0		Recorder.....		Cum. Day Charge Hrs (Job)...	99.4
Prepost Change.....				W/ on Spread.....		Standby Hrs.....	6.3
Debut Form.....				Other.....		Cum. Standby Hrs (Job)...	13.8
W.D.S.....				Time Prod/Production.....	0.3	Total Day Prod Non Charge Hrs...	16.3
QC Spread.....				Total Down Time.....	0.0	Cum. Total Charge Hrs (Job)...	112.8
Travel.....				Cum. Down Time (Job).....	0.5		
Other.....							
Layon Spread.....							
Focus Spread.....							
Weather Standby.....							
Mobilization.....							
Cum. Mobilization.....							

COORDINATES	Layout Line	Station #	Tot	Pickup Line	Station #	Tot
Production km's: 0			0			0
Other = Washdown and preparing vehicles for Go Home						
Total Crew #s: 27, 28 personnel in the field						
Bad Equipment: Calcs - 1, Phones - 0						
LT#:	0	MT#:	0	FAC#:	0	Total Stations:
						0
						0

EXTRA PERSONNEL		EXTRA VEHICLES	
1 Security Guard		1	
Charge Day.... 1		Charge Day.... 1	
Cum. Charge Days (Job) 2		Cum. Charge Days (Job) 2	

TRAFFIC MANAGEMENT Recording Crew		TRAFFIC MANAGEMENT Survey Crew	
Supervisor with Vehicle	2 Man Crews with Vehicle	Supervisor with Vehicle	2 Man Crew with Vehicle
1	0	1	1
Charge Day.... 1.0		Charge Day....	
Cum. Charge Days (Job) 1.0		Cum. Charge Days (Job) 4.0	
COMMENTS:		COMMENTS:	

Crew Manager _____



APPENDIX H

RECORDING STATISTICS

RECORDING STATISTICS

Date	Multi-Recording	Inter-Project Rate	Travel Date	Definitive	Revisions	Capitalized Expenses	MSR	QC Spend	Receiver/Vibrator	Other	Drums & Efforts	Line Churns	Testbed/Trackdown	Wellhead Parameters	Washes/Other	Early Meetings	Toll Spend	Total Payments	Traffic Management Survey	Traffic Management Recording	Misspense - Survey & Recording	Supervisor Approved	Extra Volumes		
																								Changeable	Changeable
28 March 2007		6.50	0.60	1.50	0.30	3.80		0.50	0.70				0.40	1.80		0.30	0.30	11.70	12.00				1	1	
29 March 2007			1.00	1.50	0.50			0.50	0.70				0.40	1.80		0.30	0.30	10.00	12.00				1	1	
30 March 2007			0.70	1.50	0.80			0.80	0.90		1.80		0.10		3.60	0.30	0.30	3.90	7.60	11.60			1	1	
31 March 2007			1.30	0.10	0.30	6.40		0.10	0.90		3.40		0.10			0.30	0.30	12.00	12.50	8.32			1	1	
1 April 2007			1.80	0.30	0.30	2.80		1.10	0.70				0.20			0.30	0.30	11.40	12.20	9.54			1	1	
2 April 2007			1.50	0.10	0.30	2.30		0.30	0.80			1.00		0.70		0.30	0.30	11.60	12.30	9.30			1	1	
3 April 2007			2.70	0.10	0.30	5.00		0.30	0.80			2.90		0.30		0.30	0.30	11.50	12.50	6.66			1	1	
4 April 2007			2.20	0.30	0.30	6.80		0.50	0.60			0.60		0.80		0.30	0.30	10.60	12.30	8.00			1	1	
5 April 2007			1.80	0.40	0.30	6.90		0.50	0.50			0.70		0.20		0.30	0.30	10.20	10.50	8.28			1	1	
6 April 2007			1.80	0.40	0.30	6.90		0.50	0.50			0.70		0.20		0.30	0.30	11.70	12.40	7.92			1	1	
7 April 2007			1.50	0.30	0.30	7.60		0.60	1.30			1.30		0.10		0.30	0.30	11.60	12.00	8.96			1	1	
8 April 2007			1.80	0.30	0.30	7.50		0.30	0.80			1.30		0.10		0.30	0.30	12.00	13.00	9.26			1	1	
9 April 2007			1.80	0.30	0.30	7.30		1.10				1.30		0.10		0.30	0.30	12.40	12.40	4.26			1	1	
12 April 2007			1.70	0.20	0.30	6.30		0.40				1.30		0.10		0.30	0.30	11.40	12.00	7.66			1	1	
13 April 2007			1.70	0.20	0.30	6.30		0.40				1.30		0.10		0.30	0.30	11.70	12.20	6.52			1	1	
14 April 2007			1.30	1.10	0.30	7.00		0.30	0.90			2.10		0.20		0.30	0.30	10.70	12.20	6.92			1	1	
15 April 2007			1.70	0.30	0.30	6.30		0.40	0.80			2.10		0.10		0.30	0.30	11.60	12.50	7.66			1	1	
16 April 2007			1.80	0.20	0.30	5.20		0.50	0.40			3.00		0.40		0.30	0.30	12.20	12.70	6.14			1	1	
17 April 2007			3.00	0.20	0.30	6.40		1.30	0.50			3.00		0.40		0.30	0.30	16.20	12.20	8.08			1	1	
18 April 2007			2.80	0.30	0.30	7.10		0.20	0.50			1.00		0.40		0.30	0.30	11.80	12.30	8.94			1	1	
19 April 2007			2.80	0.30	0.30	6.30		0.20	0.50			1.40		0.40		0.30	0.30	11.70	12.20	6.16			1	1	
21 April 2007			2.10	1.60	0.30	7.60		0.40	1.00			1.40		0.10		0.30	0.30	17.10	12.50	8.50			1	1	
22 April 2007			2.30	1.60	0.30	6.90		0.50	0.20			5.00		0.10		0.30	0.30	10.50	12.40	6.06			1	1	
23 April 2007			2.60	2.50	0.30	1.00		0.30	0.20					0.40		0.30	0.30	8.90	11.70	0.98			1	1	
24 April 2007			0.70	1.40	0.30	8.20		0.30	1.00		0.20		0.40		0.30	0.30	10.10	12.50	7.72			1	1		
25 April 2007			0.80	0.30	0.30	8.50		0.40	0.30			1.40		0.40		0.30	0.30	11.60	12.00	9.76			1	1	
26 April 2007			0.60	0.30	0.30	9.20		0.40	0.30					0.10		0.30	0.30	11.20	11.70	11.64			1	1	
27 April 2007			0.90	0.20	0.30	9.30		0.70	0.80			0.20		0.10		0.30	0.30	11.90	12.50	12.00			1	1	
28 April 2007			1.30	0.30	0.30	7.30		0.60	1.00			0.20		0.10		0.30	0.30	11.50	12.00	9.94			1	1	
29 April 2007			1.40	0.30	0.30	3.50		0.50	0.70					0.10		0.30	0.30	4.80	6.10	11.00	4.52		1	1	
30 April 2007			1.60	0.60	0.30	2.00		0.70	0.40					0.10		0.30	0.30	6.00	5.80	12.40	2.36		1	1	
1 May 2007			1.70	0.30	0.30	6.40		0.80	1.30					0.30		0.30	0.30						1	1	
2 May 2007			2.10	0.30	0.30	6.80		0.40	0.60					0.30		0.30	0.30	11.90	12.40	9.30			1	1	
3 May 2007			2.30	0.30	0.30	6.80		0.40	0.60					0.30		0.30	0.30	11.50	11.60	8.42			1	1	
4 May 2007			2.30	0.30	0.30	3.80						2.60				0.30	0.30	8.70	9.00				1	1	
Total			18.50	15.50	14.50	54.00	14.70	5.50	7.30	0.20	0.20	9.00	1.20	0.40	10.30	3.90	14.10	19.50	141.30	177.70	2.00	2.00	2.00	14.00	14.00



**AVO ANALYSIS REPORT
FOR
GREAT SOUTH LAND MINERALS**

Location : Tasmania
Permit : SEL 13/98
Surveys : 2001 and 2006 Tasmanian Seismic Surveys
Date : July 2007

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1 INTRODUCTION

Fugro Seismic Imaging was requested to undertake AVO analysis of three lines from the Tasmania Basin area. Two of the lines were from the 2001 survey, whilst a third was from the 2006 survey. The 2001 lines were reprocessed from field tape using the same parameters as previously. The 2006 line was taken directly from DMO CDP gathers.

Line	CDP Range
TB02-BA	2300-3000
TB01-PB	5650-6350
TB01-TD	1-600

Personnel

Fugro Seismic Imaging Pty Ltd

Mark Brailey Land Processing Manager

GSLM

Diego Gonzalez Geologist

2 BACKGROUND

It is known that reflection coefficient at an interface varies with angle of incidence. The Poisson's Ratio of the strata either side of the interface affects the way in which the reflection coefficient varies. A low Poisson's Ratio sand will result in an increase in reflection coefficient or amplitude with angle of incidence.

Fugro Seismic Imaging (F.S.I.) AVO analysis is applied using the Shuey Approximation. A velocity function is used to calculate the angle of incidence at each layer boundary and then interpolated to produce the angle of incidence at each time sample and offset. A robust linear regression is used to calculate the intercept and gradient of the amplitudes at each time sample (Walden, 1991). Four types of attributes are routinely produced from this analysis; Intercept, Gradient, Product (Intercept times Gradient) and Delta Rp (based on cross-plotting intercept and gradient), but many others are possible.

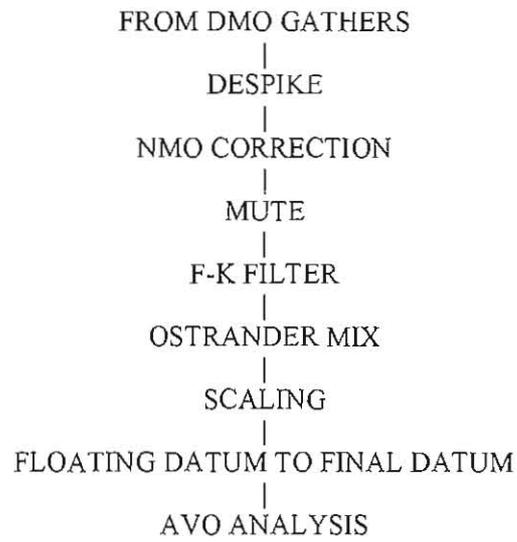
Delta Rp

This method is based on the concept of cross plotting AVO measurements. Data input to the cross plot are Rp (or Intercept) and the Gradient measurement from the seismic gathers. The F.S.I. algorithm calculates a lithological trend from the Rp and Gradient data. This trend represents the average response of brine-filled rocks in the analysis window. Unusual rocks, like gas-filled sands are displaced from this wet trend. The Delta Rp calculation is the reflectivity separation between a data point with anomalous reflectivity and the trend. The top of a class III hydrocarbon saturated sand unit is displayed as a trough, whereas the base is a peak. All anomalous points to the left of the lithological trend in the cross-plot are negative numbers (trough) while all anomalous points to the right of the lithological trend are positive (peak).

Intercept , Gradient and Product

I represents intercept, which is the zero offset reflection coefficient and G represents gradient, which is essentially the change in amplitude with offset at any particular time sample within a CDP gather. The product of these two attributes tends to give the largest anomalies at the top and base of gas sands with low acoustic impedance (class III). This normally serves to highlight events in the CDP gather with either high intercepts, high gradients, or both. The calculation uses the sign of both the intercept and gradient as the sign of the product is used in the interpretation of the results.

3 PROCESSING SEQUENCE DIAGRAM



4 PROCESSING SEQUENCE

This sequence details the additional processing required to condition the gathers prior to AVO analysis. While the 2001 lines were processed from field tape only post-DMO processes are mentioned below.

4.1 DESPIKE

Automatic trace editing was used to down-weight spiking data based on peak-to-median ratios and standard deviations within user specified windows.

4.2 NMO CORRECTION

Dix fourth order NMO correction was performed using the final velocity functions.

4.3 MUTE

A post NMO outer trace mute was applied to remove any coherent noise on the outer traces and to reduce contamination from the effect of NMO stretch on the far offsets.

4.4 F-K FILTER

An F-K filter was applied to the CDP gathers to remove dipping noise using a 5 ms/trace cut.

4.5 OSTRANDER MIX

A 1-2-1 mix of the data was applied in the offset and CDP domains.

4.6 SCALING

A 1000 ms AGC was applied to the gather traces to compensate for amplitude irregularities.

4.7 STATICS

Floating datum to final seismic reference component of the statics was applied prior to stack. This corrects the data from floating datum to a final datum at sea level. New time origin: -500 ms (TB02-BA) and -700 ms (TB01-PB and TB01-TD)

4.8 AVO ANALYSIS

Four AVO attributes were produced; intercept, gradient, product and Delta Rp stacks. The analysis was conducted over 0 to 30 degrees. A typical angle of incidence distribution from line TB01-TD can be seen below (where every division equates to 5 degrees).

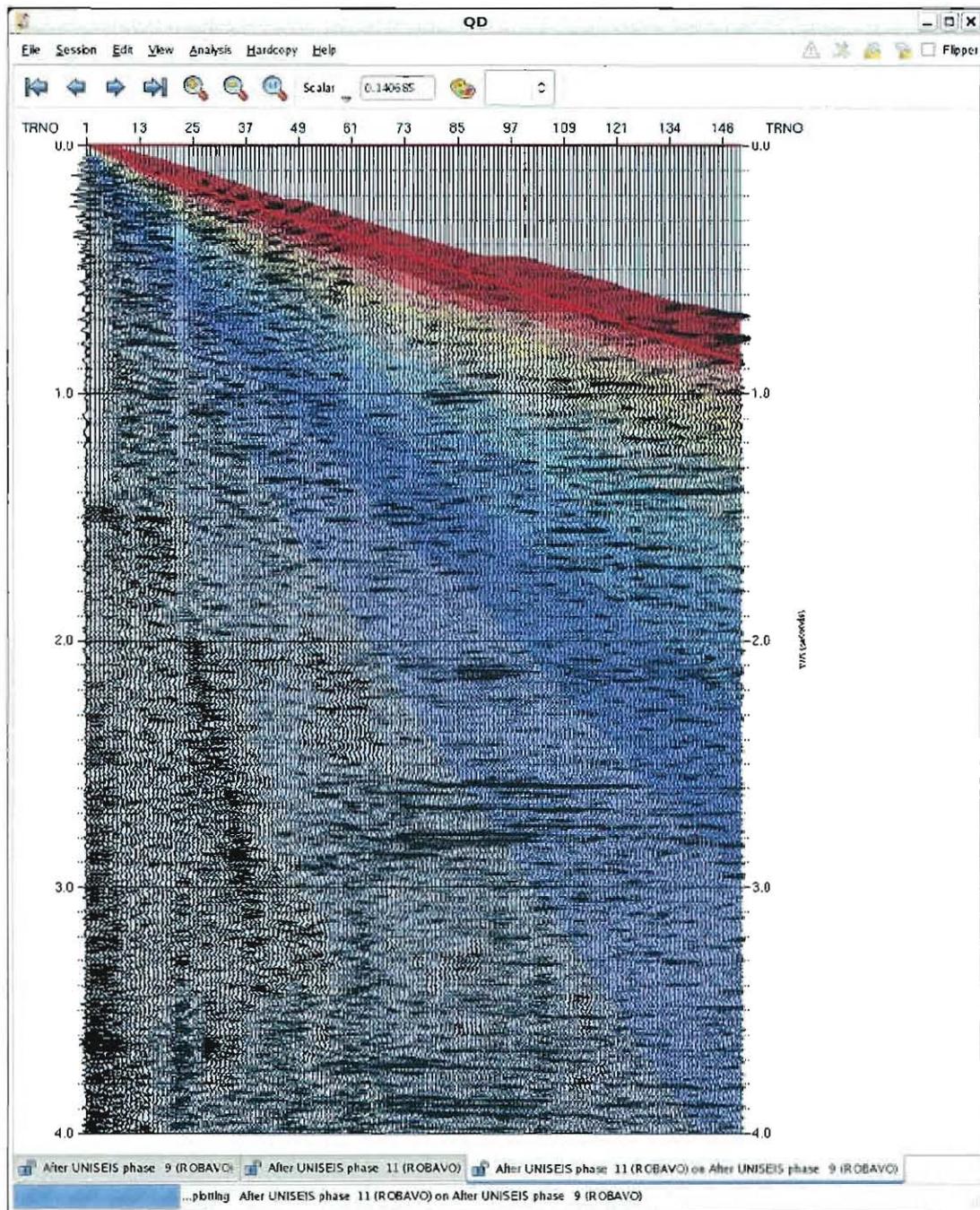


Figure 1 : Line TB01-TD typical angle of incidence overlaying CDP gather.

5 OBSERVATIONS

Line TB01-PB:

On this line various flat spots were visible on the final migration. The gradient stack highlights much of the region exhibiting these flat spots, so much that it is difficult to identify the truly anomalous areas. However, some of the stronger gradient responses also coincide with a strong intercept, Delta Rp and product stack anomaly. eg CDP 5960 at 1800 ms. The Delta Rp response of the upper anomalies (around 1700-1900 ms) are stronger than those below (2100-2400 ms). The product stack contains anomalies but not of the expected polarity for a typical low impedance gas sand, which would be distinguished by a strong red (positive value) at both the top and base of the sand. On the CDP gather at 5960 the reason for the anomalous behaviour at 1800 ms is clear. But the manner of amplitude change with offset is not consistent.

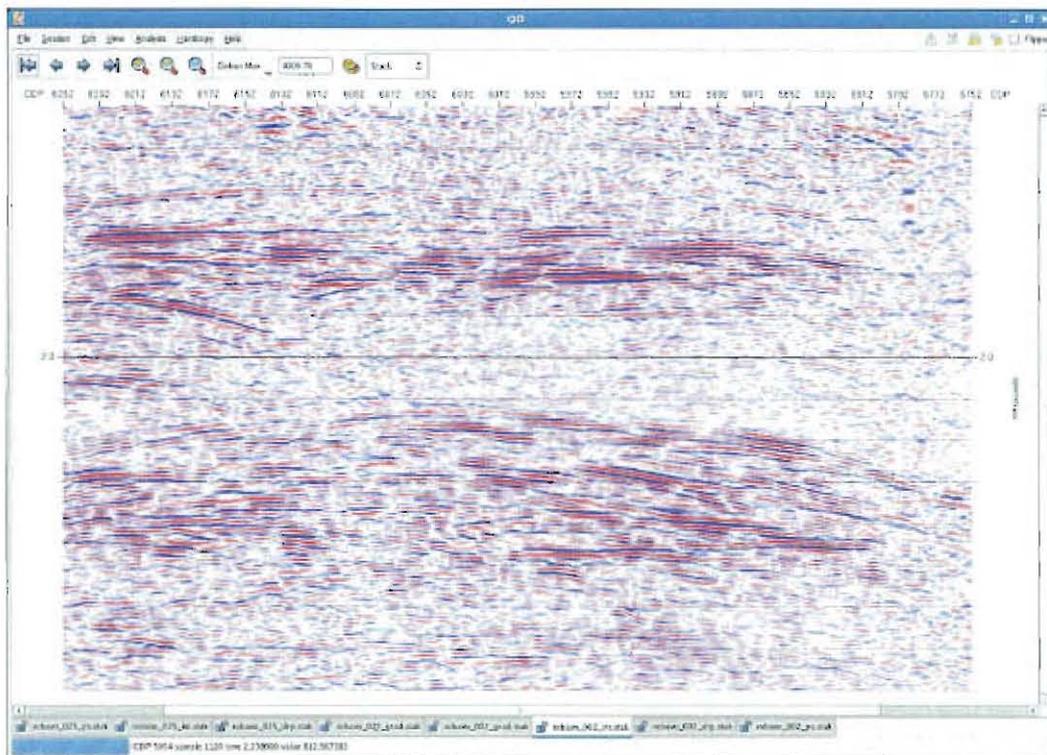


Figure 2 : Line TB01-PB Intercept stack.

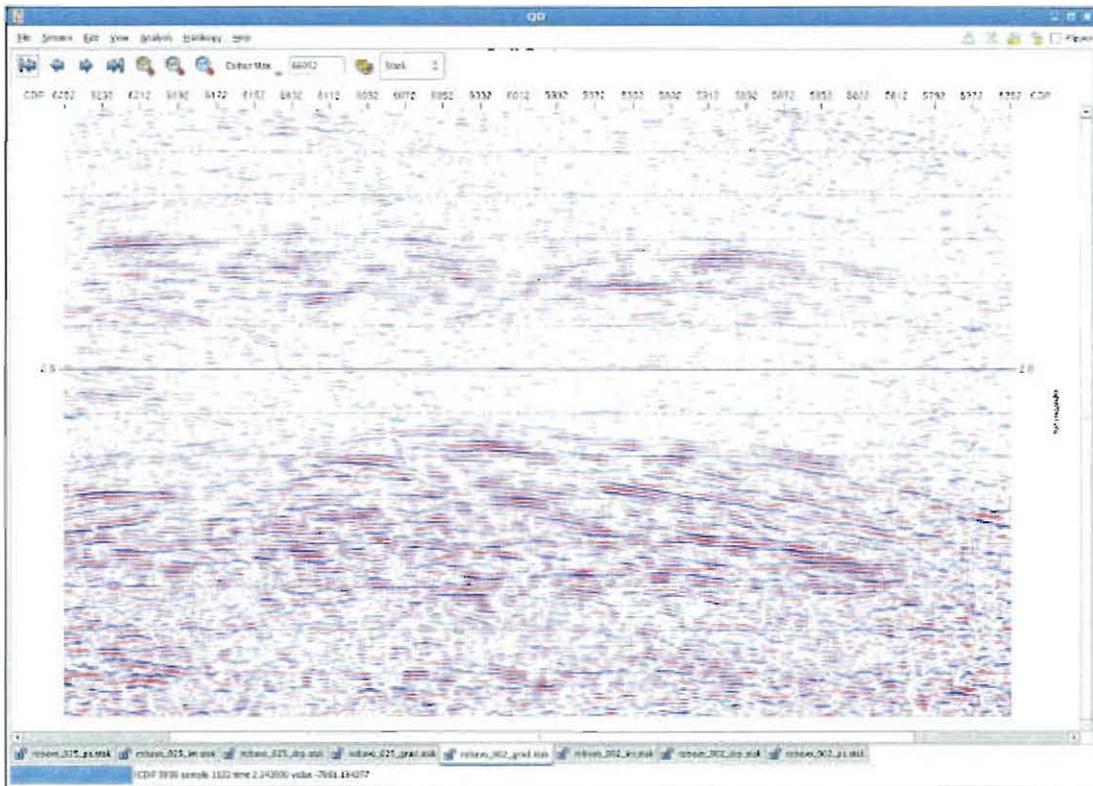


Figure 3 : Line TB01-PB Gradient stack.

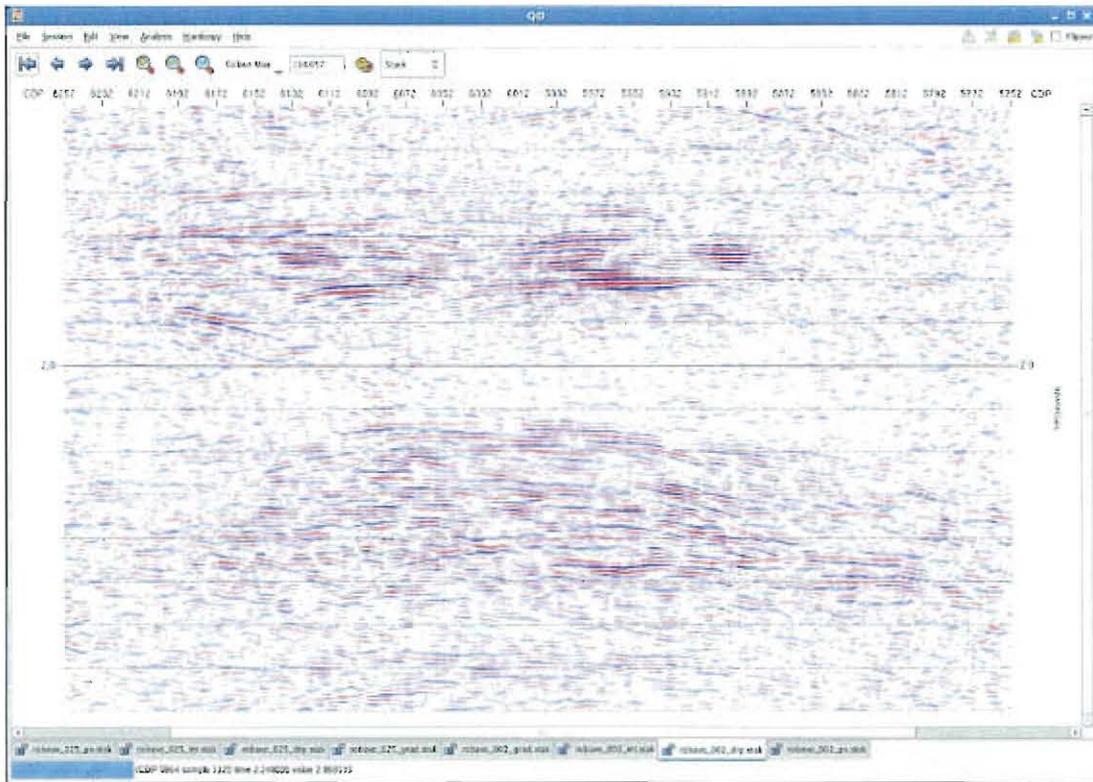


Figure 4 : Line TB01-PB Delta Rp stack.

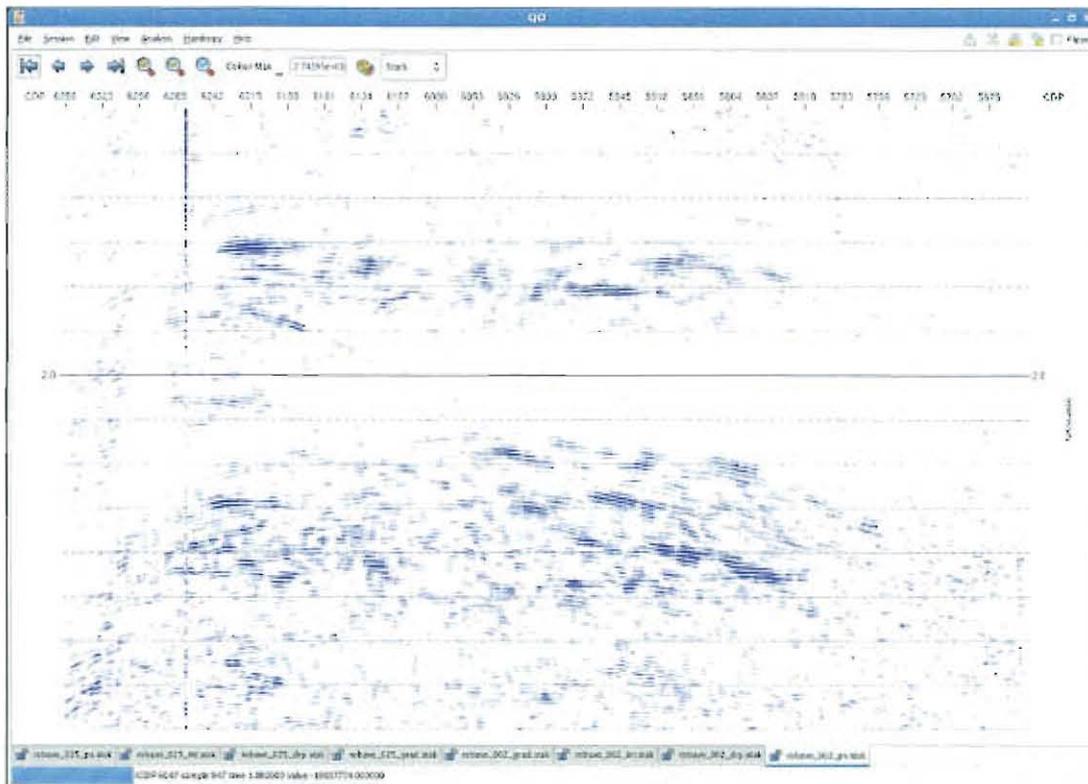


Figure 5 : Line TB01-PB Product stack.

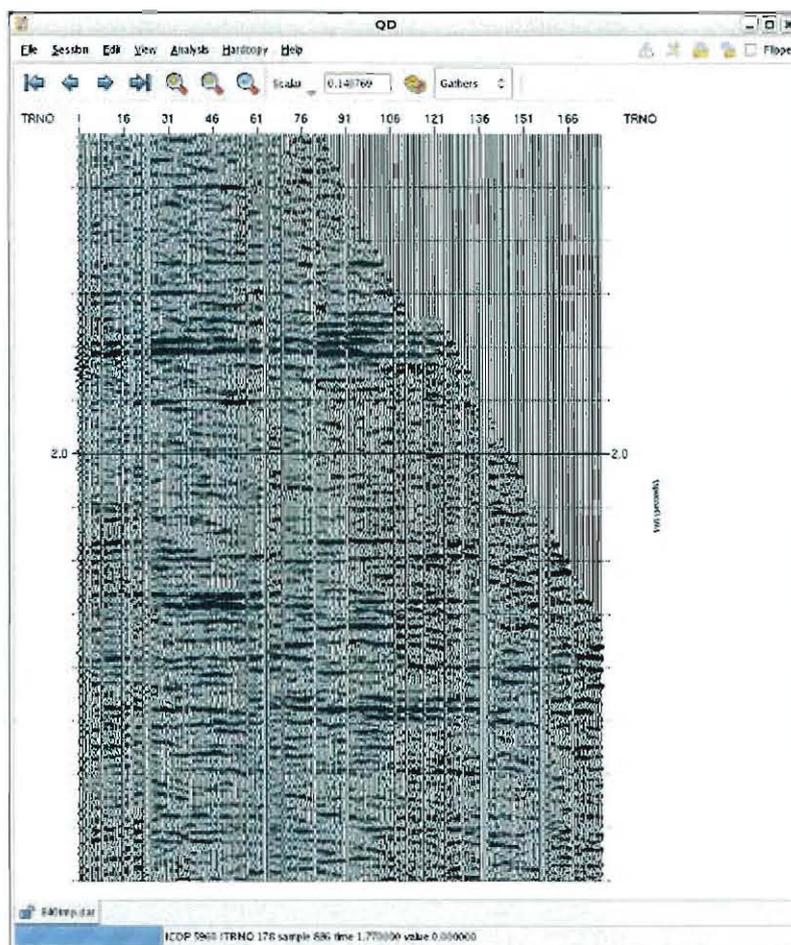


Figure 6 : Line TB01-PB CDP gather 5960.

Line TB01-TD:

Note that only CDP 100-600 have been included due to the noise introduced as the fold drops towards the end of the line. Even at CDP 100 some higher amplitudes are visible which are associated with this noise. The noisy vertical bands are also caused by CDPs with lower fold. The gradient stack shows a strongly anomalous zone at about 2900-3000 ms. This corresponds to the strong blue events on the product stack. The Delta Rp stack doesn't really corroborate the gradient anomaly except at the very highest part of the anomaly (approx CDP 200). If anything the Delta Rp suggests that further up-dip of this event is more anomalous. There is also a strong Delta Rp response at 2400 ms. But the CDP gather (CDP 135) at this time is not convincing. On other CDP gathers (100 and 185) the reason for the high gradient response is event with high amplitudes coming out at the far offsets.

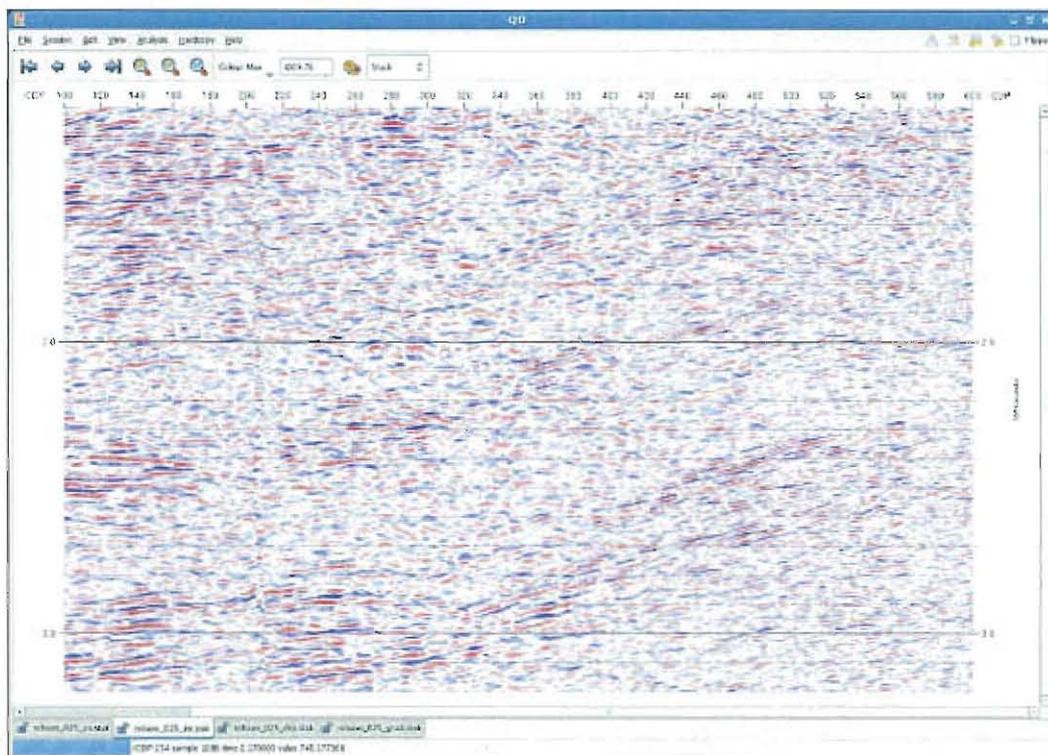


Figure 7 : Line TB01-TD Intercept Stack

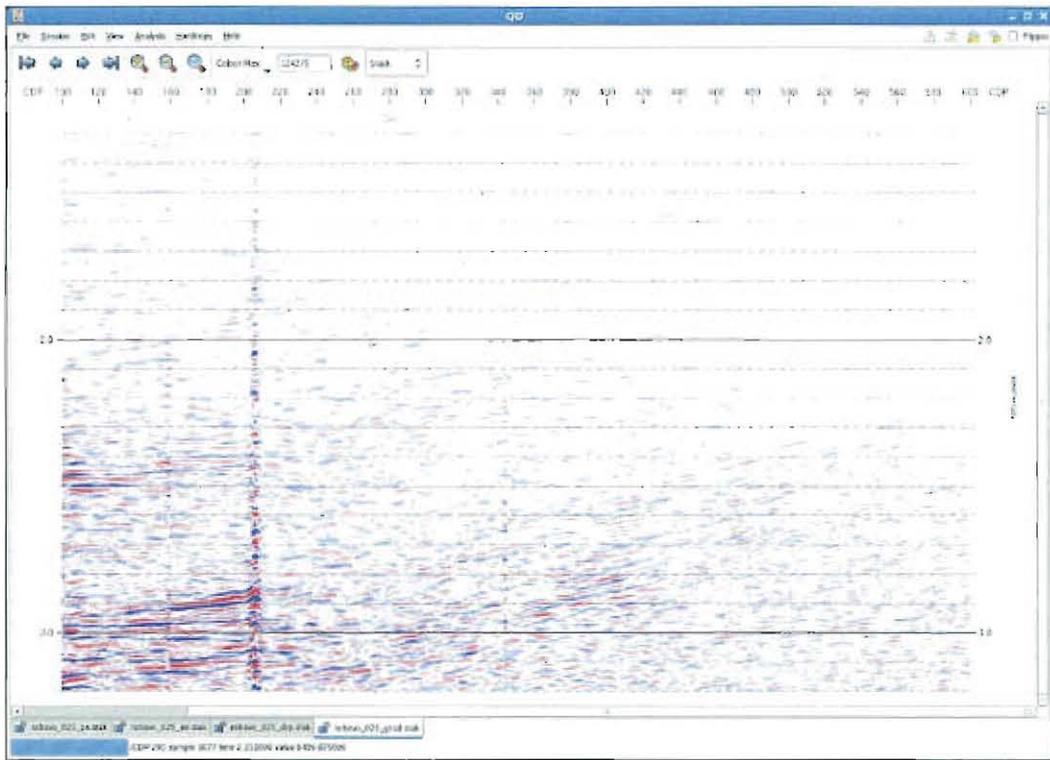


Figure 8 : Line TB01-TD Gradient stack.

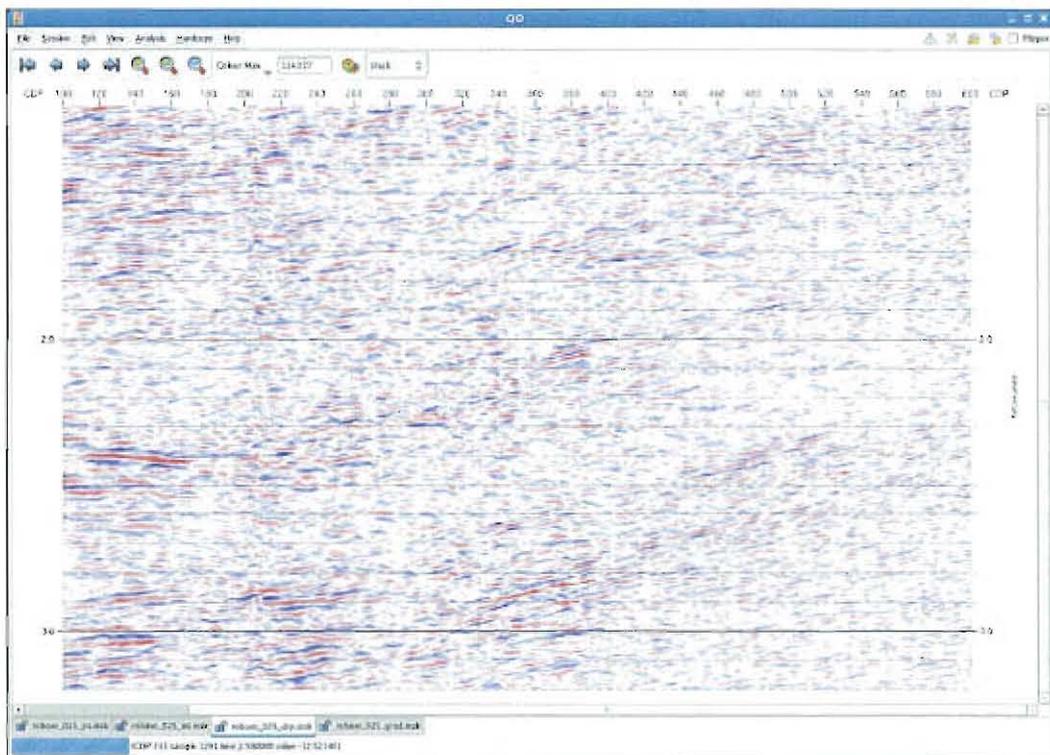


Figure 9 : Line TB01-TD Delta Rp stack.

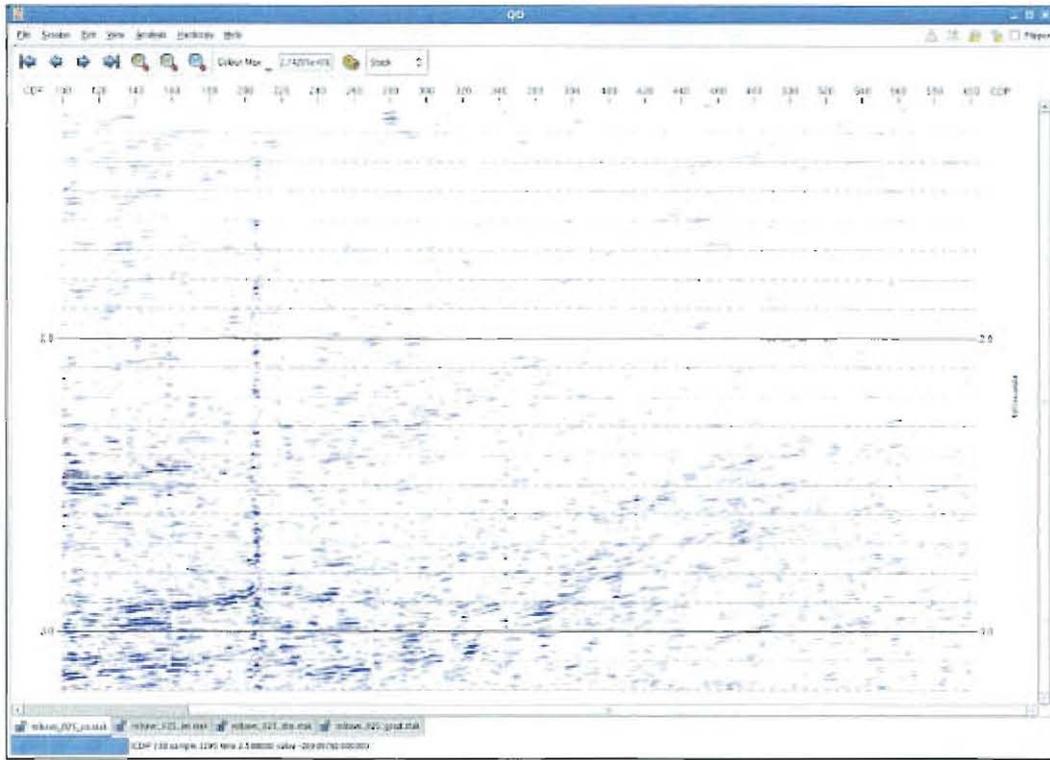


Figure 10 : Line TB01-TD Product stack.

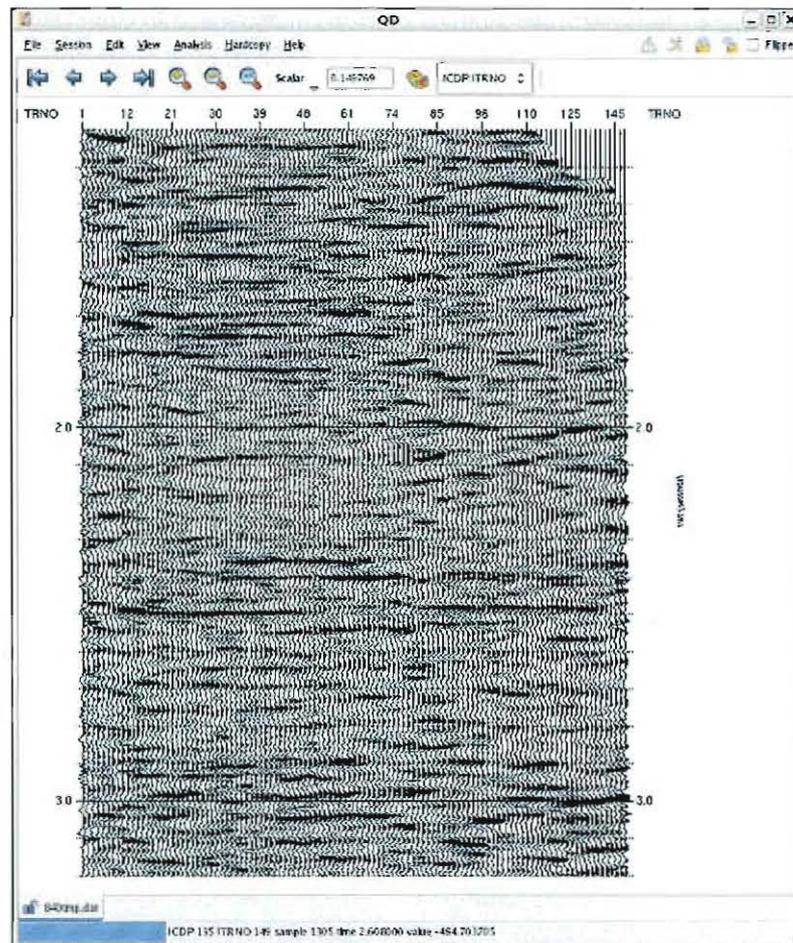


Figure 11 : Line TB01-TD CDP gather 135.

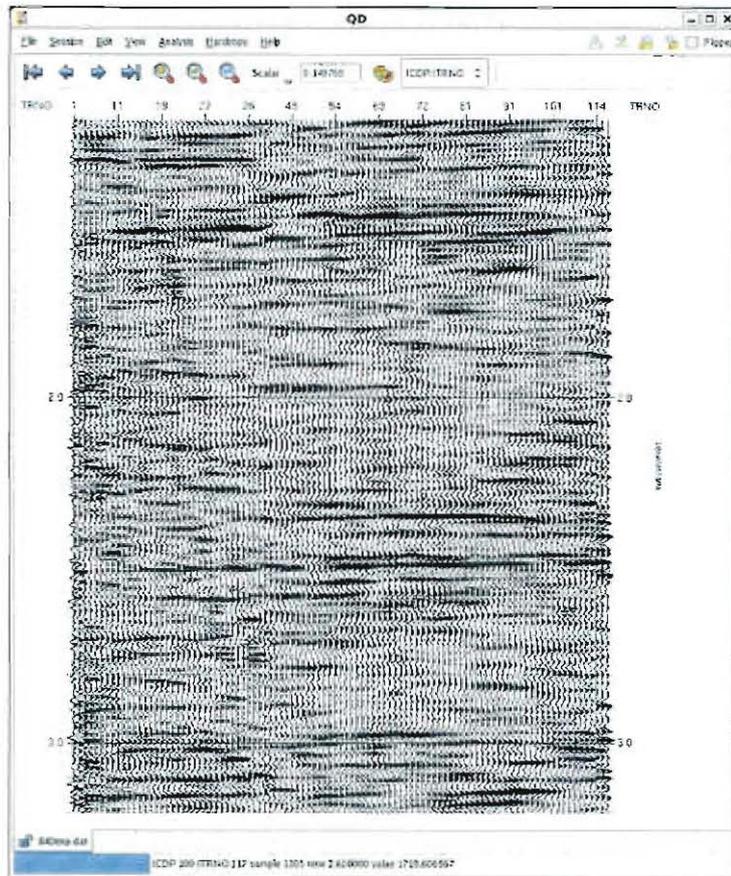


Figure 12 : Line TB01-TD CDP gather 100.

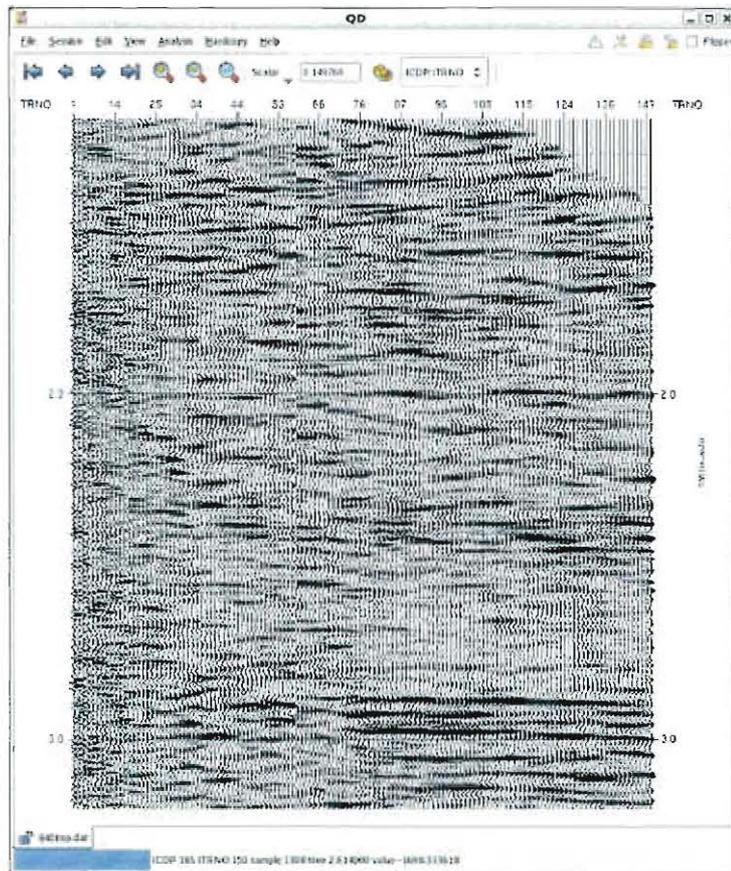


Figure 13 : Line TB01-TD CDP gather 185.

Line TB02-BA:

The gradient stack below suggests some minor local anomalies around the top of the main structure at about 1100 ms. In particular at CDP 2560 1070 ms there is a Gradient and Product stack anomaly which corresponds to an event on the CDP gather displaying a minor amplitude effect. The Delta Rp is effectively silent and the Product stack shows the same response as on the other lines.

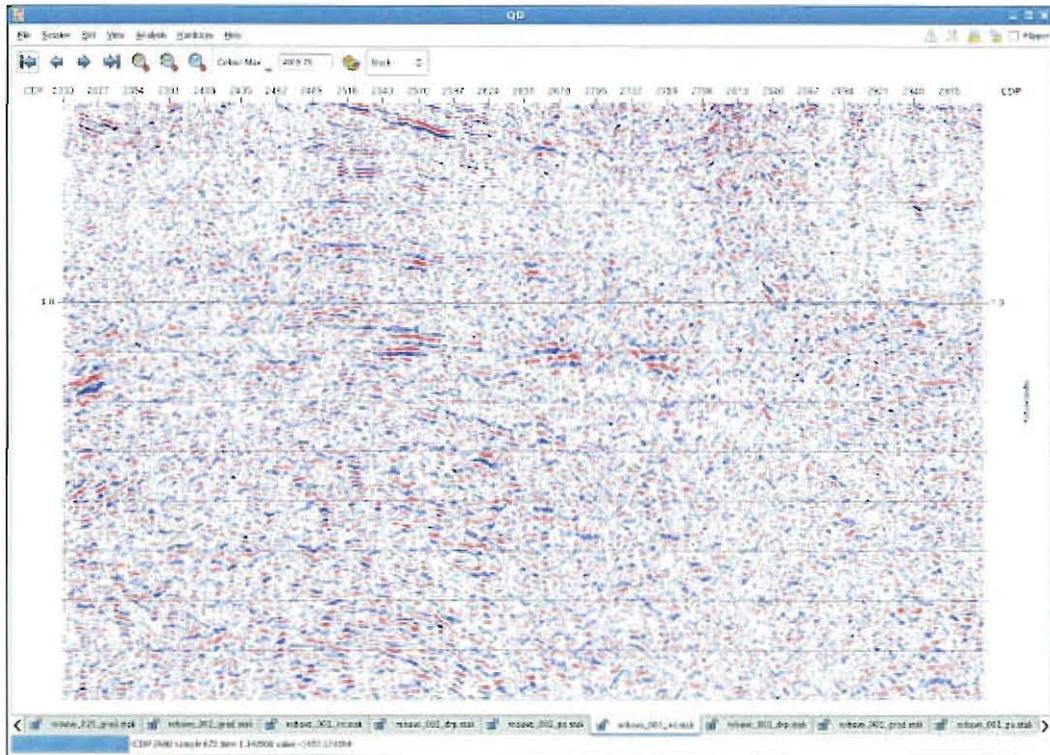


Figure 14 : Line TB02-BA Intercept stack.

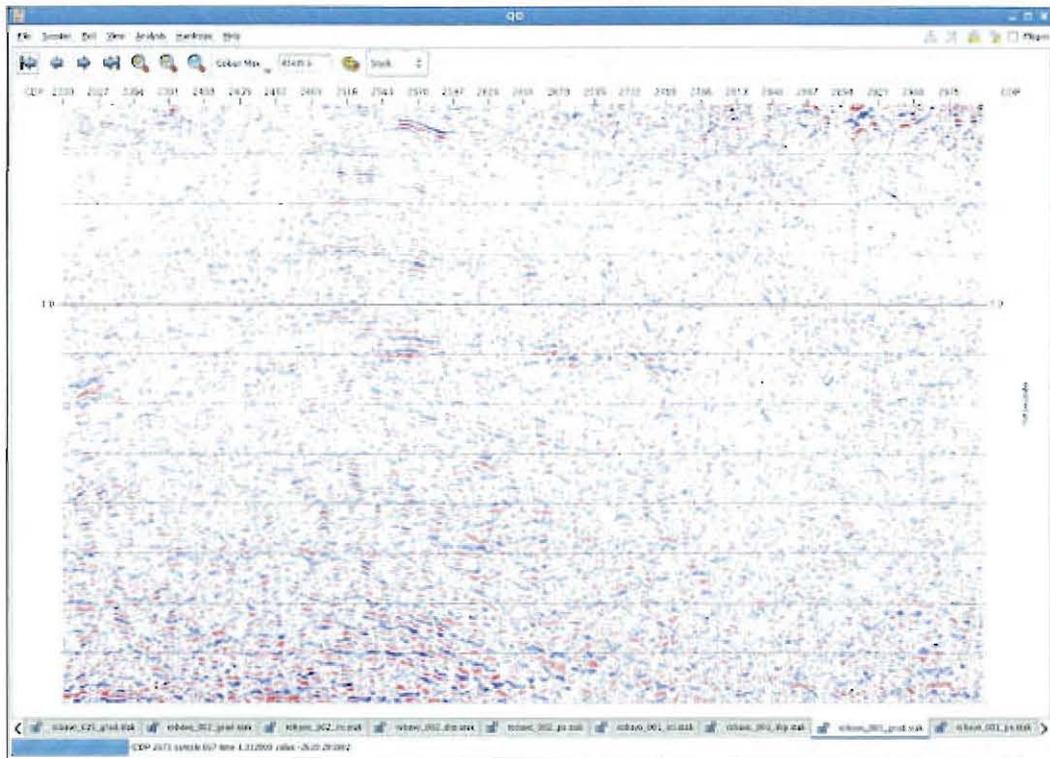


Figure 15 : Line TB02-BA Gradient stack.

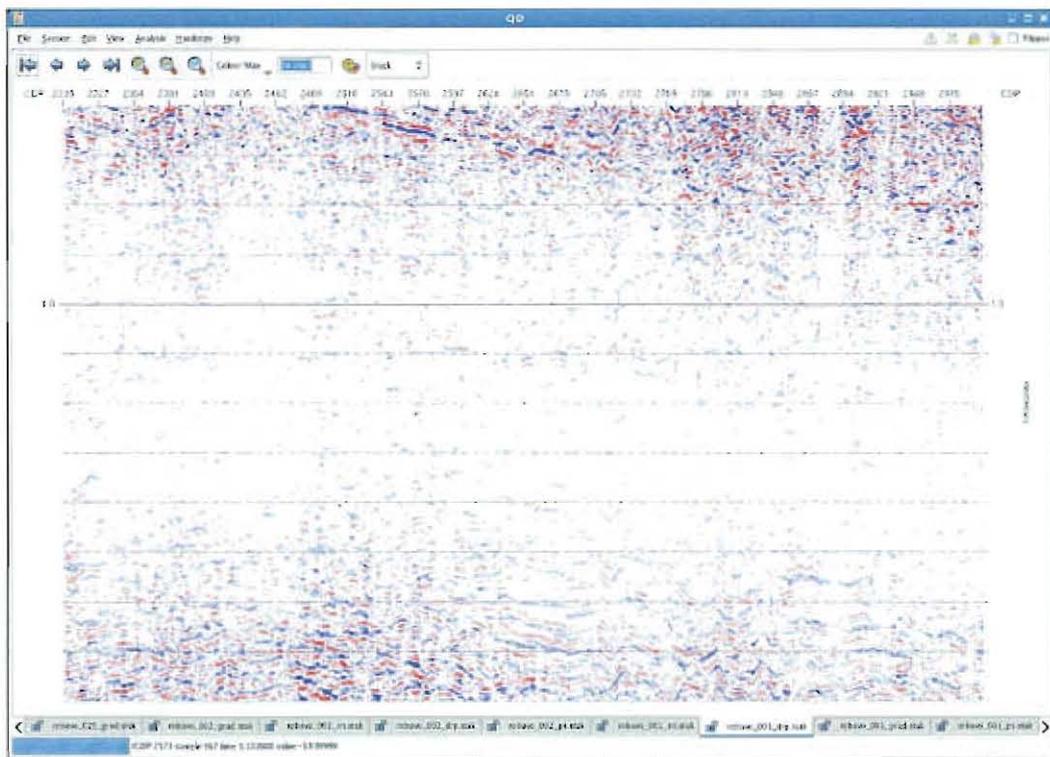


Figure 16 : Line TB02-BA Delta Rp stack.

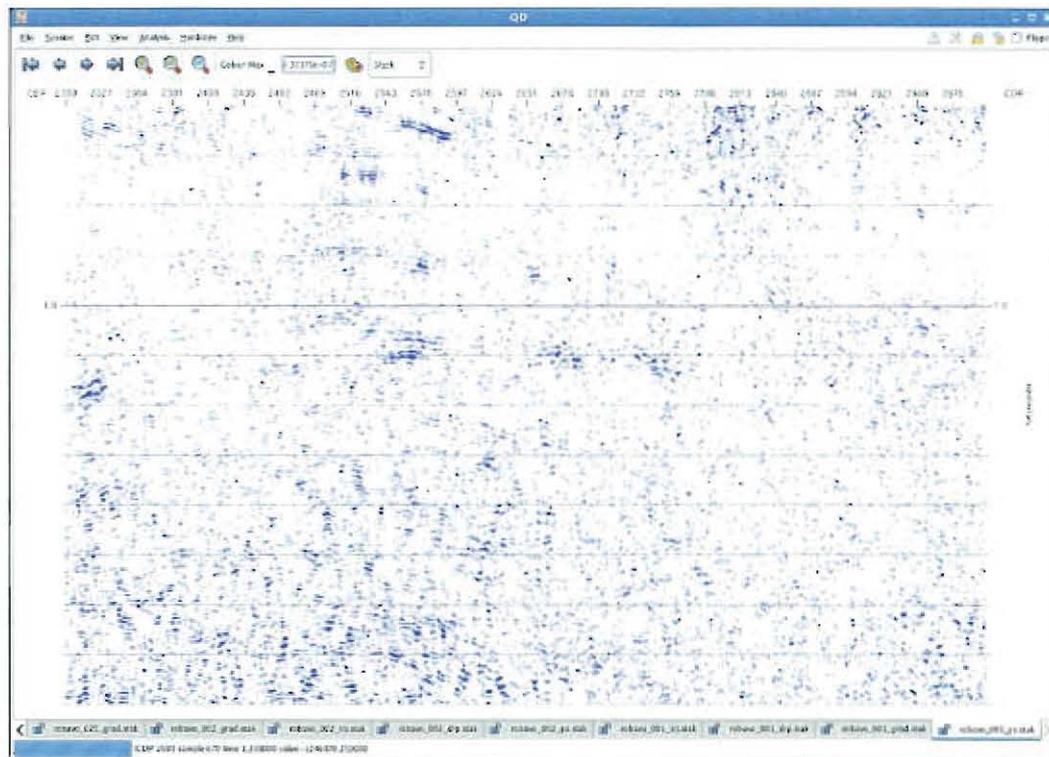


Figure 17 : Line TB02-BA Product stack.

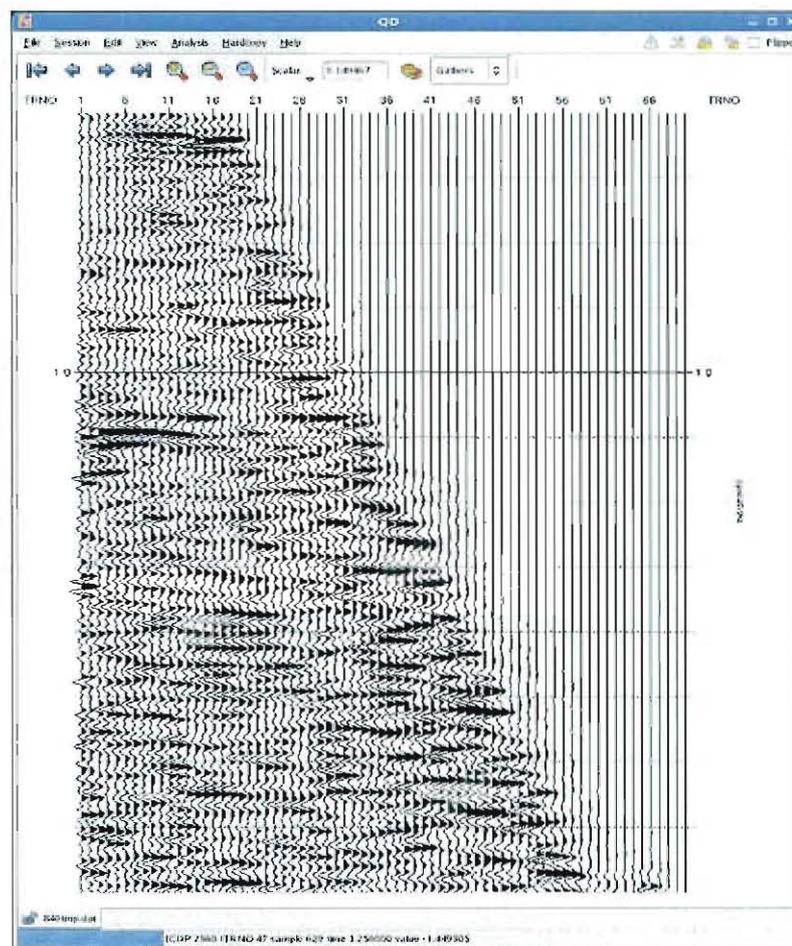


Figure 18 : Line TB02-BA CDP gather 2560.

6 COMMENTS

As we are dealing with pre-stack data we must do without the noise attenuating power of the stack, along with any post-stack noise attenuation. As the input gathers have only DMO applied we must also make do without the focusing of energy via migration. The CDP gather conditioning prior to AVO analysis is essentially designed to address some of these concerns by improving the signal-to-noise ratio.

Due to the lack of well information:

- 1) we cannot confirm the polarity of the data.
- 2) we cannot determine the expected AVO response (ie. calibrate the AVO).

Note that the timing (TWT) on all displays assume the time of first sample is 0 ms. Depending on which line is being considered this might compare to -500ms (TB02-BA) or -700 ms (TB01-PB,TD).

The gradient stack has been the most useful attribute for highlighting anomalous zones. However, it cannot be used in isolation. It has been shown on gathers that sometimes the reason for the high gradient is not valid. When considered in combination with the other attributes and gathers more credibility can be assigned to the anomaly. The product stack did not provide any typical low impedance gas sand anomalies. But then this is a limestone reservoir, overlain by sandstone and siltstone. Without any well log data it is difficult to ascertain for sure, but the reservoir is perhaps more likely to be high impedance (hard sand). In this case the product stack is not indicative. The Delta Rp stack has supported other attributes and provided alternative anomalies.

While the AVO analysis has highlighted some anomalous areas not a great deal can be concluded about the nature of these anomalies. With so little detailed geological information available it is impossible to determine the expected response from a particular horizon and very difficult to reliably interpret any results. I suggest that any future AVO analysis needs to be more targeted and involve logged well data.

7 APPENDIX I – DELTA Rp

AN AVO INTERPRETATION PROCESS BASED ON Rp AND GRADIENT CROSSPLOTS

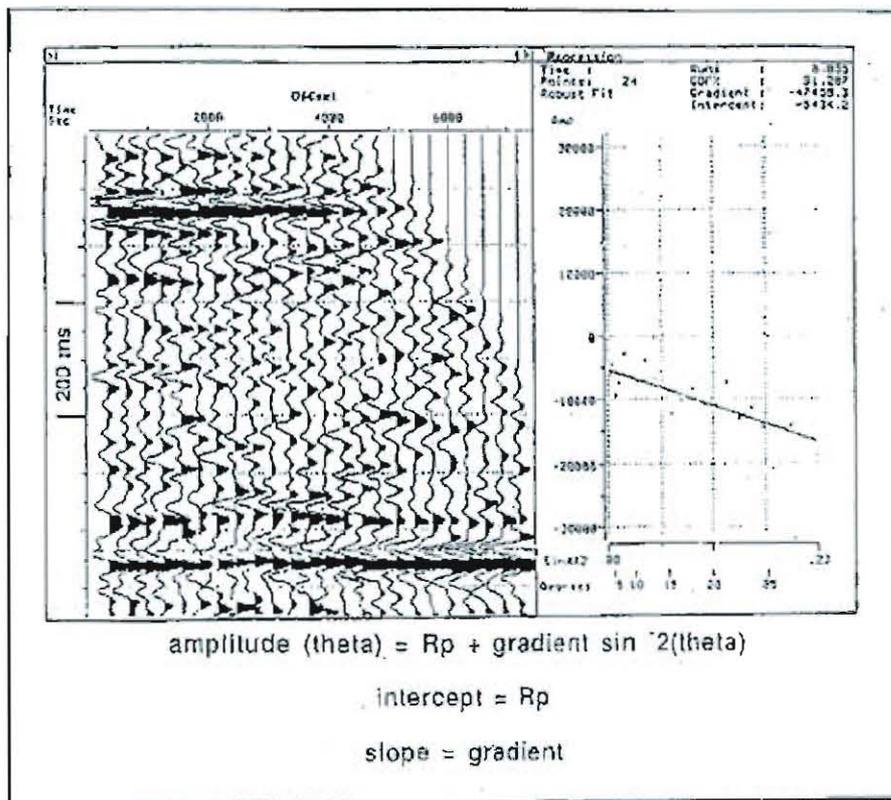
THE CONCEPT

F.S.I. has developed a method of AVO Analysis that is based on the concept of crossplotting AVO measurements. Data input to the cross plot are Rp (often called intercept) and the Gradient measurement from seismic gathers. The F.S.I. algorithm calculates a lithological trend from the Rp and Gradient data. This trend is the response of brine-filled rocks in the analysis window. Unusual rocks, like gas-filled sands are displaced from this wet trend. The ΔR_p calculation is the reflectivity separation between a data point with anomalous reflectivity and the trend.

With calibration the method serves to identify lithology or fluid content.

THE MEASUREMENT

F.S.I. has designed a seismic processing flow to optimize the quality of gathers input to AVO analysis. This processing flow includes pre-stack migration. The Rp (intercept) and Gradient are calculated for each time sample using F.S.I.'s Robust Least Squares fitting technique. This allows statistical control in the measurement. The procedure is based on the Shuey hypothesis.

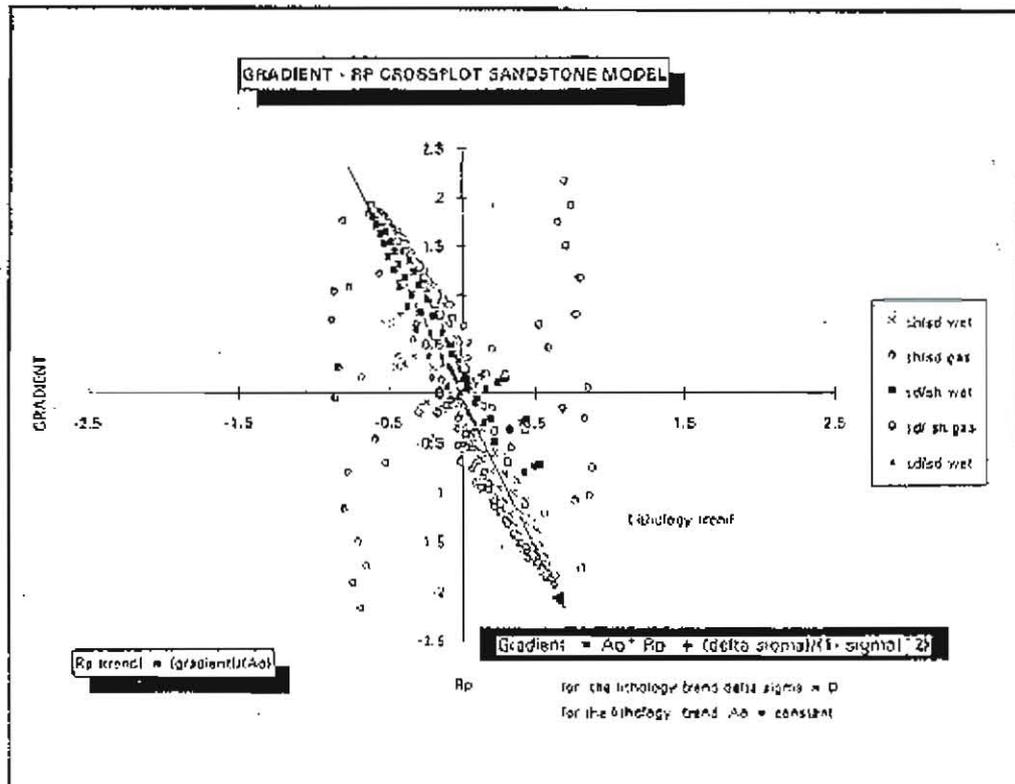


ROCK PROPERTIES – THE BRINE-FILLED LITHOLOGICAL TREND

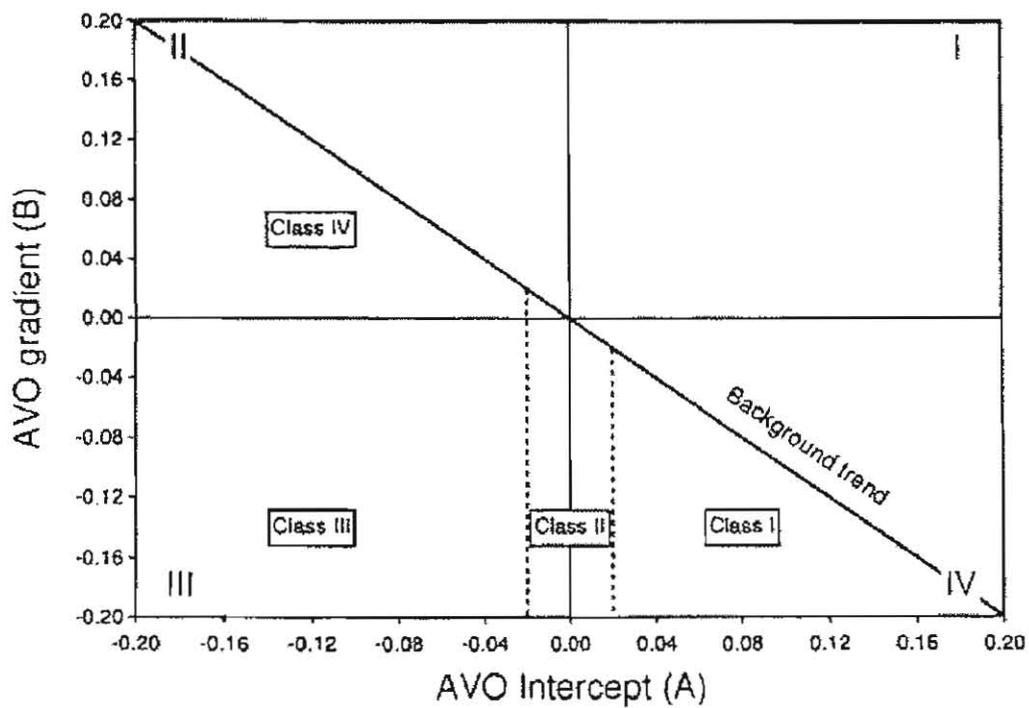
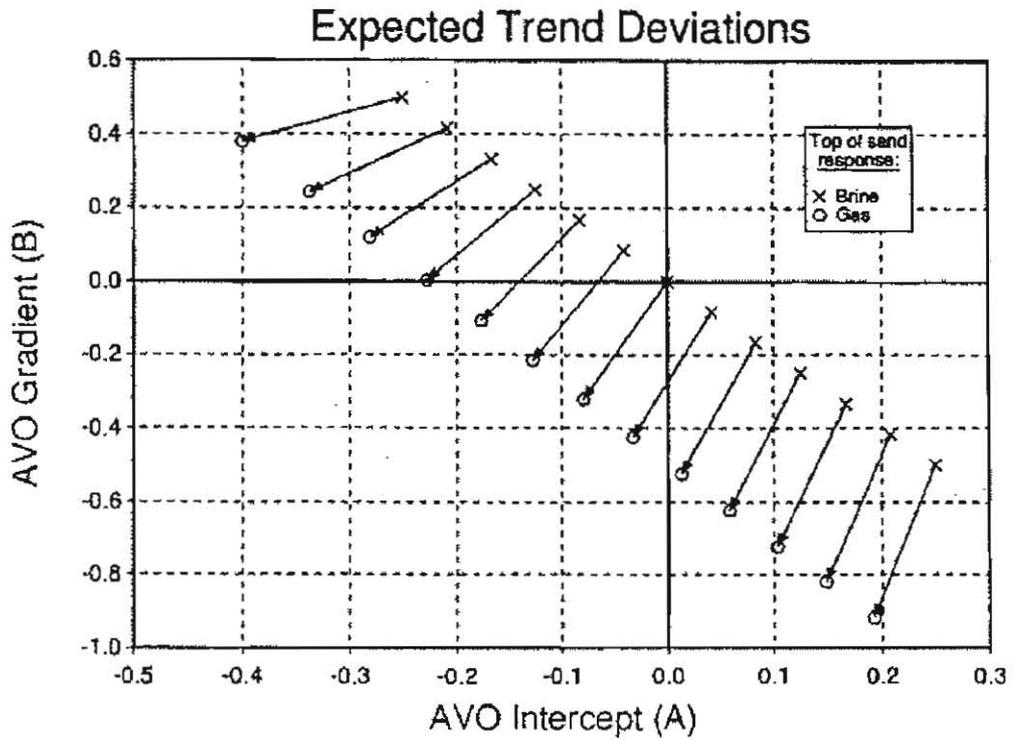
Analysis of crossplots of R_p and Gradient from seismic traces, well logs and theoretical data reveal a trend in the data points. A crossplot based on a model of sandstone encased in shale serves to illustrate this idea. The shales range from 5,000 to 12,000 ft/sec, brine and gas sands range between 3 and 40% porosity. This model is supplemented by brine-sand to brine-sand interfaces with a 3% porosity contrast. The crossplot of this model exhibits a negative trend for the brine-sands that is similar to that of logs and seismic traces. This lithological trend supplies a relationship between brine-filled R_p and Gradient that is useful for AVO studies.

The lithological trend of brine-filled rocks in a study interval is related to the gradient defined in the AVO equations. The average change in Poisson's ratio for the brine-filled lithologic trend is zero, while the (A_0) term of the Shuey gradient expression is a constant. The ΔR_p measurement is based on the derivation of this brine-filled lithologic trend.

The F.S.I. AVO algorithm calculates the brine-filled lithologic trend for each seismic trace within design gates that vary spatially and in time. ΔR_p is the difference in amplitude between the actual reflectivity and the brine-filled lithological trend. The model data crossplot illustrates the natural separation of gas and brine-filled sands.



8 APPENDIX II – AVO CLASSIFICATIONS



9 APPENDIX III – FACTORS AFFECTING AVO



**SEISMIC DATA PROCESSING REPORT
FOR
GREAT SOUTH LAND MINERALS**

Location : Tasmanian Basin, Tasmania
Permit : SEL 13/98
Surveys : 2007 2D Seismic Survey
Date : November 2007

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1 INTRODUCTION

The 2007 seismic data covered approximately 345 km and was acquired in 3 different areas. There were 11 lines in the Central Highlands, 4 lines in Thunderbolt and 5 lines in the Zeehan region. The Zeehan region was processed for Zeehan Zinc under the GSLM label.

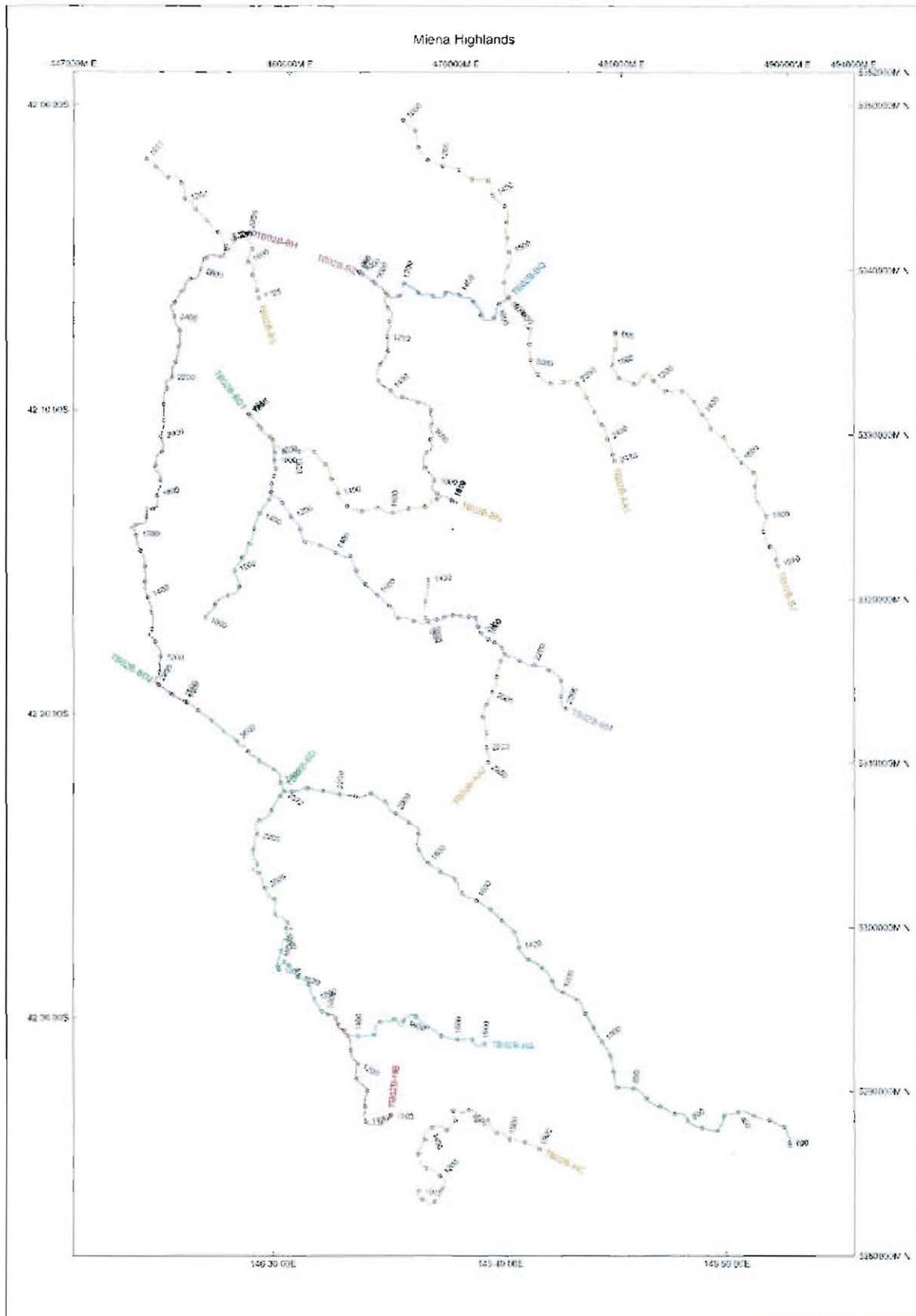
A line summary is given in section 3.0.

Field data was acquired by Terrex seismic crew 401 in April and May 2007.

2 ACQUISITION PARAMETERS

2006 Tasmanian Seismic Survey	
<i>Data recorded by:</i>	Terrex seismic crew 401
<i>Date recorded:</i>	April 2007
<i>Seismic source:</i>	3 vibrators in line
<i>Source type:</i>	Paystar
<i>Vibe spacing:</i>	12.5 m pad to pad
<i>Vibe move up:</i>	Standing sweeps
<i>Sweeps per vp:</i>	2
<i>Sweep frequency:</i>	6-140 Hz
<i>Sweep type:</i>	Linear 200 ms taper
<i>Vp interval:</i>	20 m
<i>Recording system:</i>	Sercels sn 388
<i>Record length:</i>	5 sec sweep + 6 sec listen
<i>Sample rate:</i>	2 milliseconds
<i>Tape format:</i>	SEG-D 3490 zero phase
<i>Field filters:</i>	6-140 Hz
<i>Data channels:</i>	300
<i>Coverage:</i>	150 fold
<i>Geophone type:</i>	SM4 10 Hz
<i>Geophone array:</i>	12 in line over 18.3 m
<i>Element spacing:</i>	1.125 m
<i>Group interval:</i>	20 m
<i>Split spread:</i>	2990-10-vp-10-2990m

3 SURVEY MAP



4 LINE SUMMARY

CENTRAL HIGHLANDS

line	sp's	cdp's
TB02B-AA1	1000-2470	2-2698
TB02B-AA2	2250-1776	2-843
TB02B-BD1	1746-1000	1-1390
TB02B-BD2	2791-1530	1-2453
TB02B-BH	2855-1000	1-3227
TB02B-BJ	895-1970	2-1938
TB02B-BM	1000-2395	1-2578
TB02B-BN	1810-1340	2-1223
TB02B-BQ	995-1634	1-1056
TB02B-BS	1725-1011	2-1189
TB02B-BZ	1914-950	2-1678

THUNDERBOX

line	sp's	cdp's
TB02B-HA	1000-1900	3-1491
TB02B-HB	1000-1503	2-853
TB02B-HC	1900-1015	1-1301

ZEEHAN

line	sp's	cdp's
TB02B-ZA	1000-1864	2-1652
TB02B-ZB	1000-1000	1-732
TB02B-ZC	1000-2002	2-1803
TB02B-ZD	900-1400	1-922
TBO2B-ZF	1000-1570	1-969

5 PARAMETER TESTING

The lines were processed as for the 2001 and 2006 surveys to keep the surveys similar. Pre stack time migration was looked at but it was felt that the data was more smeared with this process when compared to the normal post stack migration.

Filters, scaling and muting were tested to ensure the previous values were accurate especially as the frequencies were expanded to 140 Hz.

6 PROCESSING SEQUENCE

6.1 TRANSCRIPTION

Field data were converted from SEG-D format to Fugro's internal format .

6.2 GAIN RECOVERY

Spherical divergence gain function was used.

Gain (db) = $3.0t + 26\text{Log}(t) + 110$

6.3 PHASE CONVERSION

Convert zero phase to minimum phase.

6.4 CDP GATHER

Shot records were sorted into common depth point gathers.

Nominal fold = 150 CDP interval = 10m

6.5 DECONVOLUTION

16 msec gapped deconvolution using two windows

Operator		120	120	ms
Gaps		2	2	ms
White noise		0.1	0.1	%
Design	near	150-2400	2000-4000	ms
	far	1000-3000	2800-4200	ms

6.6 REFRACTION STATICS

Refraction first breaks were picked using Green Mountain Refraction Statics Delay Time Method which estimates the refractor velocities to model the weathering thickness.

6.7 FIRST PASS VELOCITY ANALYSIS

First pass velocities were interpreted using Fugro's interactive velocity analyses program "MGIVA". Each analysis comprised a 20 CDP stacked panel, repeated 15 times with a different NMO velocity functions. The velocity function displayed at +/-3 %, +/-6%, +/-9%, +/-12%, +/-16%, +/-20% and +25% increments from a central velocity function which was based on a regional velocity function. The MGIVA velocity analysis is a 'map driven' package, where the user can instantly see modifications to the velocity field in map or section view. Neighbouring velocity functions are superimposed on the current location for easy recognition of velocity trends. Velocity interpretation is performed on the pre-computed stack suite, or on a colour contoured semblance display. Semblance interpretation is assisted with markers illustrating the position of potential multiples, and with an interval velocity curve. Analyses were performed at 1.5 km intervals.

6.8 FIRST PASS RESIDUAL STATICS

Fugro "NEBULA" Surface-consistent Residual Statics Package computes statics based on summed cross-correlations at source and receiver locations. A pilot trace is constructed at each CDP using a weighted mix of stacked traces. Cross-correlations of the pilot trace with traces in the respective CDP gather are summed into buffers for each source and receiver station number before being resampled and picked to derive a static value.

6.9 SECOND PASS VELOCITY ANALYSIS

Second pass velocity analysis was performed on gathers with first pass residuals statics applied. The first pass velocity field was used as centre function for Fugro's interactive velocity analysis package, MGIVA. Analyses were performed at 1.0km intervals.

6.10 SECOND PASS RESIDUAL STATICS

Second pass residual statics was run using the picked second pass velocity field as input to NMO corrections.

6.11 DMO

Log stretch DMO using Hale algorithm.

6.12 THIRD PASS VELOCITY ANALYSIS

Third pass velocity analysis was performed on DMO gathers with both first and second pass residuals statics applied. The second pass velocity field was used as centre function for Fugro's interactive velocity analysis package, MGIVA. Analyses were performed at 0.5km intervals.

6.13 NMO CORRECTION

Fourth order NMO correction was performed using the third pass velocity functions.

6.14 MUTE

Testing comparisons between outer trace mute and stretch muting was carried out. It was decided to use a stretch mute of 60% for processing.

6.15 PRE-STACK SCALING

The CDP gather traces were modulated to compensate for amplitude irregularities by scaling each trace using 500 ms AGC .

6.16 STATICS

Floating datum to final seismic reference component of the statics is applied prior to stack. This corrects the data from floating datum to a final datum at mean sea level. To avoid losing data above datum, data was time shifted by 500ms prior to static correction to datum and a new time origin of -500ms was established.

6.17 COMMON DEPTH POINT STACK

The traces within each common depth point gather were summed using $1/\sqrt{N}$ stack compensation with 150 fold coverage and CDP interval of 10 m.

6.18 CDP TRIM STATICS

Fugro's "PASTA" package was used to compute cdp consistent residual statics. "PASTA" is an automatic residual statics program which applies static shifts on a CDP consistent basis, using cross-correlations of NMO-corrected CDP gather traces with a CDP pilot trace for each depth point.

6.19 SPECTRAL BALANCE

Spectral balance is a zero phase deconvolution after stack. The frequencies for the desired output were 10 – 90 Hz.

6.20 MIGRATION

Dual Finite Difference Migration uses the technique of downward continuation in order to map reflectors to their true time position. It is performed in the frequency – space domain. Steep dip second order solution (65 degrees) and depth step of 12m were used.

6.21 BAND PASS FILTER

Unwanted noise that lay outside the frequency range of the desired reflection and diffraction data were removed by the application of a series of time variant filters.

Time (ms)	Frequency (Hz)
500	10 / 14 - 95/110
1000	10 / 14 - 95/110
3000	10 / 14 - 65/80
4000	10 / 14 - 55/70

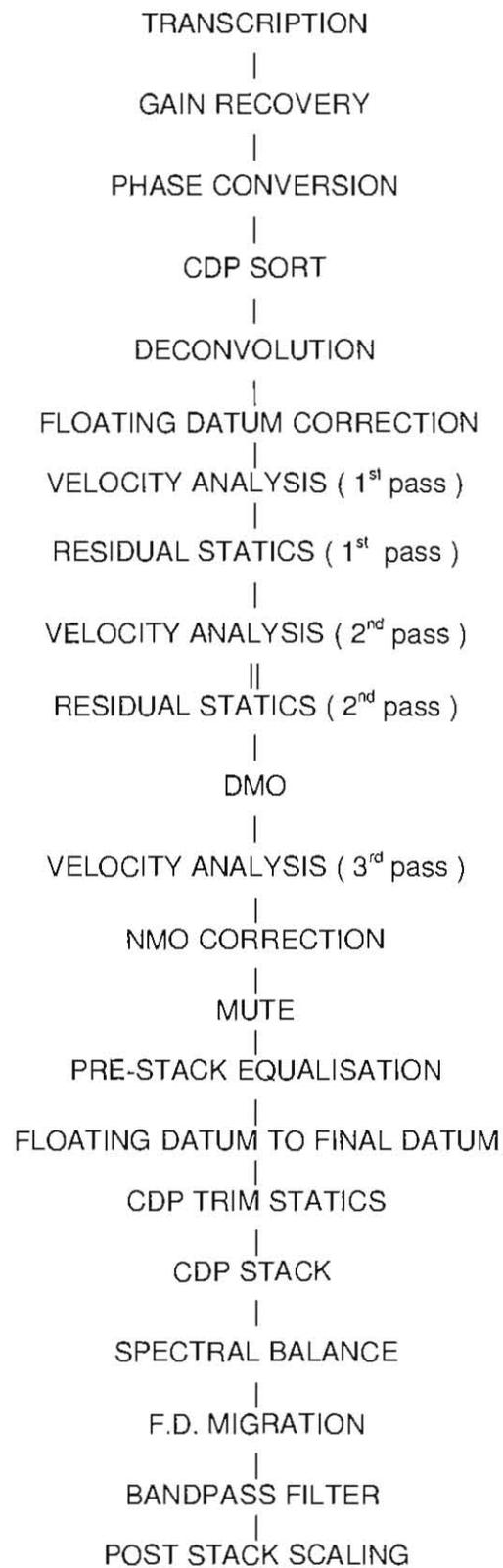
6.22 POST STACK SCALING

Dual window AGC with window lengths of 1000 ms and 400 ms.
Equalisation applied : 50%

6.23 TAUP

Time variant dip and coherency filter. Mix back : 60%

7 PROCESSING SEQUENCE DIAGRAM



8 FINAL DISPLAYS

Final displays of final & migrated stack were produced on paper and a CD of CGM+ format files with cdp coordinates.

Horizontal scale: 1 : 20,000 (50.8 traces per inch)

Vertical scale: 5 cm/sec

9 ARCHIVES

Final migrated stacks, final stacks, raw stacks, and raw migrated stacks of each line were written onto DVD in SEG Y format for workstation interpretation and archival.

Trace headers summary

<u>BYTE</u>	<u>DESCRIPTION</u>	<u>BYTE</u>	<u>DESCRIPTION</u>
17-20 (32-bit)	SPNO	97-98 (16-bit)	source residual static
21-24 (32-bit)	CDP number	99-100 (16-bit)	receiver residual static
41-44 (32-bit)	Elevation	101-102 (16-bit)	Receiver static
81-84 (32-bit)	CDP easting	103-104 (16-bit)	Datum static applied
85-88 (32-bit)	CDP northing	109-110 (16-bit)	Time of first sample
91-92 (16-bit)	weathering vel	115-116 (16-bit)	Number of samples
93-94 (16-bit)	refractor vel	117-118 (16-bit)	Sample interval
		189-192 (32-bit)	SP number

10 CONCLUSION

Line TB02-BD2 was reprocessed from the start as the incorrect coordinates and elevations were supplied.

The data was processed rather quickly for its complexities. The previous processing sequence proved the best with the exception of the stretch mute which when tested, gave some improvements in the more shallow levels and did not affect the deeper data.

There was a lot of attention given to pre and post stack migration with the pre stack time migration rejected due to its smearing effect on the data. Probably cause of this was the "crookedness" of the lines and an inability to create consistency in the binning process. This was coupled with the very fast velocities to create an undesirable result so post stack migration proved the way to go.

There were some inconsistencies between the observed seismic velocities and some borehole data that was available in the Thunderbolt region. Generally when we pick velocities we look for 3 things - a strong bullseye on the semblance, flat gathers, and a good stack response. All three of these criteria pointed to a velocity about 3360 at 60ms. The borehole data suggested a velocity in the vicinity of 6000 m/sec at this level. This discrepancy was investigated via some extra velocity analyses aimed specifically to identify if possible a velocity of about 6000 m/sec at 50 ms (as per the borehole data). It was not really evident but a trial was performed placing a velocity close to 6000 m/sec at zero time (avoiding negative interval velocities) and then basically picking an event at 200 to 250 ms below floating datum a bit faster than previously (around the high 4000's to low 5000's) then returning to the original pick around 350 to 400 ms which was generally around 5000 m/sec. There was no real evidence of the expected dolomite at 50 ms but there was perhaps something stacking in a bit better at the 200 - 250ms level. This trend of course misses the event at 100ms at 3500 m/sec. There are some effects on the data at 400ms not all of them good but below that things were pretty much the same. The gathers look under corrected above 200 ms. Stacks and Migrations with these faster shallow velocities were produced and compared with the original versions. After consultation with Diego it was decided to employ the original velocities.

Mick Curran

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

Geoffrey J. Hicks - July, 2008

The seismic was mainly acquired along roads and tracks. Although it is rather unlikely that these roads and tracks coincide with subsurface structural highs (especially pre Permian), the mapped structural highs are mainly controlled by single seismic lines.

I. Bellevue Anticline

The structuring is predominantly pre-Tertiary, increasing the chance that earlier migrating hydrocarbons would be trapped.

Top of Ordovician structure as mapped is constrained to the west by the interpretation of Lines TB02b-BZ and TB01-TD and to the east by the interpretation of Line TB02b-BQ. **Figure 1. Bellevue - TWT Map for Upper Limestone Member of the Gordon Group.**

However, the structure's extent and integrity to the north and south-east of the mapped culmination is more problematic.

As the interpretation of Line TB02b-AA ceases near its intersection with Line TB02b-BQ, the contouring to the south-east of the mapped culmination, beyond the 0.850 TWT contour, is not based on actual data. Thus, it is possible that the 0.850 TWT contour opens toward the south-east and that the structural high is also to the south-east of where it is currently mapped. The possibility is reduced by the presence of a topographic low to the south-east of the mapped culmination, assuming that this relative low is due to draping of the younger section over a pre-Permian high.

There is little basis in actual data for the contouring to the north of the mapped culmination, with a greater than 10km gap between the interpretations on Lines TB02b-AA and TB01-PB. Of concern is the significance of the high plateau to the north of the mapped culmination. This unusually flat plateau is about 250m higher than the proposed drill site. By similar logic to that above, such a high plateau

may indicate draping of the younger section over a pre-Permian high, indicating that the structural high is to the north.

If a well must be drilled at the current proposed location before additional seismic data is available, the potential up-dip hydrocarbon volume should be calculated.

Lastly, the thickness of the section below the Permian unconformity, as seen on the southern ends of Lines TB02b-BZ and TB02b-AA, indicates that the Top Upper Limestone Member, prognosed at 2,425m, may well have been buried to more than 6,000m. The effect of such burial depth should be taken into account in the estimation of reservoir parameters.

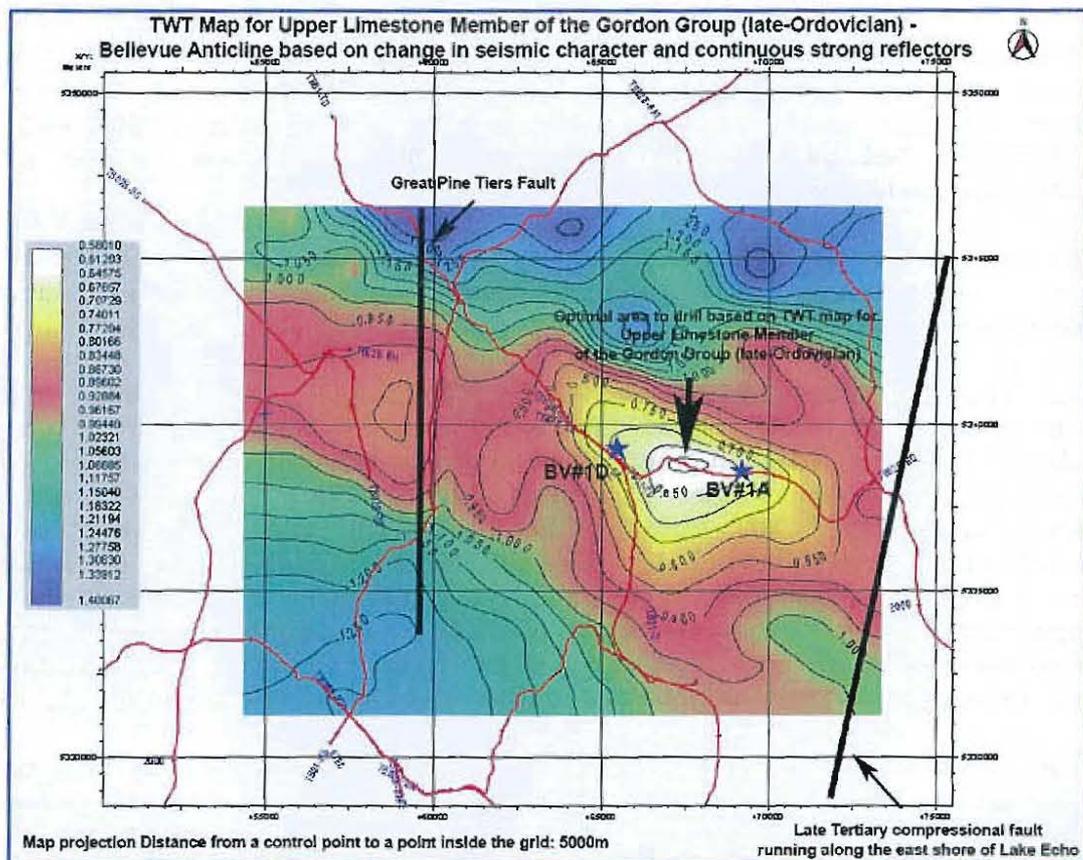


Figure 1. Bellevue - TWT Map for Upper Limestone Member of the Gordon Group.

II. Thunderbolt Anticline

A fair proportion of the structuring is pre-Tertiary.

Top of Ordovician structure is likely to be an elongate anticline, trending northwest-southeast, plunging toward the northwest, from a structural high in the southeast.

The southeastern high is constrained by the interpretation of Line TB02b-HC. A lesser structural high, mapped on Line TB02b-HA, near the intersection with Line TB02b-HB, in conjunction with the deeper and almost flat nature of the same horizon on most of Line TB02b-HB, indicates that the strike of the structure may be to the east of Line TB02b-HB. *Figure 2. Thunderbolt - TWT Map for the Upper Limestone of the Gordon Group.*

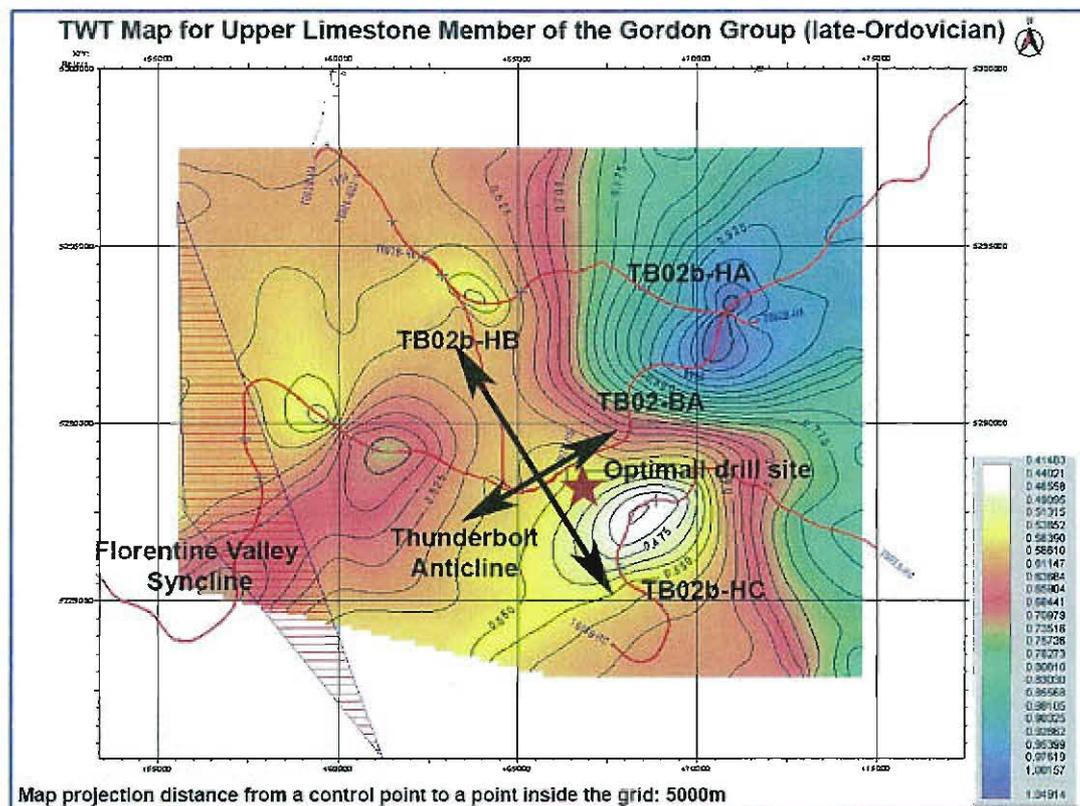


Figure 2. Thunderbolt - TWT Map for the Upper Limestone of the Gordon Group.

The structure is well constrained to the northeast by the interpretation of Lines TB02b-HA, TB02b-HC and TB02-BA.

However, aside from the area near the interpreted low on Line TB02-BA, the structural constraint to the southwest is more problematic. The Florentine Valley Syncline and its associated fault system most likely provides overall closure for the structure. Of most concern is the lack of data for the area to the southwest from between the southwest end of Line TB02b-HC and the southern end of Line TB02b-HB.

If a well has to be drilled before additional seismic data is available, given the uncertainty of the structural interpretation, such a well should be targeted as close as possible to the crest of the high mapped on Line TB02b-HC.

As the track on which Line TB02b-HC was acquired is unsuitable, the Line TB02-BA track will be used to transport the drilling rig and equipment. The topographic map indicates a reasonably flat spur, extending to the southeast, from near the intersection of Lines TB02-BA and TB02b-HB. It may be possible to locate the accommodation/offices, material storage, tubular laydown racks, etc near the track but site the drilling rig toward the southeastern end of the spur.

III. Stockwell Fault Block

The structuring is mostly very young. There is insufficient seismic data to interpret a closed structure.

Geoffrey J. Hicks
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**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 horizons 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 ubiquitous 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 reservoir 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 hydrocarbons 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 dolerite 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 fissures of overlying dolerites found in the quarries 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 tectonism 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 developed 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, aerial 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 bound 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 strike 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 acquisition 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).

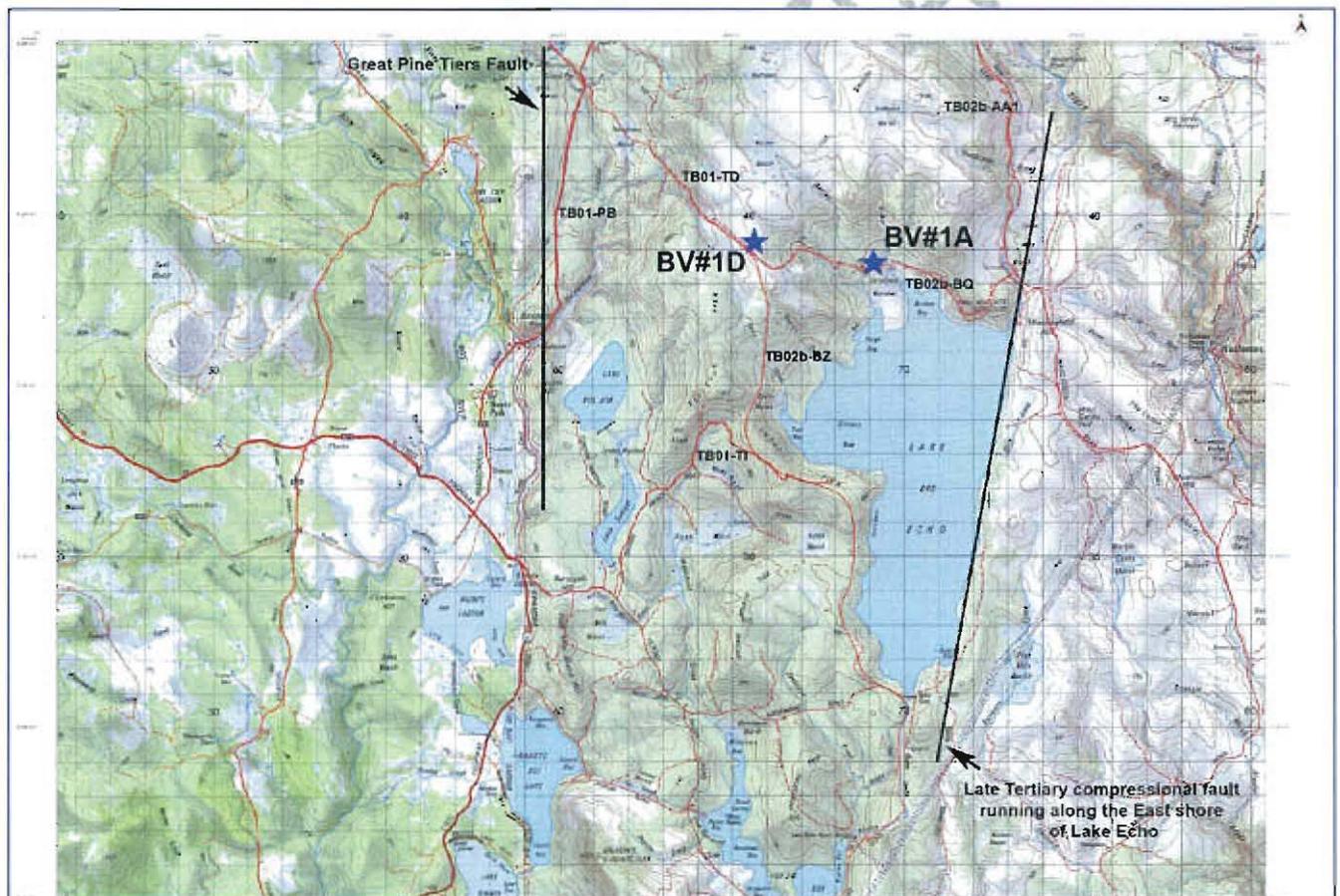


Figure 1: Topography Map - Bellevue Anticline.

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

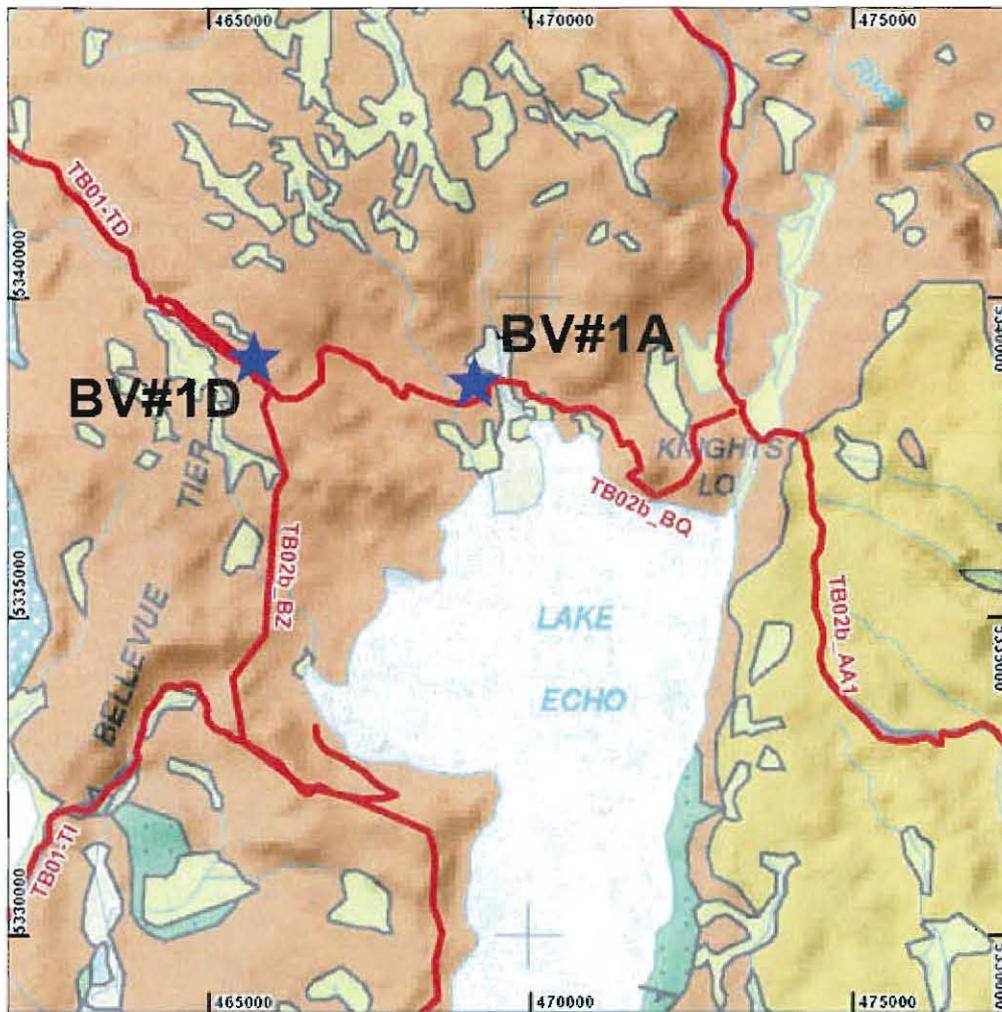


Figure 2: DEM Geology for the Bellevue Area (Dolerite outcropping in orange)

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).

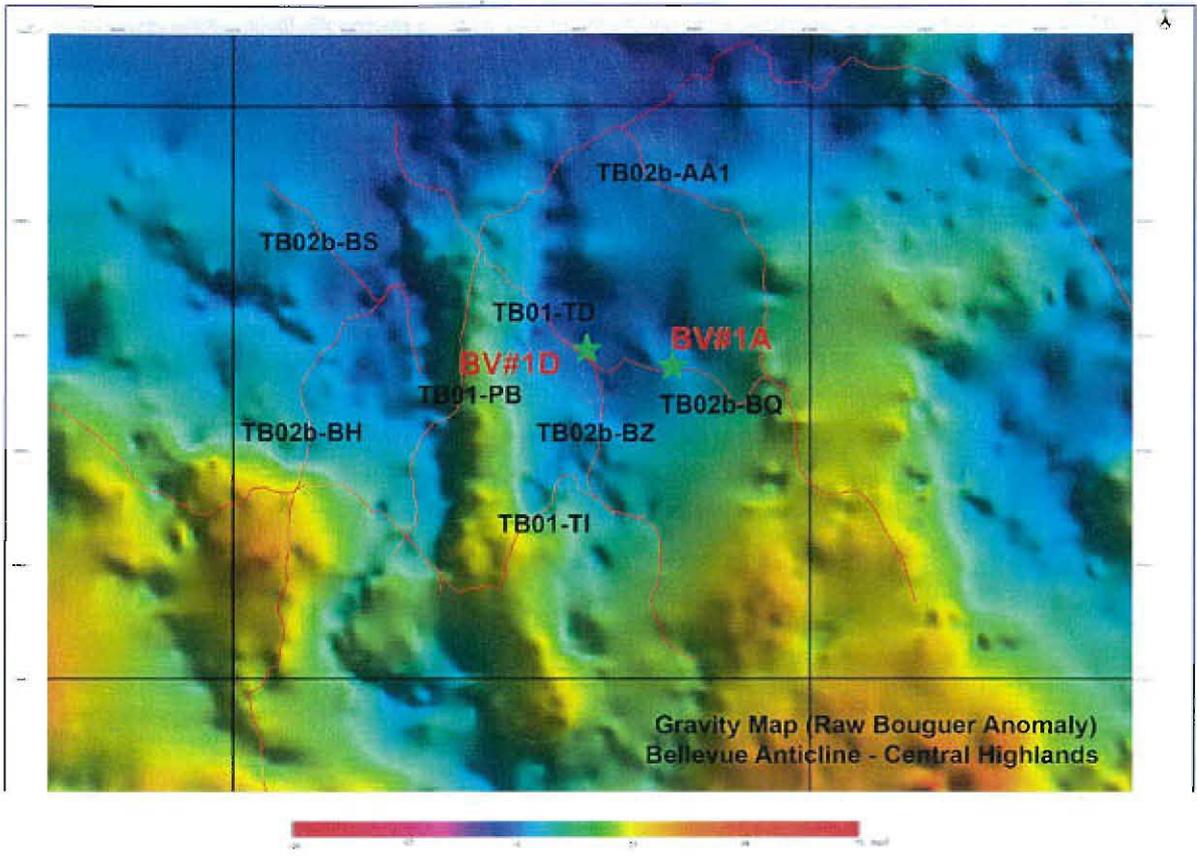


Figure 3: Gravity Map (Raw Bouguer Anomaly), Bellevue Structure - Central Highlands

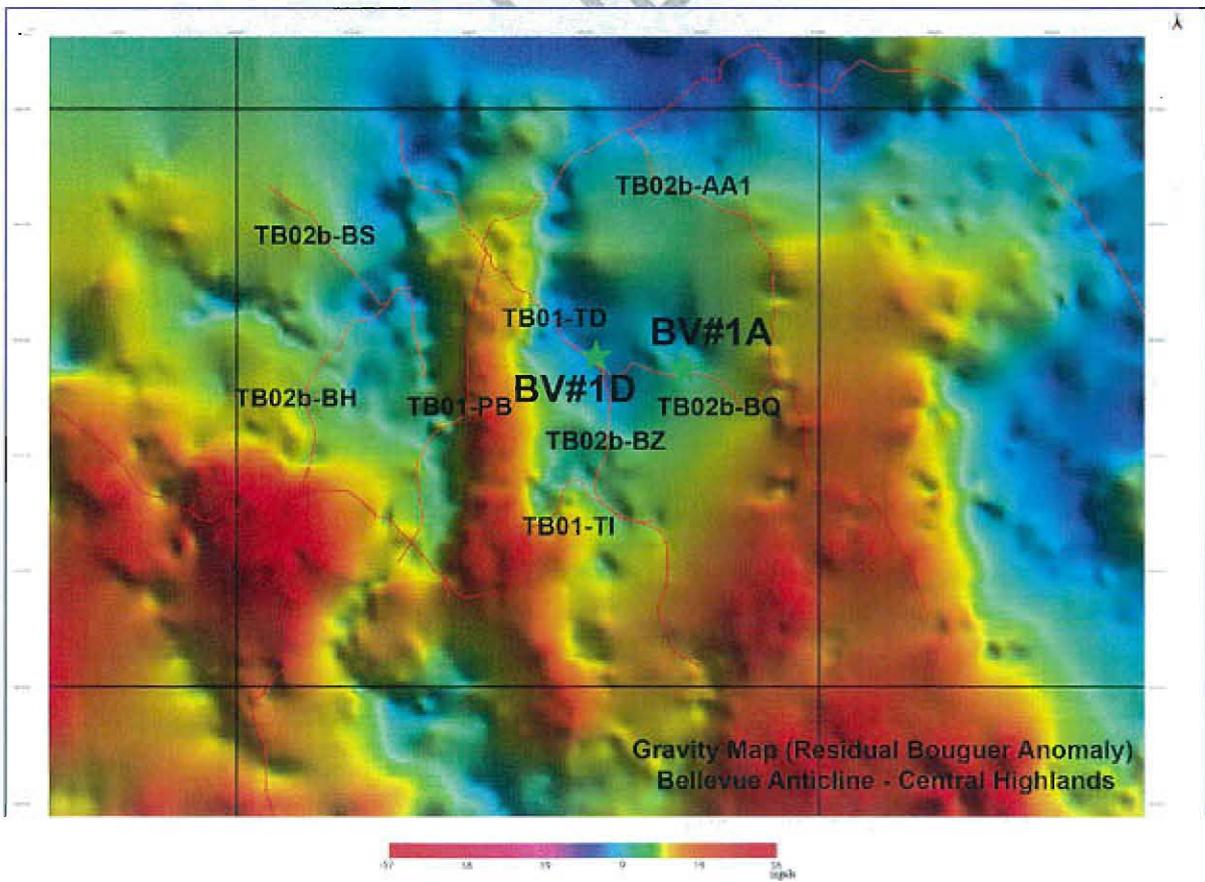


Figure 4: Gravity Map (Residual Bouguer Anomaly), Bellevue Structure - Central Highlands

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.

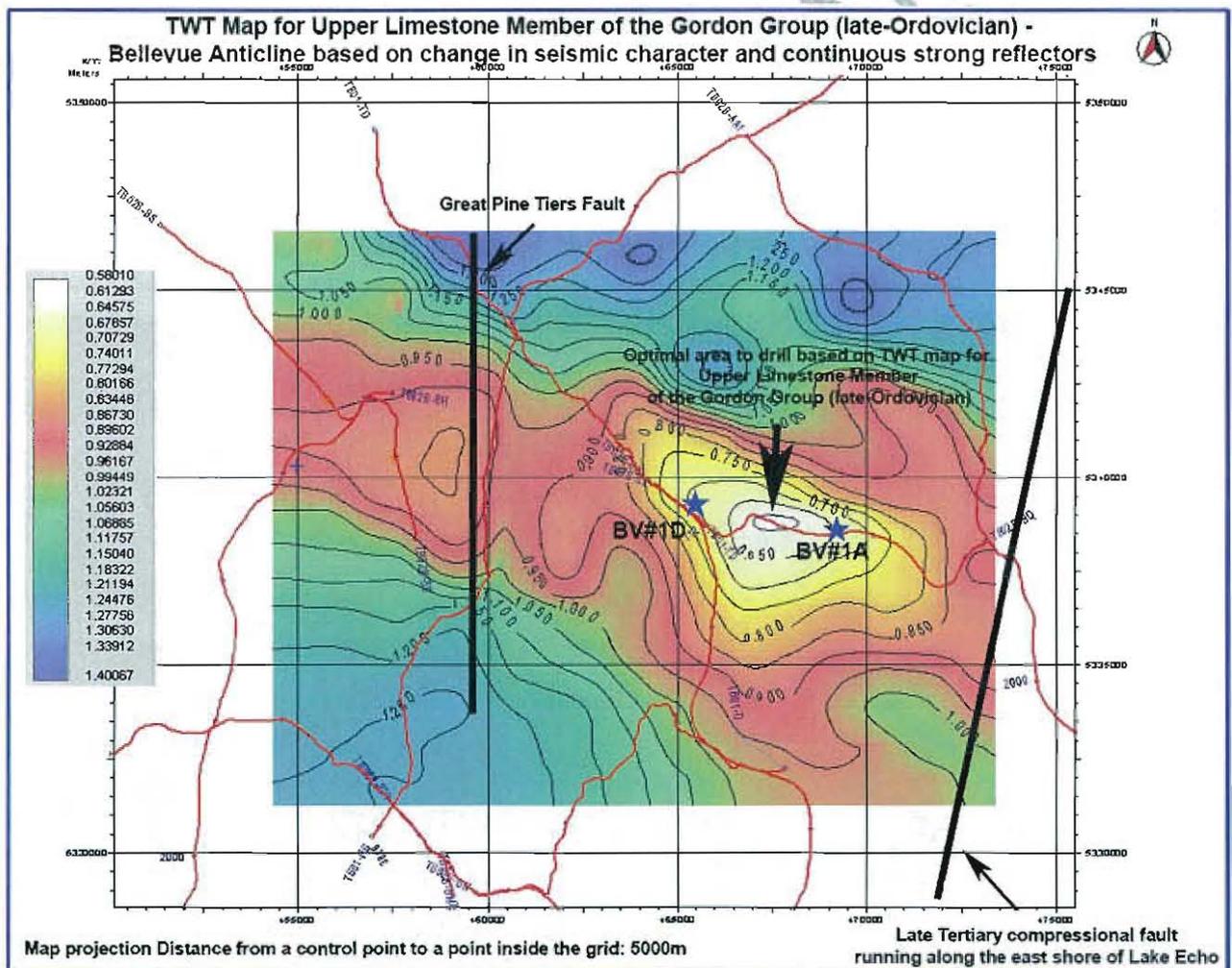


Figure 5: TWT Map for Upper Limestone Member of the Gordon Group (Late Ordovician) - Bellevue Anticline based on change in seismic character and continuous strong reflectors

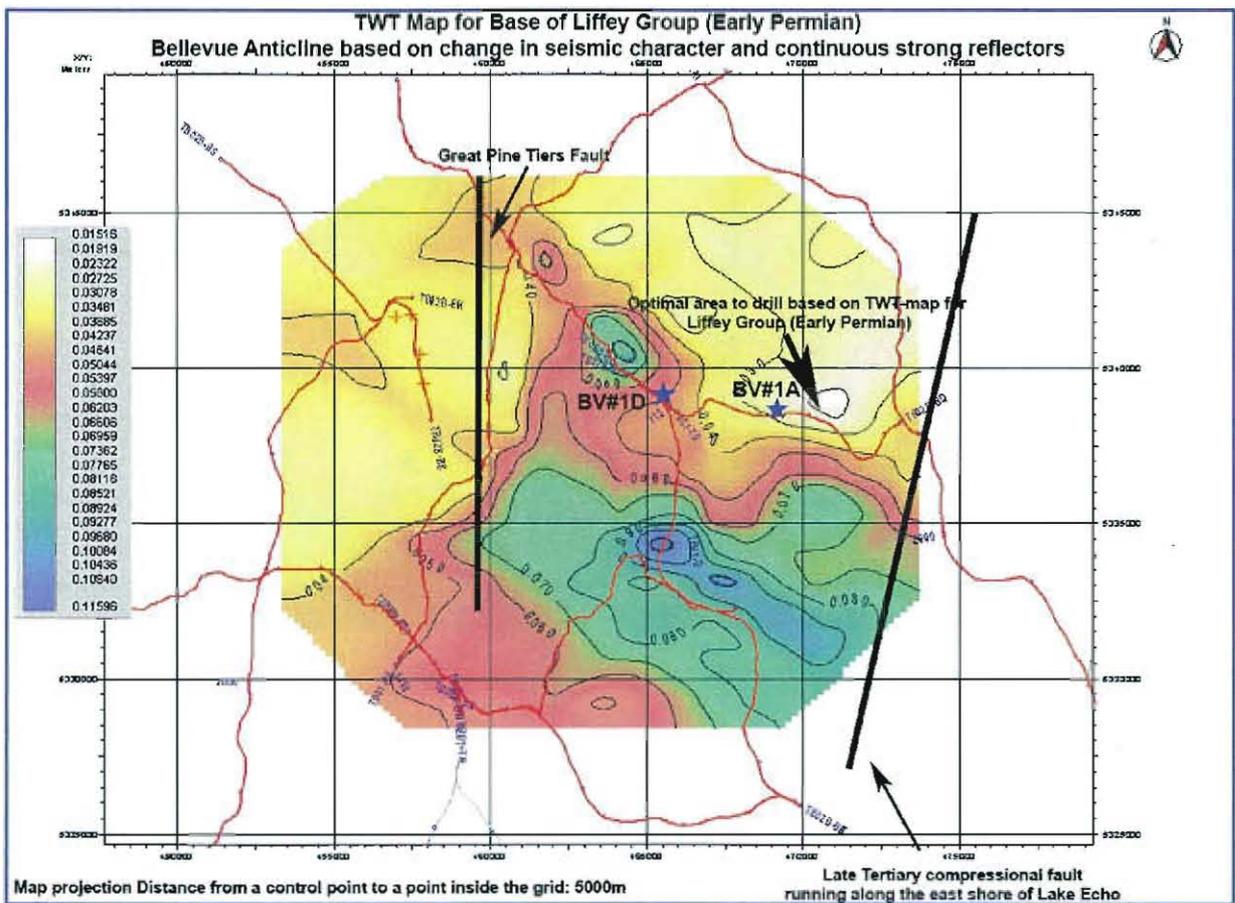
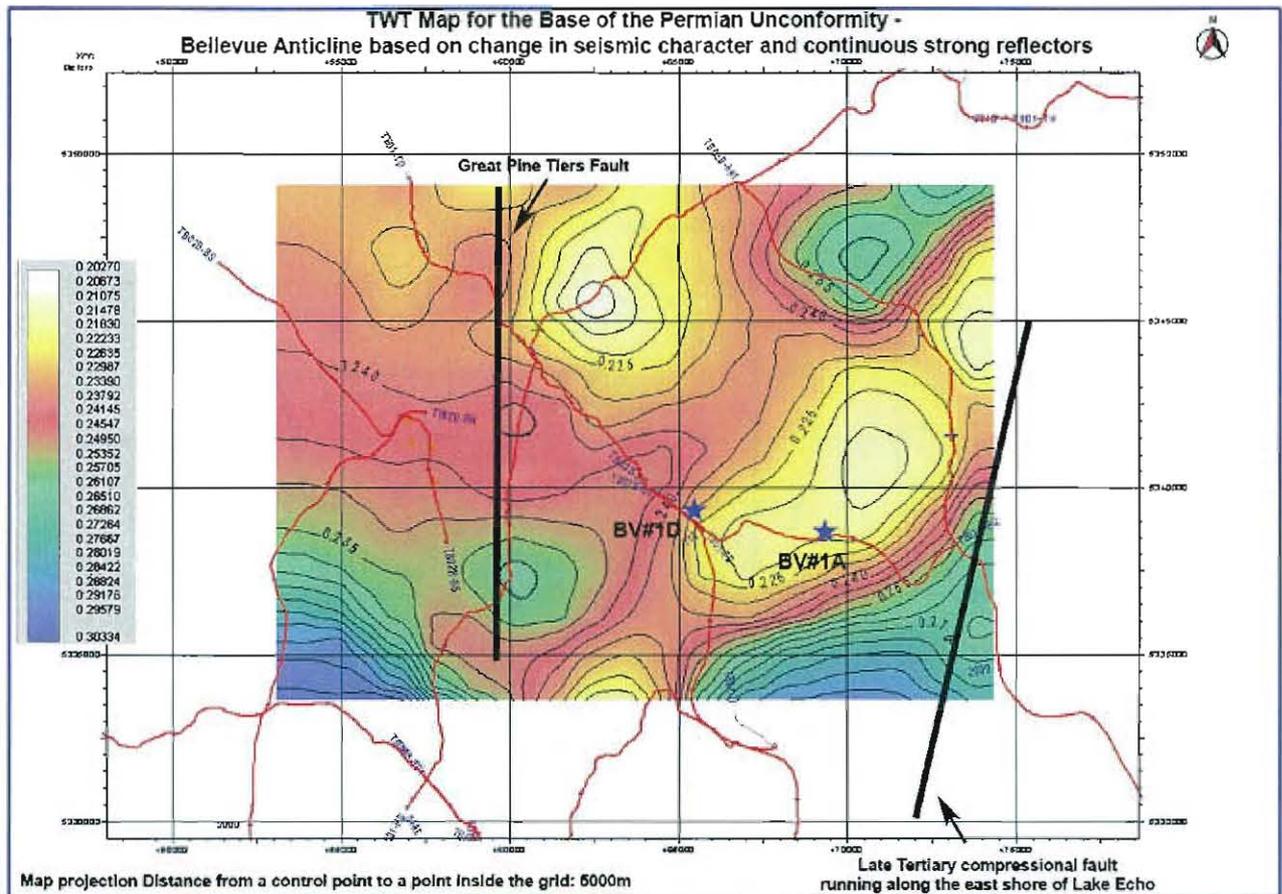


Figure 6: TWT Map for Liffey Group (Early Permian) -

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.

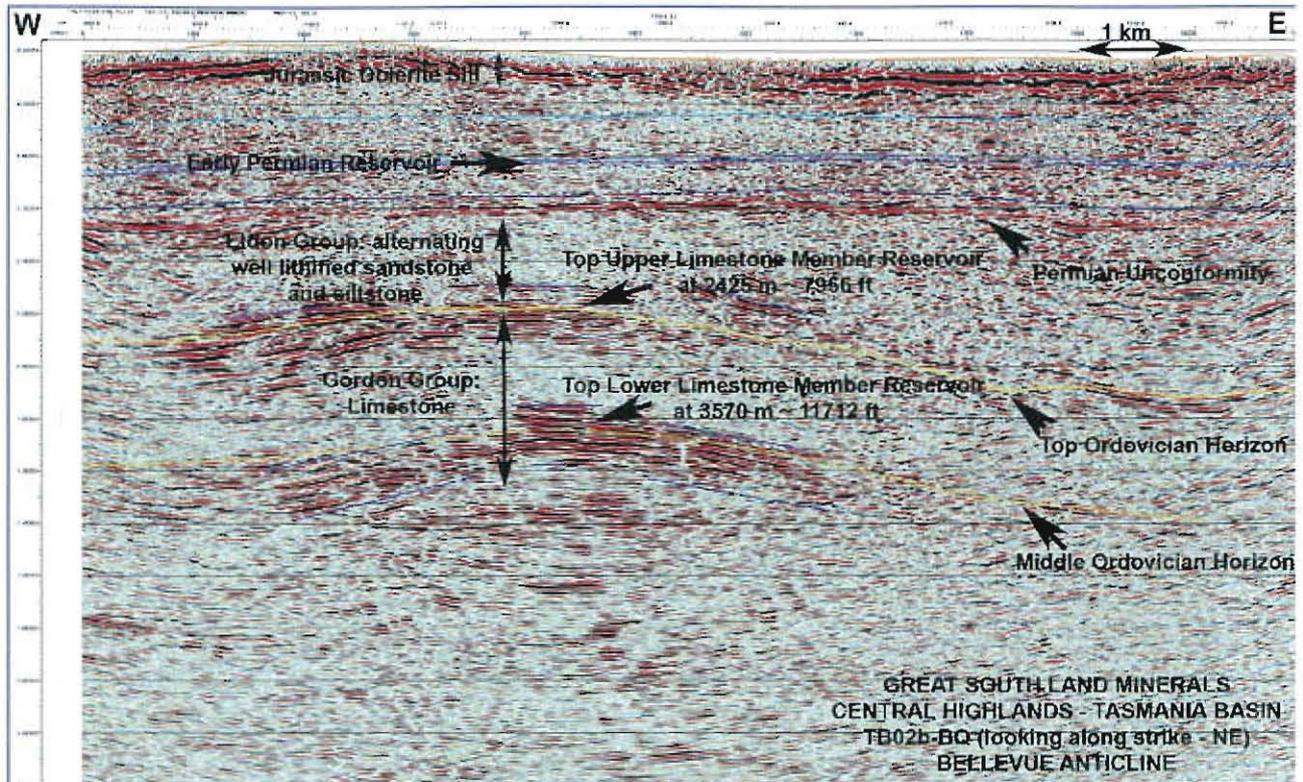


Figure 8: TB02b-BQ (looking along strike - NE)

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 Bellevue 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 area, 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 vicinity 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.

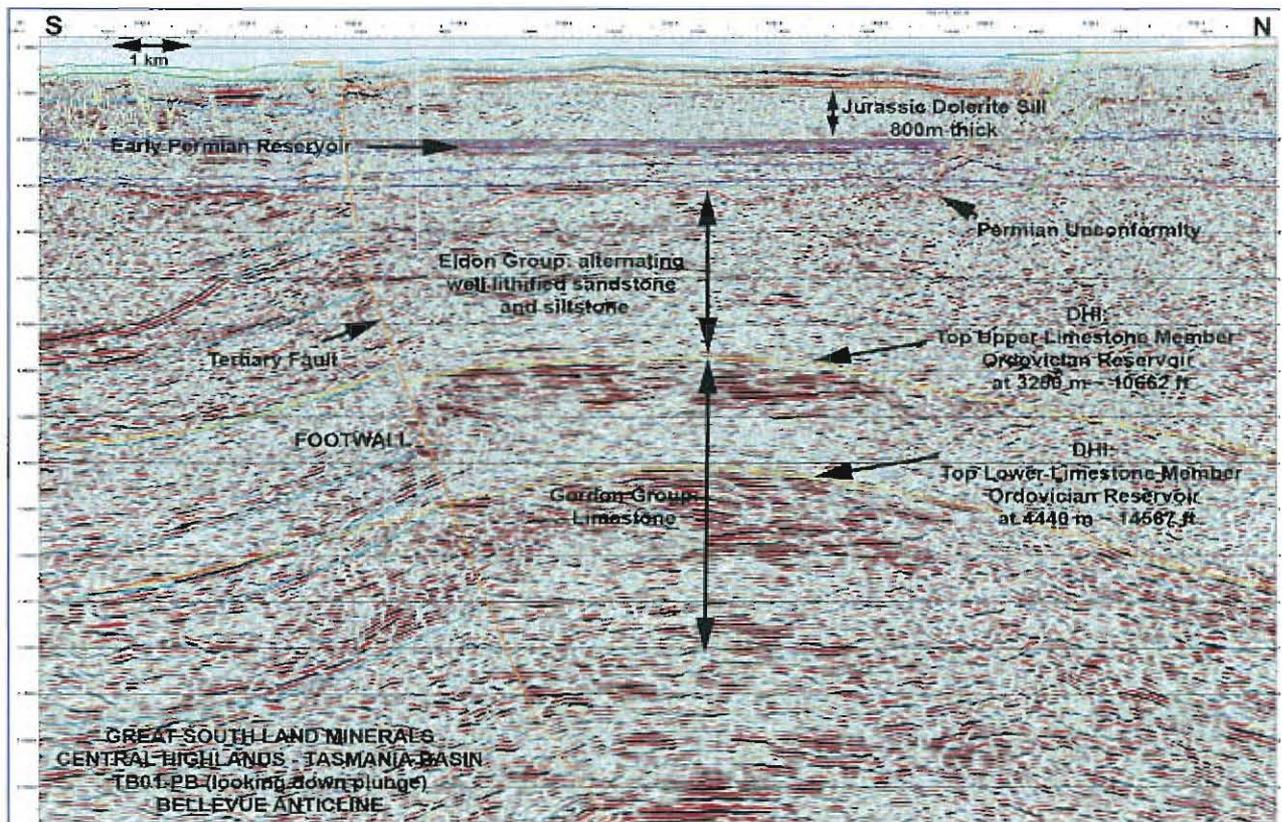


Figure 9: Seismic cross-section of the Bellevue Anticline on TB01-PB (looking down plunge - NW)

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.

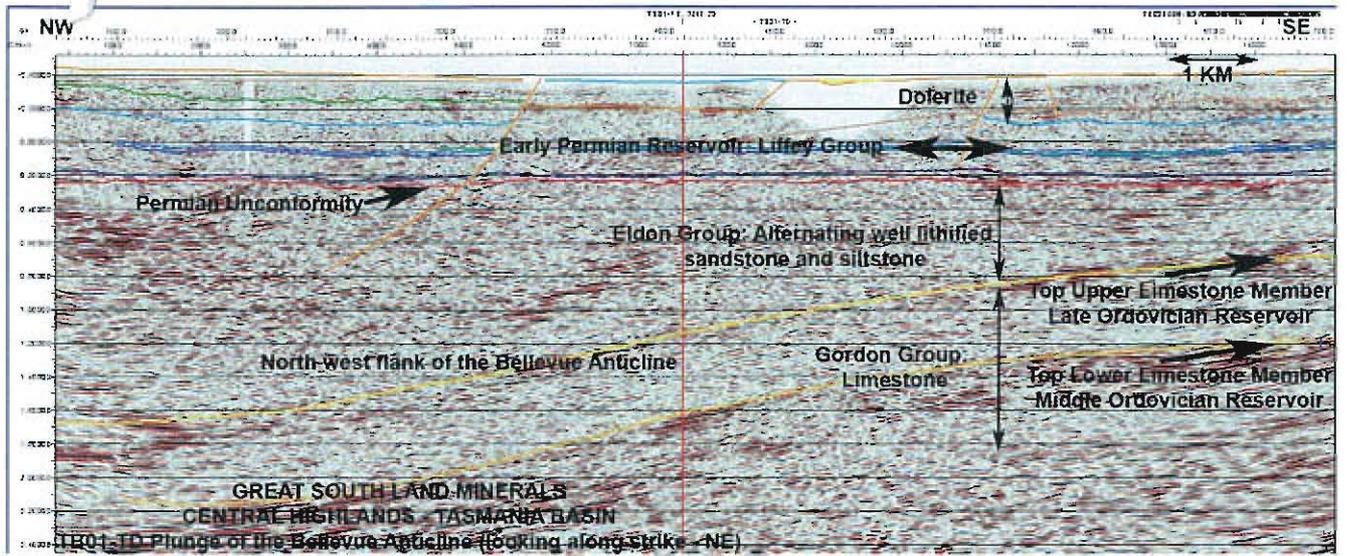


Figure 10: TB01-TD, plunge of the Bellevue Anticline (looking along strike - NE)

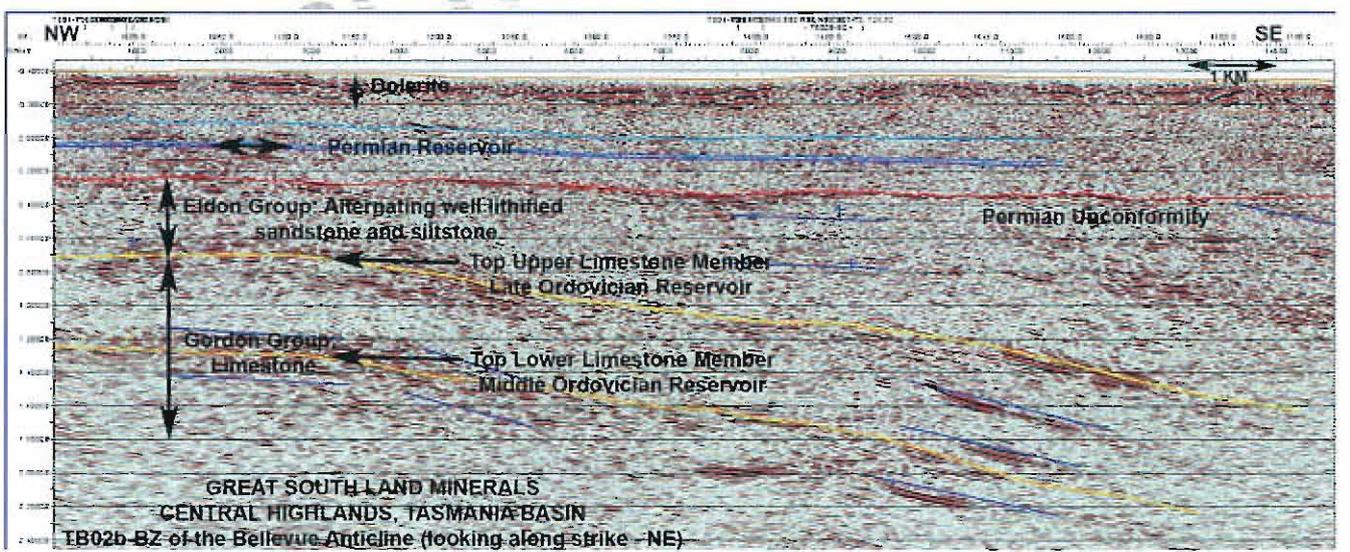


Figure 11: TB02b BZ, plunge of the Bellevue Anticline (looking along strike - NE)

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 (98ft), 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),

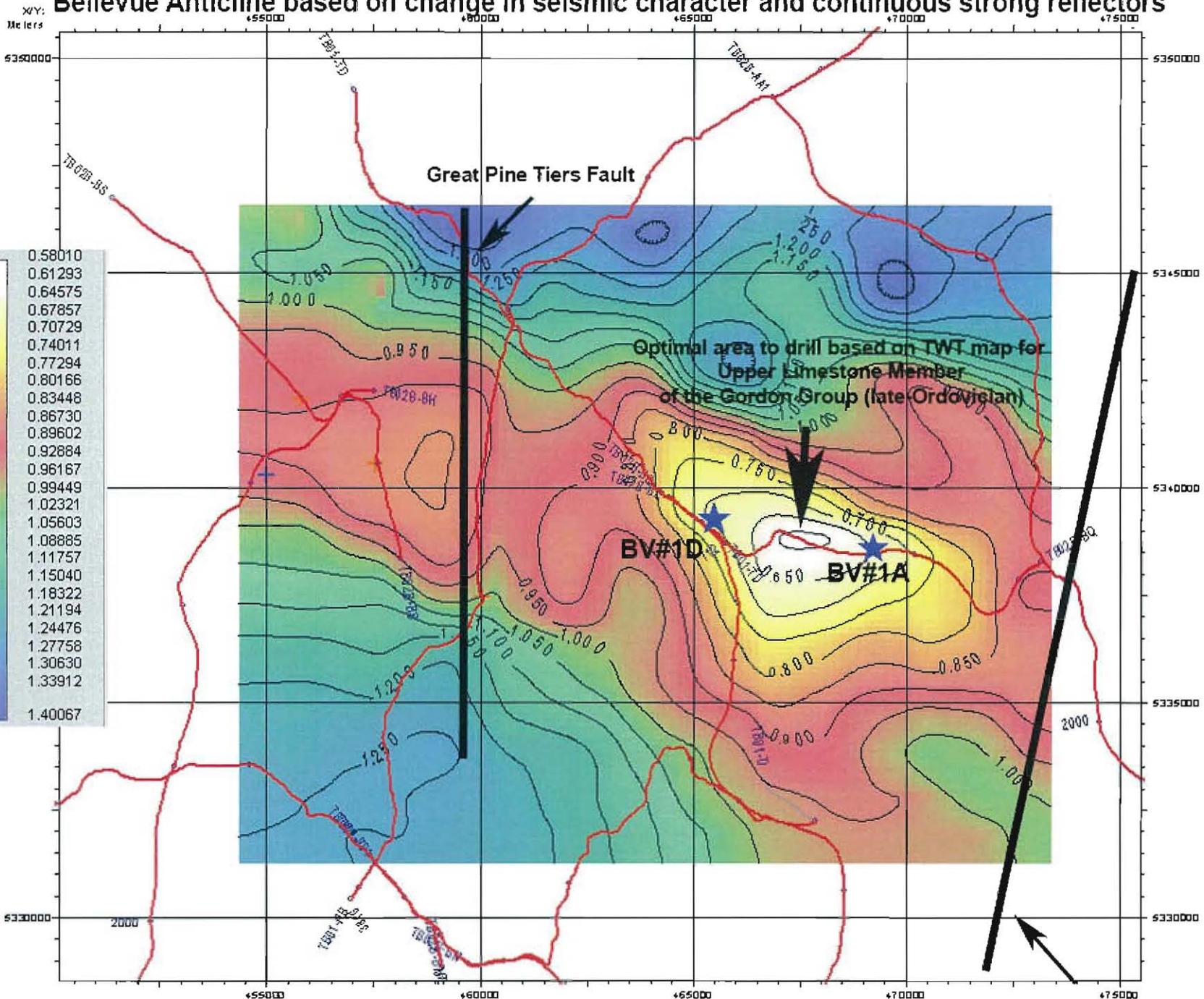
FAULTS: Pre-Middle Jurassic, early and late Tertiary movement pose some risk to the integrity of the reservoir.

Reservoir Volume as US Barrels (BOE) 283 million barrels (P90)

(Monte Carlo calculation of potential, undiscovered prospective resources) 620 million barrels (P50)
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**



**Optimal area to drill based on TWT map for
Upper Limestone Member
of the Gordon Group (late-Ordovician)**

BV#1D **BV#1A**

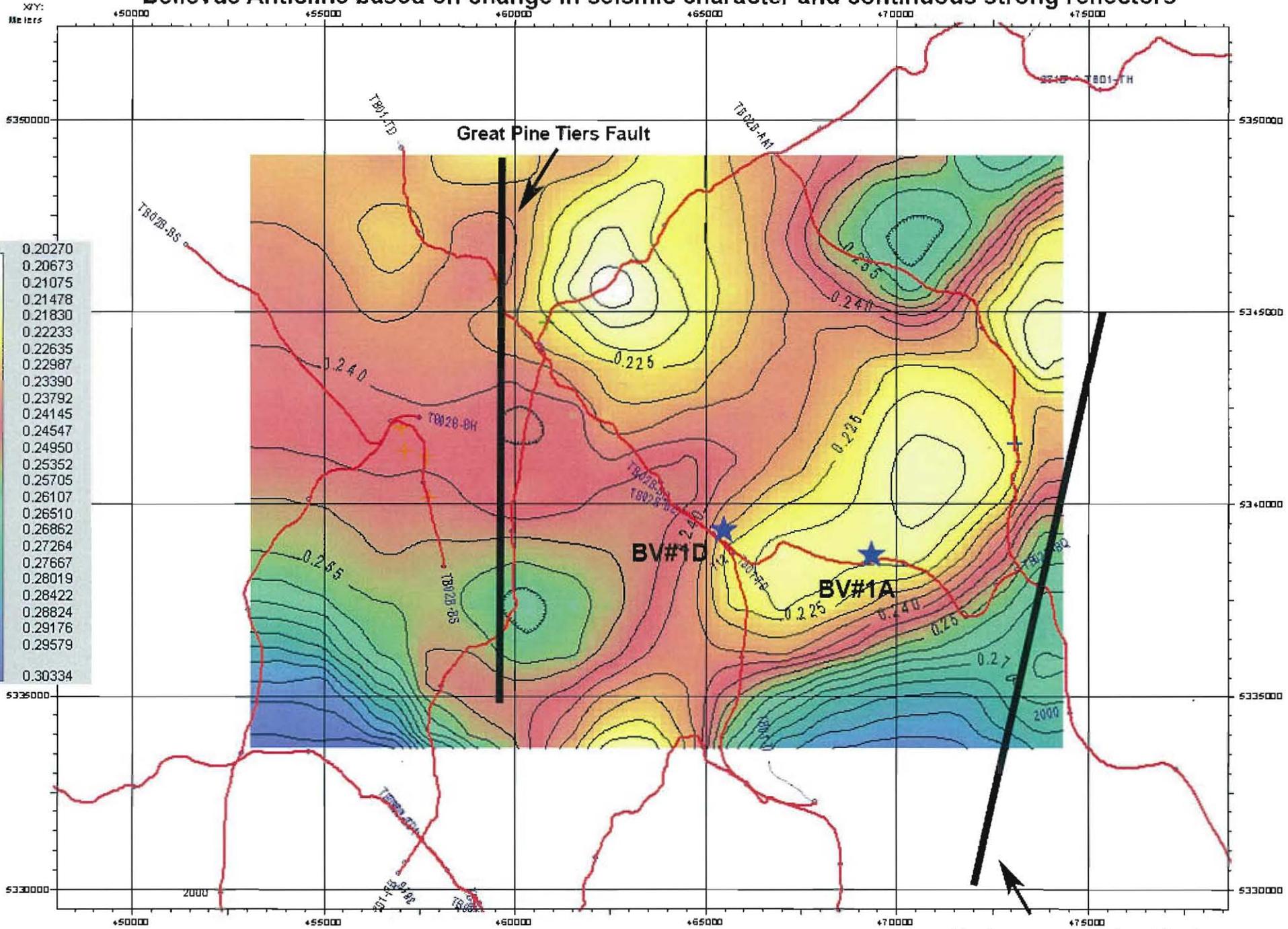
Great Pine Tiers Fault

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

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

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

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LEAD/PROSPECT DEFINITION

Thunderbolt Anticline

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 developed 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.

The anticline identified at the southern end of seismic line TB02-BA probably affects Eldon and Gordon Group sequences. The structure lies approximately half wavelength east of a large scale syncline mapped in the Florentine Valley (**Figures 2 & 3**).

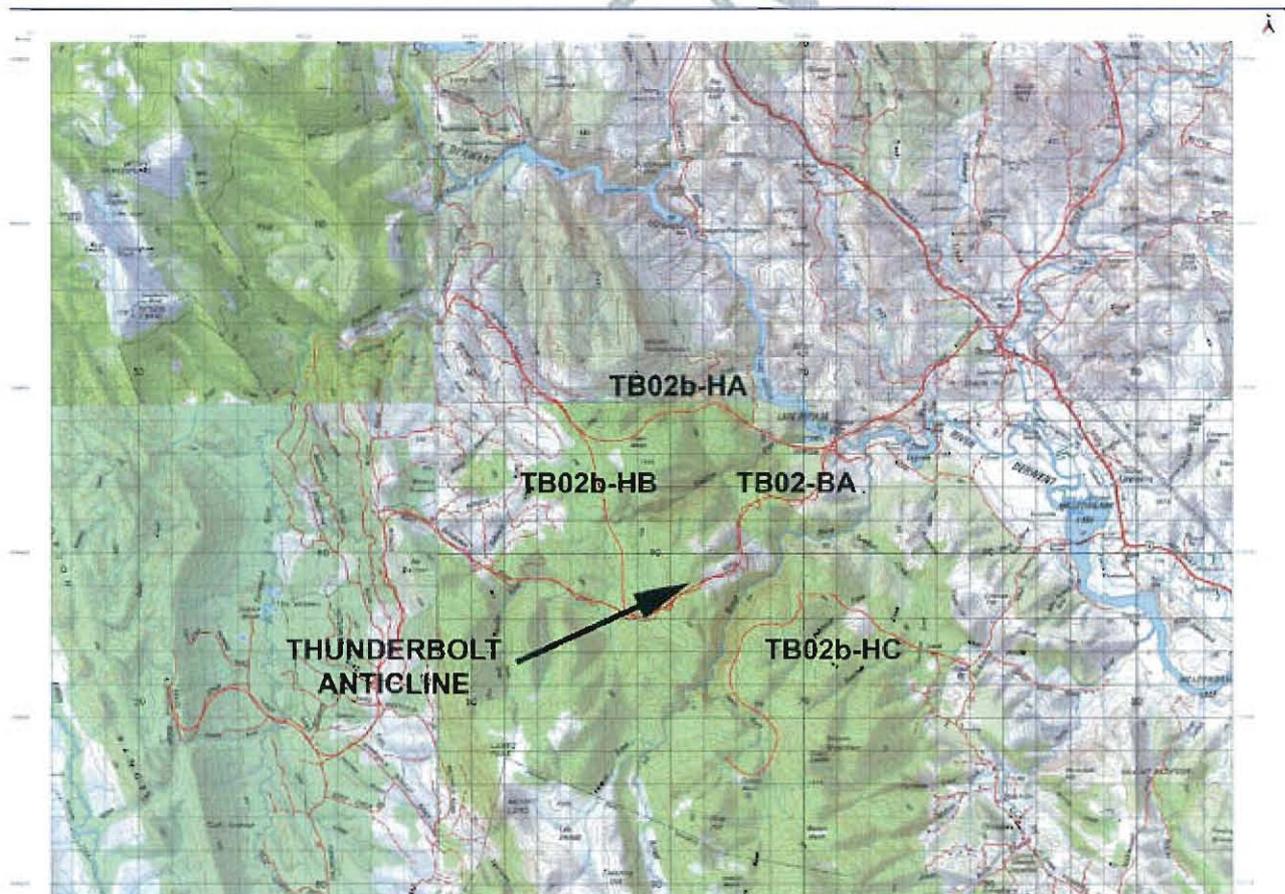


Figure 1: Topography Map. Location of the Thunderbolt Anticline on line TB02-BA

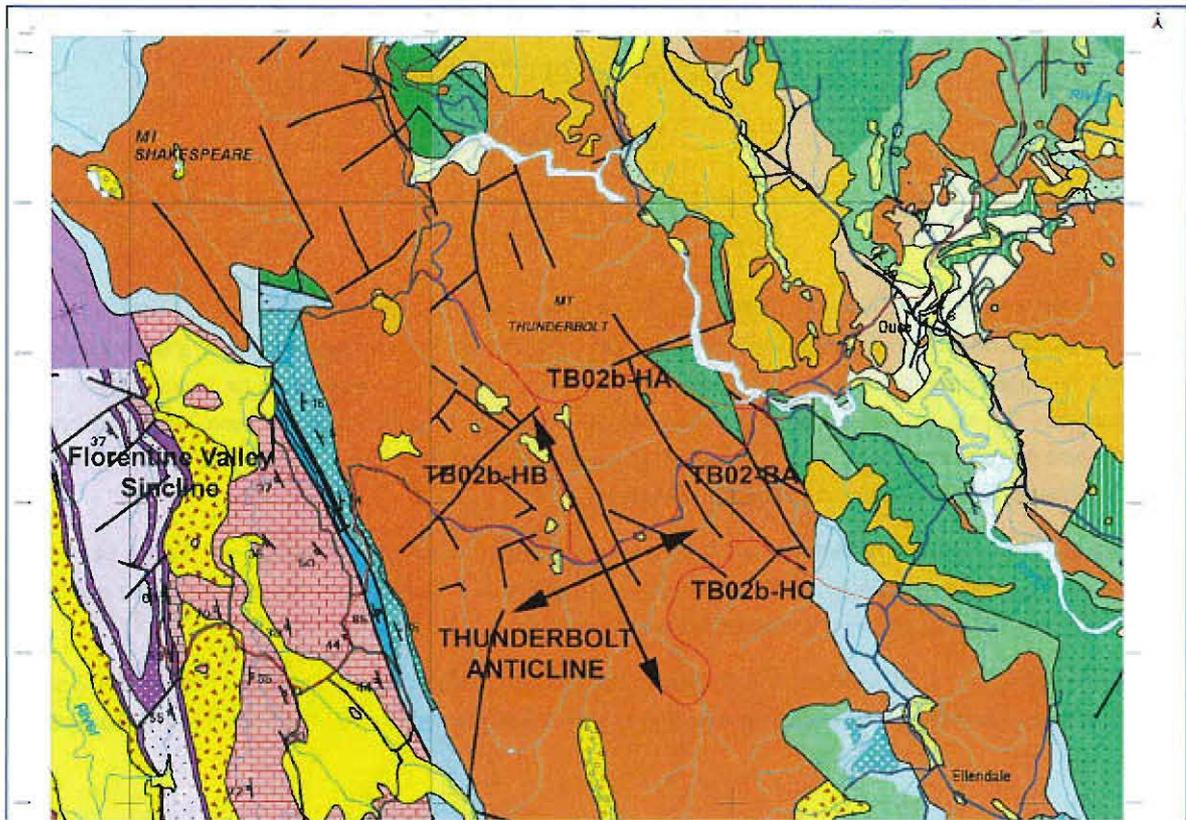


Figure 2: Extent of the Thunderbolt Anticline and the location of the similar sized Florentine Valley Syncline.

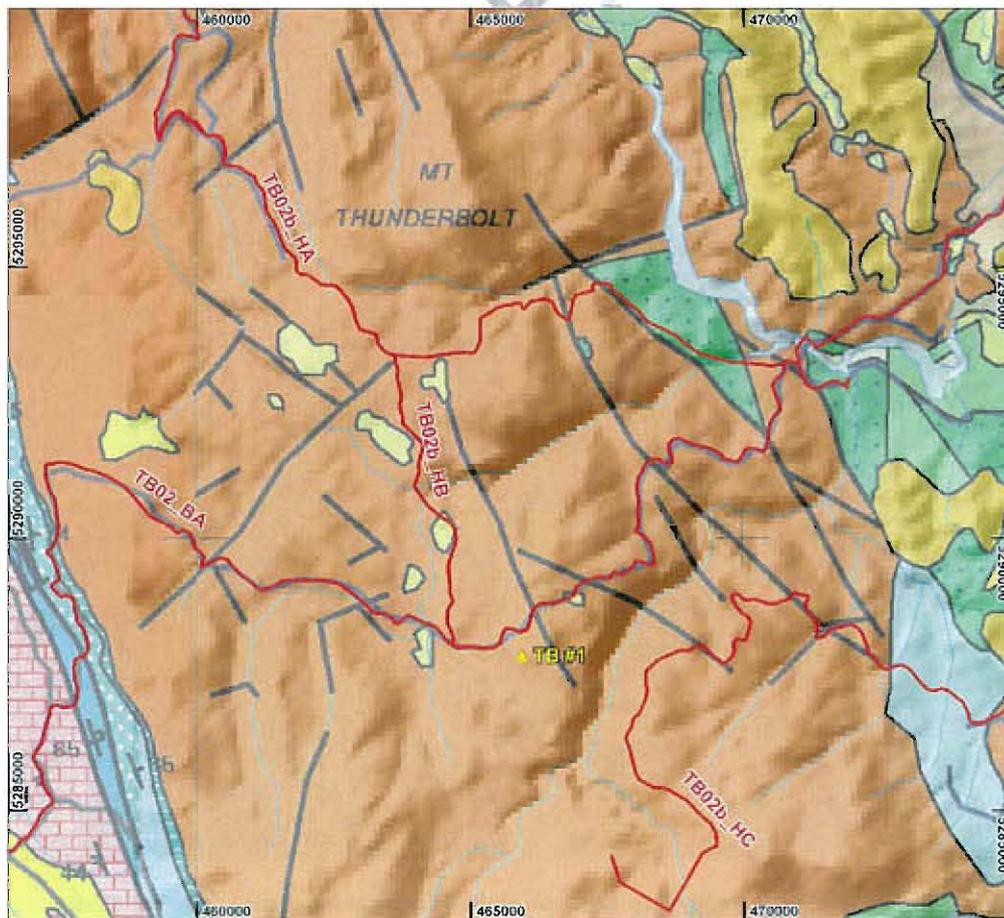


Figure 3: DEM Geology for the Thunderbolt Area

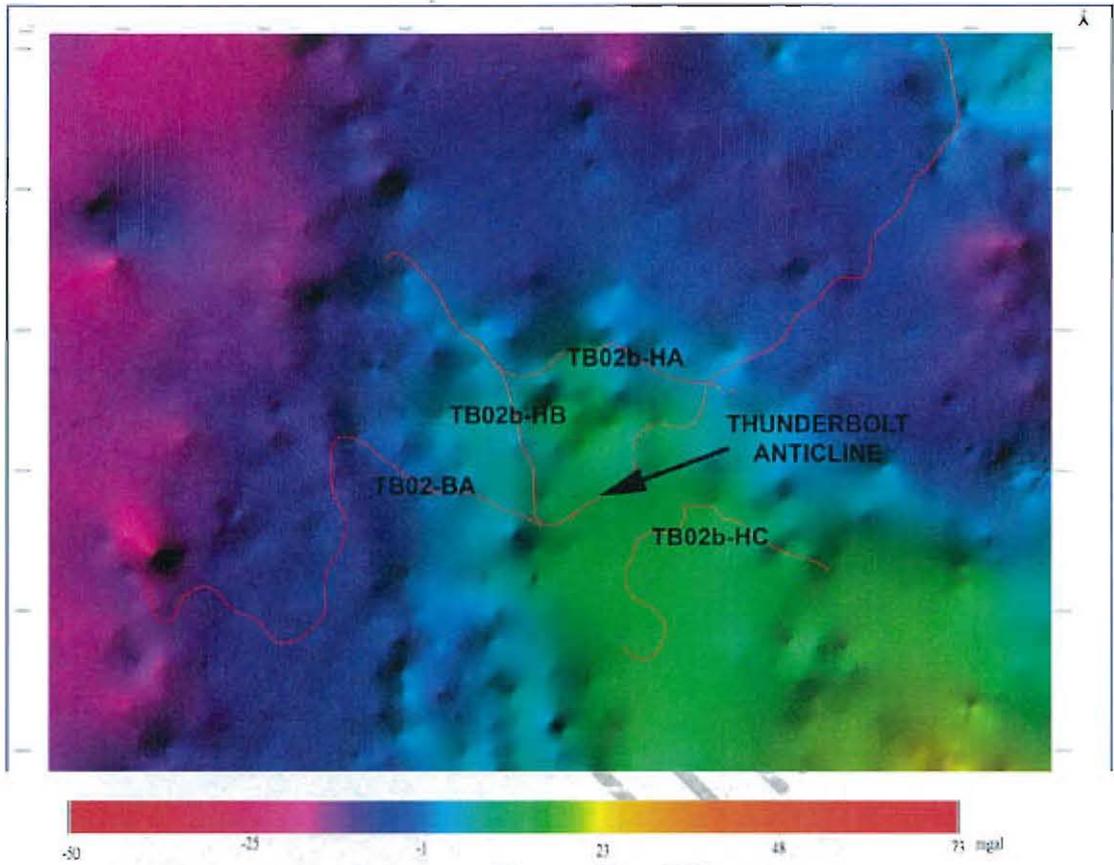


Figure 4: Gravity Map (Raw Bouguer Anomaly) - Thunderbolt Structure

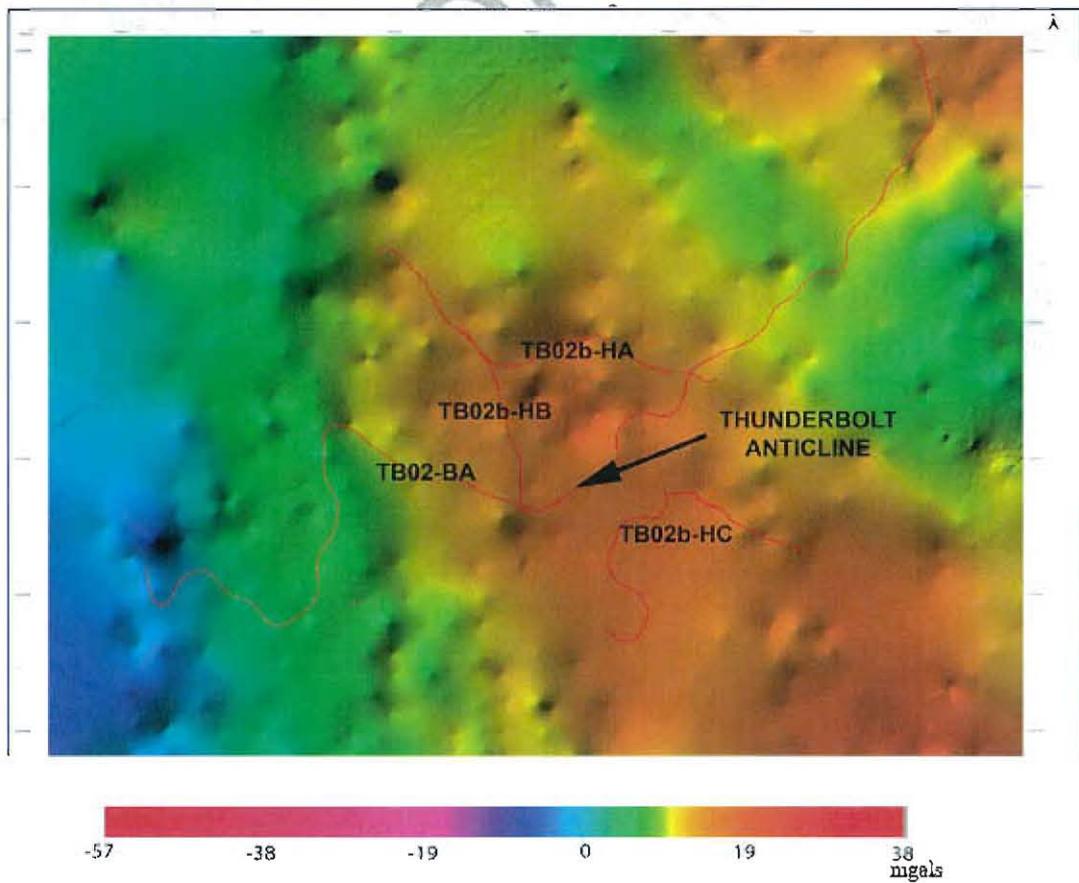


Figure 5: Gravity Map (Residual Bouguer Anomaly) - Thunderbolt Structure

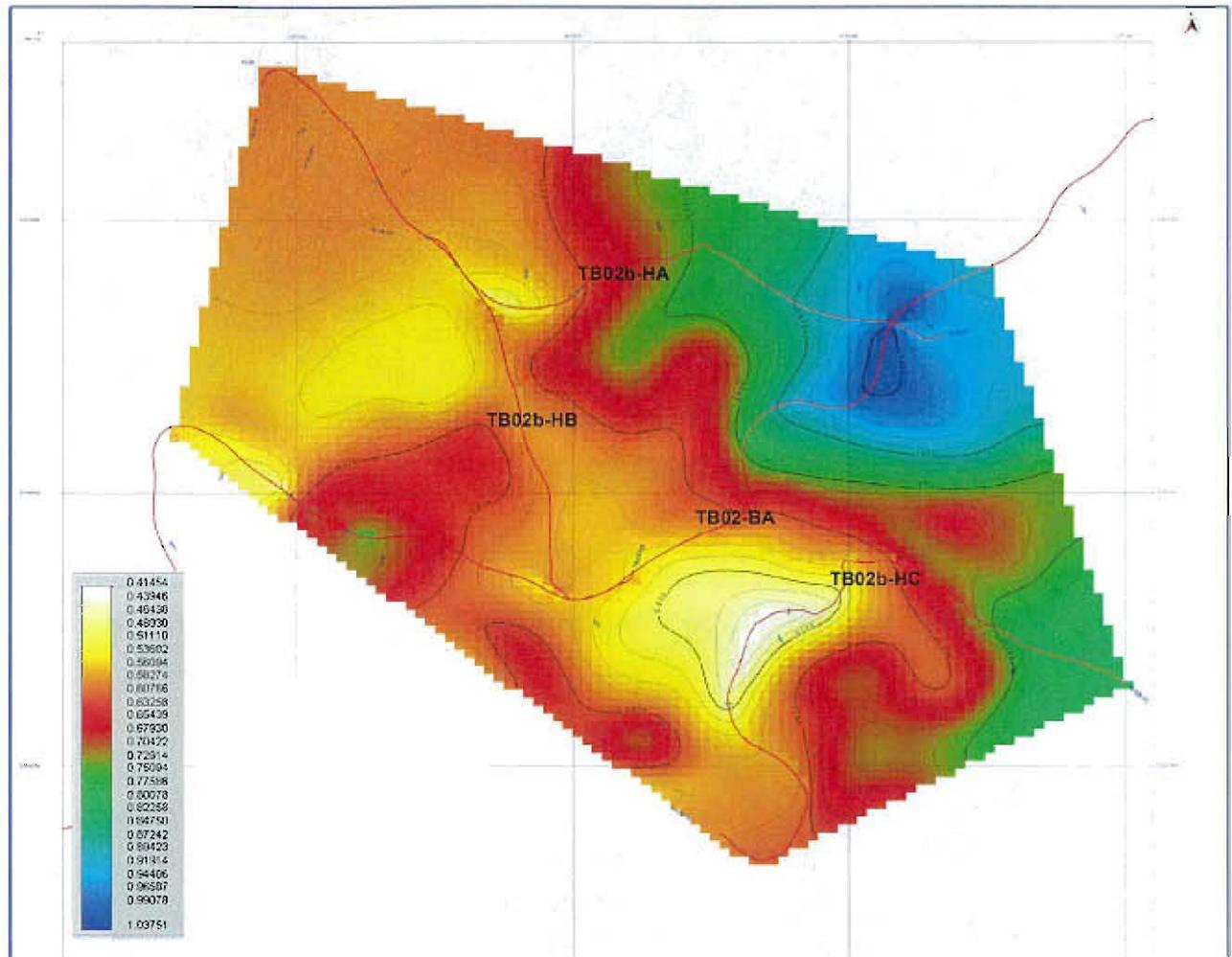


Figure 6: TWT Map for Upper Limestone Member of the Gordon Group (late-Ordovician) - Thunderbolt Anticline based on change in seismic character and continuous strong reflectors

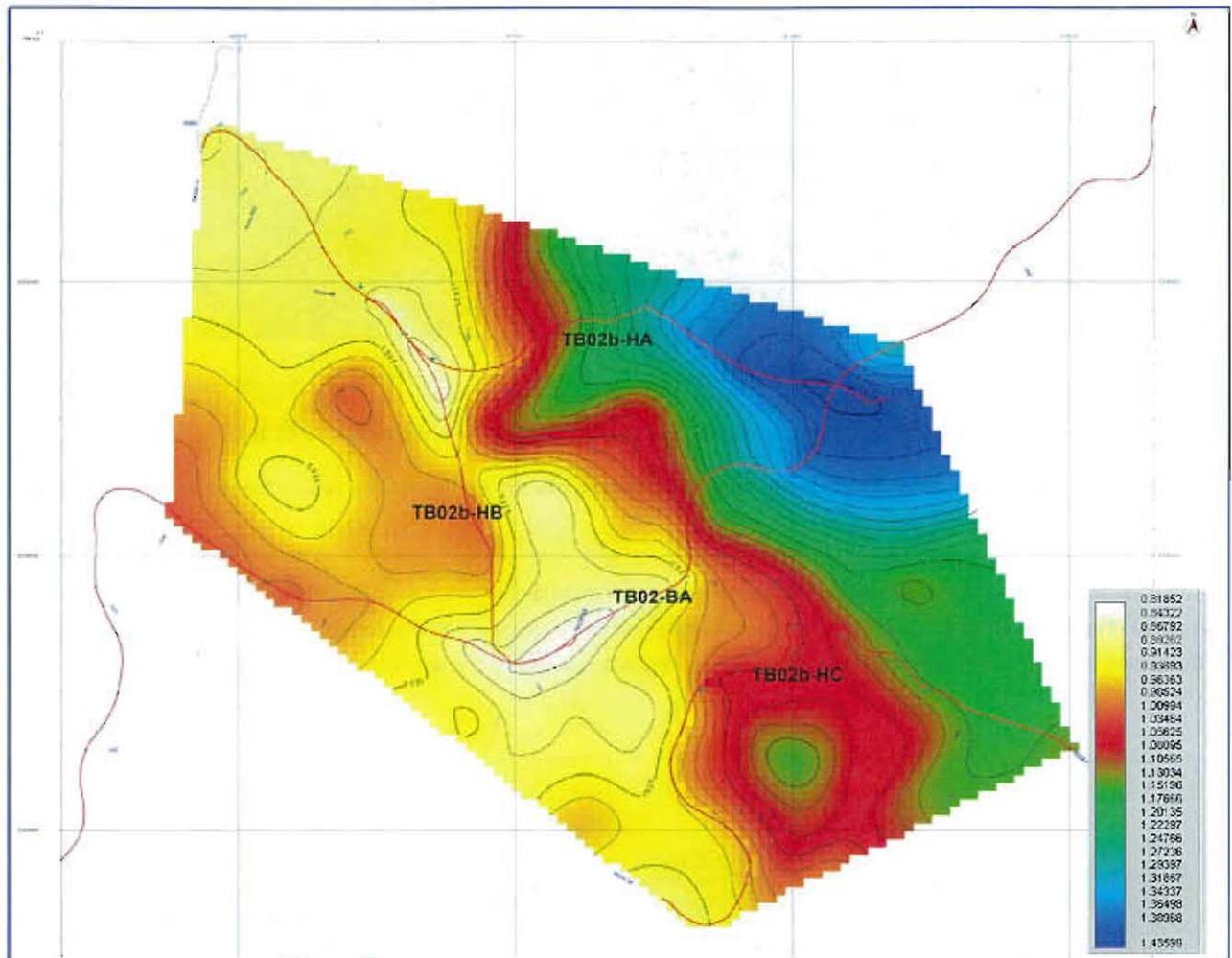


Figure 7: TWT Map for Lower Limestone Member of the Gordon Group (middle-Ordovician) - Thunderbolt Anticline based on change in seismic character and continuous strong reflectors

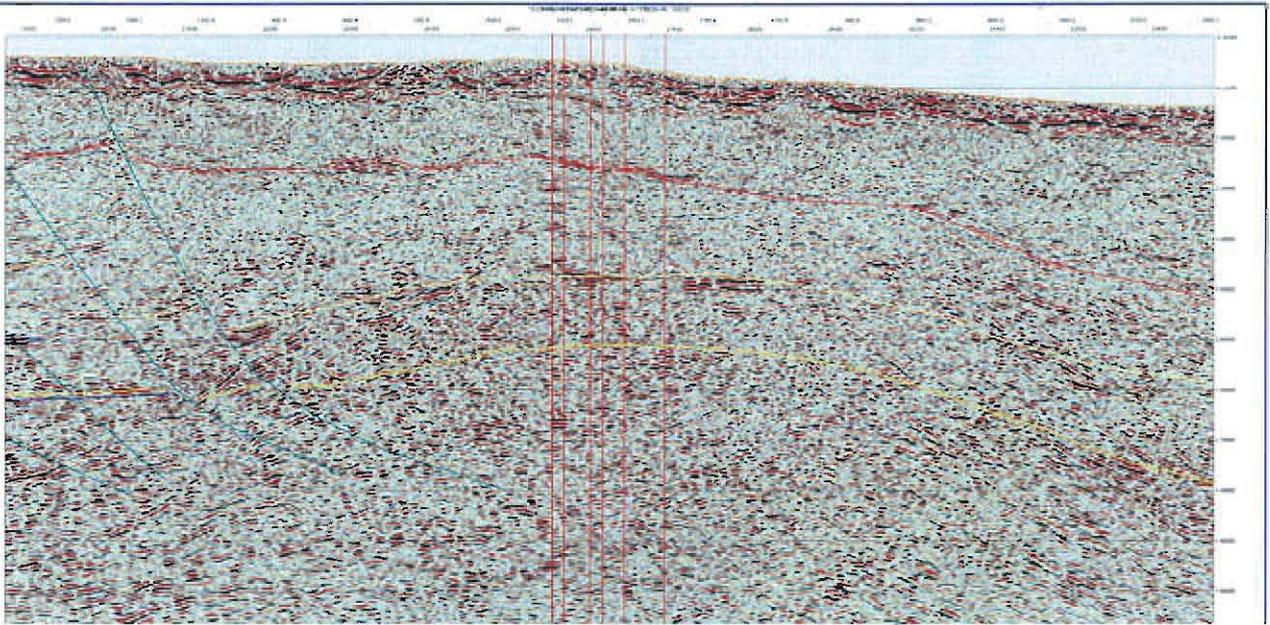


Figure 8: Seismic cross-section of the Thunderbolt Anticline on TB02-BA -

East-West thrusting is a very major event here and possible Silurian log is represented by the major reflection event

The crest of the structure is truncated by the Base Permian Unconformity which lies 1922 m (6305 ft) below the surface in this location (**Figure 8**). The shape of the structure is distorted of the seismic-section due to the crooked line acquisition (**Figure 8**). Other than the central anticlinal trap, other possible plays include palaeokarst and sub-unconformity traps.

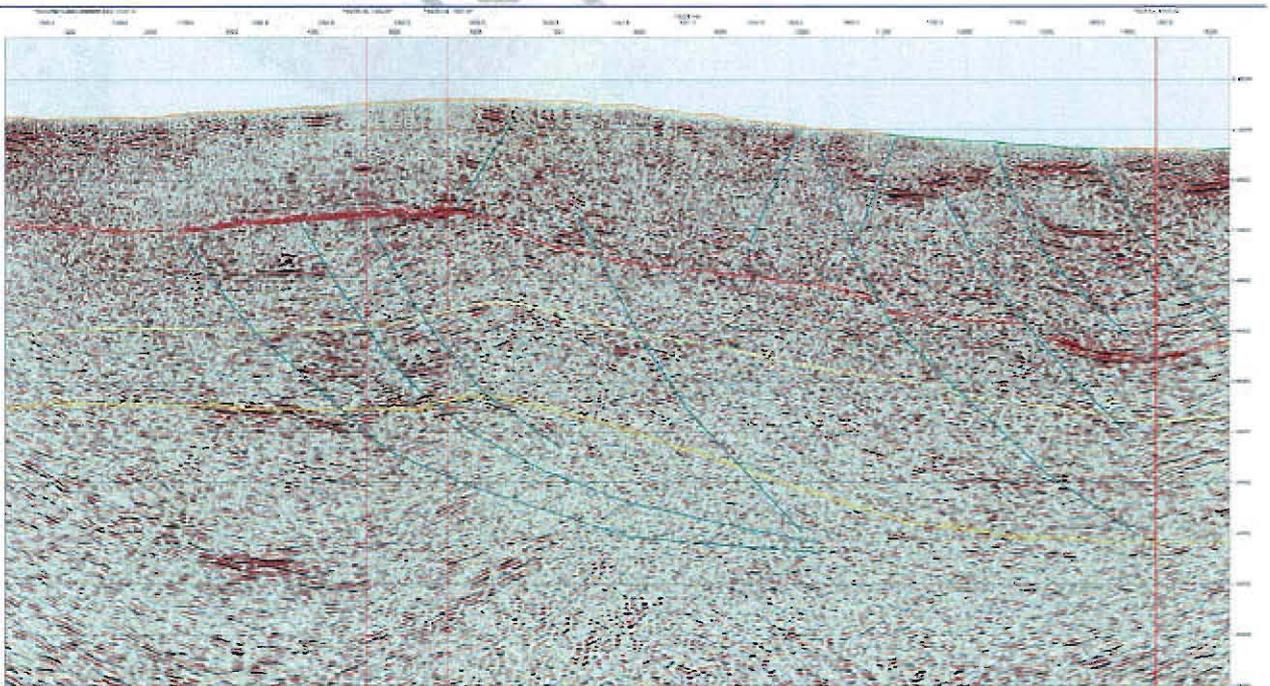


Figure 9: Seismic cross-section of the Thunderbolt Anticline on TB02b-HA

- Major Thrust faulting E-W

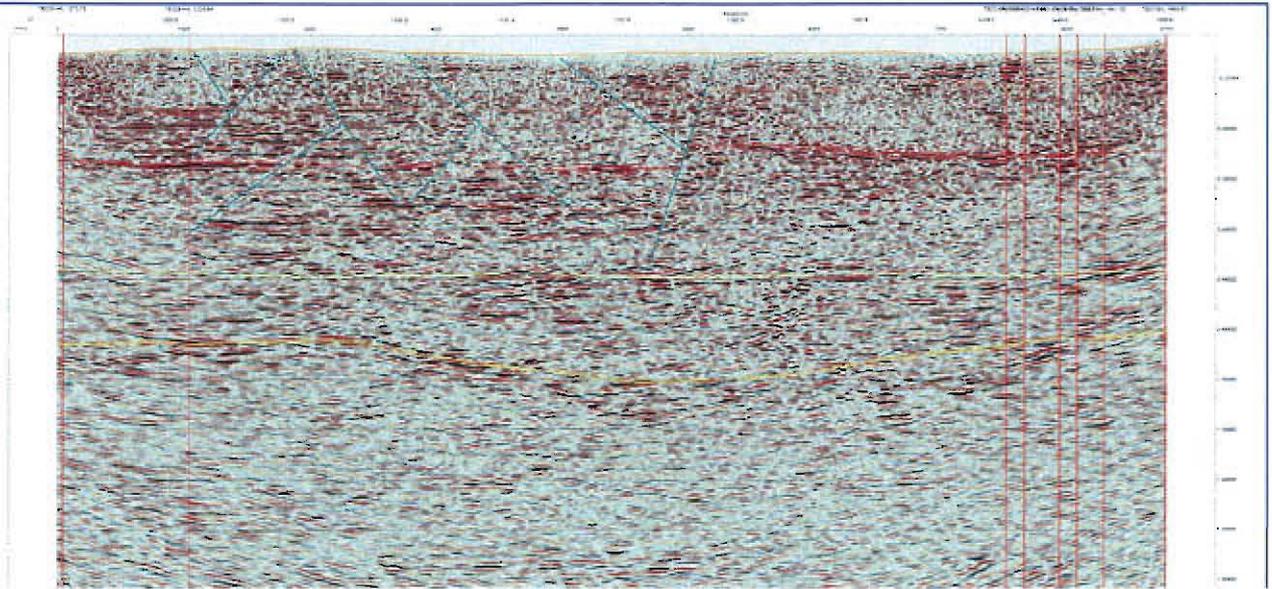


Figure 10: Seismic cross-section of the Thunderbolt Anticline on TB02b-HB
- Parallel to the strike of the possible thrust faults

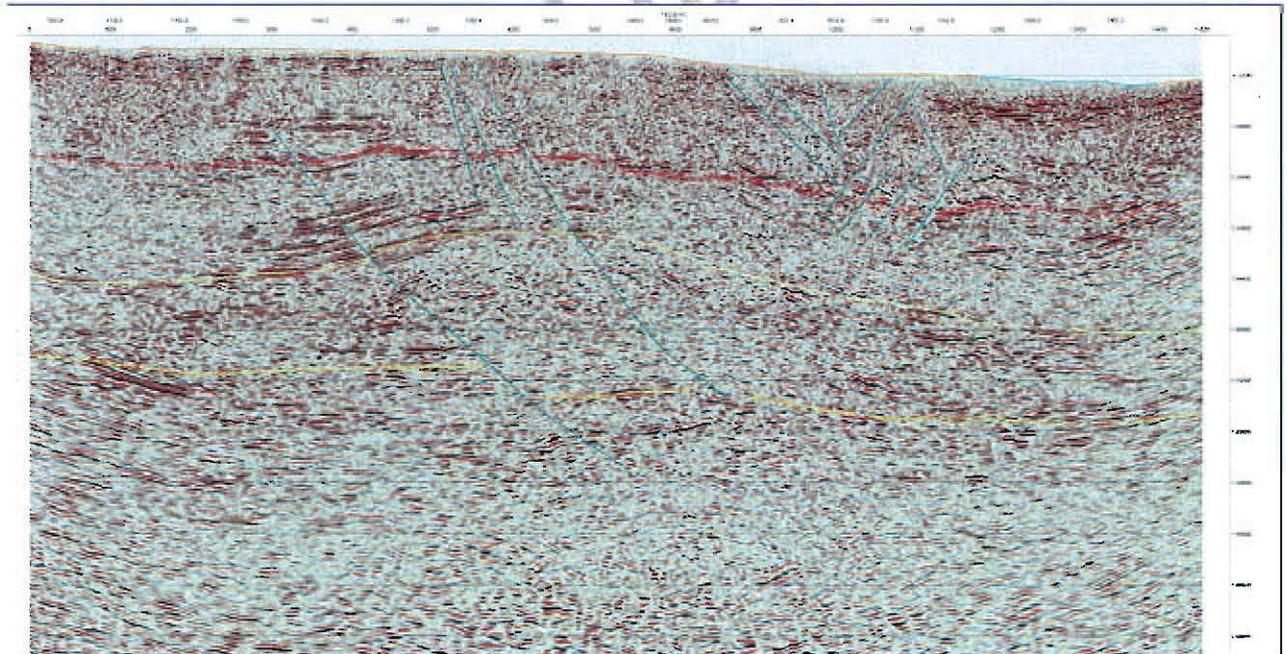


Figure 11: Seismic cross-section of the Thunderbolt Anticline on TB02b-HC
- Westward thrusting is evident on this section

Drill Hole: TB #1

Location: TBA

Landowner: TBA

Structure: Anticline

Size of structure: 3- way closure defined by TB02-BA, TB02b-HA, TB02b-HB, TB02b-HC

Target Surface Area: 35 km²

Estimated Depth of Drilling: 3000-3500m (9840-11483 ft) (Calculated using an average seismic velocity of 5000m/s for the Formations encountered)

Length: 10000 m (32 800 ft) (Similar to length of the Florentine Valley Structure),

Width of closure: 3500 m (1148 ft) @ *max thickness of horizontal reflectors.*

Pay zone: 250 m (984 ft) @ *max thickness of horizontal reflectors*

Estimated Porosity: ~8 %

Size of Potential Reservoir: 7.0 x 10⁹ m³ @ *max thickness of horizontal reflectors* (calculated using a rectangular prism to determine reservoir area and reservoir length of 10 km)

Traps: Anticline, palaeokarst and sub-unconformity

Seal: Jurassic Dolerite, Ferntree Formation

Reservoir: Unit 2 (Triassic), Unit 1, Faulkner Group (Permian), Upper Limestone Member (Ordovician)

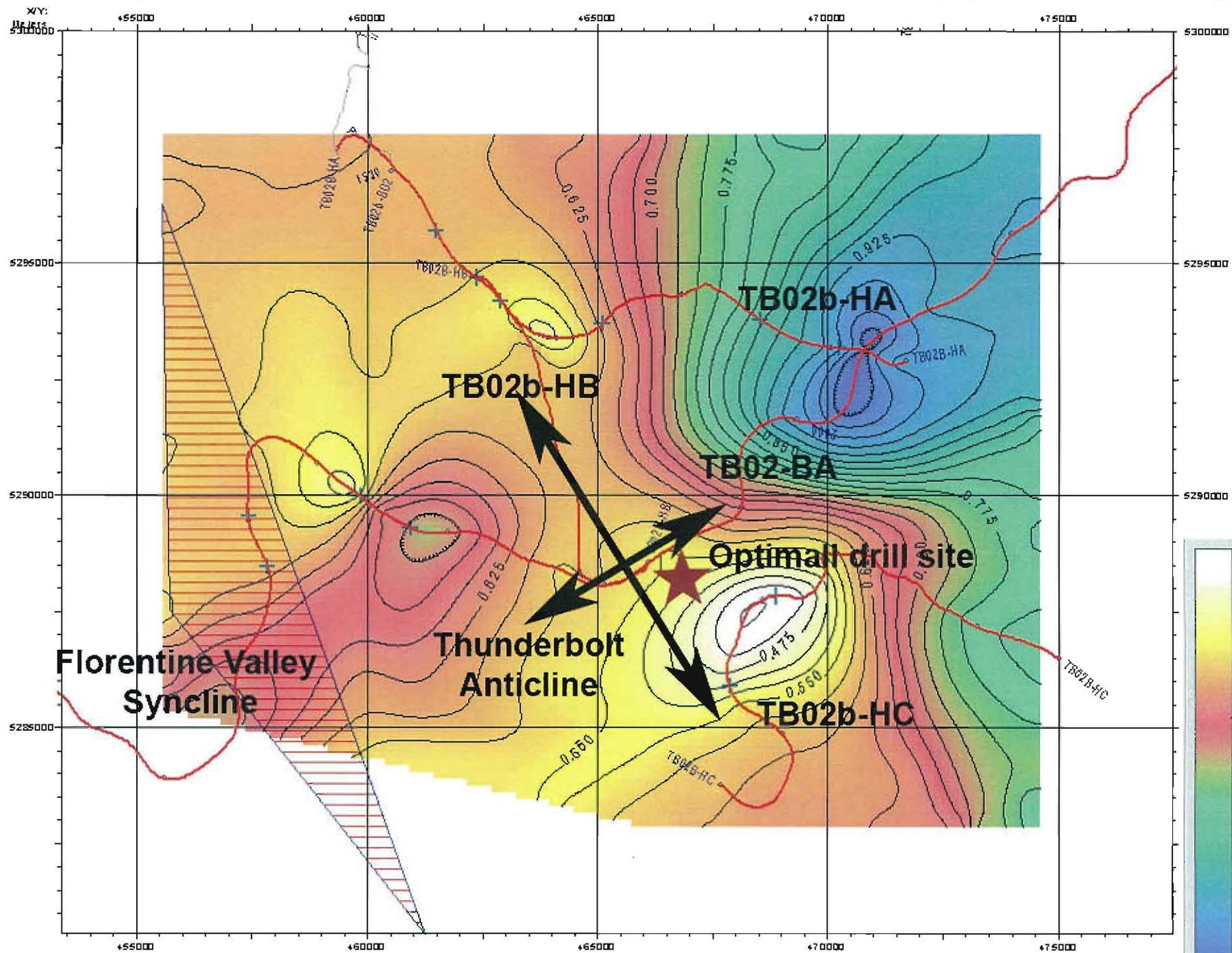
Source: Faulkner Group, Woody Island (Tasmanite oil shale), Upper Limestone Member, Lower Limestone Member (Gordon Group)

Risks: Source, quality and maturation. Recent work indicates the Gordon Group may be prospective for hydrocarbons. Potential source rocks are also present in Woody Island Siltstone.

Reservoir Volume as US Barrels (BOE)	116 million barrels (P90)
(Monte Carlo calculation of potential,	243 million barrels (P50)
undiscovered prospective resources)	468 million barrels (P10)

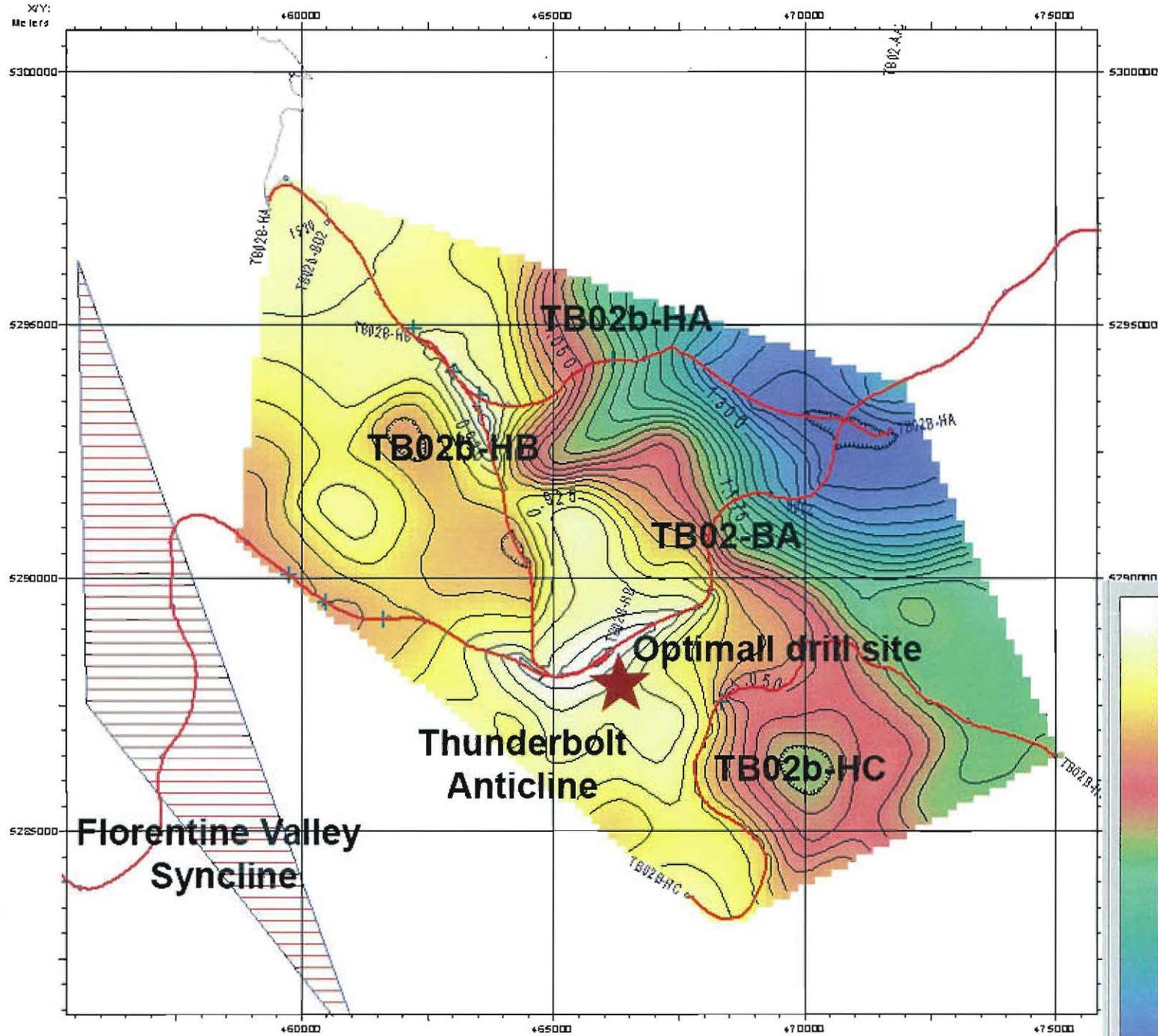
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TWT Map for Upper Limestone Member of the Gordon Group (late-Ordovician)



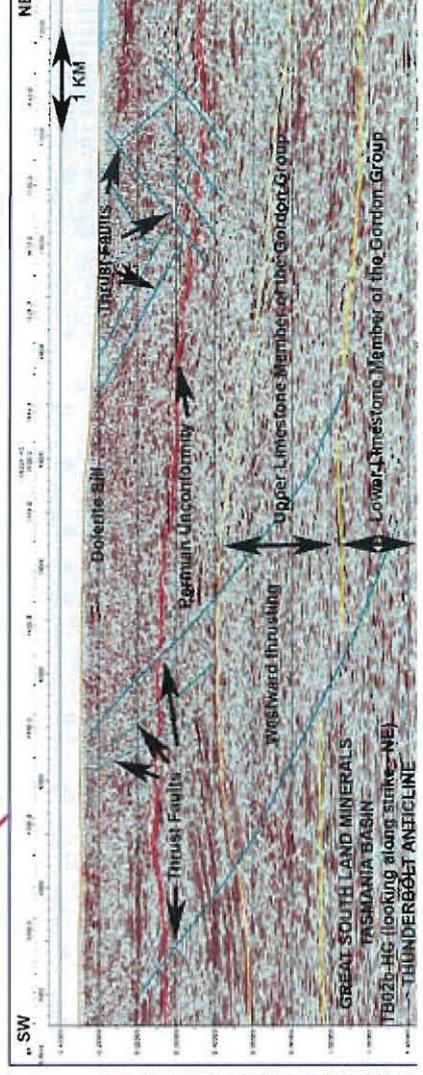
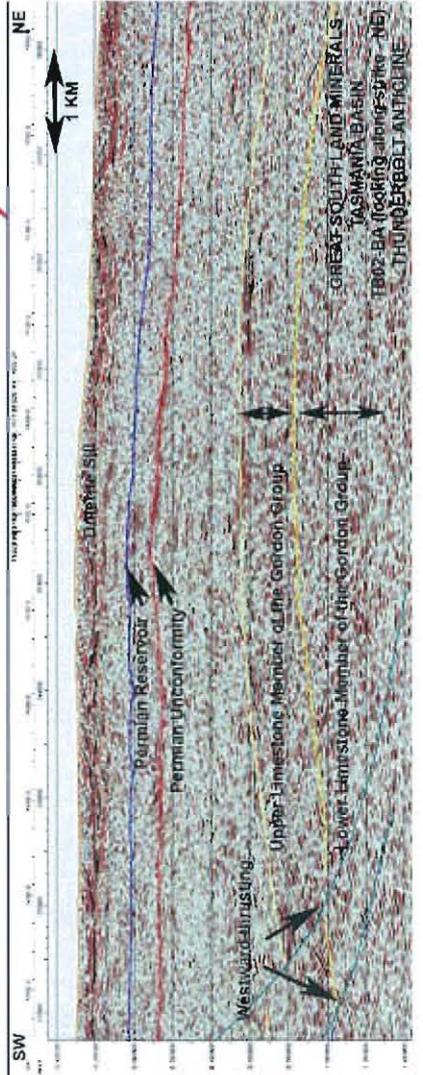
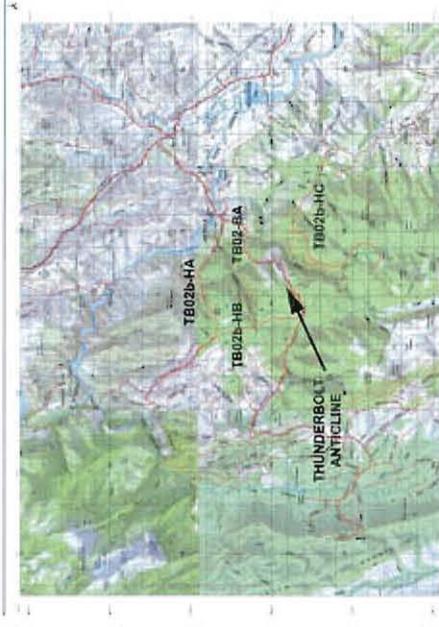
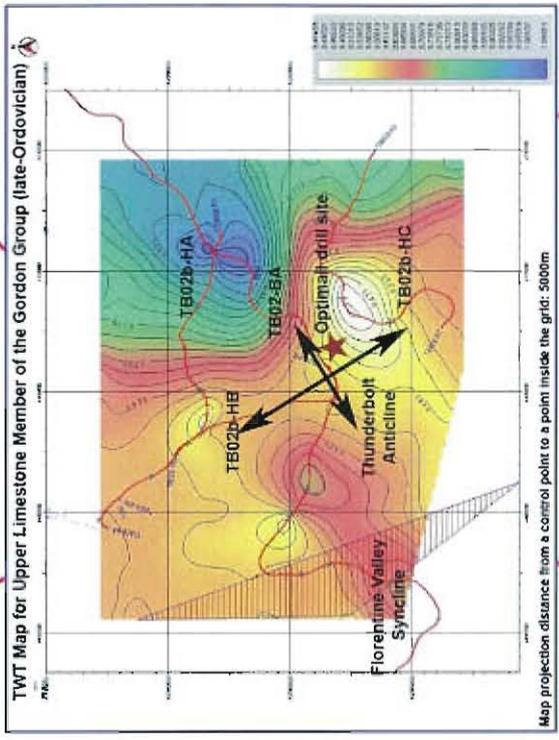
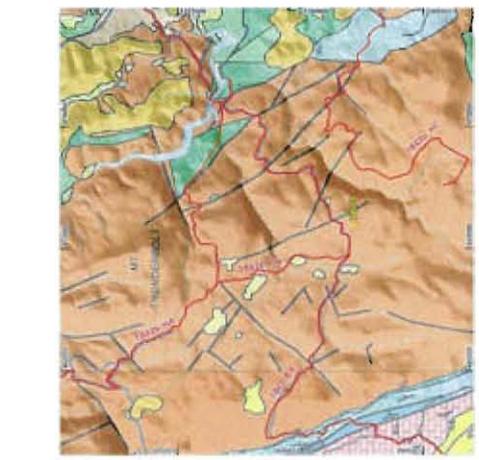
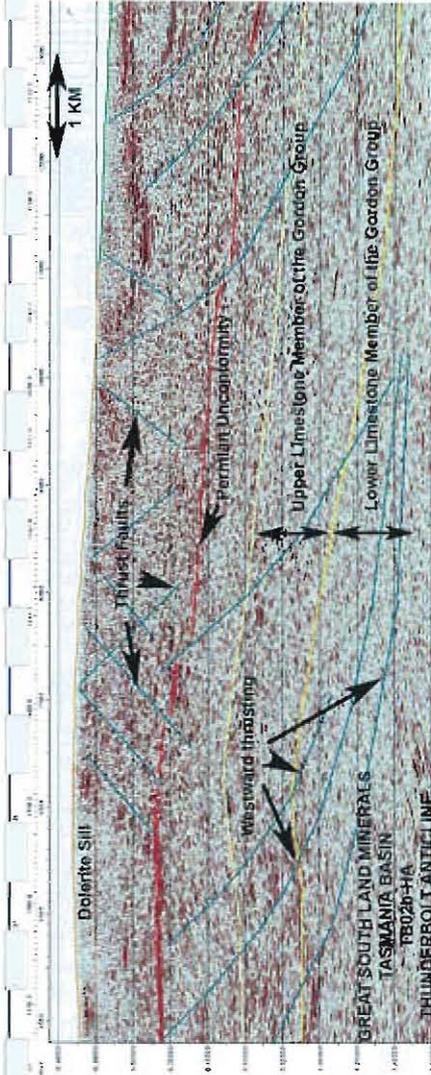
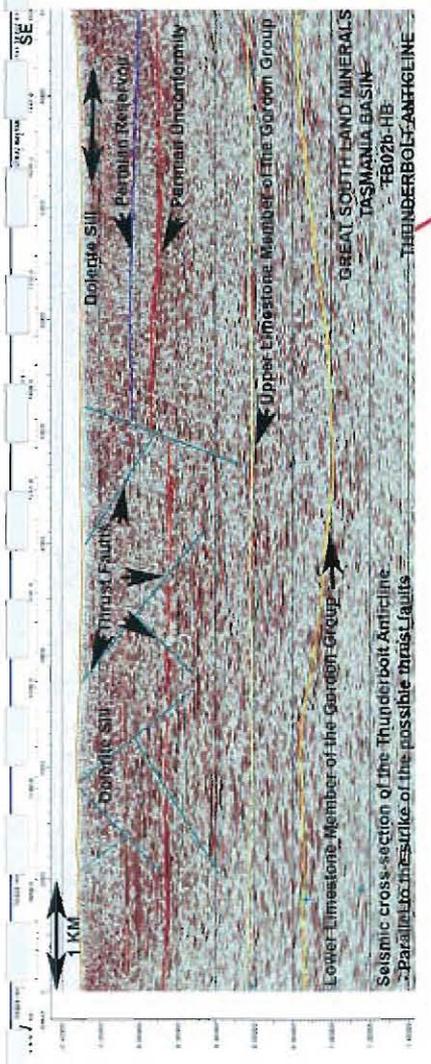
Map projection distance from a control point to a point inside the grid: 5000m

TWT Map for Lower Limestone Member of the Gordon Group (middle-Ordovician)



0.81852
0.84322
0.86792
0.89262
0.91423
0.93893
0.96363
0.98524
1.00994
1.03464
1.05625
1.08095
1.10565
1.13034
1.15196
1.17666
1.20135
1.22297
1.24766
1.27236
1.29397
1.31867
1.34337
1.36498
1.38968
1.43599

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



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LEAD/PROSPECT DEFINITION (Draft)
Stockwell (Lachish) - TB01-PT

The structure is defined by seismic lines TB01-PT, TB01-TE and TB01-PF.

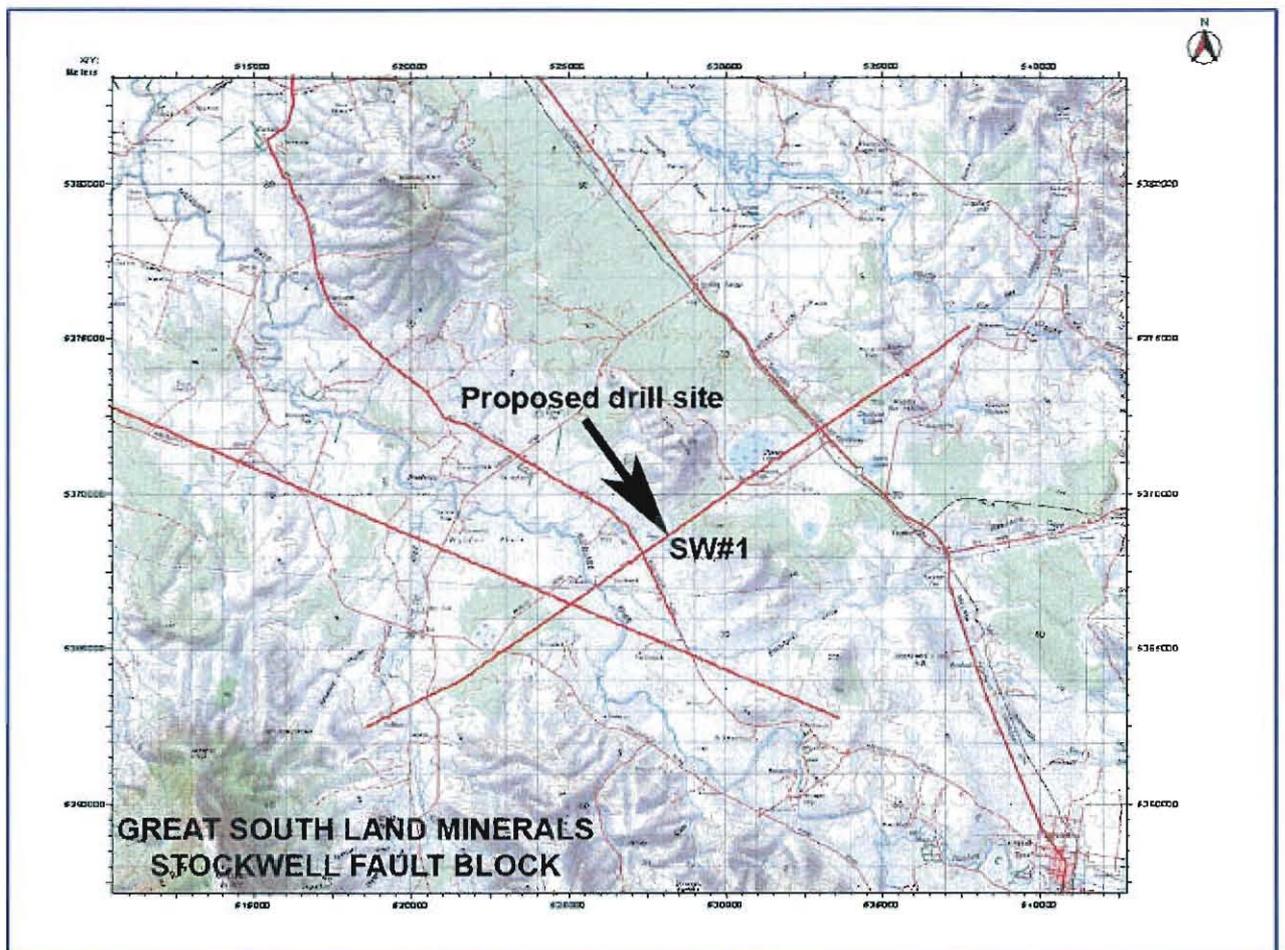


Figure 1: Topography Map - Stockwell Fault Block

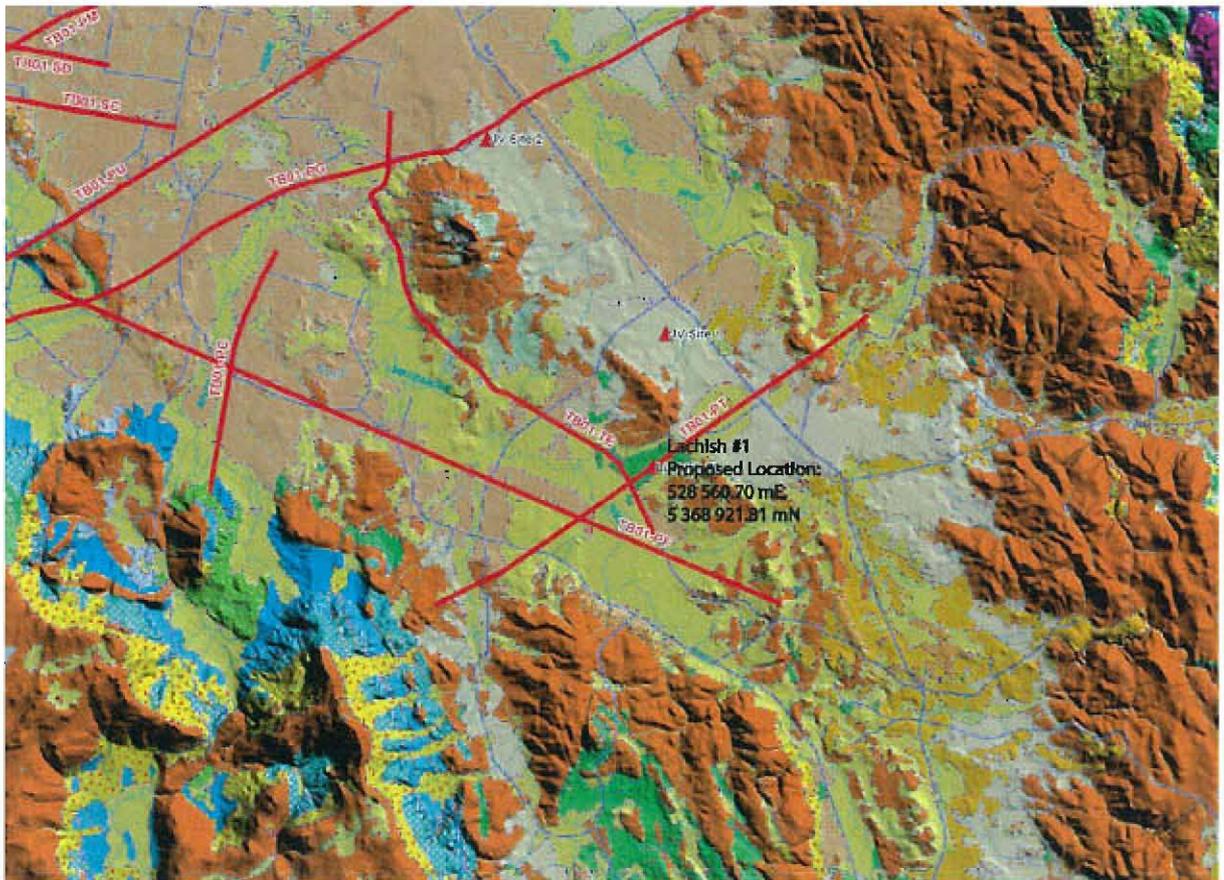


Figure 2: DEM Geology for the area (Dolerite outcropping in orange)

The gravity data is presented in terms of AMG66 zone 55 coordinates and AHD. **Figure 4** presents raw Bouguer anomalies (as observed, corrected and reduced), and **Figure 5** shows residual Bouguer anomalies (after removal of crustal trends using the method of Leaman & Richardson, 1989 and Roach et al, 1994).

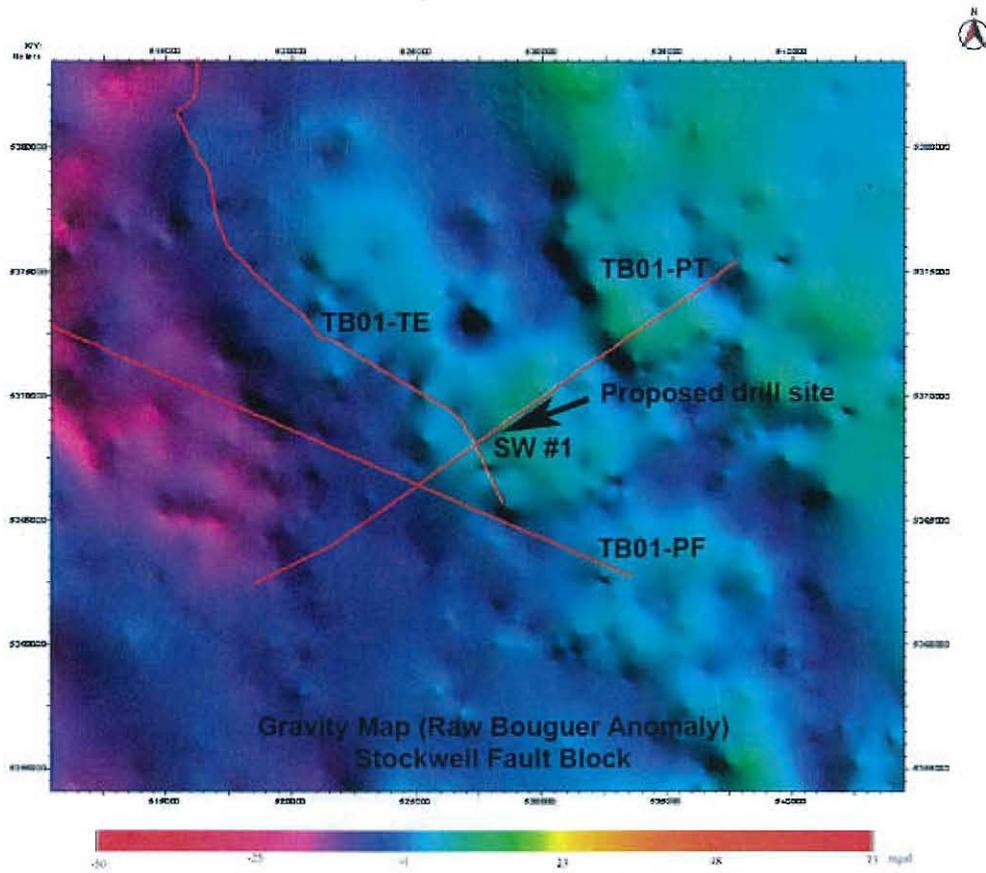


Figure 4: Gravity Map (Raw Bouguer Anomaly), Stockwell Fault Block

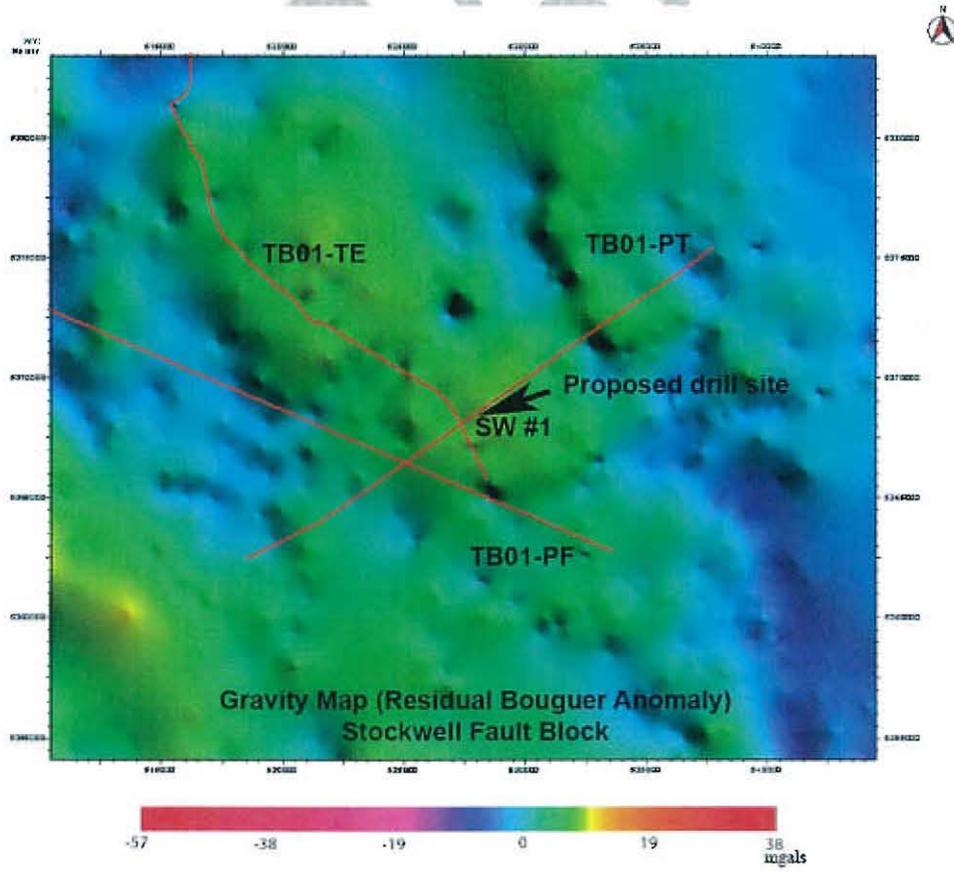


Figure 5: Gravity Map (Residual Bouguer Anomaly), Stockwell Fault Block

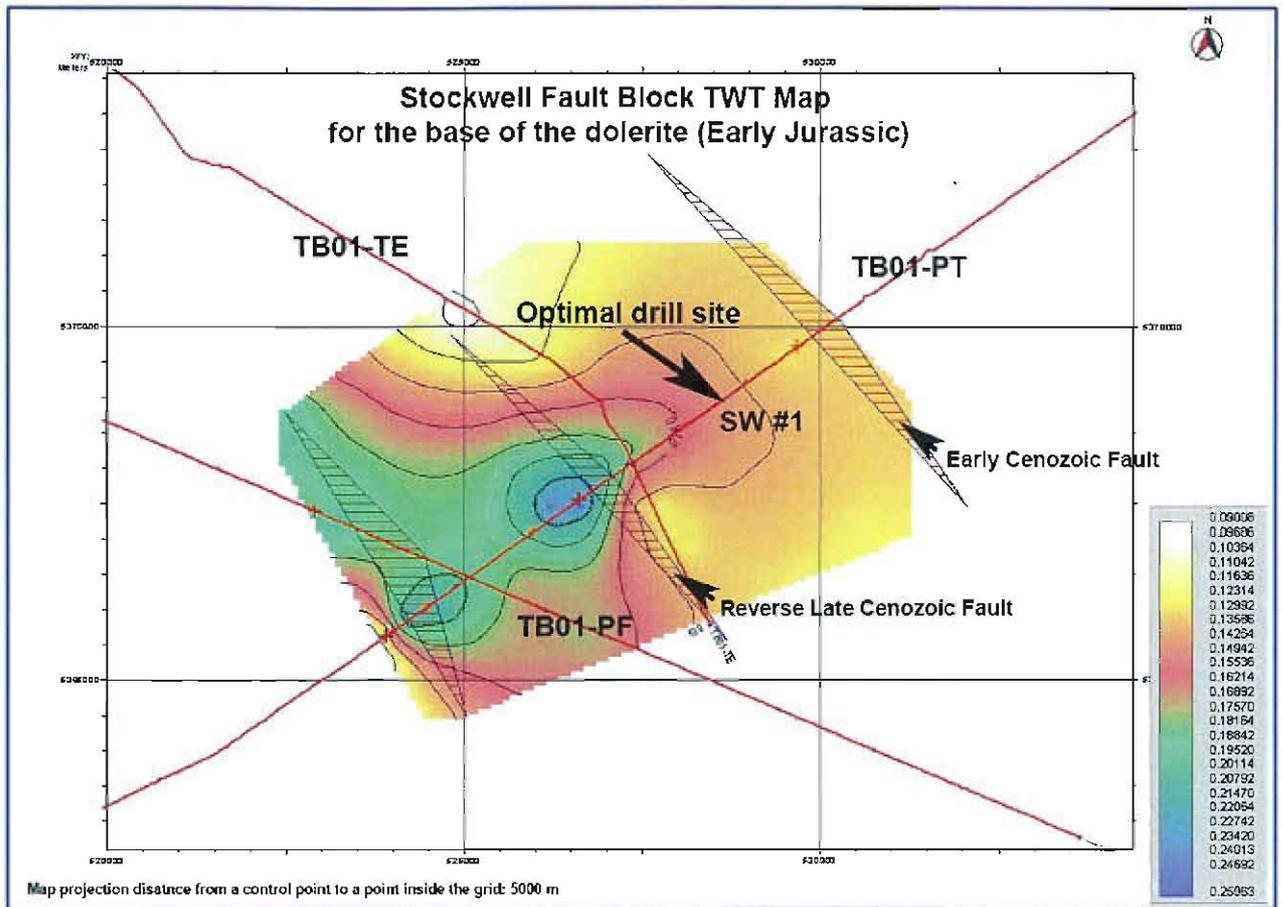


Figure 6: Stockwell Fault Block - TWT Map for the base of dolerite (Early Jurassic) based on change in seismic character and continuous strong reflectors

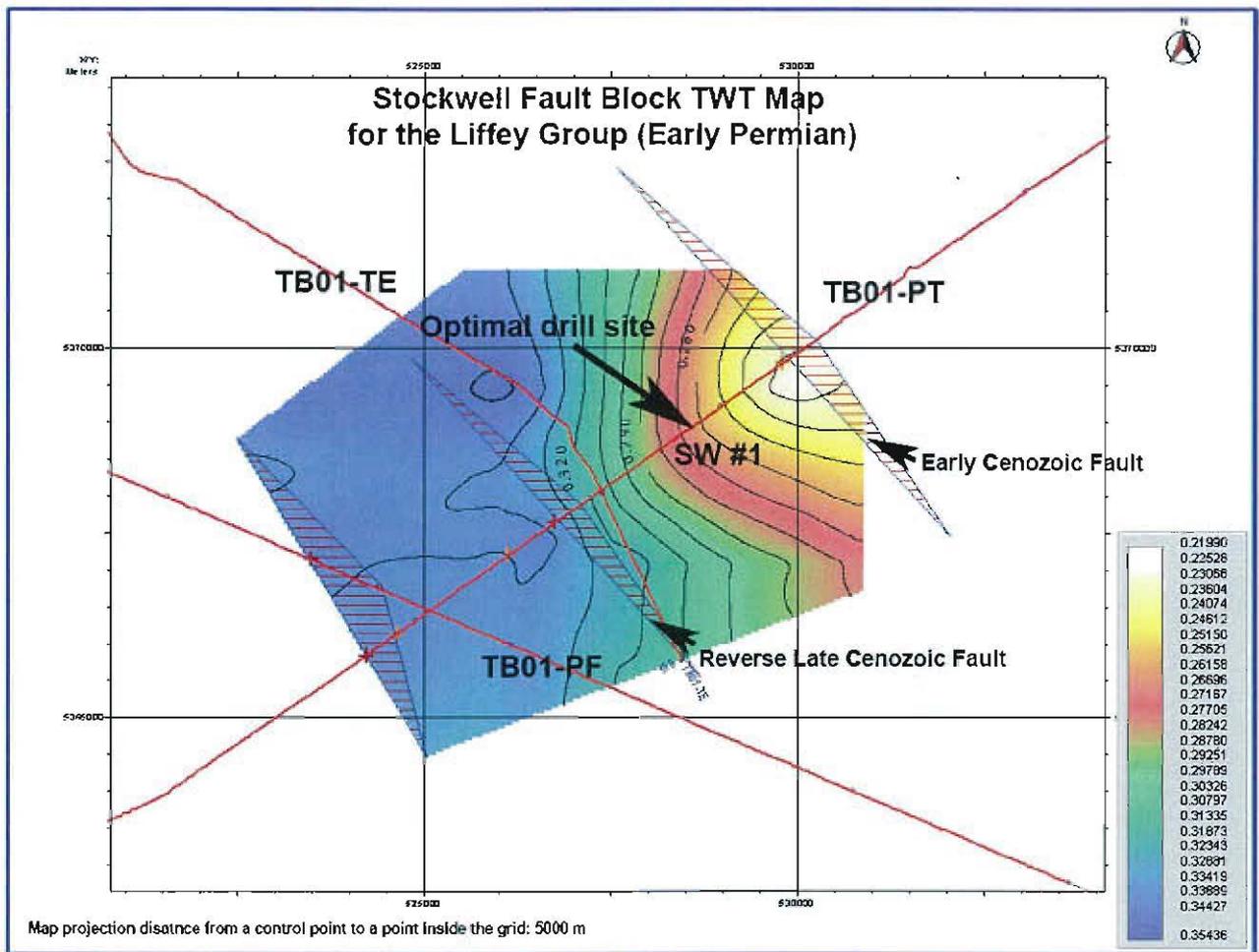


Figure7: Stockwell Fault Block - TWT Map for the Liffey Group (Early Permian) based on change in seismic character and continuous strong reflectors

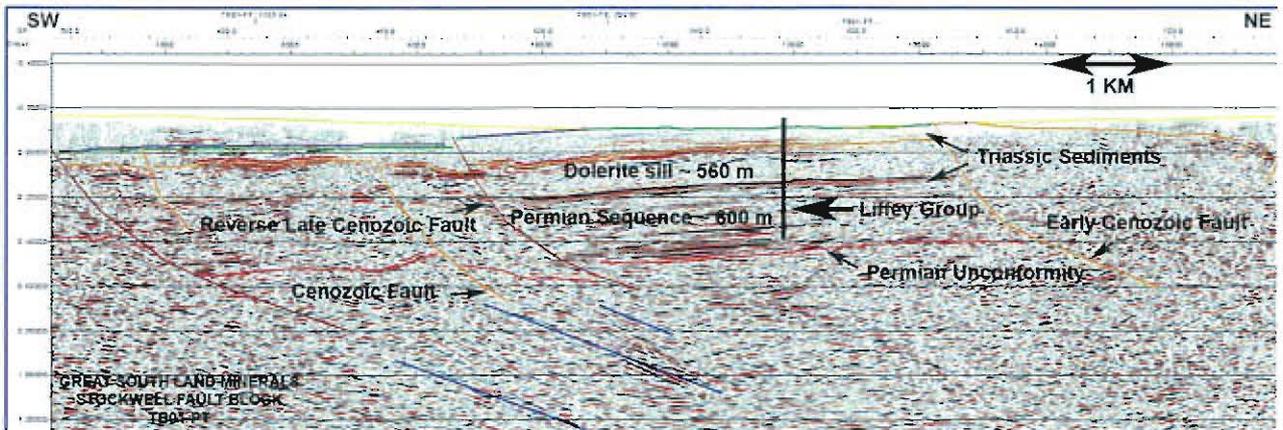


Figure 8: Stockwell Fault Block on TB01-PT

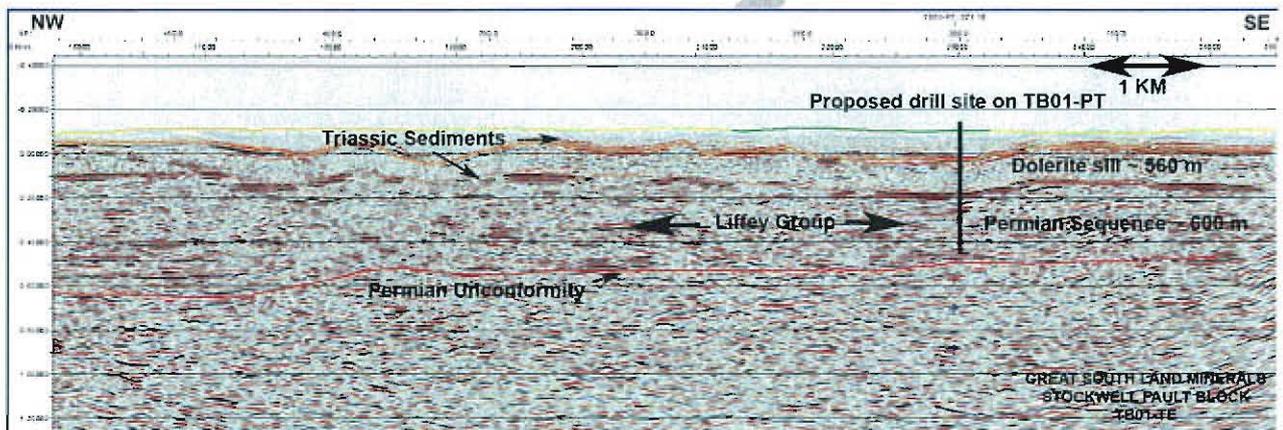


Figure 9: Stockwell Fault Block on TB01-TE

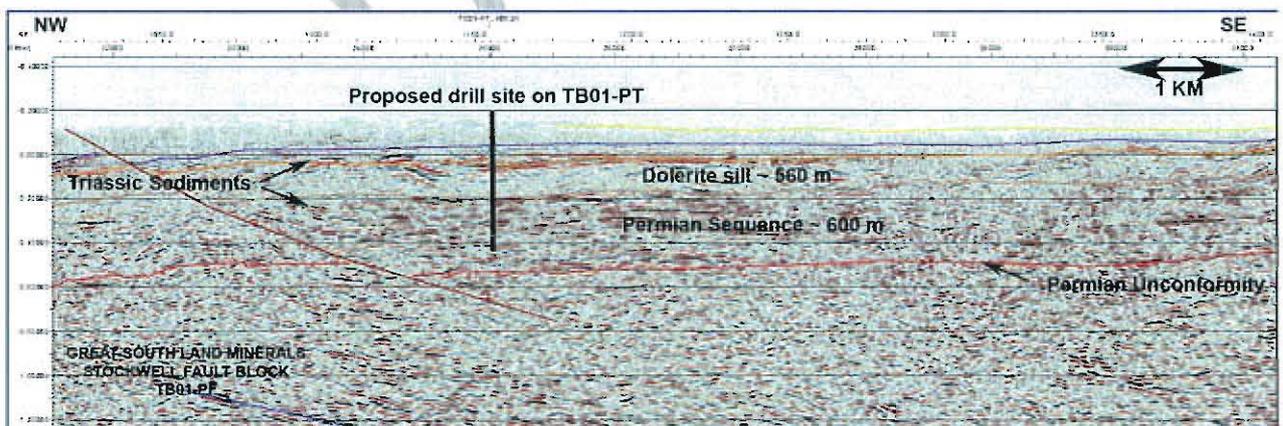


Figure 10: Stockwell Fault Block on TB01-PF

Stockwell (Lachish)

Drill Hole: Stockwell #1

Location: 528 560.70 mE, 5 368 921.81 mN

Landowner:

On seismic line: TB01-PT between shot-points: 550 and 650

Structure: Fault Block bounded to the NE by an Early Tertiary Fault and to the SW by a Later Tertiary Fault

Size of structure: 3500m (two-way)

Size of potential reservoir (based on 1km square area, 50m Pay Zone, 10% Porosity):

5 MM m³ in situ (Unit 2)

Size of potential reservoir (based on 1.2km square area, 15m Pay Zone, 5% Porosity):

1 MM m³ in situ (Liffey Group)

Depth to Target: Multiple Targets, Unit 2-Triassic, Liffey Group-Lower Permian Supergroup

Top Unit 2 ~ 800m

Liffey Group ~ 1200m

Seal: Jurassic Dolerite, Ferntree Formation

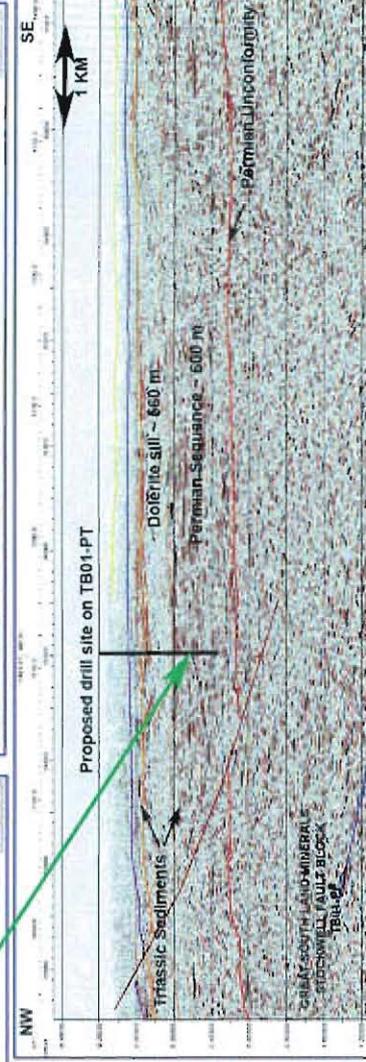
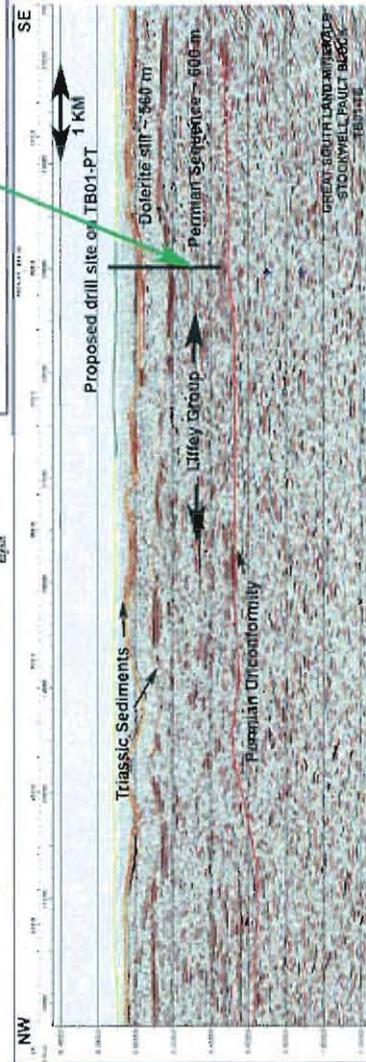
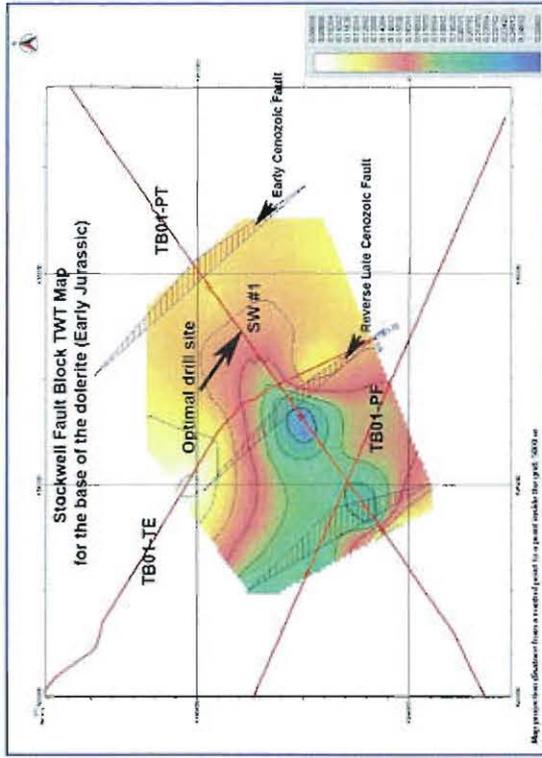
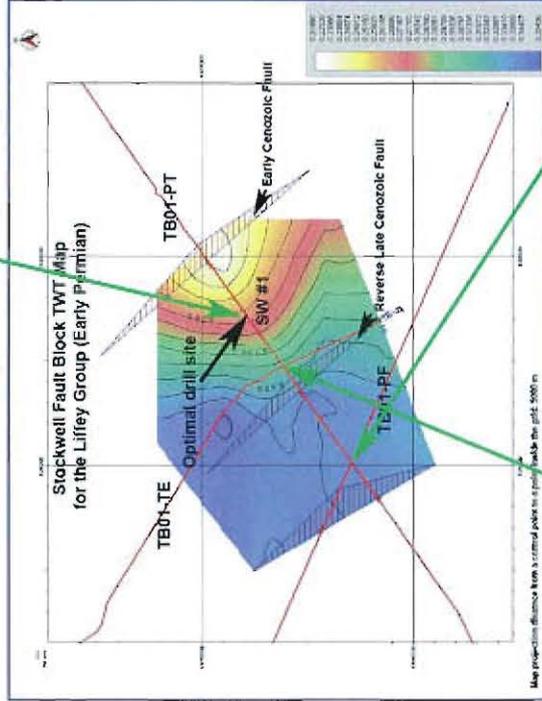
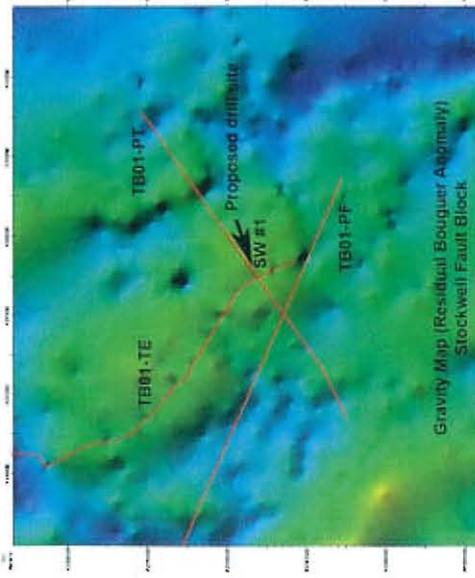
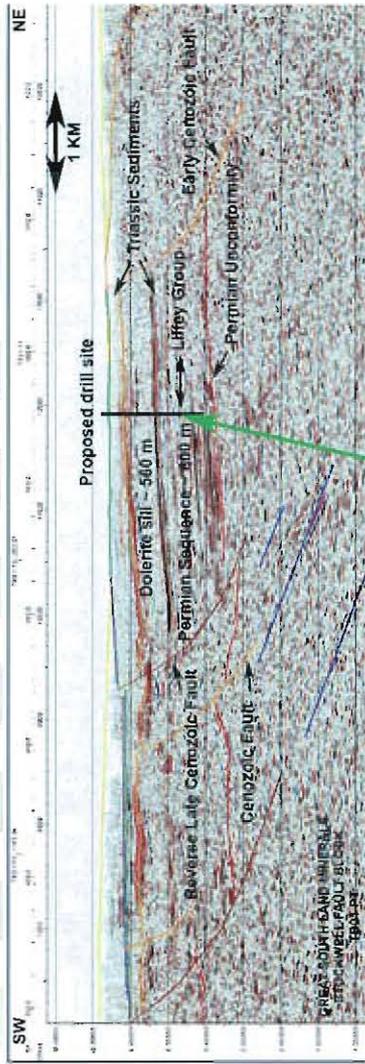
Reservoir: Unit 2, Liffey Group

Source: Woody Island Formation (Tasmanites)

Risks: Timing - Maturation and migration in the Mid-Jurassic to the Cretaceous - traps were formed in the early Tertiary to the Miocene. Burial in the Tertiary, plus an elevated geothermal gradient may result in generation of late hydrocarbons.

Reservoir Volume as US Barrels (BOE)	4 million barrels (P90)
(Monte Carlo calculation of potential, undiscovered prospective resources)	11 million barrels (P50)
	25 million barrels (P10)

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LEAD / PROSPECT DEFINITION (Draft)
Quamby Fault Block

Plays in the Gondwana petroleum system such as the Quamby Fault Block involve a diversity of structural traps developed by both pre- and post- dolerite tectonic events and stratigraphic traps resulting from pinch outs with dolerite sheets. The best potential traps are formed by rollover anticlines and numerous tilted fault blocks in the Longford Sub-basin. Large fault bounded blocks are the most common style in the Northern Midlands. No exploration well has been drilled on a target identified from a seismic reflection survey.

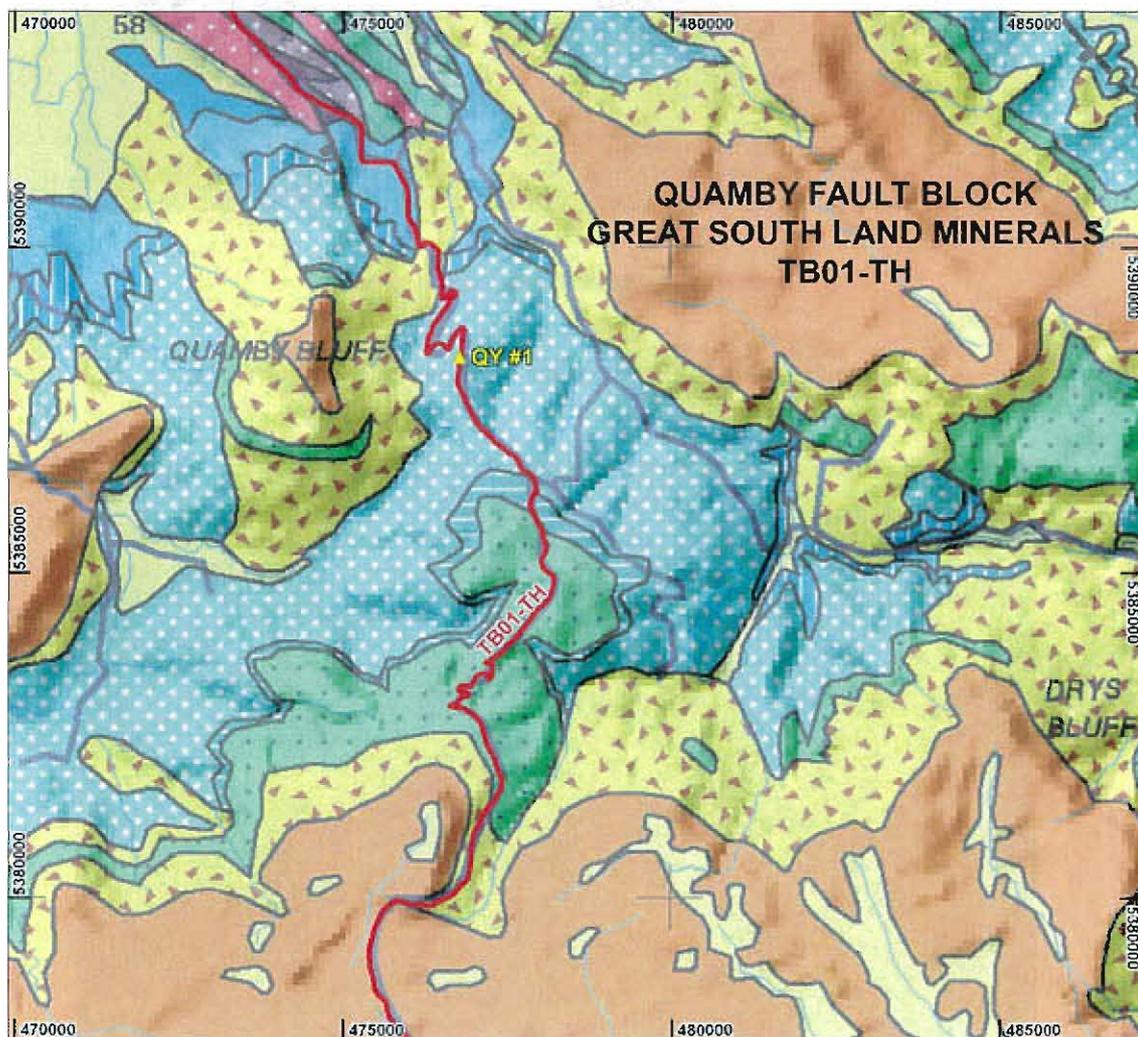


Figure 1: Geology DEM Map (Dolerite outcropping in orange)

The gravity data is presented in terms of AMG66 zone 55 coordinates and AHD. **Figure 2** presents raw Bouguer anomalies (as observed, corrected and reduced), and **Figure 3** shows residual Bouguer anomalies (after removal of crustal trends using the method of Leaman & Richardson, 1989 and Roach et al, 1994).

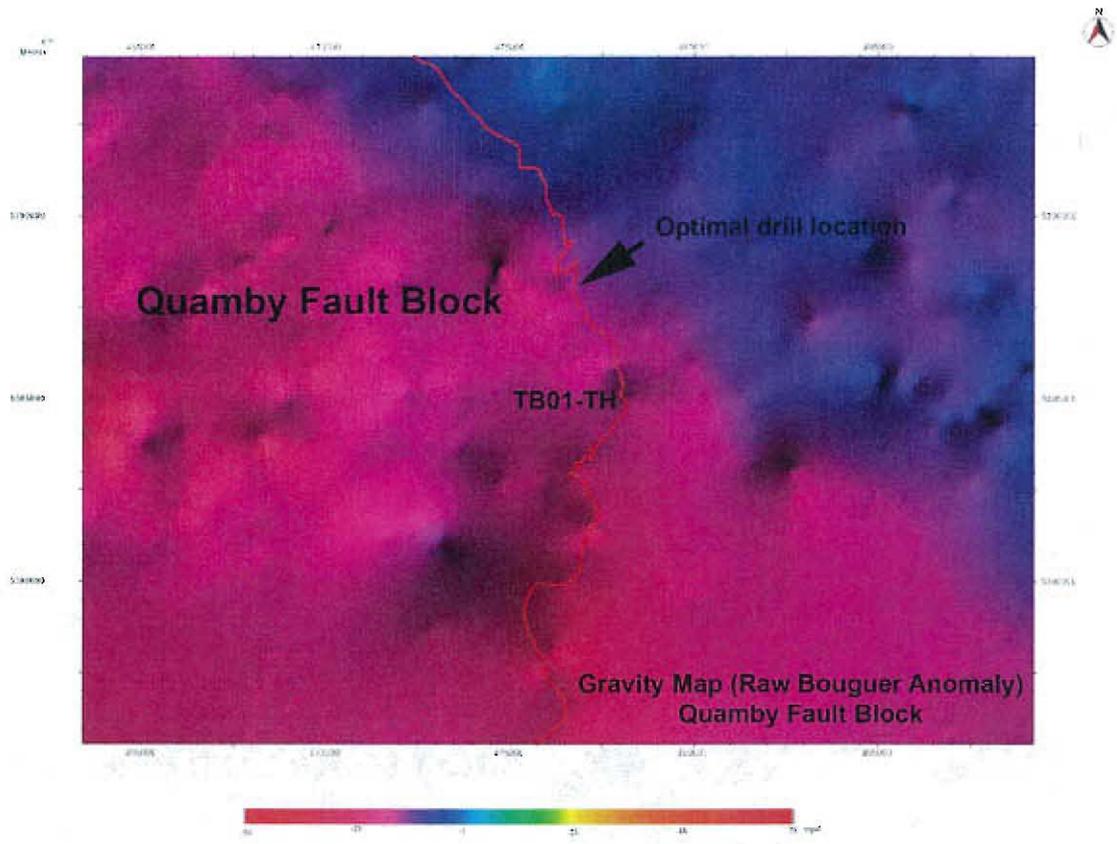


Figure 2: Gravity Map (Raw Bouguer Anomaly), Quamby Fault Block

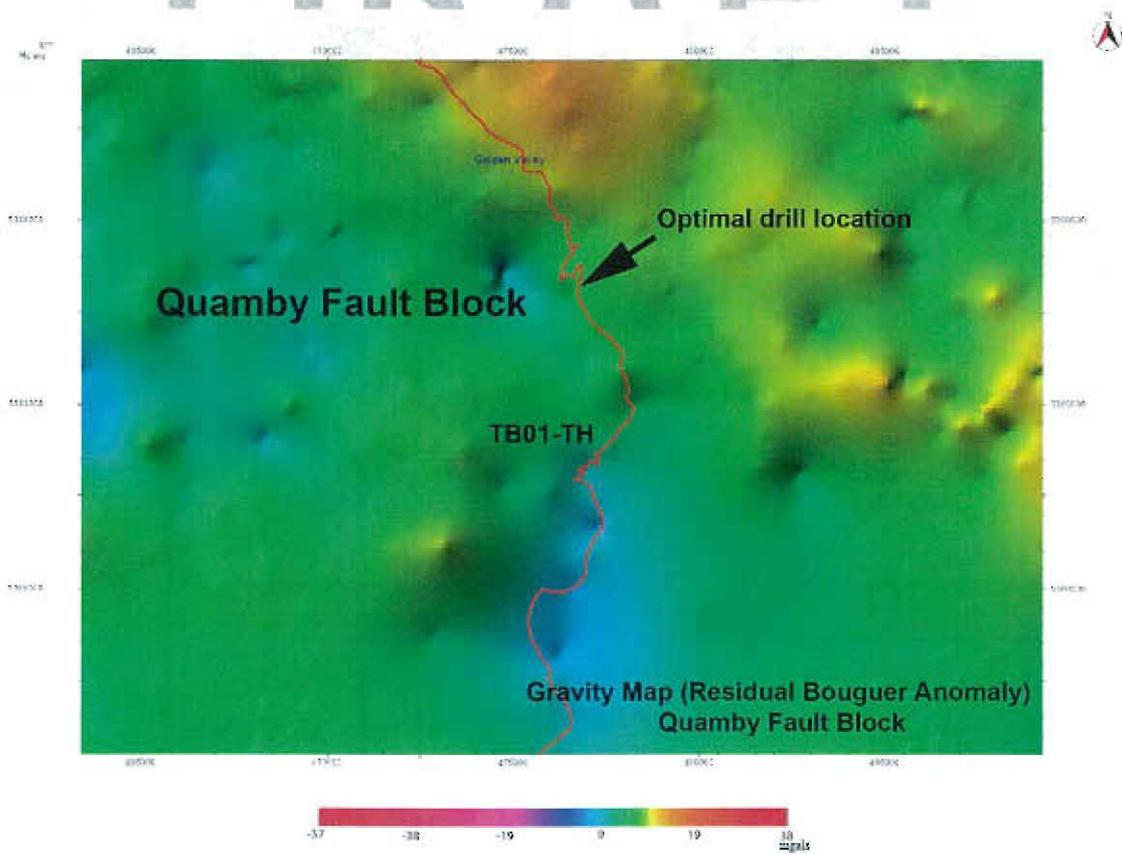


Figure 3: Gravity Map (Residual Bouguer Anomaly), Quamby Fault Block

The Tasmania Basin was faulted and weakly folded prior to and/or during the intrusion of dolerite in the Middle Jurassic. Structures of this age are common in the Central Highlands, but difficult to recognise in the Longford Sub-basin/Northern Midlands regions. Gentle folds and faults with both normal and reverse offset are recognised. Some faults have acted as conduits for dolerite dykes and step ups in sills. Following the intrusion of dolerite the Tasmania Basin was affected by uplift, erosion and extensional faulting. Folds and faults formed in the Tasmania Basin at this time are more common than earlier structures (Stacey A, 2007).

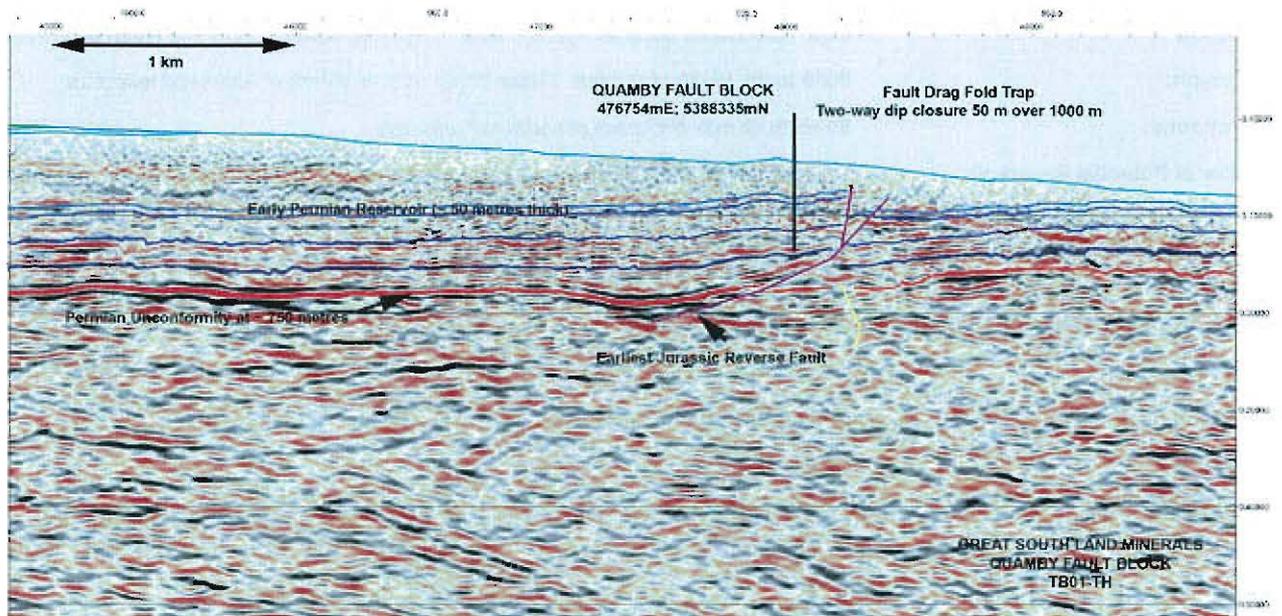


Figure 4: Quamby Fault Block - Two-way dip closure 50m over 1000m

Drill Hole: QY#1
Location: 476 754 mE: 5388 335 mN
Landowner: TBA
On seismic line: TB01-TH
Structure: Quamby Fault Block

Target Surface Area: 9 km² m (two-way)
Depth: m (ft) (Calculated using an average seismic velocity of 4500m/s for the entire sequence)
Length: 3000 m (ft), Width of closure: 3000m (ft) @ *max thickness of horizontal reflectors*.
Pay zone: 50 m (ft) @ *max thickness of horizontal reflectors*

Size of Potential Reservoir: 0.9 x 10⁹ m³ @ *max thickness of horizontal reflectors* (calculated using a rectangle to determine reservoir area and reservoir length of 3 km) which at 10% porosity approx. 0.56 billion barrels (or gas equivalent)

Depth to Target: Liffey Group-Lower Parmeener Supergroup
 Liffey Group at ~ 230 m

Seal: Jurassic Dolerite, Ferntree Formation

Reservoir: Liffey Group - Early Permian

Source: Woody Island Formation (Tasmanites)

Risks: Timing - Maturation and migration in the Mid-Jurassic to the Cretaceous - traps were formed in the early Tertiary. Burial in the Tertiary, plus an elevated geothermal gradient may result in generation of late hydrocarbons.

Reservoir Volume as US Barrels (BOE)	2 million barrels (P90)
(Monte Carlo calculation of potential,	5 million barrels (P50)
undiscovered prospective resources)	10 million barrels (P10)

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LEAD / PROSPECT DEFINITION

Bracknell Dome

This prospect is located on the northeast part of the license area (SEL 13/98) where a northwest to southeast trending Tertiary Sub-basin was formed on the Jurassic age dolerites causing them to subside under the Tertiary basin filling. The structure is defined primarily by seismic lines TB01-SA, TB01-PM and TB01-SD; TB01-PW, TB01-SC and TB01-SB are within vicinity of the structure and help to characterize the structure. Bracknell Dome is approximately 2.5 km wide and at least 8 km long.

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 dolerite 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 fissures of overlying dolerites found in the quarries 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 tectonism which formed this prospect.

Tertiary fault bounded structures may be exploration targets if charged by secondary migration. Steep faults and vertical feeder and dyke systems associated with Jurassic Dolerite may provide migration pathways to stratigraphically higher reservoirs such as the Risdon Sandstone and Unit 2 (Bacon et al., 2000). Stratigraphic traps may include the lutite of Unit 2 and pinch outs beneath dolerite seals (Bedi, 2003).

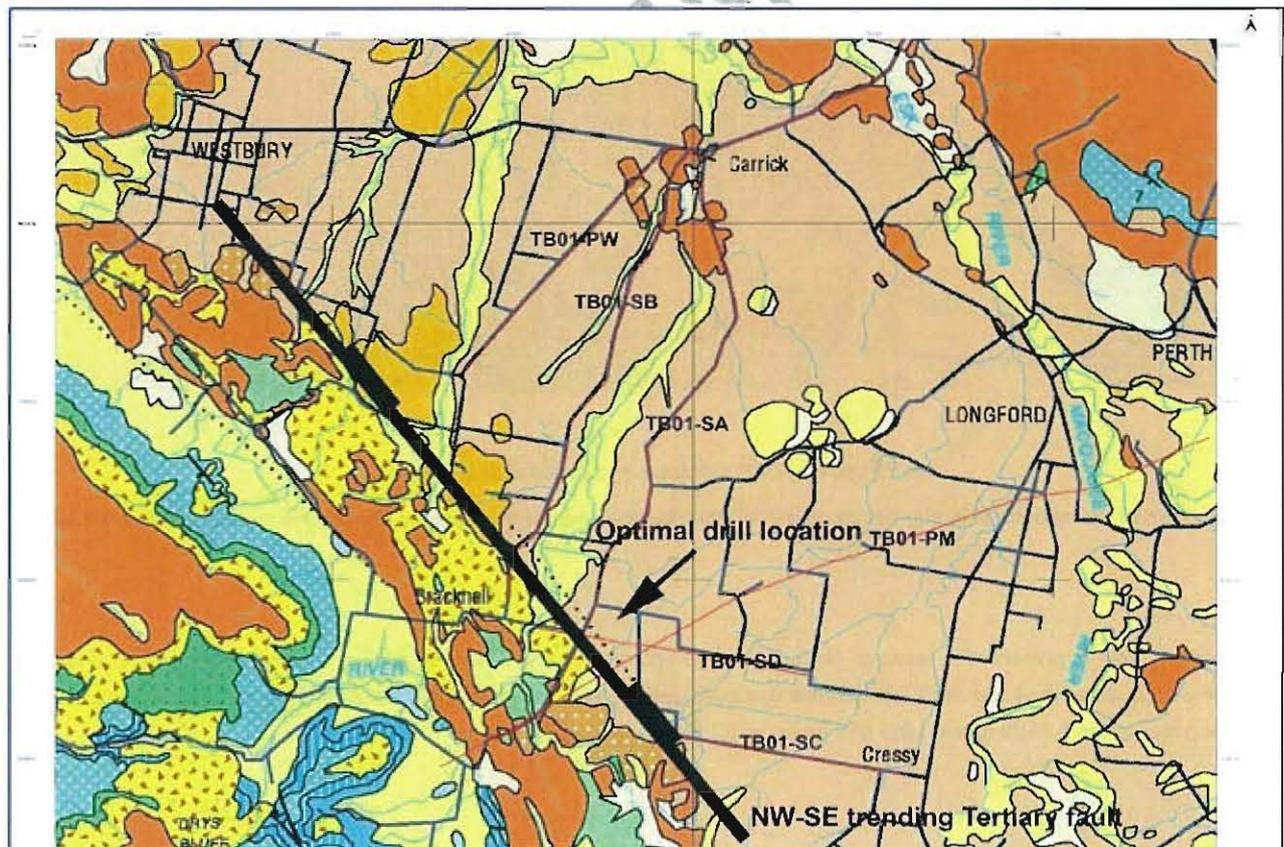


Figure 1: Geology Map (Dolerite outcropping in orange). Location of the optimal drill site based on a TWT Map for the base of the Tertiary Unconformity of the Bracknell Dome.

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 1450m.

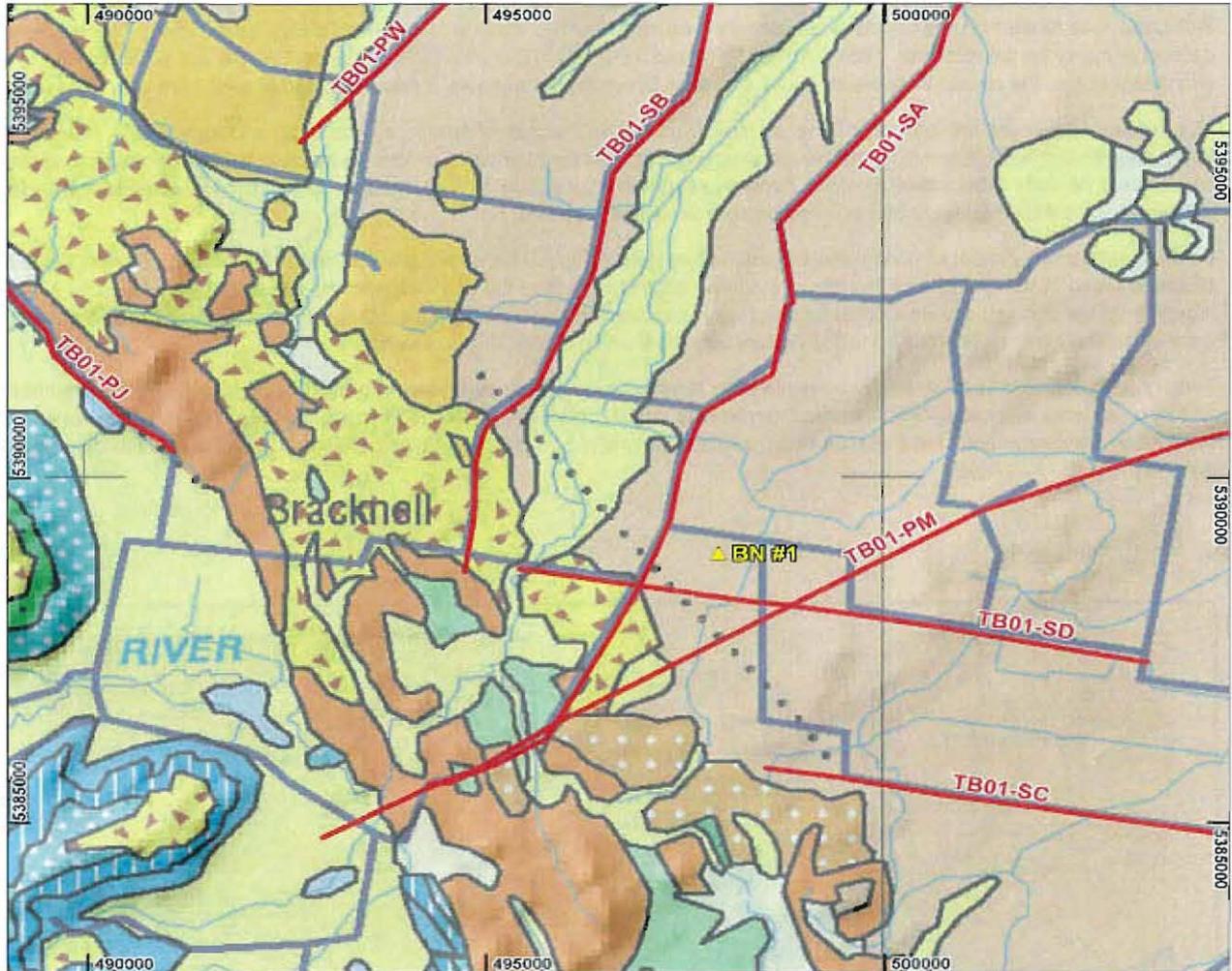


Figure 2: DEM Geology, proposed drill site BN#1 -

Location of the optimal drill site based on a TWT Map for the base of the Tertiary Unconformity of the Bracknell Dome.

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).

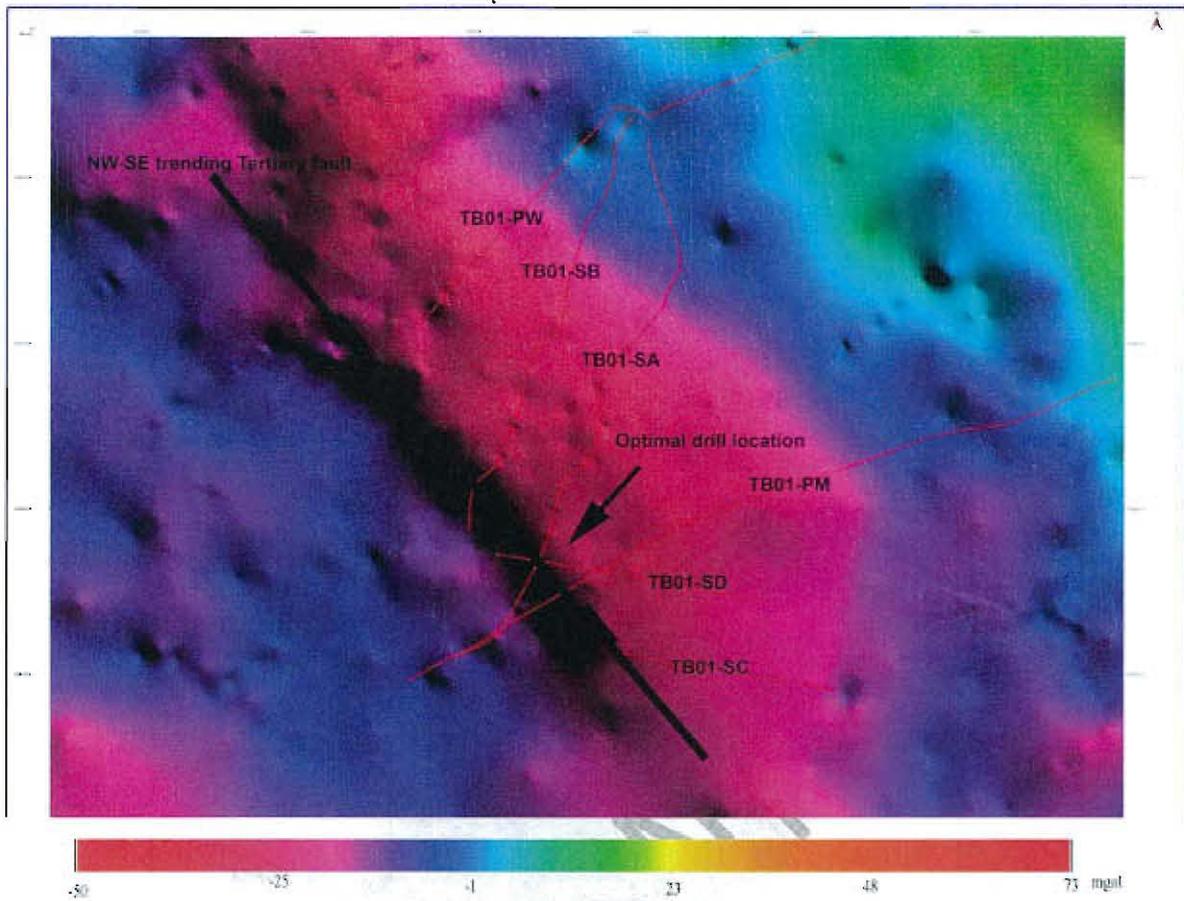


Figure 3: Gravity Map (Raw Bouguer Anomaly Bracknell Dome)

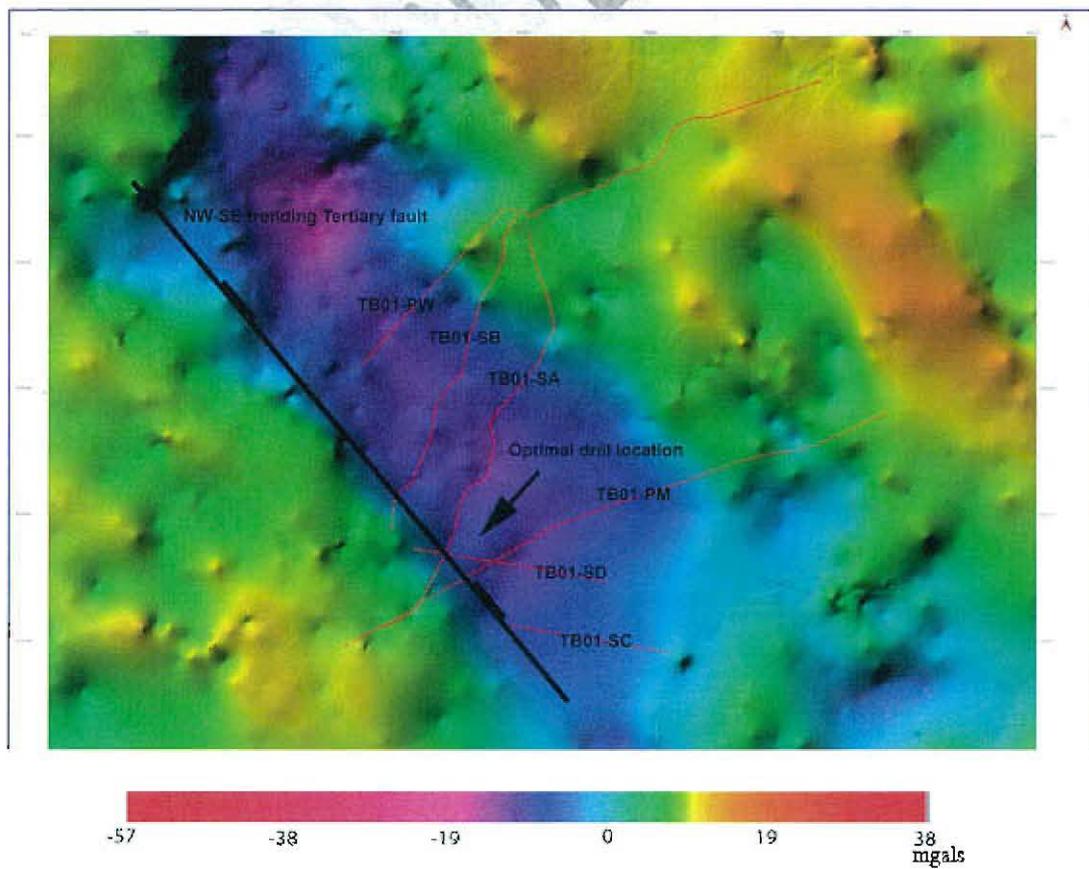


Figure 4: Gravity Map (Residual Bouguer Anomaly) - Bracknell Dome

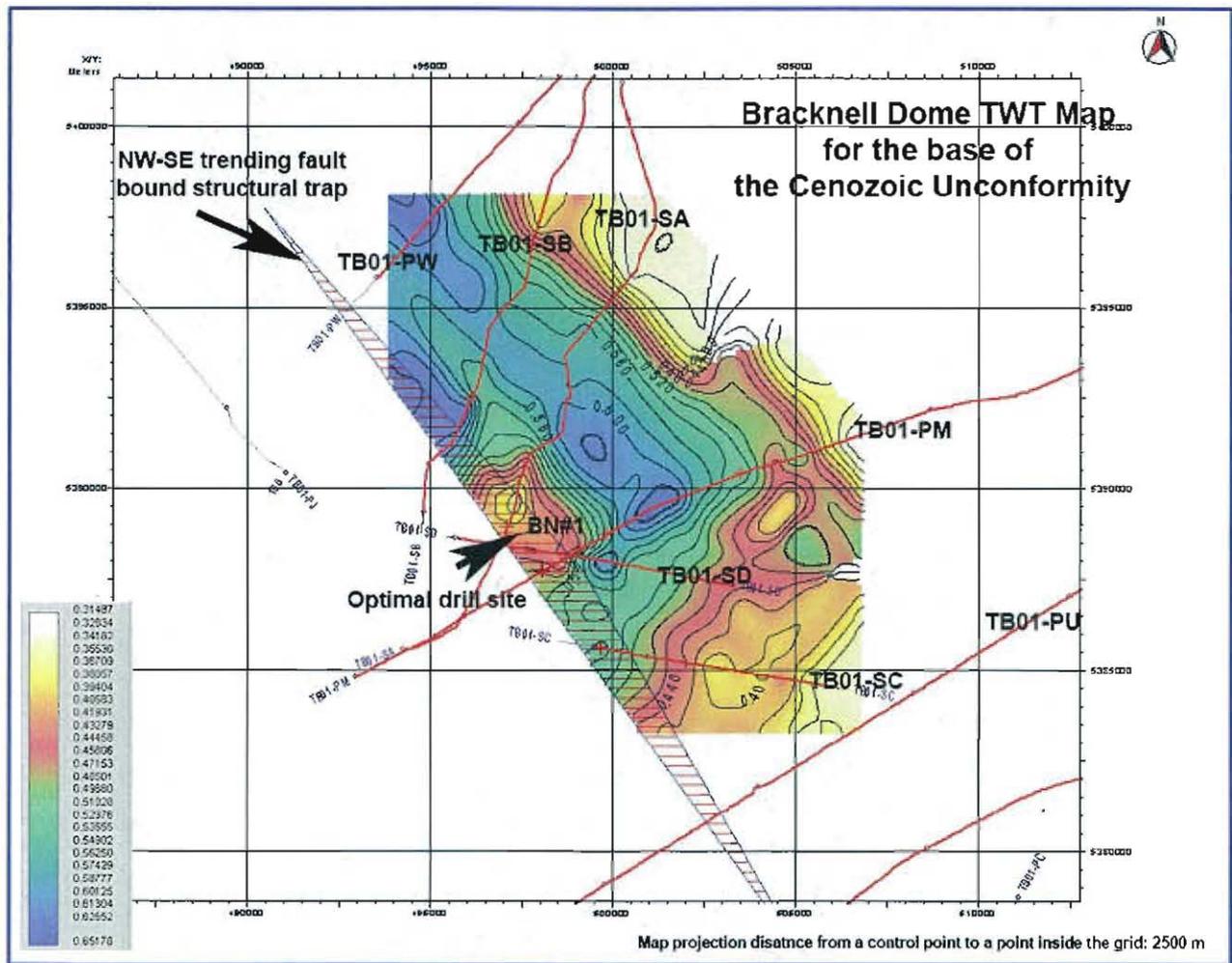


Figure 5: TWT Map for the base of the Cenozoic (Tertiary) Unconformity of the Bracknell Dome based on change in seismic character and continuous strong reflectors.

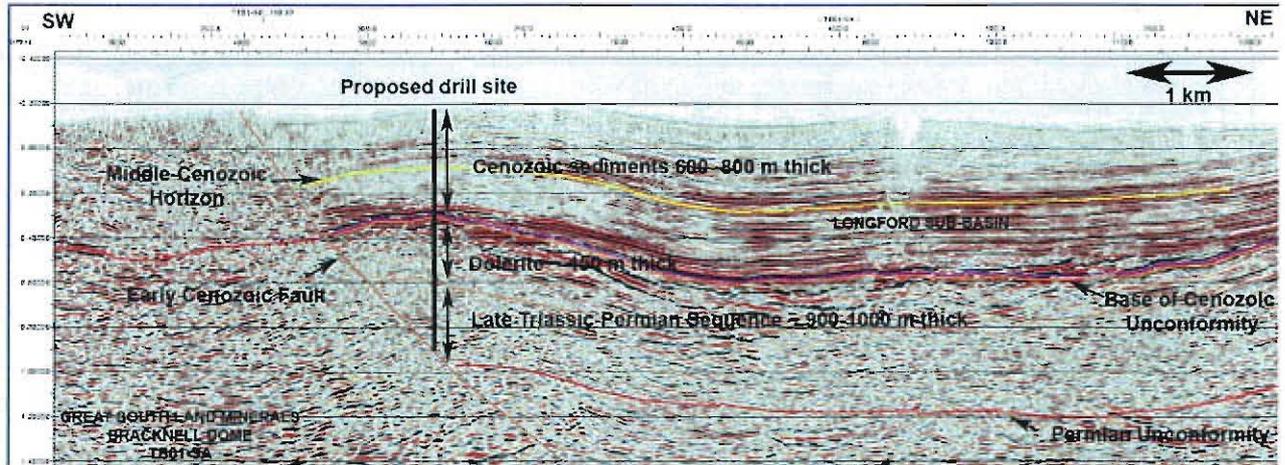


Figure 6: TB01-SA Bracknell Dome - Proposed drill site based on TB01-SA

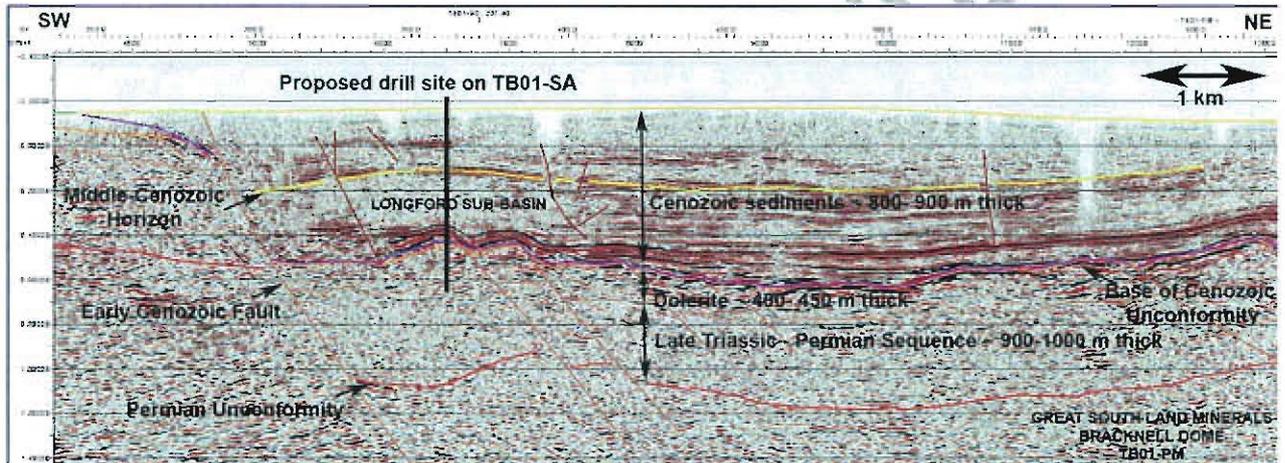


Figure 7: TB01-PM Bracknell Dome - Proposed drill site based on TB01-SA

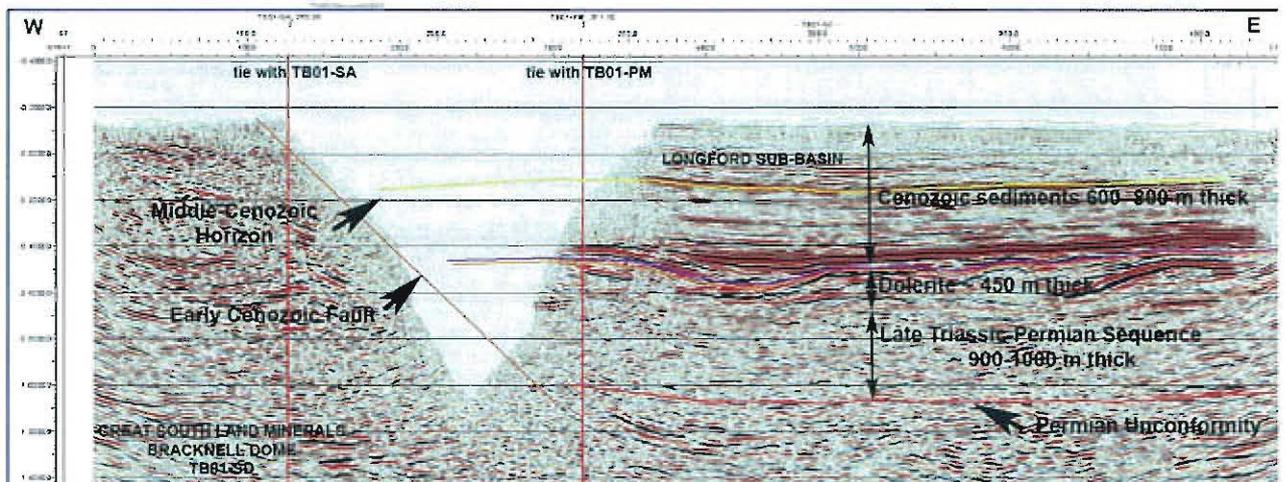


Figure 8: TB01-SD Bracknell Dome

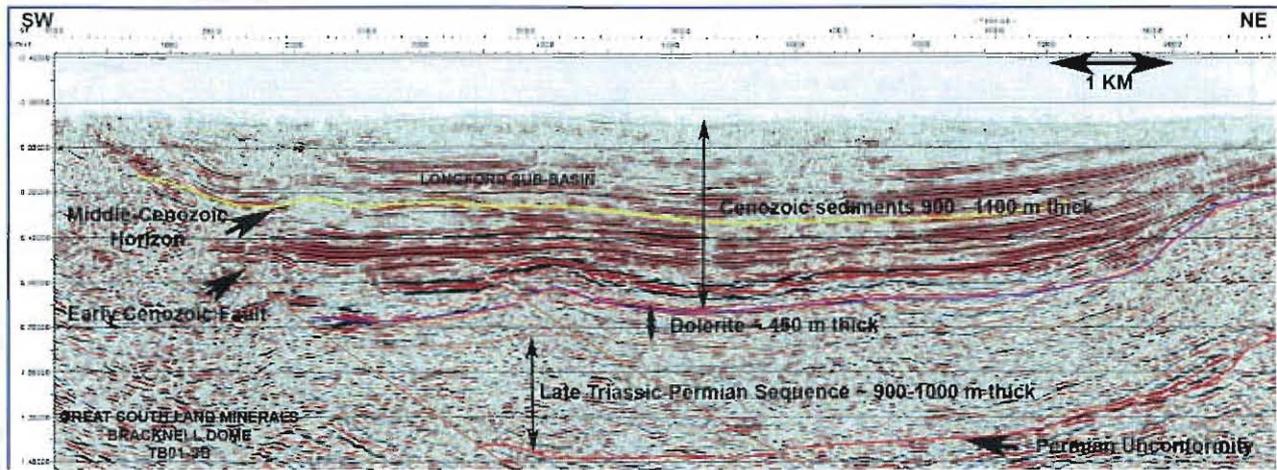


Figure 9: TB01-SB Bracknell Dome

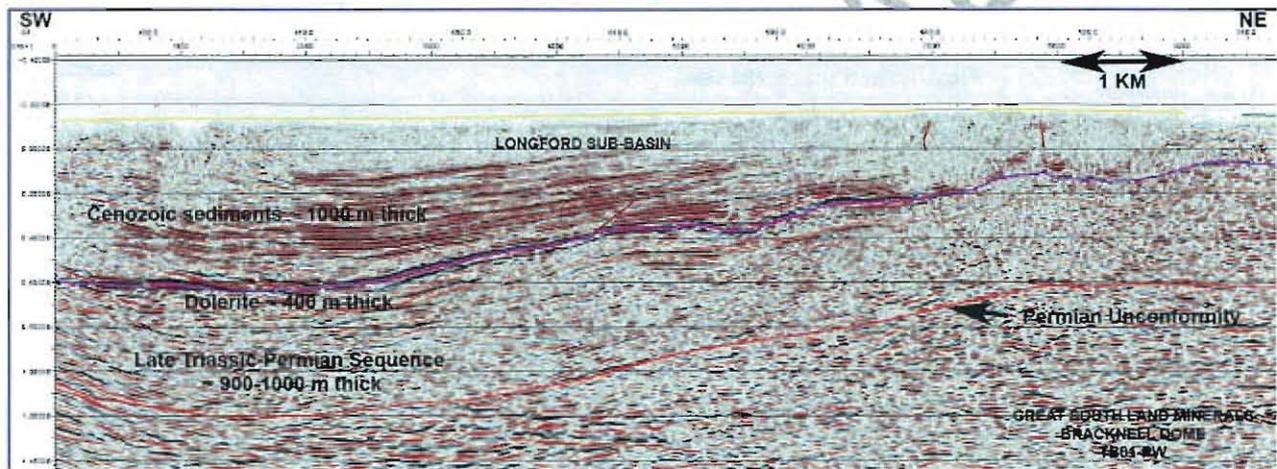


Figure 10: TB01-PW Bracknell Dome

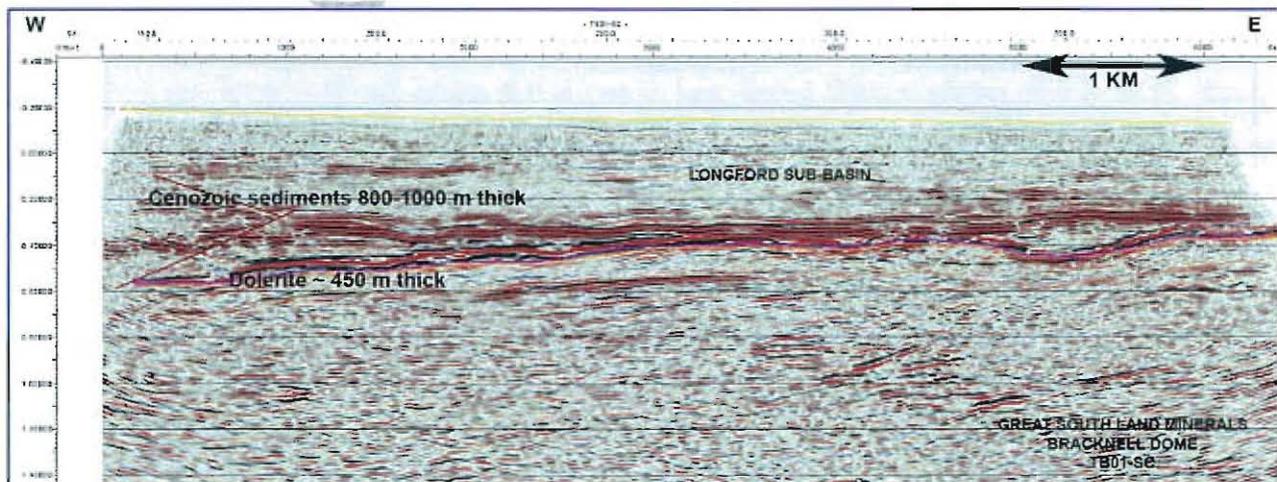


Figure 11: TB01-SC Bracknell Dome

DRILL HOLE: BN#1

LOCATION: 497 915 mE; 5 388 924 mN

Three-way dip closure = ~50 m over 2 km (TB01-SA and TB01-PM)

Primary Target: Dome in Mid-Cenozoic (Early - Middle Eocene)

Secondary Target: Half graben affecting the Upper Parmeener Supergroup Unit 2 (Early Cenozoic) & the Lower Parmeener Supergroup Liffey Group (Early Permian)

On seismic line: TB01-SA and TB01-PM

Structure: NW-SE trending fault bound structural trap formed beneath the Tertiary basin at the level of Jurassic dolerites

Target Surface Area: 20 km² (three-way dip closure)

Estimated Depth of Drilling: 1450 m (4757ft) (Calculated using average seismic velocity for each of the Formations encountered)

Length: 8000 m (26246ft), Width of closure: 2500m (8202ft) @ *max thickness of horizontal reflectors.*

Estimated Porosity: ~7.5 %

Size of Potential Reservoir: 2.4 x 10⁹ m³ @ *max thickness of horizontal reflectors* (calculated using a rectangular prism to determine reservoir area)

RESERVOIRS: Early - Middle Eocene, Unit 2 (Triassic), Fractured dolerite (Jurassic), Liffey Group (Early Permian)

Cenozoic Reservoir: Unit 2 / top dolerite Depth ~ 600 m
Pay Zone ~ 30 m

Permian Reservoirs: Liffey Group Depth ~ 1350 m
Pay zone ~ 25 m

SEAL: Middle Eocene, Jurassic dolerite, Ferntree Formation

SOURCE: Unit 1, Woody Island Formation (Tasmanite)

RISKS: Timing - Maturation and migration in the Mid-Jurassic to the Cretaceous - traps were formed in the early Cenozoic. Burial in the Cenozoic, plus an elevated geothermal gradient may result in generation of late hydrocarbons.

Reservoir Volume as US Barrels (BOE)	49 million barrels (P90)
(Monte Carlo calculation of potential, undiscovered prospective resources)	100 million barrels (P50)
	194 million barrels (P10)

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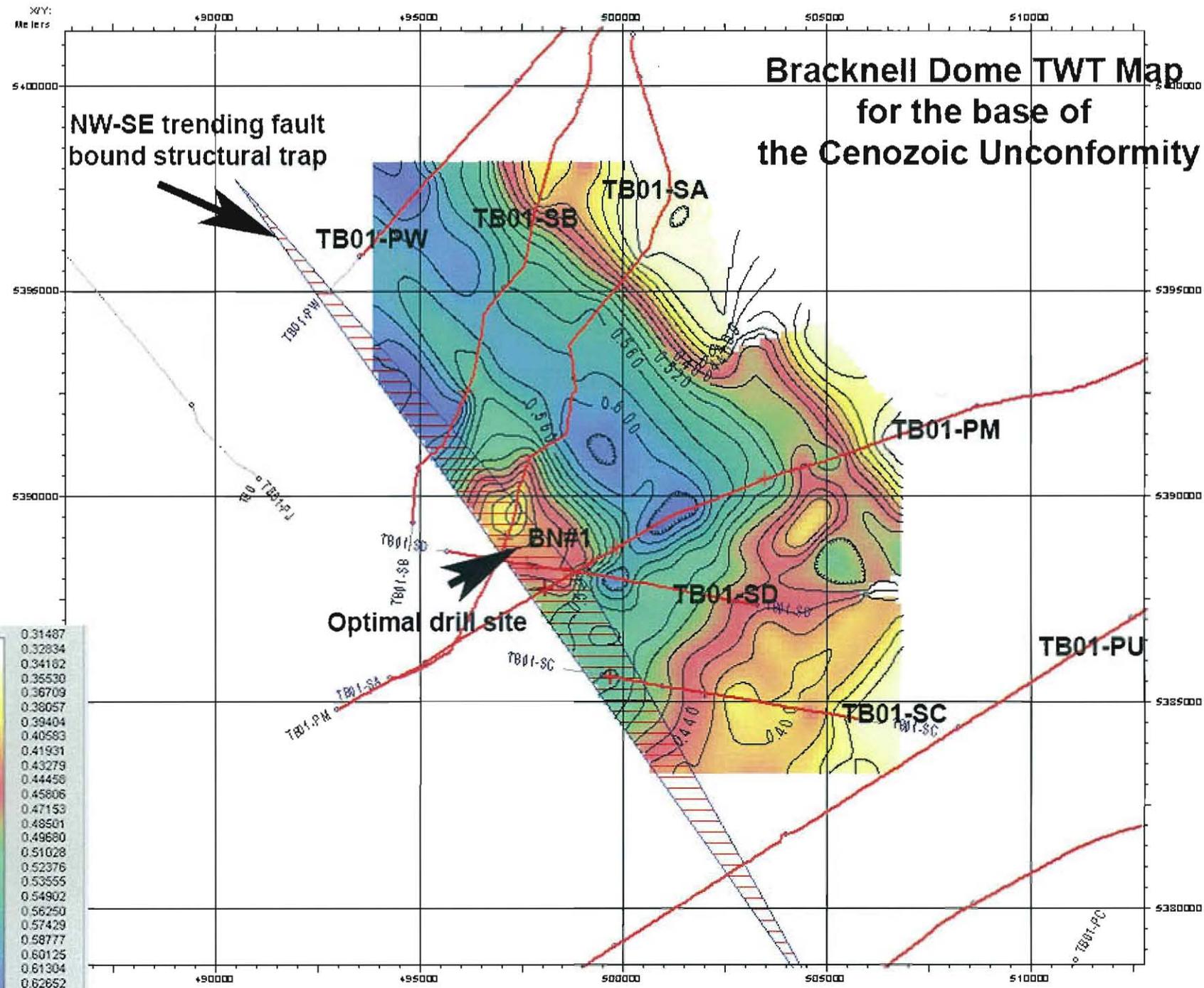
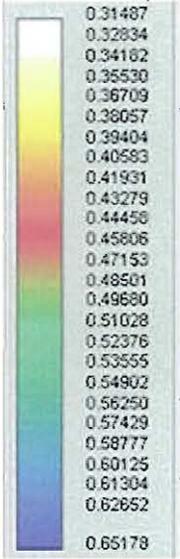


Bracknell Dome TWT Map for the base of the Cenozoic Unconformity

NW-SE trending fault
bound structural trap



Optimal drill site



Map projection distance from a control point to a point inside the grid: 2500 m

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LEAD / PROSPECT DEFINITION

Interlaken Anticline

Traps in the Gondwanan Petroleum System are predominantly structural (Bradshaw, 1993). Suitable hydrocarbon traps may have been formed in the Tasmania Basin by folding and faulting during a Mesozoic (pre-Middle Jurassic) compressional phase, Middle Jurassic dolerite intrusion and an Early to Middle Tertiary extensional phase. Folded structures are rare in the Tasmania Basin and the most likely traps are probably formed by fault offsets.

Plays in the Gondwanan Petroleum System such as Interlaken Anticline involve a diversity of structural traps developed by both pre- and post- dolerite tectonic events and stratigraphic traps resulting from pinch outs with dolerite sheets. The best potential traps are formed by rollover anticlines and numerous tilted fault blocks in the Longford Sub-basin. Interlaken Anticline is a gentle anticline form and is the most probable trap structure in the Central Highlands.

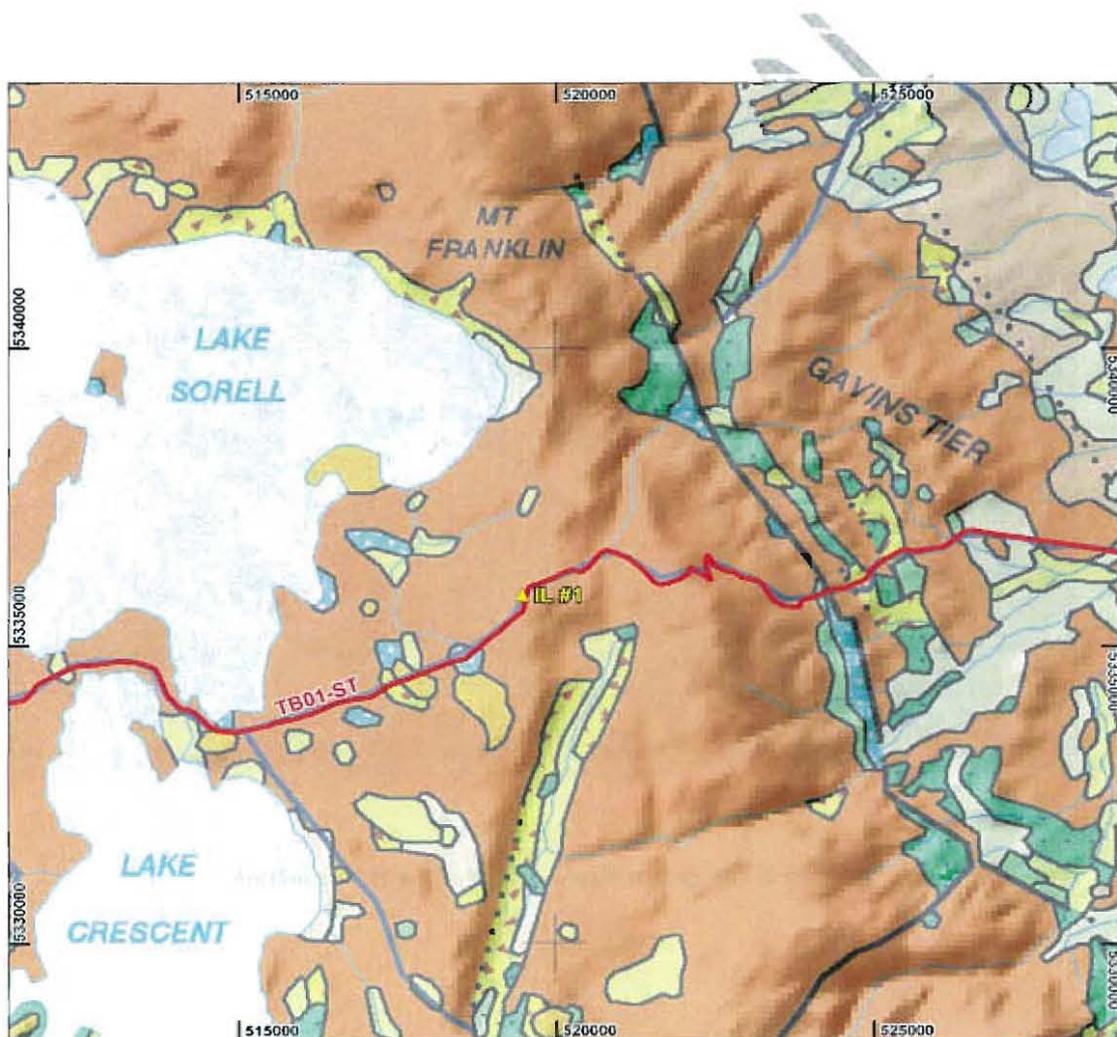


Figure 1: DEM Geology (Dolerite outcropping in orange)

Proposed drill site IL #1

The Tasmania Basin was faulted and weakly folded prior to and/or during the intrusion of dolerite in the Middle Jurassic. Structures of this age such as Interlaken Anticline are common in the Central Highlands. Gentle folds and faults with both normal and reverse offset are recognised. Some faults have acted as conduits for dolerite dykes and step ups in sills. Following the intrusion of dolerite the Tasmania Basin was affected by uplift, erosion and extensional faulting. Folds and faults formed in the Tasmania Basin at this time are more common than earlier structures (Stacey A, 2007).

With maturation and migration most likely the result of a Jurassic to Cretaceous thermal maximum, the most likely charged structures are those formed prior to or during the intrusion of dolerite in the Middle Jurassic. Many Jurassic faults were sealed by intruding dolerite, reactivation and further faulting during the Tertiary represents a significant risk to the integrity of these structures (Bacon et al., 2000).

No exploration well has been drilled on a target identified from a seismic reflection survey.

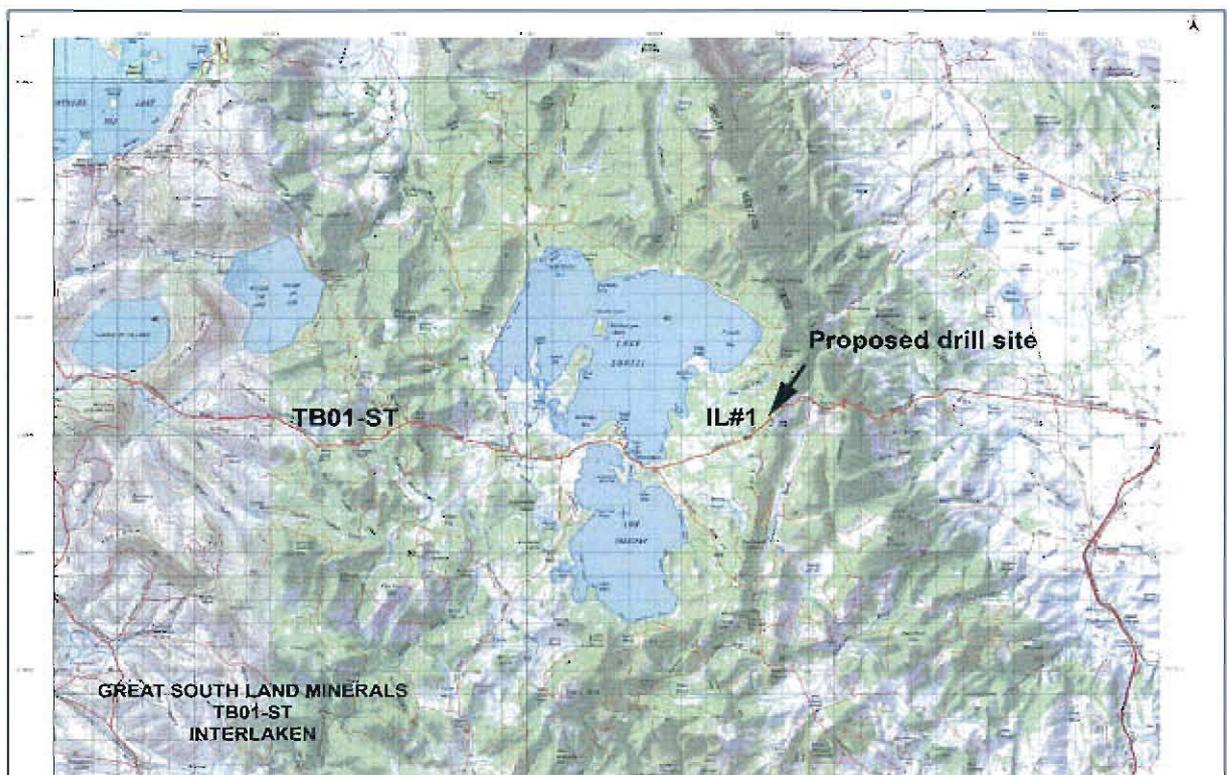


Figure 2: Topography Map - Location of the optimal drill site

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). Changes in the measured gravity field along TB01-ST indicate variations in the thickness of the dolerite sill or are associated with faulting.

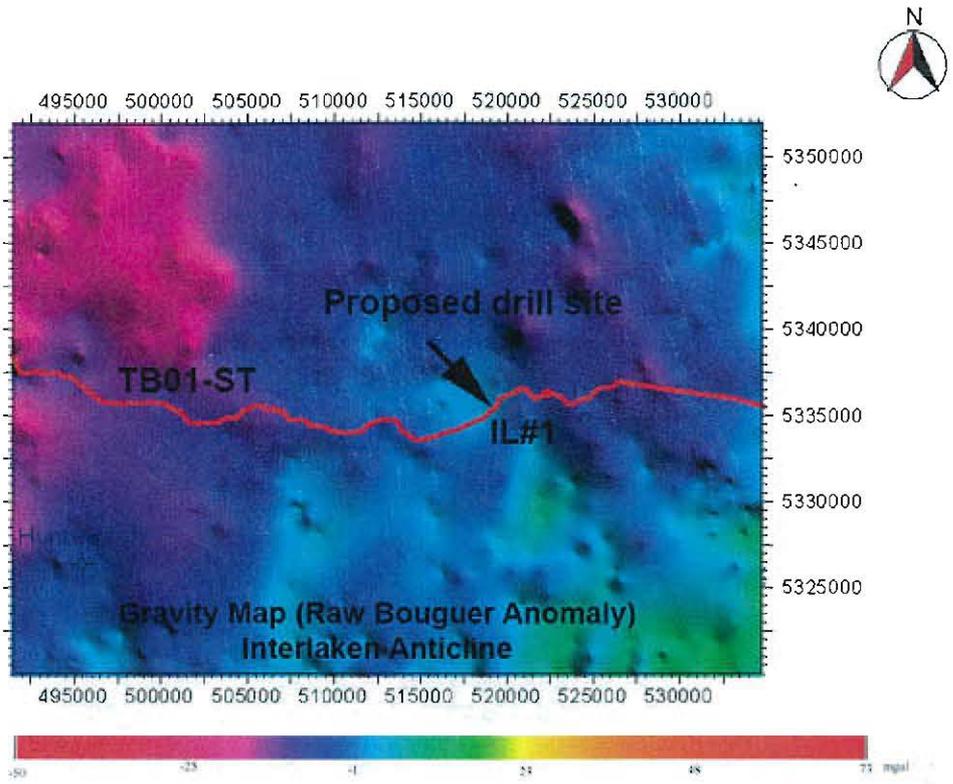


Figure 3: Gravity Map (Raw Bouguer Anomaly) - Interlaken

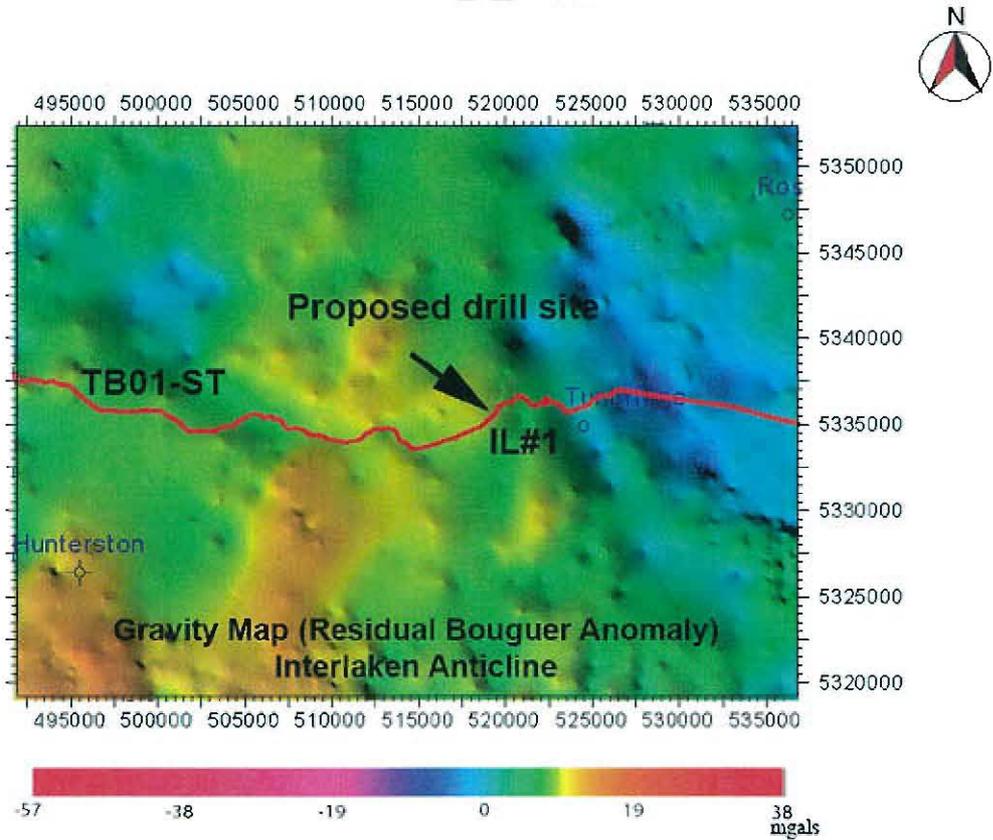


Figure 4: Gravity Map (Residual Bouguer Anomaly), Interlaken.

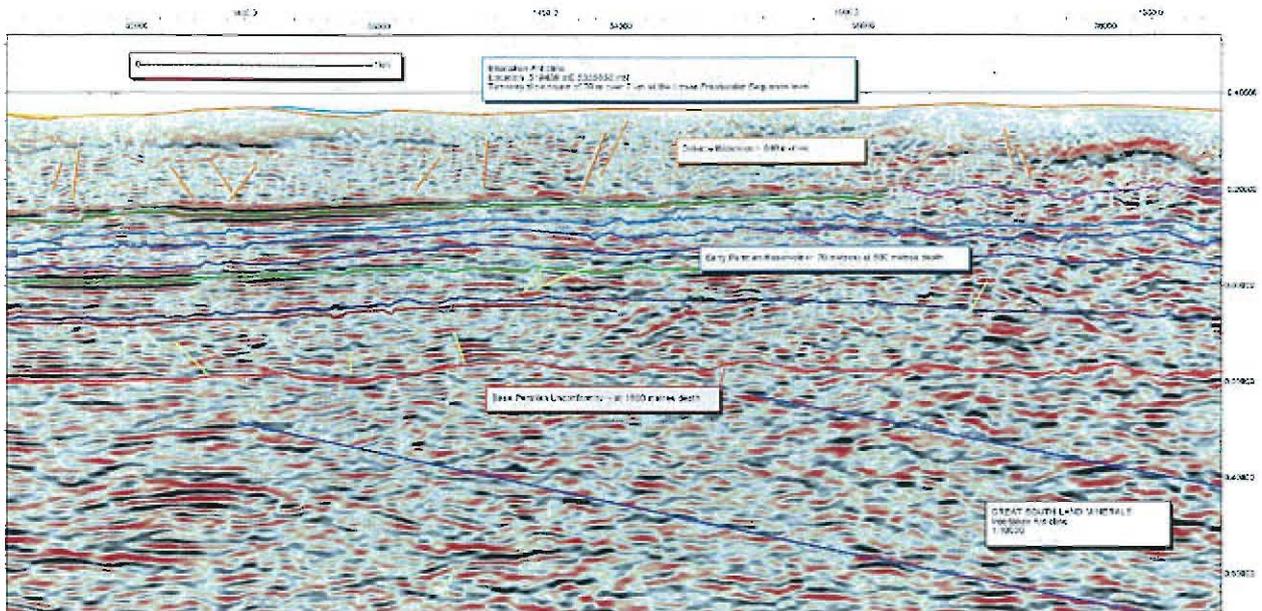


Figure 5: TB01-ST Interlaken Anticline. A distinctive change in seismic character is interpreted to mark the base of the Bundella Mudstone. This horizon is used as a marker to interpret the positions of other horizons in the Lower Parameerian Supergroup section.

The overall structure of the Parameerian Supergroup in this section appears relatively simple, with few major faults either geologically mapped or interpreted in the seismic data. A dolerite sill outcrops across the whole of the Highlands section.

The Lower Parameerian Supergroup lies beneath the dolerite sill, which intruded at the boundary between the Upper and Lower Parameerian Supergroup, at or near the top of the Lower Marine Sequence (Figure 5). With the exception of the lowermost units, the thickness of the individual Parameerian Supergroup units remains relatively constant across the Highlands. The position of the Parameerian Supergroup horizons is based on the Parameerian Supergroup stratigraphy established in the RG-145 drill hole at Tunbridge Tier using the velocity data acquired at the Hunterston 1 DDH.

Drill Hole: IL#1
Location: 519,456 E
 5,335,869 N
Landowner:
On seismic line: TB01-ST
Structure: Interlaken Anticline (Two-way dip closure of 50 m over 7 km at the Lower Freshwater Sequence level)
Target Surface Area: 28 km² m (two-way dip closure)
Estimated Depth of Drilling: 600m (1968ft) (Calculated using average seismic velocity for each of the Formations encountered)
Length: 7000 m (22965ft), Width of closure: 4000m (13123ft) @ *max thickness of horizontal reflectors*.
Pay zone: 100 m (328ft) @ *max thickness of horizontal reflectors*
Estimated Porosity: ~5 %
Size of Potential Reservoir: 2.24 x 10⁹ m³ @ *max thickness of horizontal reflectors* (calculated using a rectangular prism to determine reservoir area and reservoir length of 7 km)
Reservoir: Garcia Sandstone, Palmer Sandstone, Liffey Group (Lower Parmeener Supergroup)
Depth to Reservoir: Garcia Sandstone = ~570 m, Palmer Sandstone = ~630 m, Liffey Group = ~700 m,
Thickness of reservoir: Garcia Sandstone = ~5 m, Palmer Sandstone = ~ 4 m, Liffey Group = ~30 m
Seal: Jurassic Dolerite, Latest Permian mudstone
Source: Woody Island Formation (Tasmanite)
Risks: Timing - Maturation and migration in the Mid-Jurassic to the Cretaceous - traps were formed in the early Tertiary. Burial in the Tertiary, plus an elevated geothermal gradient may result in generation of late hydrocarbons.

Reservoir Volume as US Barrels (BOE) **21 million barrels (P90)**
(Monte Carlo calculation of potential, **45 million barrels (P50)**
undiscovered prospective resources) **92 million barrels (P10)**

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LEAD / PROSPECT DEFINITION

Butlers Rise

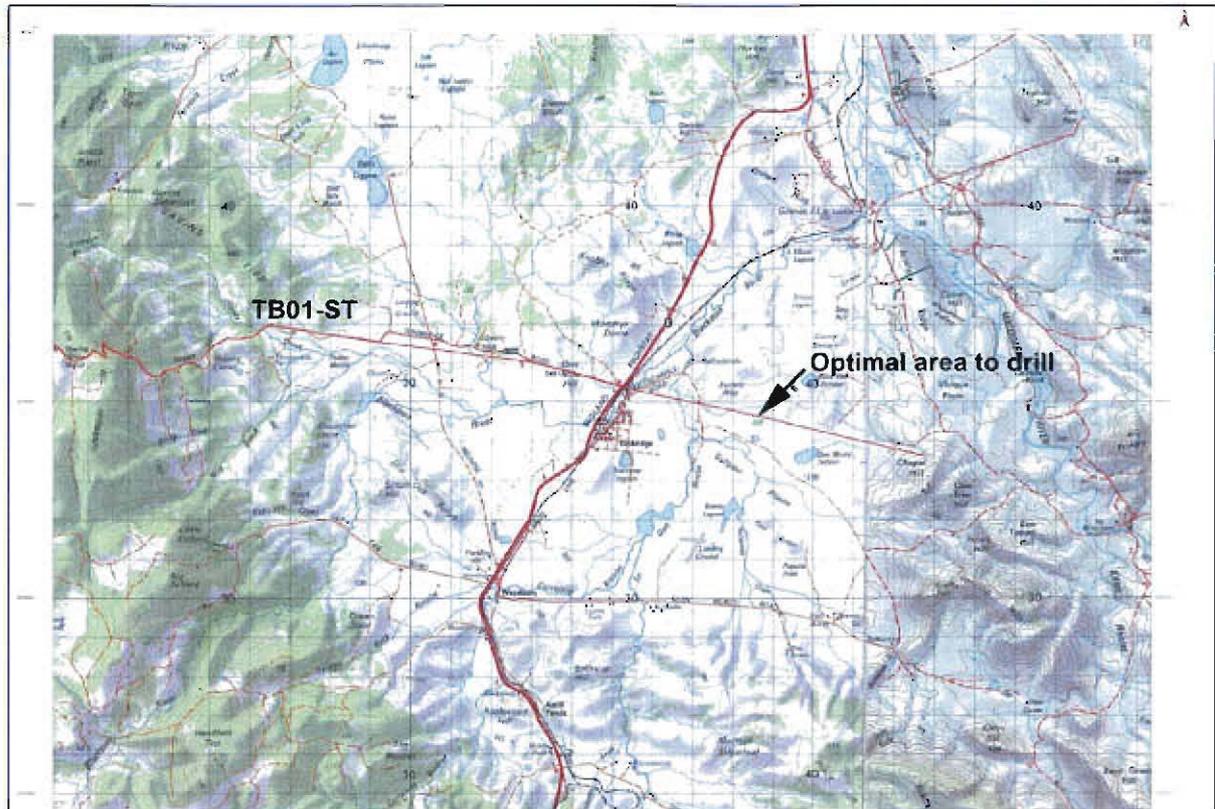


Figure 1: Topography Map. Location of the optimal drill site.

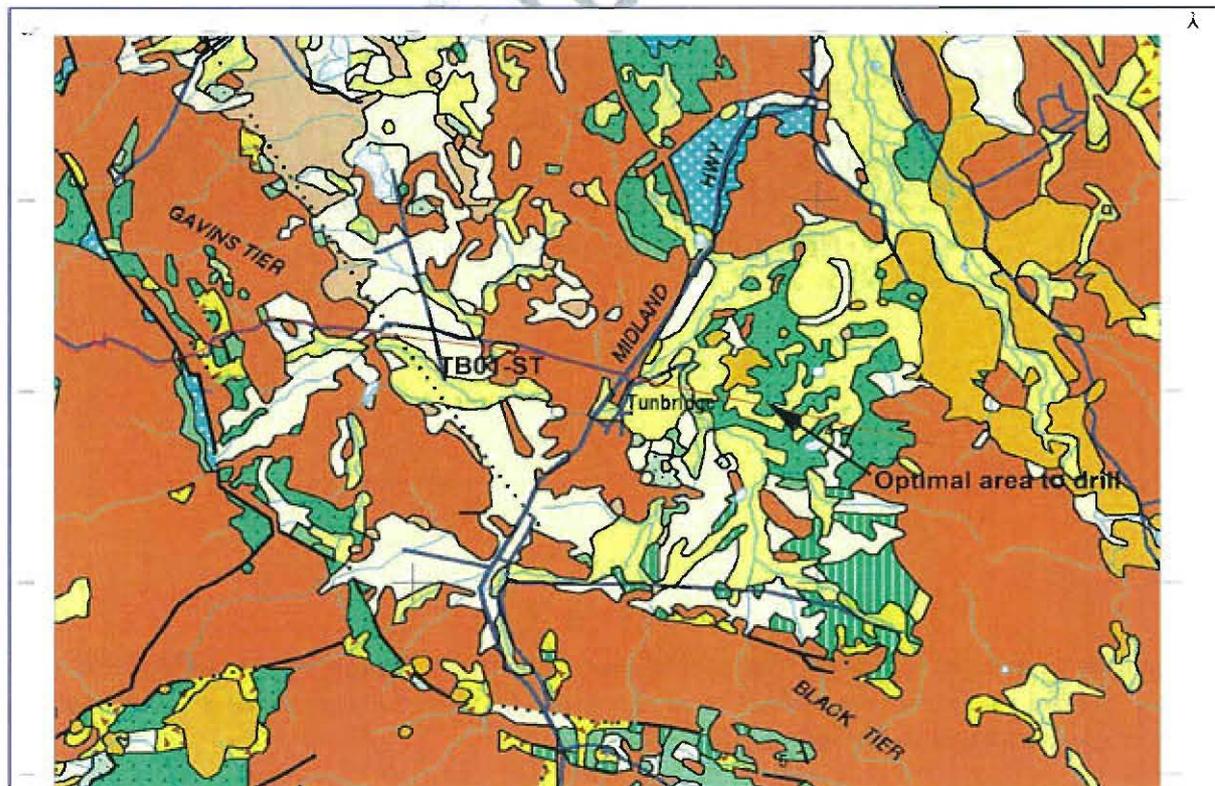


Figure 2: Geology Map (Dolerite outcropping in orange) -
Location of the optimal drill site based on seismic interpretation of TB01-ST.

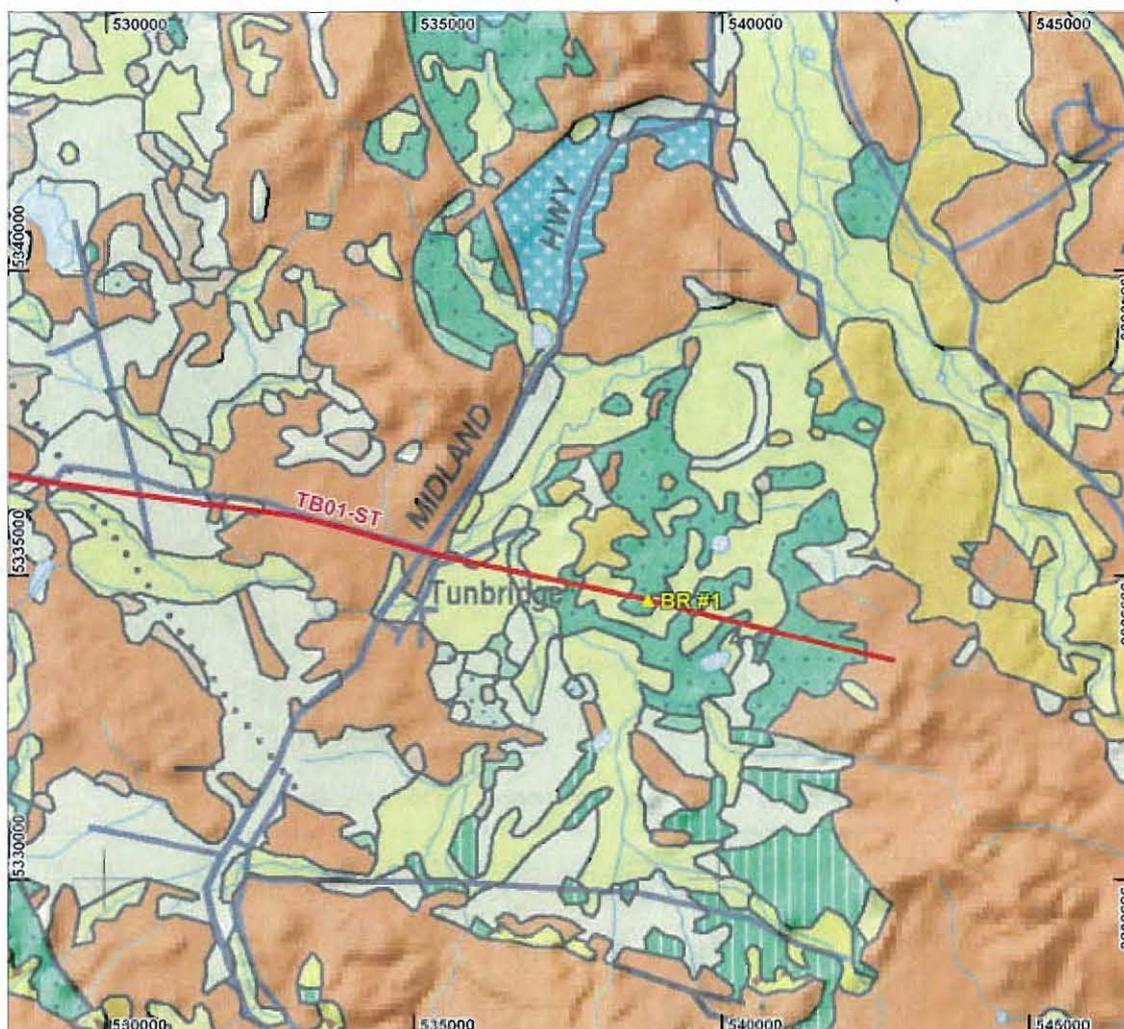


Figure 3: DEM Geology, proposed drill site BR#1

The gravity data is presented in terms of AMG66 zone 55 coordinates and AHD. **Figure 4** presents raw Bouguer anomalies (as observed, corrected and reduced), and **Figure 5** shows residual Bouguer anomalies (after removal of crustal trends using the method of Leaman & Richardson, 1989 and Roach et al, 1994).

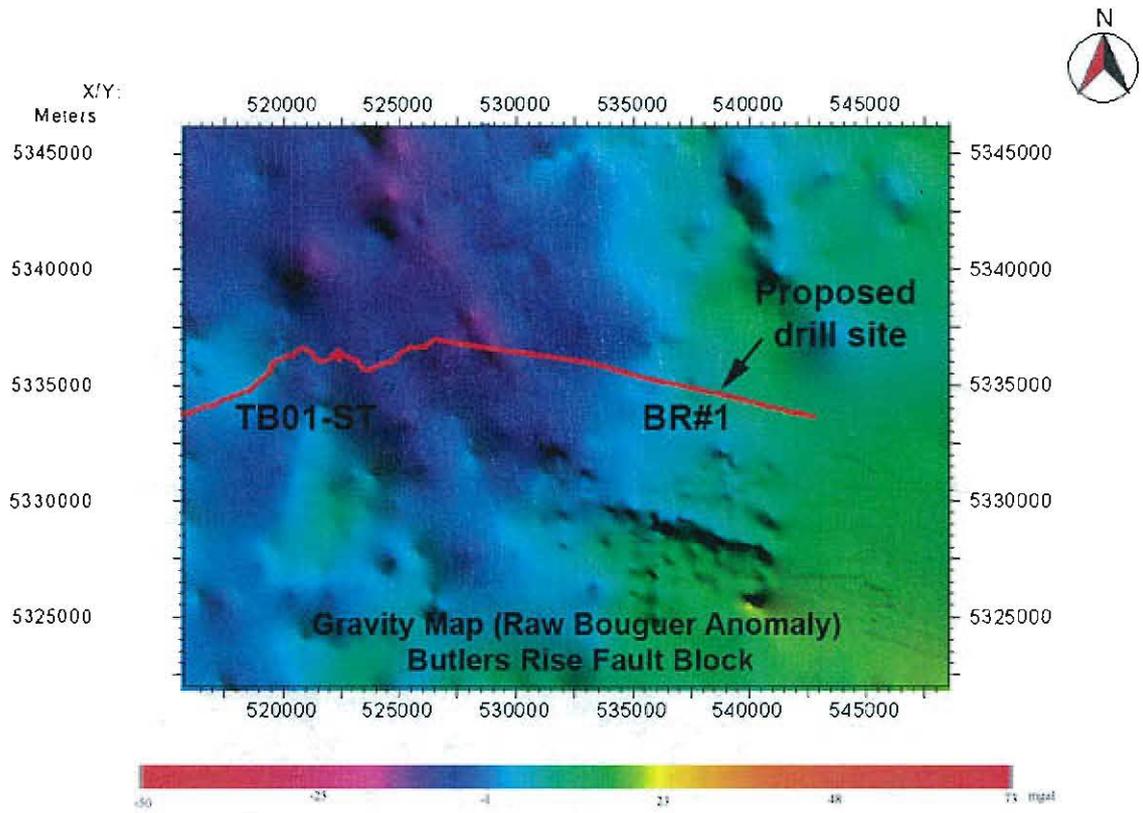


Figure 4: Gravity Map (Raw Bouguer Anomaly), Butlers Rise Fault Block

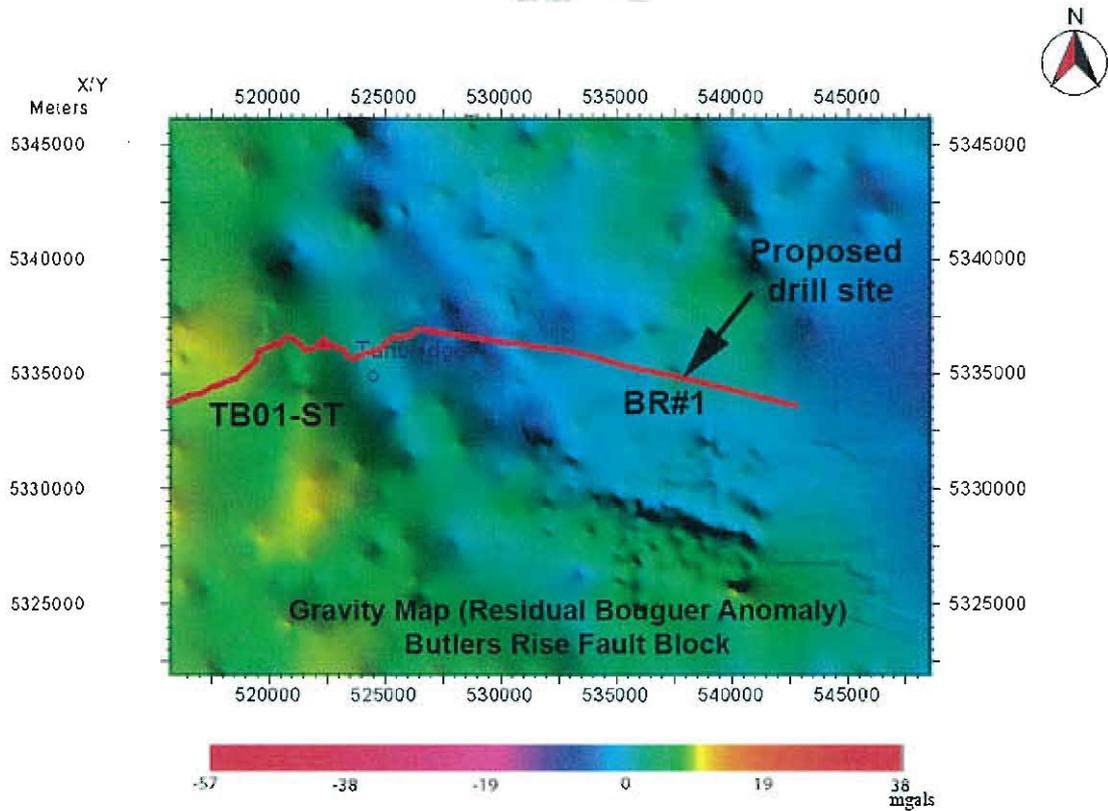


Figure 5: Gravity Map (Residual Bouguer Anomaly), Butlers Rise Fault Block

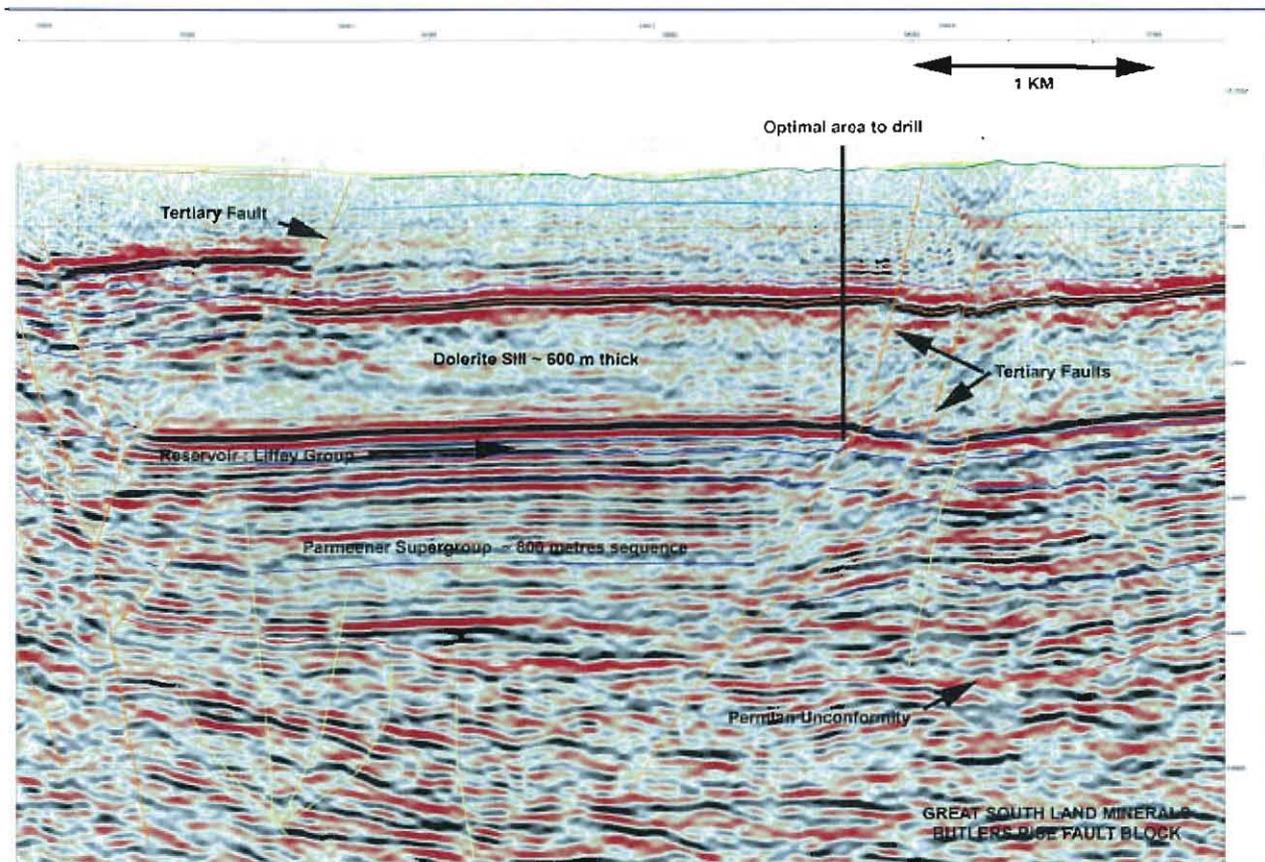


Figure 6: TB01-ST - Butlers Rise Fault Block

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, aerial 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 bound 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 strike slip fault could be tested by a 1200m deep well. Potential hydrocarbon bearing zone in this prospect being the Permian clastic sequences underlying the Jurassic dolerites, a 1200m deep exploration well could test prospectivity of all the Permian sequences here.

DRILL HOLE: BR#1

Location: 537,627 E
5,334,856 N

Landowner:

On seismic line: TB01-ST

Structure: Fault Block - Fault bound structural trap

Target Surface Area: 24 km² m (two-way closure)

Estimated Depth of Drilling: 1030 m (3399 ft) to 1200 m (3937ft) (Calculated using average seismic velocity for each of the formations encountered)

Length: 6000 m (19700ft), Width of closure: 4000m (13125ft) @ *max thickness of horizontal reflectors.*

Pay zone: 100 m (330ft) @ *max thickness of horizontal reflectors*

Estimated Porosity: ~5 %

Size of Potential Reservoir: 2.24 x 10⁹ m³ @ *max thickness of horizontal reflectors* (calculated using a rectangular prism to determine reservoir area)

Seal: Jurassic dolerite, Latest Permian mudstone

Reservoir: Liffey Group

Source: Quamby , Mudstone (Tasmanite)

Risks: Timing - maturation and migration in the Mid-Jurassic to the Cretaceous - traps were formed in the early Tertiary. Burial in the Tertiary, plus an elevated geothermal gradient may result in generation of late hydrocarbons.

Reservoir Volume as US Barrels (BOE) 18 million barrels (P90)

(Monte Carlo calculation of potential, undiscovered prospective resources) 40 million barrels (P50)

79 million barrels (P10)

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AN INTEGRATED INTERPRETATION
of
SEISMIC, GRAVITY AND MAGNETIC
DATA
(as available in December, 2006)

CENTRAL TASMANIA

SEL 13/98

Report for Great South Land Minerals Limited

by
Dr. D. E. Leaman

January 2007

Note that the contents of this report represent an interpretation of geophysical data of varied and often limited quality. It represents a best technical study within the experience of the interpreter. Such an interpretation must inevitably contain some opinion and assertion and should be treated as a basis for discussion, refinement and regional guidance for further programs. It cannot provide consistent reliability or any assurance of correctness and Leaman Geophysics cannot be liable or responsible for any loss, cost damages or expenses incurred or sustained by anyone resulting from any use made of it.

Report "An Integrated Interpretation..Central Tasmania, SEL 13/98" was prepared by David Leaman and presented to Great South Land Minerals Limited.

A handwritten signature in cursive script, appearing to read "D Leaman".

January 29, 2007

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SUMMARY

A comprehensive review and interpretation has been completed of the central plateau region of Tasmania; an area of exploration interest to Great South Land Minerals Limited (GSL) which holds a petroleum exploration licence. This work was undertaken in order to assess the nature of structures and stratigraphy, whether any prospects were already identifiable and which areas required further data – and the nature of that data.

Previous work had suggested that the post Carboniferous cover across most of the region was relatively thin; generally less than 1000 m. Underlying structures and sequences are unknown but extrapolations from surrounding regions suggest a range of Precambrian and Palaeozoic sequences. These were thought to be arranged in folds and thrust stacks with many wedged and unconformable relationships. Well control of these deep units is restricted to one well which encountered dolomitic Precambrian rocks. All other knowledge is inference from preliminary gravity and magnetic interpretations.

Acquisition of some high quality seismic data has led to a review of such preliminary studies and the present work is the most detailed study yet done of the region. It has exposed the considerable weaknesses in the data available and of the problems of acquiring sound data in the first instance. These problems involve the terrain (often rough and of high relief), non straight traverses, and irregular sheets of Jurassic dolerite which intrude the cover rocks and which are often exposed. Each of these factors work to degrade the quality and value of seismic data. The present traverse coverage also leaves much to be desired and recommendations have been offered on this point.

The fragmentary nature of reflections and lack of continuity, coupled with negligible factual control of lithology, has required the integration of potential field data in order to assess structures and probable lithologies from inferred property and geometry combinations. It should be noted that all previous work amounted to free potential field interpretations since no significant seismic data coverage existed until the GSL surveys of 2001 and 2006, nor did well Hunterston-1 which, at least, confirmed an earlier prediction of basement type at the site. Assessment of the disjointed and block nature of structurally framed elements requires use of many methods.

Unfortunately this type of analysis places demands on the data which the gravity coverage (Tasmanian state data base) could not meet uniformly across the region. The magnetic coverage, acquired by Conga Oil, was of useful quality but restricted in value due to its line spacing. Further, the geological data base is woefully inadequate across nearly all of the region and further analysis, analysis using improved data and able to handle the issues posed within the cover sequence, will need some improvements in this knowledge. Improved gravity and magnetic coverage, so critical to full integration of blind seismic data, or poorly controlled seismic data, has been recommended: as has some ground inspection of critical exposures and areas.

The analysis essentially confirms the structural style predicted by earlier, less detailed studies completed in the absence of seismic data. Most major reflections appear to involve Cambrian ultramafics and are thrusts. Both east-dipping and west-dipping thrusts have been identified and many blocks are fully enclosed by such structures and such materials.

Folded structures may be traced beneath the cover from exposed elements in the west near the Florentine River valley and Mt King William, and from the north at Golden Valley. In some cases most major Palaeozoic rock sequences, as exposed in western Tasmania, may be inferred. There are many cases where key elements are missing and the most common omission is Cambrian in age (volcano-sedimentary sequences and volcanics). Not all units can be identified with confidence but the presence of the lower density, non magnetic Silurian and Devonian members have been deduced in various areas, mainly south of Great Lake. These rocks may offer reservoir potential and older source rocks may underlie them.

The only region which, given present data and analysis, might contain a nest of potentially closed structures is near Lake Echo, east of Bellevue. These structures are tiered and not concentric but are not yet defined to the east. Much effort should be focussed on this region.

Many other structures which present apparent crests would seem, at this stage, to be open in at least one direction. This is especially true of any structures involving the post Carboniferous (Parmeener Supergroup) cover, plus dolerite. The cover, indeed the entire region and the basal unconformity involved, is ramped with long wavelength regional dips. Apparent domes are not closed domes; they open, usually to the north. This observation will have implications for migration and reservoir assessment involving these rocks.

A number of ambiguities and conflicts have arisen which cannot be resolved with present data, and without further well control. Recommendations have been offered of drill sites which would resolve some of these uncertainties, constrain any future analysis and improve general understanding of the region.

The preparation of such recommendations, coupled with suggestions about structures, structural style and some sequence compositions, can be considered both the aim and result of this integrated review.

It must be clearly understood, however, that the interpretation has stretched the data sets to their power of resolution and, in some cases – especially gravity in western areas, exceeded this. Some aspects of some models offered are over-interpretations of gravity data, but within the resolving power of the seismic and magnetic data available.

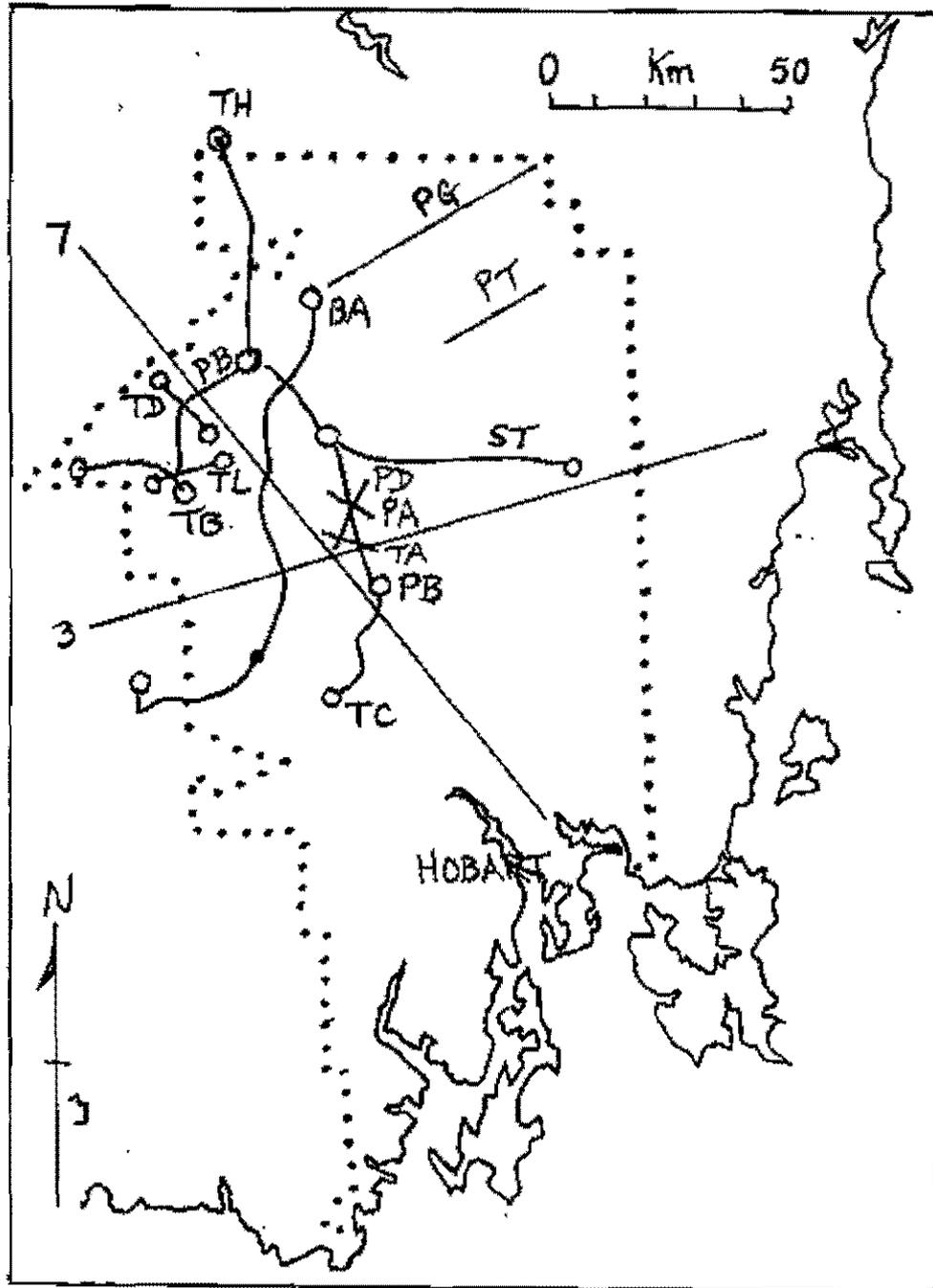


Figure 1: Location of licensed area and seismic lines, central Tasmania.
 (Additional lines are available in the northeast part of the licence area but these map post Permian structures and are not generally relevant to the present study. Lines PG and PT have been included from this set for reference purposes only)

INTRODUCTION

The integrated interpretation presented in this report was commissioned by Great South Land Minerals Limited (GSL) for several reasons. It is important that those reasons be stated, along with some comments about the inevitable limitations contained in the analysis. This interpretation is, at least, a current update of past research and a comprehensive improvement will not be attained until many elements of the data sets are themselves improved, and there is significant coverage of deep well control in the complex – and largely unknown – pre-Permian geology of central Tasmania.

The geological setting

The licence area, and adjacent region, is largely blanketed by a nearly flat-lying cover of Permian and Triassic rocks intruded by sheets of Jurassic dolerite (or dolerites) of varied thickness. This cover largely blinds the explorer seeking stratigraphic relationships (sequence thicknesses, contents, onlaps, unconformities, variations) or structural features (folds, ramps, faults and thrusts). These two classes of relationship form the heart of petroleum exploration. They are not evident in central Tasmania although it is clear that rock units, as exposed laterally, do possess considerable variations which may well offer potential. Further, some lower Palaeozoic rocks can generate, and have generated, hydrocarbons, as may some Lower Permian formations. Previous documents (such as GSL 2002) prepared for Great South Land Minerals Ltd have demonstrated these facts, essentially supported by Bacon *et al* (2000).

A few studies of the pre-Permian (essentially pre-Permian) sequences and structures beneath central Tasmania have been completed. These are by Leaman (1987, published as Leaman, 1990) which considers southern Tasmania, Leaman (1991a, b) which reported a more preliminary study of northern and central Tasmania, a private revision used as a framework for Leaman (1996b), and elements of TASGO project (2001) and selected sections of Leaman & Webster (2002). The original 1990 study of central Tasmania was begun by an earlier parent of the present company but work was halted due to funding and data constraints. The implications were summarized in Leaman (1991) and incorporated in Leaman (1992) and Leaman *et al* (1994).

These relatively limited studies, undertaken in the absence of significant seismic coverage, indicated a complex, repeated thrust regime in which the thrust packages generally dip eastward but, in the western part of Tasmania, and the western part of central Tasmania, often dip westward. Both regimes are known to exist in western Tasmania. This pattern could be expected across the entirety of basement Tasmania but it appears that east dipping thrusts become dominant in eastern Tasmania.

The first seismic problem

There is little about the geological setting which, in normal circumstances could not be clarified, perhaps resolved, using the seismic method. The crucial factor is the Jurassic dolerite, its variable presentation on the land surface – in terms of soil and weathering cover, and its variable and generally very high velocity at shallow depths.

Any failure to appreciate these variables has devalued and degraded seismic data. Early work (Leaman, 1978b, Leaman & Richardson, 1980, Richardson & Leaman, 1981) showed that good reflection records could be obtained where high dynamic ranges were sustained using a wide frequency range (15 to 120 Hz at least). In such conditions the depth of fracture closure (and its velocity step) was recognisable, as was the base of the intrusion and some features beneath it. Overstacking was not always found to be beneficial and best results were obtained in this early work where dolerite occurred at some depth (> 100-200 m), and preferably beneath water or low velocity sedimentary materials (< 2000 m/s). Most problems were encountered when dolerite was at surface and this was exemplified by test profiles at various locations (Leaman, 1978b; 1996a; Leaman & Richardson, 1980). Indeed, Leaman (1978a) suggested varied firing and stacking patterns might be needed for optimal results: a potentially costly option. This research was summarised in Leaman (2002).

The problem for central Tasmania is apparent: dolerite is on surface for much of the region.

Why is dolerite a problem?

Dolerite is a high velocity medium but this need not be cause for difficulty. Many other formations may possess similar velocities and, provided they are part of the stratigraphic cake, will be mapped and defined.

Dolerite, however, is rarely “part” of the stratigraphic cake. The intrusions tend to be irregular, transgressive, multiple, near surface, and extremely variable physically. All such characteristics disturb the assumptions of the reflection method, data stacking, processing and migration.

The issues related to dolerite have been summarized in Leaman (2002). See Figure 2.

The second seismic problem

Other seismic problems are related to line location and terrain. It is simply unrealistic and expensive to traverse straight, cut lines across the body of the Tasmanian countryside, and few valleys offer any line length. Consequently, traverses must be irregular in three dimensions: a factor which is not critical for deeper reflections in general since these can be inferred, located and shifted in processing provided the line excursions are not too great. Unfortunately, the dolerite-near-surface problems (geometry and physical variability) compound the line geometry issues and degrade reflection quality – typically for two way times of less than 0.5 to 0.8 seconds. This time range tends to contain all the Parmeener (post Carboniferous unconformity) information – including the dolerite.

All these elements are evident in GSL’s seismic data (2001 and 2006 surveys). Fragments are shown in Figure 3. The presence of Permian and Triassic rocks at surface enables reasonably clear definition of a contained dolerite sheet. But, where dolerite is at surface, it is often difficult to recognise the intrusion base and other sequence character – including the nominal base Permian unconformity, is obscured and diffuse. There are exceptions where uniformity of dolerite character at surface, and of terrain and line orientation with respect to structures, permits adequate resolution (e.g. Figure 3A, B),

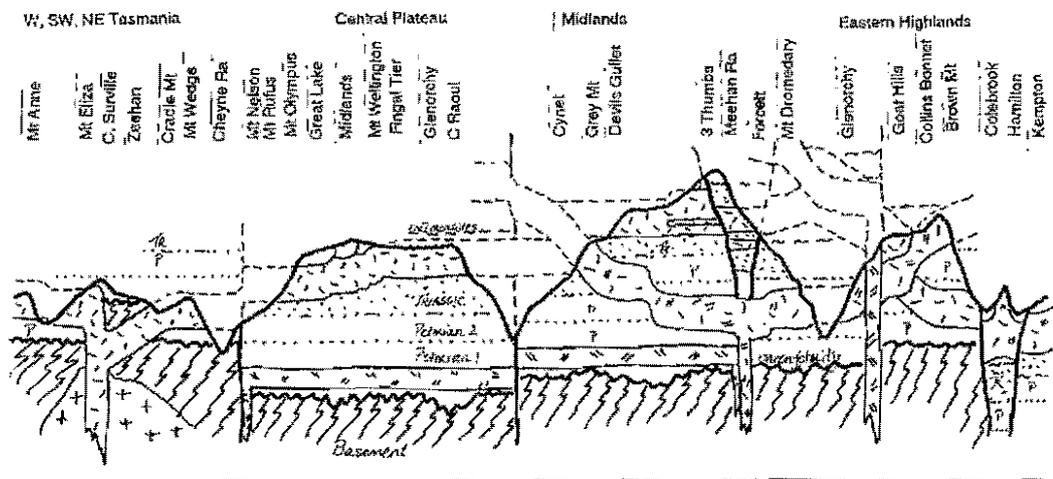
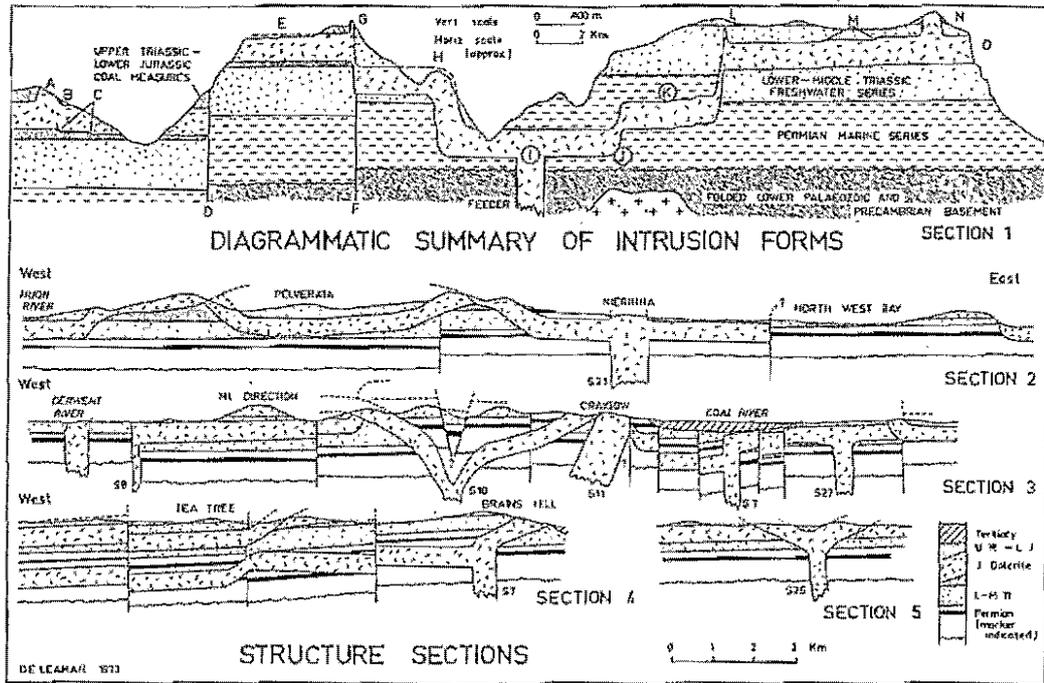


Figure 2: Examples of style of dolerite intrusion.

Upper diagram from Leaman (1975) and lower diagram from Leaman (2002). Each serves to illustrate the enormous range of intrusion relationships. It is also now known that many (if not most or all) intrusions have been multiply injected; a factor which can complicate interpretation or field decisions about apparently small intrusions or exposures.

North Great Lake), but these are quite limited in extent. Their importance cannot be over-emphasized since any clarification of section or spatial information provides vital control. Spot control, however, cannot replace continuous data or profiles. Careful specification and observation of the survey is essential.

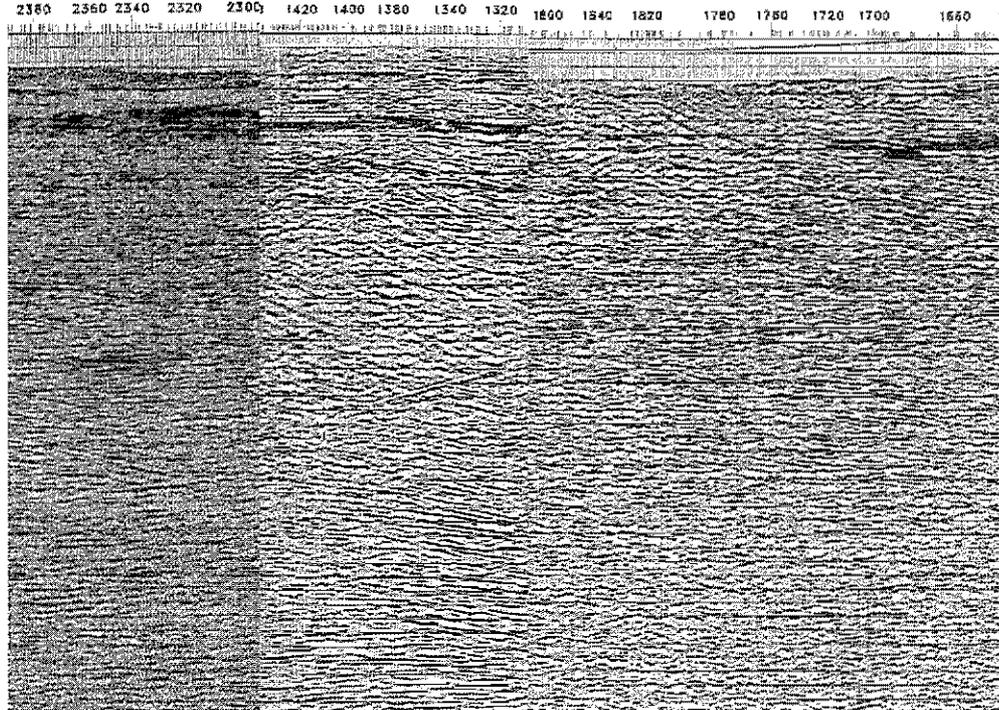


Figure 3A Figure 3B Figure 3C
Diagrams to illustrate the variability of responses and effect of Jurassic dolerite.

Line TB02-AA2
North of Strickland
Triassic rocks at
surface

Dolerite is indicated
by a "white" zone.
Good result

Line TB01-TH Line TB01-TH
High plateau, Lake Hwy Beside Great Lake, Lake Hwy
Dolerite exposed at surface. Note the marked change of
character near SP 1720 implying a major change in dolerite
geometry or properties, or both. Much detail, in the upper
part of the section has been lost or much obscured.

The base of the dolerite is marked by a moderate reflection.
at about 100 ms.
Good result Poor result

The third seismic problem

Reflection character from the Parmeener (and dolerite) part of the seismic records can be reasonably correlated with known units: at least as gross packages. Figure 3B is an example of this. Many members of the Permian part of the succession can be identified in adjacent parts of this traverse at the head of the Great Western Tiers where the stratigraphy is well known. Blackburn (2004) also made this point. In these terms, and in comparison, the dolerite may be seen as bland and uniform – unless transgressive, but Triassic and Permian rocks may not be unambiguously separable.

Not enough is known of responses from Triassic rocks and definitive interpretations of sequence type (sandstone or mudstone dominant for example) is not possible. In many cases it is not yet possible to discriminate Upper Permian siltstone sequences and Lower Triassic sandstone sequences.

The real problem, of particular significance to the exploration by Great South Land Minerals, relates to identification of unit packages of Lower Palaeozoic and Precambrian rocks. Some of these may be source rocks, others reservoir rocks.

Inspection of RMS and interval velocity panels reveals that velocities involving dolerite, deeper Permian sequence, and all underlying rocks are not readily distinguished: all present velocities in excess of 5000 m/s, typically 5500-6500 m/s. Yet reflections, often high amplitude reflections, are observed from beneath the base Parmeener unconformity. Many of these features must be structural, fault or thrust elements, but some may be stratigraphic. The problem is how to link such features in geological sections and to infer lithologies, sequences and ages.

Control information is available only from the Deloraine-Golden Valley-Poatina area in the north, and from two traverses west of the central region (to Florentine Valley – line BA, and to Mt Arrowsmith – line TB). The highly patchy nature of the folded, faulted, overthrust regimes in northern Tasmania, as demonstrated in exposure and replicated potential field geophysical studies, rarely provide much assistance to interpretations of such profiles since the style of structural disruption is such that blocks are either too small (laterally), or dip too steeply. Studies beyond the confines of central Tasmania suggest the regional style which should be anticipated. Further, conditions to the west, from Mt Arrowsmith and the Florentine valley, imply major thrusting but do not permit clear tracing of units into the heart of the traverses – central Tasmania.

The role of other data sets

Available geological compilations are not relevant to resolution of the critical problem: what happens beneath central Tasmania. But, as noted below, the quality of the available mapping is not sufficient to resolve secondary questions or assist other data sets (gravity and magnetics) with specific site reviews.

Extant gravity and magnetic data can contribute to an understanding of the deep structure and lithology and this has been demonstrated by interpretations offered in the last two decades (e.g., Leaman, 1990, 1991). These interpretations have depended on extrapolation of known types of relationships to the regions examined, and then some unification of the implications of the methods or data sets. Some objective tests are available to establish whether a solution is viable and credible – not necessarily correct in the absence of well control. These tests, defined in Leaman (1994), allow recognition of spurious solutions which might fit the observed data but which are not viable in the particular setting. As such, much ambiguity can be removed. These techniques for testing solution viability evolved during the period of the earliest interpretations and, indeed, that work led to the tests and an appraisal of them. Only interpretations after 1991-1994 should be assumed to have been filtered by the testing criteria and the improved methodology of Leaman (1995, 1997b).

The early interpretations were provided in the absence of usable or extensive seismic data, or useful well control – or useful distribution of such control. Sites in the upper midlands, and at Glenorchy, provided the only control on basement lithology. This problem remains.

It has also been shown that seismic data interpretation of complex terrains can be quite misleading in the absence of interpretations of other data sets. An example of this was provided by Leaman & Webster (2002) for a traverse across the Dolcoath Granite in northwest Tasmania in which the seismic interpretation did not define the intrusion. Gravity data, however, were quite definitive. Consequently, the opportunity to match seismic sections with indications of high angle or deep boundaries and gravity and magnetic data means that some assessment of the rocks and sequences involved in the reflected features might be possible.

The present preliminary interpretation is based on this premise.

Problems with gravity and magnetic data

The integration of data sets is an advised approach but the results depend on the quality of data available, and the methods used for interpretation and integration.

In the case of central Tasmania, there has been no significant change in the gravity data base since the work of Leaman (1991). The manner of presentation, and direct usefulness, of the data available has been transformed by the conversion from raw Bouguer anomalies to crustal-isostatically corrected residual Bouguer anomalies. This was made possible by the series of gravity interpretations undertaken after the observations collected for the Mount Read Volcanics Project of the mid 1980s and the regional scale evaluations which followed. The reported interpretations relevant to the present study were undertaken in this environment of changing understanding and processing. The methodology was reported by Leaman & Richardson (1989b) and has been refined subsequently (Roach *et al.*, 1993). The conversion to residual data, whilst not improving the detail of the coverage, does allow focus on the upper 5-10 km of the crust with no need to consider deeper crustal, mantle or oceanic effects.

These improvements do not replace the need for good, reliable data coverage – and herein lies the weakness in the present data set. Some regions, especially south and east of 480 000 mE, 5300 000 mN, are reasonably served. Others are not. The Arrowsmith, Great Lake, Bronte, Interlaken regions are poorly covered, and the region west of Tarraleah and National Park is very poorly covered.

All extant stations have been terrain corrected but reliability often depends on accuracy of elevation determinations – which have, until recently, been mainly barometric. Likely errors in the Bouguer anomalies are of the order of 0.5 to 1 mgal. Gravity data thus have varied application, depending on region and reliability, but where coverage is fair then this data set is able to guide an interpretation of pre-Permian rocks.

Magnetic data are both more detailed and also more problematic.

This paradox reflects the nature of coverage and the variation in rigour of survey and specification. Three relevant data sets are in existence.

The first is a state coverage with modest traverse spacing acquired by AGSO in 1985. It has an E-W line orientation but was acquired with an unknown, varied terrain clearance (150-1000m) which renders quantitative interpretation or reprocessing impossible.

The second survey, flown at high level (1600 m) but fixed height, was acquired by Conga Oil Pty Ltd (a predecessor of Great South Land Minerals Limited) in 1989. The E-W lines are spaced 5000 m apart and this coarseness limits detailed value. It remains, however, the only consistent and fully specified, recoverable regional scale survey of central Tasmania.

The third survey, much more limited in coverage but more detailed, was undertaken by Mineral Resources Tasmania of the Oatlands area. The E-W lines have a separation of the order of 200 m and were flown with nominal terrain clearance of 100 m. This fine survey allows resolution of local and near surface features but lacks the coverage to allow full integration with the Conga survey or the present seismic coverage.

The Oatlands survey allows comprehensive assessment of Permian features and the dolerite intrusions. The AGSO data provide an indication of magnetic texture and trends of features but only the coarsely spaced Conga survey allows any quantitative regional interpretation, due to its fixed reference base. Data acquisition at high level, using coarsely spaced lines, does limit the interpretation options but a first order structural evaluation is feasible using this data, and it has been used to test various seismic and gravity implications and was used extensively by the 1990-1 interpretations to generate a view of basement structures and contents.

A relevant extract of the summary of the 1991 interpretation is shown in Figure 4. A sample of the updated revision of this interpretation provided for inclusion in the Regional Forest Agreement documents is shown in Figure 5 (from Leaman, 1996 prior to final drafting).

A more detailed, consistent magnetic data set must be acquired before any truly reliable evaluation is possible. The data interpolations, between lines, necessarily degrades certainty of location of features, or the gradients and magnitudes associated with any anomaly.

The present situation is parlous and quite unsatisfactory and probably would not be tolerated in any other Australian state. The Federal agency survey (1985), and its failure, is the fundamental reason for this condition and reflects practices which treat Tasmania as a guinea pig. State-funded surveys in west, northwest and northeast Tasmania, as well as near Oatland, are of an order better in quality but state funding has not provided an adequate coverage either of geological or geophysical information in central Tasmania as a whole.

Issues for interpretation

The interpretation provided below relates limited geological surface control to seismic response, and to both gravity and magnetic anomaly patterns. Gravity data offer better resolution for much of the region, but some elements of the magnetic field are helpful, even if of lower resolution and reliability of location.

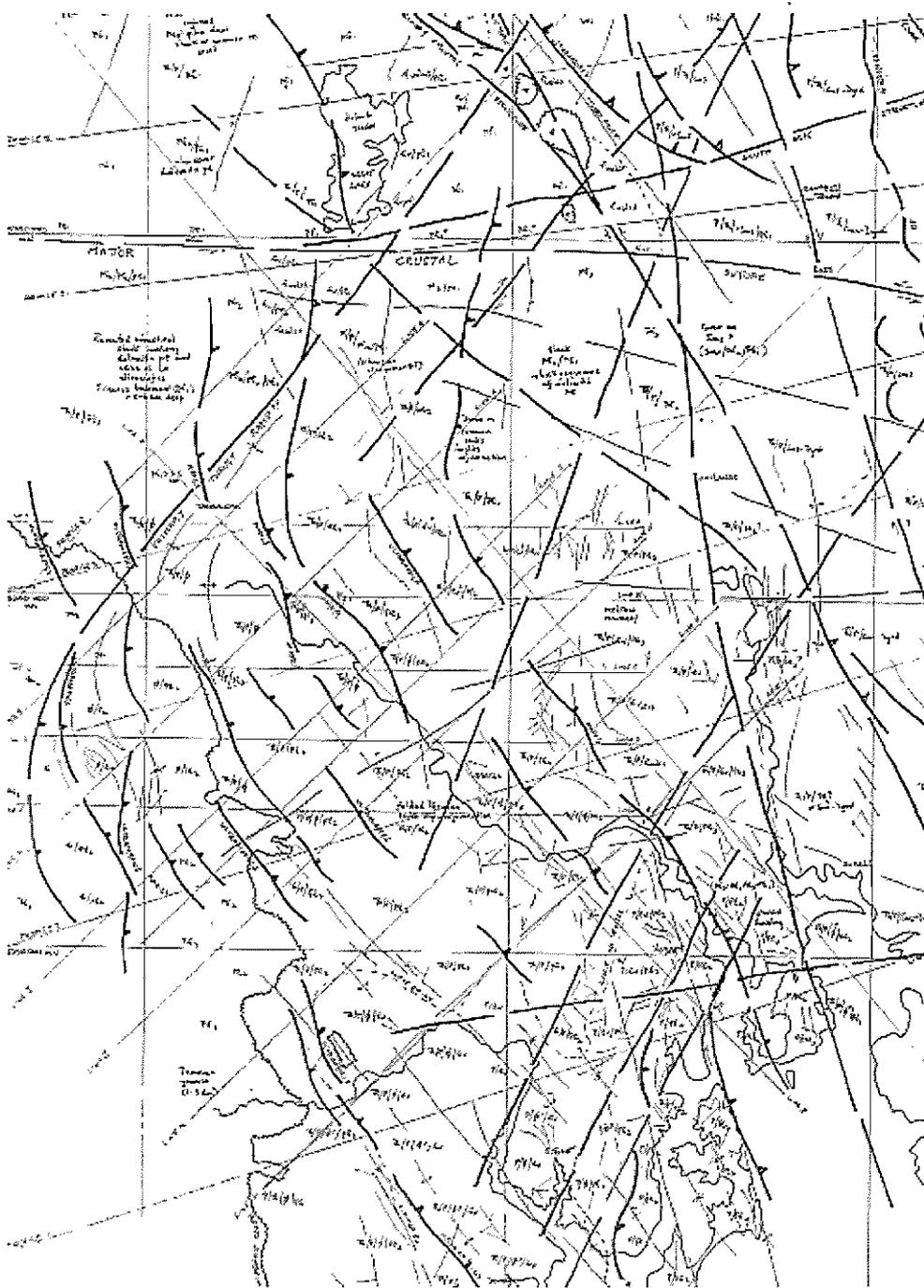


Figure 4: Extract of interpretation summary map, 1991/1992 interpretation of central Tasmania.

Note the inferred thrust character of the entire region. The comments were an attempt to indicate the general location of ultramafics and the lithologies deduced in each block.

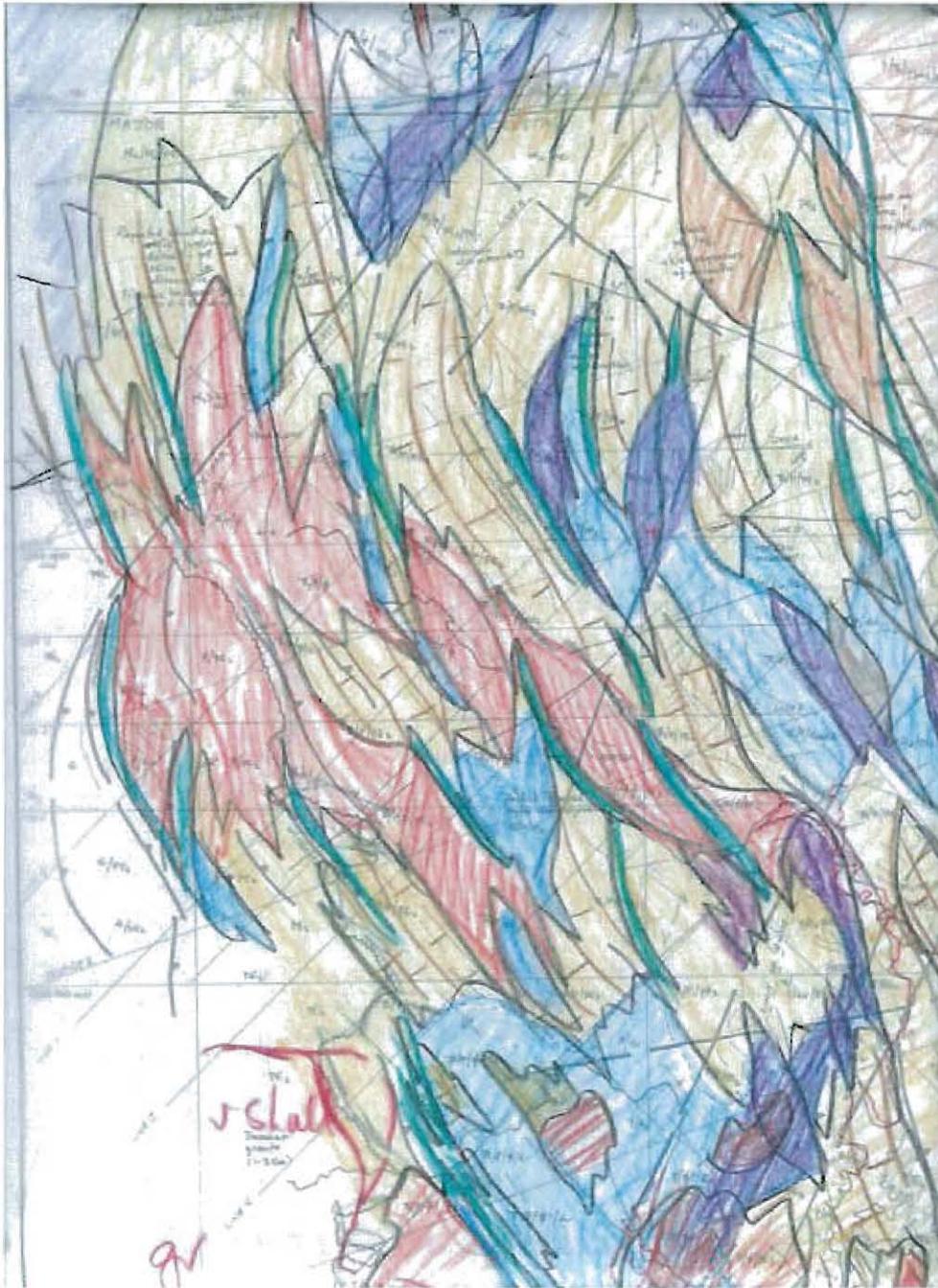


Figure 5: Extract from preliminary undrafted interpretation for 1996 RFA documents. This version has been used so that some geography and elements of the 1991 interpretation can be superimposed. The final version of this map was produced in solid colour with no geographic detail other than grids and does not permit correlation. Note the additional comment in SW corner about recognition of a shallow Devonian granitoid.

Initial inspection of all data now available suggests that many shallow, or surface, structures are related to deeper features and may represent serial rejuvenation. Several elements and boundaries have been examined by on-ground inspection in order to assess the nature and history of displacements, contacts or the presence of multiple intrusions. Multiples are known to occur in the region (e.g., Hunterston 1) and in escarpments at Liffey Bluff (along seismic line TB01-TH, sp 1300) and may lead to variations in dolerite thickness, transgression and source patterns. Corrections and assessment of such variables must be included in both the depth analysis, and feedstock for test by potential field methods.

Each seismic line has been reviewed. This approach may be contrasted with the 1991 interpretation which used a net of gravity and magnetic profiles extracted from the data base. No seismic correlation was then available. However, since the seismic lines are not straight traverses, the assessed profiles have either been segmented or selected to approximate the location of the seismic lines. Character projections have been made based on indicated, exposed geology. Preliminary geological sections were then generated using inferences about intrusion forms, stratigraphic setting and dilational patterns and faults. Such sections may depend on decisions about, and information of, intrusion multiples and the direction of intrusion: factors which usually requires direct inspection. Not all critical sites have yet been visited. Gravity and magnetic modelling may then be applied to test consistency, or existence of paradoxes and alternatives. Such alternatives are almost never crucial for interpretation of gravity-magnetic data at upper crustal scale since the details of any structures within the Permian cover tend to be gravimetrically trivial in comparison. *The bulk of the gravity field responses are generated beneath the base Permian unconformity.* An understanding of the cover section is, however, relevant to interpretation of the more obscure parts of the seismic records and more reliable time depth estimates for other parts.

There are some limitations upon the various contributions and features assessed. All structures, and at all scales, are three dimensional. The layout of currently available seismic lines rarely permits any such view. Exceptions are very local to Hunterston, Bronte and perhaps Bellevue. Further, the surface structures, especially those involving dolerite, are also three dimensional. This is particularly critical in the case of magnetic data, especially where the data are controlled only on widely spaced lines. Consequently, any potential field profile based on 2D analysis may only provide an indication of structure or sequence. There is, however, no reasonable case for 3D analysis: something which can only be justified when the implications of 2D studies have been fully appraised and controlled by some relevant drilling. Not enough is known about any part of the region at this stage and the available geophysical data sets are not of sufficient quality or distribution to permit such refinements.

Caveat

The present interpretation is thus a second pass of existing data. The first pass (1989-1991) was based only on indicated geological trends and potential field data. This new study incorporates seismic constraints, where any can be distinguished, even though the source of the reflector is not seismically identifiable. **The aim, here, is to use the other data sets to suggest the nature of lithologies and structures recognised seismically.**

It will be evident that any inferences must be simply that, inferences, pending further seismic coverage and well testing.

This study was thus designed to review the alternative explanations for both seismic features and, particularly, gravity anomalies. Magnetic information, such as it is, has been used to constrain or check any aspect which has magnetic character. The deductions offered may be used to define potential targets for further seismic coverage or to locate critical sites worthy of drilling for either direct prospecting value or critical stratigraphic control.

The acquisition of relevant well information, further general seismic coverage, and better coverage of gravity and magnetic data will allow review and revision of the present interpretation with direct application to target focus.

INTERPRETATION

As noted in Introduction this interpretation was begun with a major review of all previous interpretations, even though the basic data available had changed little. Methodology and assessment of factors which make for more reliable judgments have been evolved (Leaman, 1994) and the regional and sketchy nature of the early interpretations involved under-sampling of the existing data. For this study, the existing data has been sampled to its limit of reliability or definition and this has led to more detailed and comprehensive analyses – if far from satisfactory. The interpretations have also been polished and completed, and tested with alternatives suggested by the experience of basement studies undertaken elsewhere in Tasmania since 1991.

REGIONAL LINES 3 AND 7

Two examples of the review of the 1991 interpretation are presented here: for lines 3 and 7. In each case emphasis is placed on the style or content of basement contributions. These lines were used for regional indications and no detail is included for the Parmeener cover: that is included in the models which relate to the seismic traverses.

Line 3 is oriented WSW to ENE and extends from near Philips Lookout west of the Gordon River, to the Derwent River at Wayatinah, to Dungle Hill near Hunterston, to Woodbury and ending on the eastern side of the Eastern Highlands north of Swansea. Coordinates on traverse: 441 000 mE, 5301 000 mN; 500 000 mE, 5319 000 mN; 540 000 mE, 5331 000 mN; 576 000 mE, 5342 000 mN.

Line 7 is oriented NW to SE and extends from Clummer Bluff above the Mersey River to Lake Fanny (447 000 mE, 5366 000 mN), to north end of Lake Echo (470 000 mE, 5340 000 mN), to west of Hunterston (497 000 mE, 5309 000 mN), to Bagdad and ending at the head of Pittwater, at Horatio Point.

These two lines sample and integrate the implications of all previous work and each has been recalculated with new data sampling, and with gravity data in residual form.

LINE 3 provides a true dip line across the multitude of structures inferred in earlier interpretations (see Figures 4 and 5).

Figure 6 presents an interpretation which is directly derived from previous views. Lines such as Line 3 allow some control of the density assumptions included since it extends far enough east to sample the effects of the East Tasmanian batholiths (Leaman & Richardson, 1989a, 1992). The density of these lithologies is well established and can be used to provide constraints elsewhere in the model. Only the depth to granite may be uncertainly defined. This model also suggests the minimum thickness of the Parmeener cover but other models, as shown below, thicken this cover – depending on the number of dolerite intrusions involved. The gravity model extends the exposed Lower Palaeozoic folded section to the easting of Wayatinah. Major changes occur at this easting and this combination of rocks cannot continue. A large volume of relatively dense material must be introduced (a dense variant of Precambrian basement – approx 2.72-2.74 t/m³). This core block, which generates the relatively positive gravity field character across much of central Tasmania, tapers eastward.

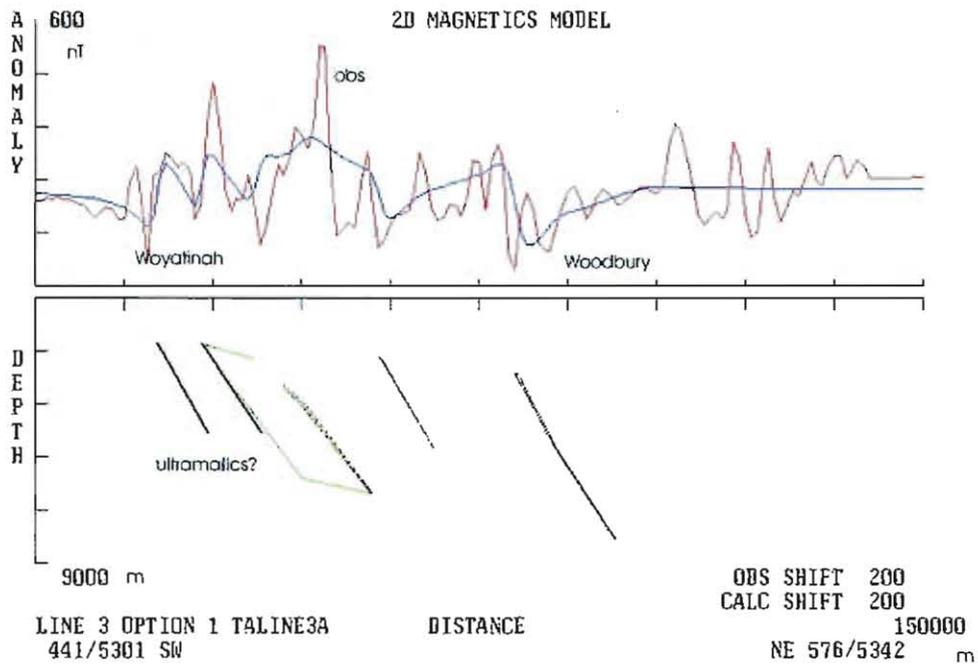
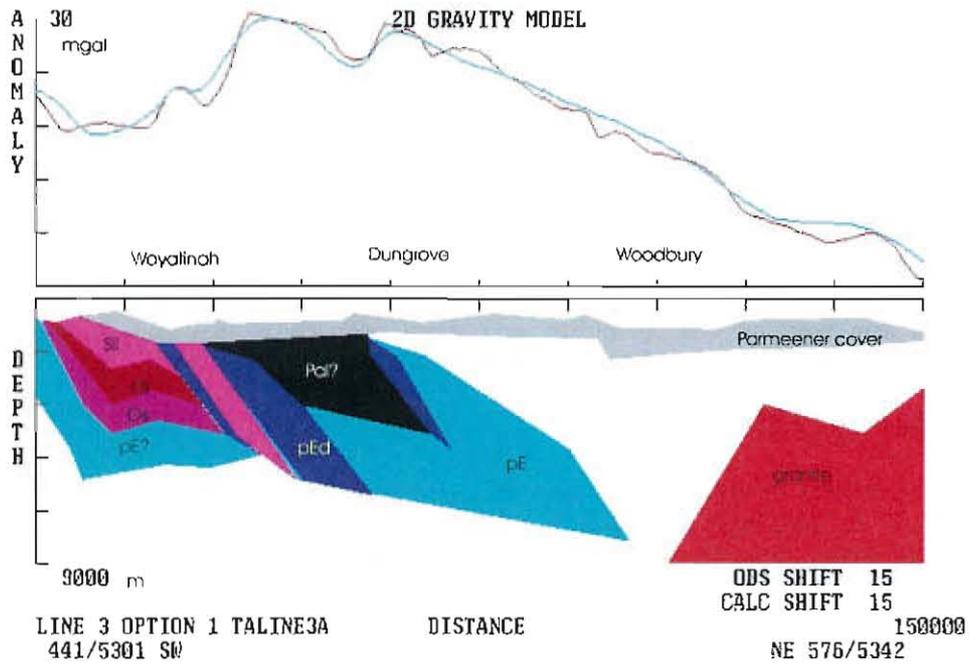


Figure 6 East dipping multi-thrust concept. Line 3 potential field model.

Basement materials in the eastern half of the section must be dominated by siliceous rocks or suites comparable to the Mathinna Beds. Granites control the east end of the gravity profile. Two other lower density sequences can also be inferred. The first occurs as a structural (?) slice beneath Wayatinah, the other just west of Dumgrove-Hunterston. This material (labelled Pal?) is almost certainly some combination of Ordovician-Silurian rocks dominated by siliceous members. Although there is no seismic control for this profile there is seismic evidence for this interpretation (discussed below for Line TB01-PB, part 1, Figure 12). The model cannot resolve whether these rocks simply overlie basement rocks or are structurally emplaced.

A test of the east-facing multithrust concept, and the issue of structural emplacement, can be provided by magnetic data. The deficiencies in the present data set are immediately evident. It is not possible to completely separate the effects of "noise" due to near surface dolerite, or dolerite feeders, and deeper sources, but there are gross features which can only be explained for when deep, narrow, intense sources are incorporated in the model. Such sources, in a Tasmanian context, are almost certainly Cambrian ultramafics and structurally emplaced. The models of Figure 6 would suggest that any component of Lower Palaeozoic rocks within the section east of Wayatinah has been structurally emplaced.

Figure 7 considers the implications of seismic sections such as TB02-BA and TB01-TB, TH (see below, Figures 10, 17, 21) that structures dip to the west in the western part of the region. This option was never considered in previous work due to time constraints, and the incomplete nature of the studies, although other work in western Tasmania (e.g., Leaman, 1986; Leaman, 1992) had revealed a preponderance of west-dipping structures, overprinted by east-dipping structures. Figure 7 not only shows that the available data support such a view, but that it is more likely. Note especially the magnetic model. Both parts of the model make clear that virtually all major relationships between units are structurally controlled.

Hole Hunterston-1 can be located in this framework. It was drilled just east of the slice of presumed Lower Palaeozoic rocks (black in Figure 7) and into the denser Precambrian core block sequence. This basement composition had been largely predicted by Leaman (1991, 1992) but considered more massive dolomite, rather than a dolomitic association, as here implied.

LINE 7 samples the entire core zone of central Tasmania and intersects Line 3 about mid section (at 90 km). There are limitations on the density range which can be applied to the basement core but all packages in the northwest appear to dip west while those at the southeast end of the section dip east. The wedged character of the core is reinforced with this orientation and the cause is probably due to offset thrust blocks. A lower density zone has been located southeast of Waddamana.

Various options are possible for block dip, volume and mass on the basis of gravity data alone. Magnetic data are, however, sufficient to separate alternatives and support the particular gravity solution offered. Ultramafics are involved along at least three of the major boundaries or contacts inferred and those west of Waddamana may only dip westward. The wedge of undifferentiated Lower Palaeozoic rocks, with densities consistent with Silurian and perhaps Devonian (?) rocks, or extremely thick Permian tillites (most unlikely), are bounded by an east-dipping structure and rejuvenations.

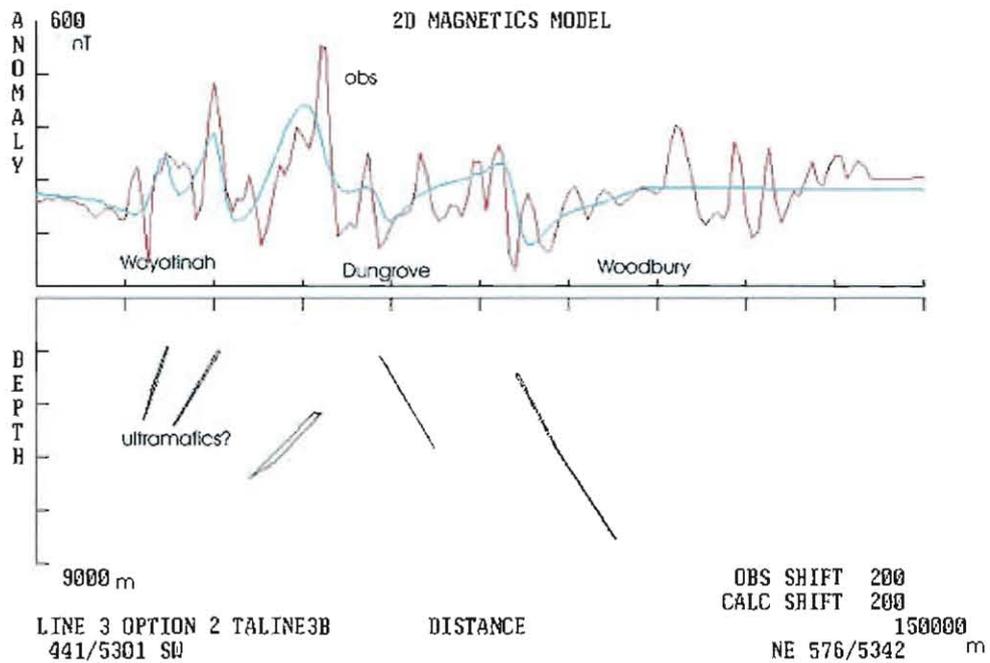
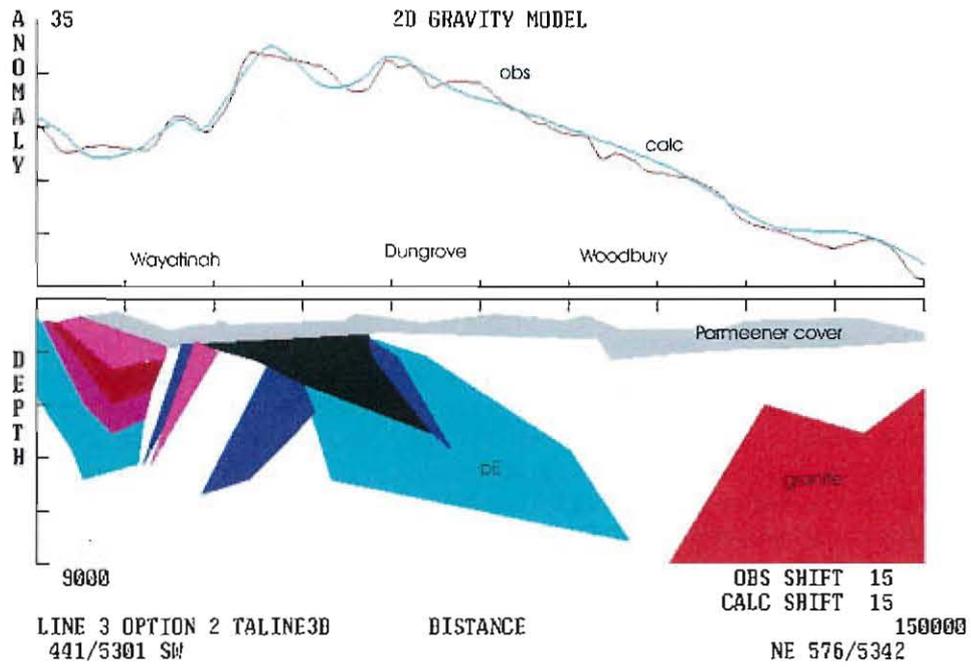


Figure 7. Opposing thrust concept. Line 3 potential field interpretation.

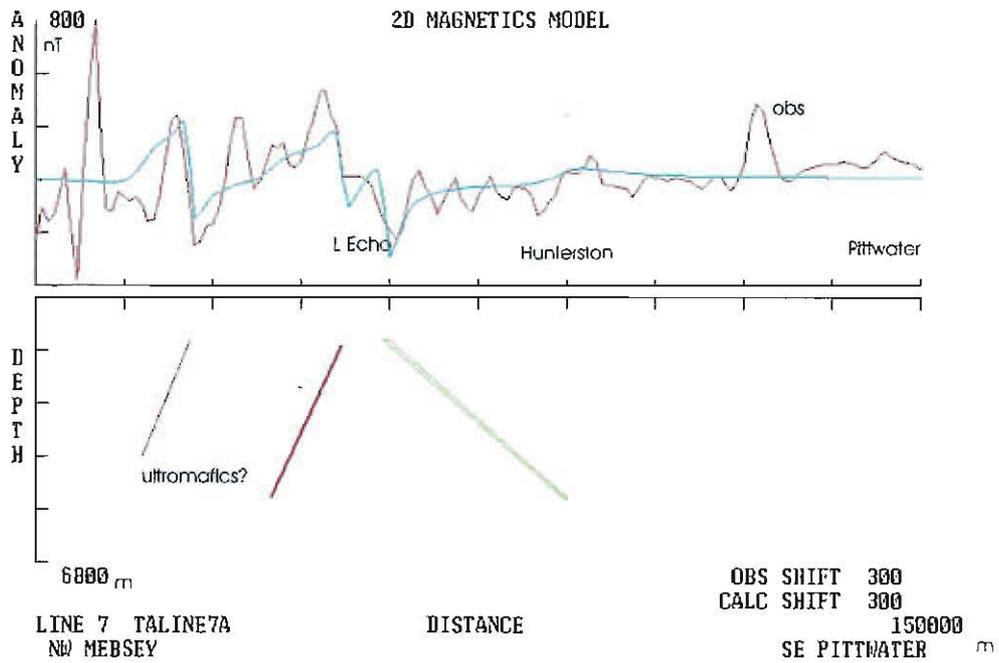
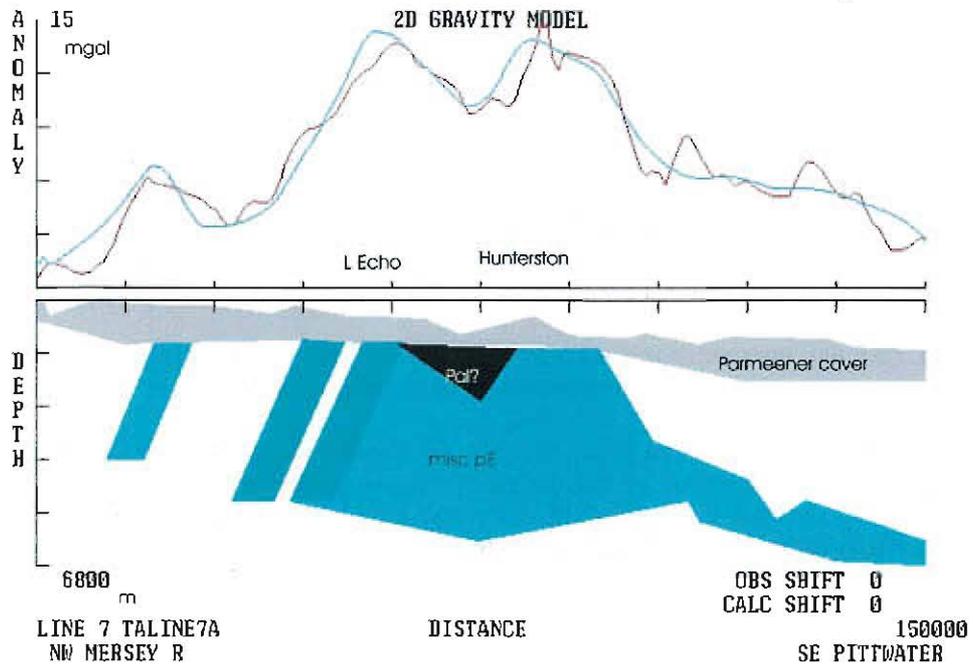


Figure 8. Line 7. Opposing thrust stack concept. Potential field interpretation.

Note that all profiles modelled for lines 3 and 7 display minor oscillations (± 1 mgal, ± 100 to 200 nT) which can be ascribed to data imperfections (gaps, poor definition, errors) or near surface effects such as the local characteristics of dolerite intrusions. Few of these have been examined in detail since close inspection of outcrops and much better magnetic data are required to make sense of the variations. More precise gravity models of the Parmeener section may also be developed when this is possible. It would be possible to present perfect fits for the model and observed field calculations but this would not guarantee their efficacy or reliability in the present circumstances. Gross effects only, as guide sections, have been established in these models.

The regional interpretations may be considered free, or unconstrained, since no independent structural constraints can be, or have been, applied.

All following sections and interpretations are based on observed seismic lines and combine the implications of that seismic data, in so far as useful detail may be discerned, and the potential field data. Seismic data can offer some structural constraints additional to the gravity-magnetic combination and suggest more precise location of structural boundaries.

It must also be noted that the seismic results are far from perfect, clear or definitive and rarely able to provide continuity of features. These deficiencies result from the very high velocities involved, the lack of contrast between velocities, the steepness of structures and the presence of major structures off, but near, traverse. Diffraction and sideswipe effects are very common – as might be expected given the implications of the regional potential field interpretations (Figures 4, 5, 6, 7, 8).

The objective of this integrated interpretation has been to place some scaling on blocks of material, thereby to constrain the physical property range, and allow inference about composition or lithology and, perhaps, age.

The order of lines, as presented, is generally north to south then west in order to provide a linked, systematic view from what is a skeleton coverage.

Seismic LINE TB02-AA2 (2006).

This traverse extends along the Strickland Road from the Lyell Highway north of Ouse (472/53011) to Duckhole Lagoons north of Strickland (4717/5312).

This data set is isolated from other existing seismic traverses and can only be linked to them via regional Line 3 at the northern end of the survey. A consistent solution is shown in Figure 9. The tie point with Line 3 involves the inferred mixed Lower Palaeozoic package some 2 km thick overlying several km of dolomitic sequence (presumably Precambrian). More siliceous Precambrian rocks occur nearby (beneath).

The basic model includes the Parmeener cover, with dolerite, possible Silurian and Ordovician sequences and then the Precambrian base. The white colour indicates generally siliceous Tyennan-type basement. Comparison of Figure 9 with Figures 6 or 7 reveals an excessive thickness of denser Precambrian types. It should be noted that these are relatively dense (2.84 gm/cc) and that their replacement with lower density

Precambrian or Cambrian, Ordovician limestone, units would compound the problems and require a thicker section. The thicknesses suggested are compatible with seismic data and velocities.

The seismic section clearly reveals dolerite within the sequence and the base Parmeener unconformity lies some 300 ms deeper. The deeper section, below this, includes at least three relatively flat-lying reflecting boundaries. The first of these is of the order of 2000 m below the Parmeener cover.

Since the regional solutions are tied to granite densities which are tightly constrained, and set in a much lower Precambrian density framework this section presents a problem. The paradox is almost certainly due to three dimensional features assessed using two dimensional methods and sampling (all data: seismic, gravity and magnetic). The problem develops near the cross tie position (with Line 3) since the remainder of the model is consistent with the rest of Line 3. Note that Line 3, on the basis of all that is known of structural trends, is a dip line: AA2 is a strike line (at least approximately) and may not represent features reliably.

Complete resolution of the issues posed by this line fragment may not be resolved until the line is extended (as planned), nor until a cross line can be observed which ties both AA2, PB and any other new traverses along the Lyell Highway.

Magnetic data do, however, provide an interesting test by suggesting the existence of an ultramafic slice within the dense Precambrian segment. This depth, within a few hundred metres, is quite consistent with the structural boundaries implied along Line 3. The magnetic profile has a most distinctive form: it is a step anomaly of long wavelength and cannot be explained by any near surface materials (basalt or dolerite) or shallow structures. Such elements generate the "noise" on the profile. High contrast magnetic materials at moderate depth are required to account for this profile. The subhorizontal nature of the causative body indicates a structure whose strike virtually parallels the model section.

Line 3 model B (Figure 7) stresses the crucial setting of Strickland. Model B is the preferred solution and it suggests the tangle of basement structures which underlie the Strickland area: many of which involve ultramafics.

Shallow structures involving the Parmeener cover are much simpler. All data indicate one dolerite sheet within the section but this sheet passes to an unroofed plug form south of Strickland. Seismic data resolve most of the dolerite character along this short traverse but only patchily define the base of the cover sequence.

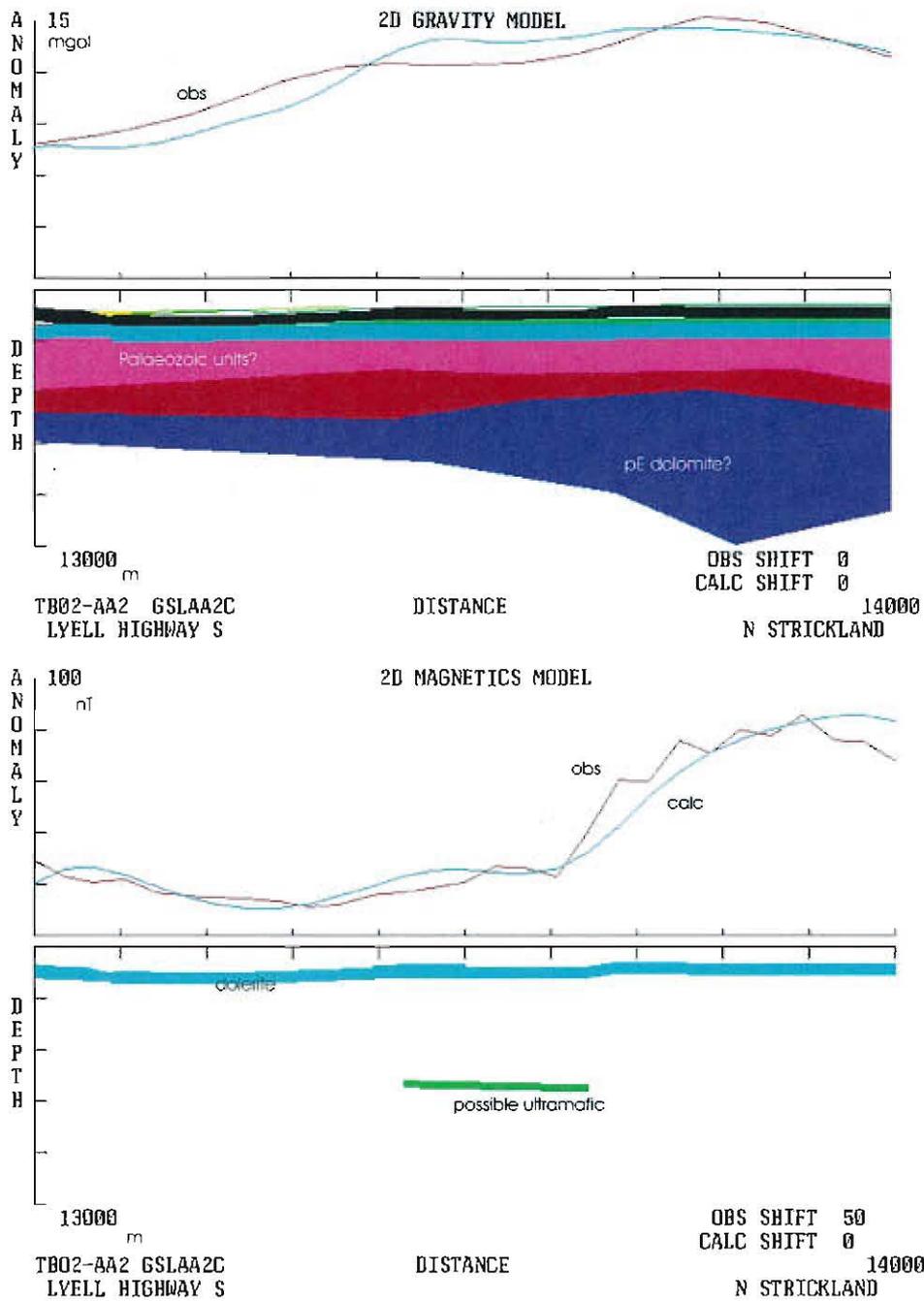


Figure 9. Possible structuring consistent with seismic profile TB02-AA2.

Seismic LINE TB02-BA (2006).

Line BA extends from the Tiger Range above the Gordon River (450/5201), where there was some redundant acquisition which did not assist profiling, migration or correction, to the central plateau and terminates northeast of Great Lake at the very edge of the Great Western Tiers above Poatina (487/5369). The line crosses the topographic ramp onto the plateau. Refer to Figure 10. This line begins on the exposed Lower Palaeozoic rocks of interest to Great South Land Minerals Limited – in the Florentine Valley region.

Both regional control lines intersect this traverse (at about 44 and 77 km; lines 3 (42 km) and 7 (65 km) respectively). No difficulty was experienced correlating the few seismic features observed and the implications of the potential field data. Thus the multiple reflection pattern observed deep in section near Line 7 is probably related to the fault/thrust offset at depth and a similar relationship can be observed near Line 3. North or east-dipping structures are implied consistent with Figure 4. Major steps in the basement complex are implied in all data sets. Magnetic data confirm most of these concepts even though resolution is limited.

Near Line PB (at 85 km), where Palaeozoic rocks are inferred beneath Parmeener cover, magnetic data indicate that the south face of the sequence is either deposited on and old, thrust surface, on exposed ultramafics, or has been thrust subsequently. Each option is possible and all have been observed, somewhere, in western Tasmania. None of the extant geophysical data can separate these possible solutions. All, however, suggest major basement structuring at various times from the Proterozoic to the Permian (and presumably the Present). The situation is simpler south of the River Derwent. Structural facings oppose and the constitution of the pre Permian basement is quite different. Magnetic data even suggest that part of the basement sequence, thought to be dolomitic on the basis of gravity anomalies, may be magnetic – which would imply equivalents of the Crimson Creek Formation are present. Between shot points 700 and 1600 reflections wedge and dip west. This effect has been reproduced in the models (from 10 to 22 km).

The most distinctive magnetic feature is near Waddamana and may, partly, have a basement origin although there is no suggestion of a density offset. There is a flower-like fan of structures in the seismic record. It is possible for dolerite to account for some of the effect observed and this could be confirmed with more detailed survey. Much of the section north of Ouse contains two dolerites: an irregular sheet base near surface, and a hidden sheet at depth. A feeder may be present south of Native Tier and also north of Waddamana, near Shammon. North of Shammon it appears that only one major sheet is present: exposed. Around the Waddamana area, however, two almost entire sheets intersect and intrude each other. The inter-sheet transgressions are ghosted in the seismic data. Tertiary basalt conceals much of the geometry and alters reflection character. All this structuring, and volcanics, overlie the fan of basement structures which may be hinted seismically.

Long sections of this seismic record are bland and without major event. The implied synformal wedge of Palaeozoic material at the north end of the line is supported by changes in seismic character and dipping reflections.

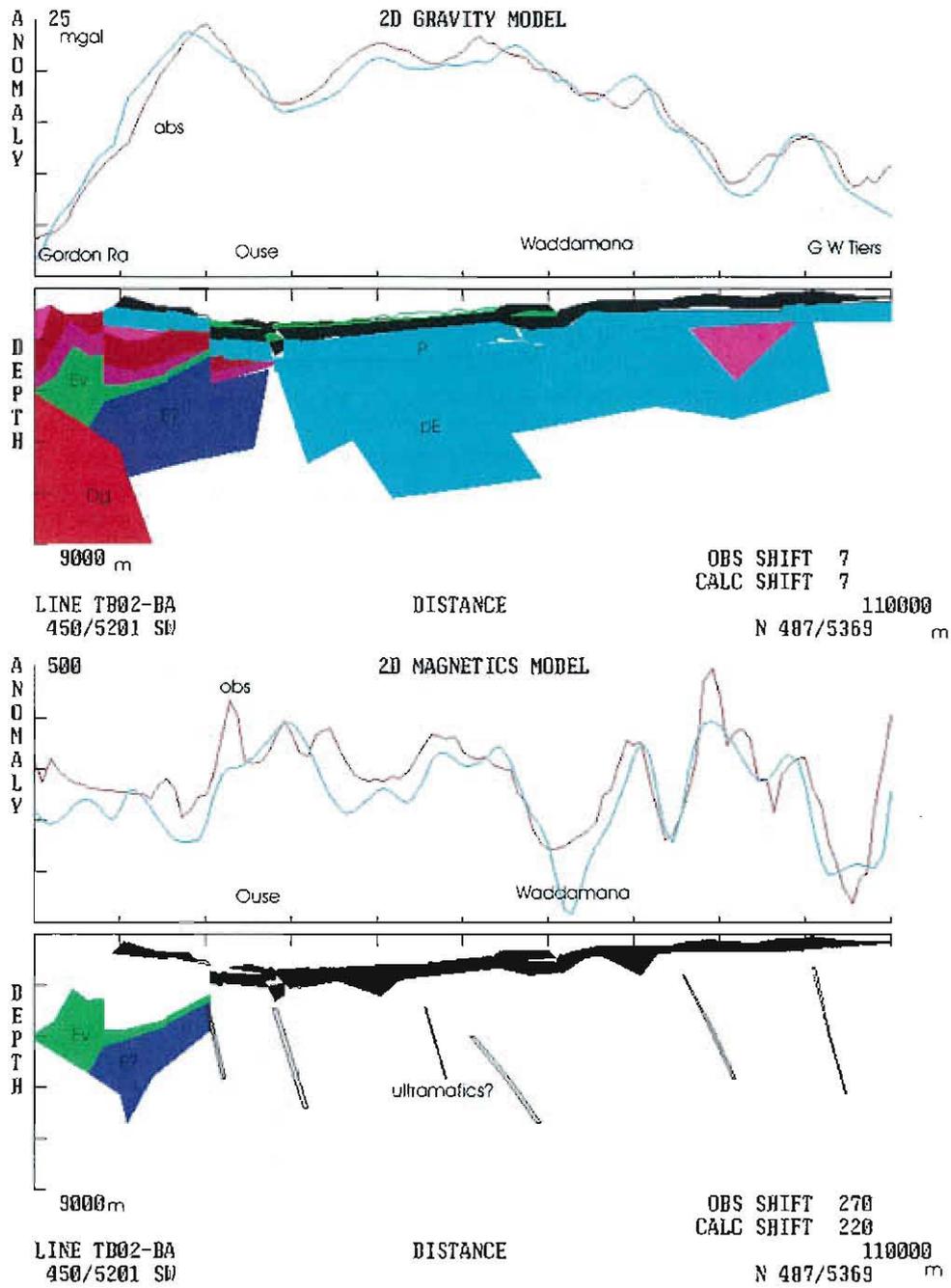


Figure 10. Possible structures consistent with features of seismic line TB02-BA

Seismic LINE TB01-TC (2001).

Seismic line TC extends from the Lyell Highway south of Hamilton (489/52883), to Bothwell (5005/53074), using Hollow Tree Road. Line 7 (at 94 km) intersects this line near Bothwell.

The seismic record indicates up to 6000 m of massive units beneath Hamilton but with a possible shear zone at about 1500 m. The heart of the record includes an apparent arch of reflectors, dipping steeply to the south but more shallowly to the north. Some shallower synformal character is evident south of mid section. The deep record reveals a set of north dipping reflectors.

Various changes in seismic character, and which mark short sections of the line, appear to be related to the zig-zag nature of the traverse with respect to the orientation of deep structures (as inferred and indicated in Figures 4 and 5). No features present with any significant continuity.

The gravity anomaly is distinctive (Figure 11) and requires a considerable thickness of dense material in mid section. This conflicts with the arched reflectors since the depth proportions required of known lithologies cannot account for the anomaly. Matching implications from Line 7 suggests that a slab of Precambrian dolomitic sequence overlies a less dense sequence. These elements can be aligned with the few reflectors observed and account for the gravity field observations at the Bothwell end of the section. The anomaly roll over to the south thus reflects absence of the dolomite but the dominant presence of the moderately dense Precambrian rocks. The uncoloured basement is siliceous Precambrian, probably of Tyeman type.

The observed magnetic field mirrors the gravity field and, given the density links which exclude piles of strongly magnetic volcanics, the solution offered depends on two elements. Two slices of ultramafics, defining the base of the moderate density Precambrian basement and extending into the fan of structures mid section, and granophyric dolerite and feeders, account for the effect. The feeders appear to be slightly off section. The implication from the thrust relationships is that the east-dipping structure is younger but this cannot be confirmed since modest variations in volume and distribution cannot be resolved.

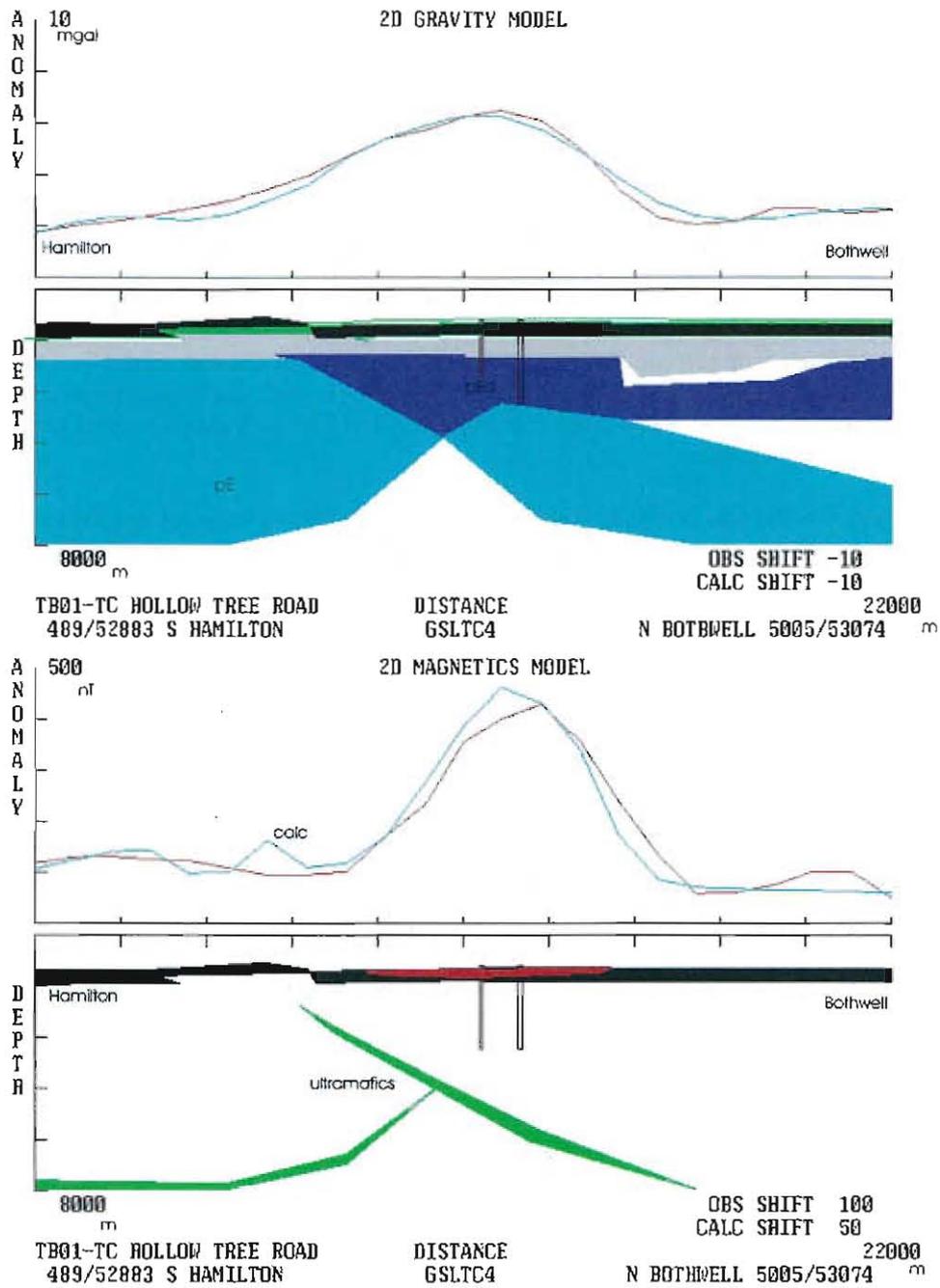


Figure 11: Interpretation of seismic line TC, Hollow Tree Road.

Seismic LINE TB01-PB (2001). Part 1: Bothwell to Steppes.

Line PB is a long, complex traverse and it has been divided into three sections for analysis. Each of these is approximately straight and the segments allow regional linkage free of the total bend in the traverse, or orientation interactions.

The first segment extends from Bothwell (5005/53074) to Steppes (4912/5339) via Highland Lakes Road and Hunterston. This segment can be cross tied to both regional lines (at 10 km to Line 3 at 65 km; at Line 7 at 95 km near Bothwell).

The pre-Parmeener part of the seismic section contains large scale antiformal elements which crest near Hunterston. The antiform is truncated by a ramp reflection at considerable depth (about 5500 m near Lines 3 and 7) and there is an even deeper feature (5000 m deeper). In the region of Steppes there are other shallow reflectors which show strong character (at about 2500-3000 m) and these are truncated by the north limb of the antiform. None of these features are well defined.

Hunterston 1 was drilled near the crest of the antiformal feature and demonstrated the presence of multiple dolerites and a dolomitic basement (pEd). This poses a question about the nature of the rocks above the seismically marked antiform. If the dolomitic content of materials encountered in Hunterston 1 is used to set a minimum contrast for density (2.74 t/m^3) then it is possible to provide an approximate depth match for the deep seismic interface. The density cannot much exceed this value and cannot be as high as pure dolomite (2.84 t/m^3). Constraints may then be set for the amount of this material present toward Steppes. If the upper section is siliceous Precambrian and no more than 2000 m thick (consistent with character-filled seismic zone) then some variation might be allowed in the dolomitic core but a maximum depth of around 7000 m is fixed for the lower surface. A gross fault system is implied.

The Bothwell end of the section is quite different. The Precambrian core is thicker and this can only be mass-balanced by a wedge of lower density rocks (presumed mid Palaeozoic). Beneath Bothwell there are other subhorizontal interfaces and the gravity field requires some dense member (dolomite) to balance the other materials.

These conditions may be summarised in reflection and thickness terms below Parmeener cover.

At Bothwell: reflections at 1500, 3200, 5600, 6800? and 11000 m

Line 7: dense pE to 5000 m and thrust at 4000 m.

At 10 km: reflections <1000, 6500, 11300 m

Line 3: 400 m pE, 800 m pE dense, 2600 Pal?, 6100 dense pE

model: 400 m pE, 800 m pE, 3000 Pal?, 5500 dense pE

Steppes: reflections at 2500-2700 m, 7000-7500 m.

Extant magnetic data are not helpful (Figure 12) since dolerite effects could account for all observations as presently defined. Dolerite along the section involves two intrusions from a feeder presumed to lie offset from Hunterston with transgressions from the south upstepping toward Steppes. The current disposition of the entire sequence re-inforces the effect of regional ramping: ramping due to regional dips and dolerite transgression, both in the same sense (up to north). There is no closure at Hunterston.

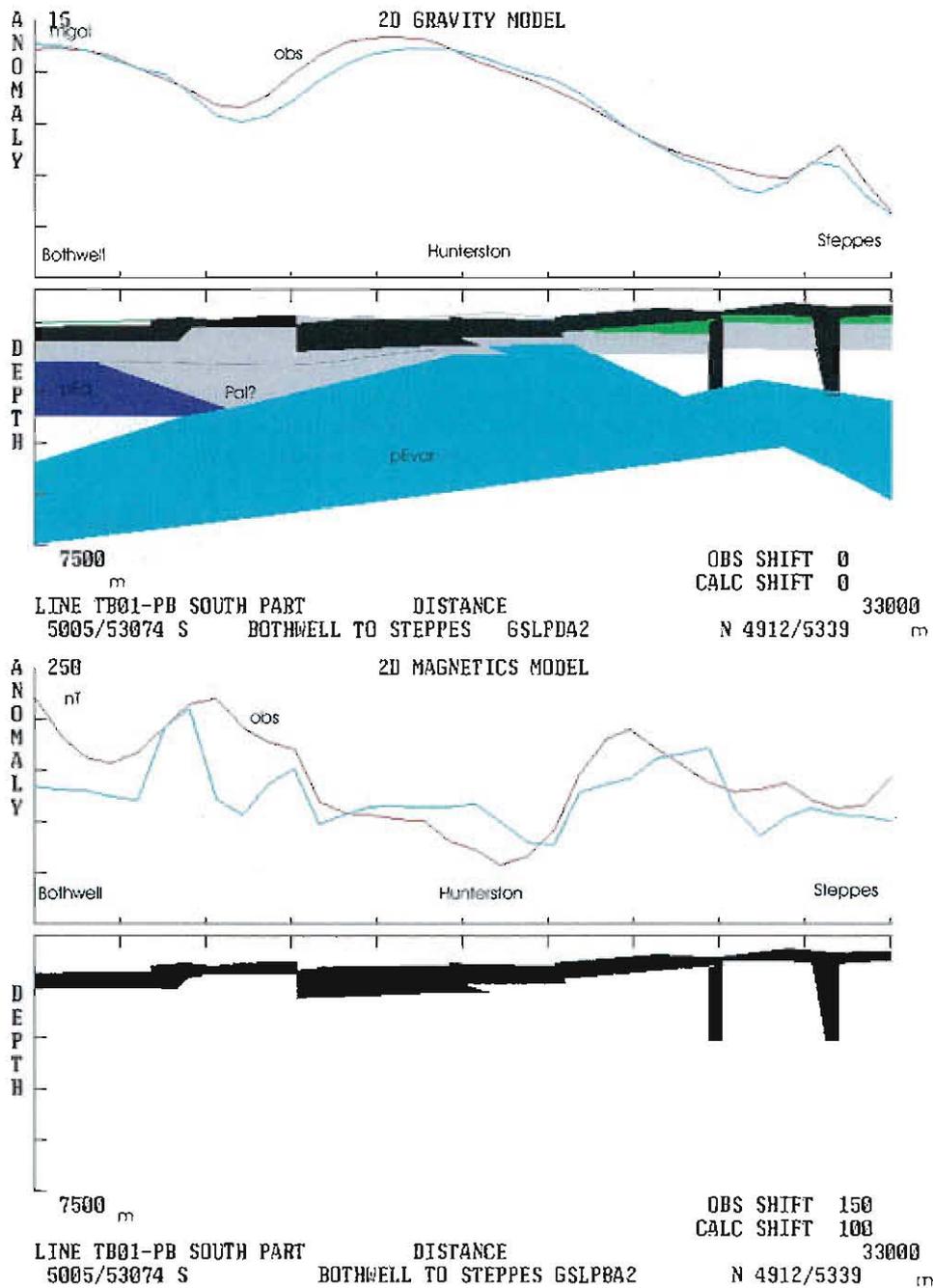


Figure 12. An interpretation of seismic line TB01-PB (first section, to Steppes)

Seismic LINE TB01-PA (2001).

This short traverse provides a cross line on Line PB at north Hunterston and well Hunterston 1 was drilled on this line (4915/5327-4974/53262).

Little seismic character can be discerned below the Parneener cover, although the dolerite in the section can be identified, until there are transgressions toward the present surface. Character is lost where the dolerite crops out.

The models of Figure 13 provide a reasonably consistent view with Line 7 (nearby to the west) and the intersection with Line PB. The gravity model provides a limiting scale on both density and depth (thickness) of the modestly dolomitic Precambrian core block. The maximum estimate is greater than seen in the longer lines since these also carry the direct effects of denser segments. Some three dimensional elements are not properly represented on this short line.

The magnetic data require the package of Precambrian rocks to be defined by a slice of ultramafic rocks. No concentrated magnetic source, such as Cambrian volcanics or the like, can be involved. The depth to such a slice, which has clearly been sampled acutely to strike at this orientation, cannot be refined without more information but could range from 5000 to 8500 m depending on structure, properties and thickness. This range is consistent with the implications of the longer lines.

Seismic LINE TB02-TA (2001).

This short traverse (Figure 14) extends east from Hermitage across the southern part of the so-called Hunterston dome (4876/53218-4984/53192).

Two steeply dipping reflectors (diffractions?, off line effects) can be identified in the pre-Parneener seismic section. the most easterly of these may be inferred to lie at about 5500 m at the position of line PB and imply such a thickness of moderately dense Precambrian section. The gravity model is consistent with this and magnetic data support the concept that an ultramafic slice forms the base to the entire core block.

West of the main central block one of the main reflectors seems also to be related to ultramafics. The gravity model would extend this structure to the base of the Parneener cover but the magnetic data is not able to resolve this detail. The two ultramafic slices can be associated with volumetric offsets in the basement block.

Part of the principal magnetic anomaly is due to near surface variation in the dolerite and a granophyre and, or, feeder, is suspected nearby. Since this location is close to Waddamana Road this inference should be checked.

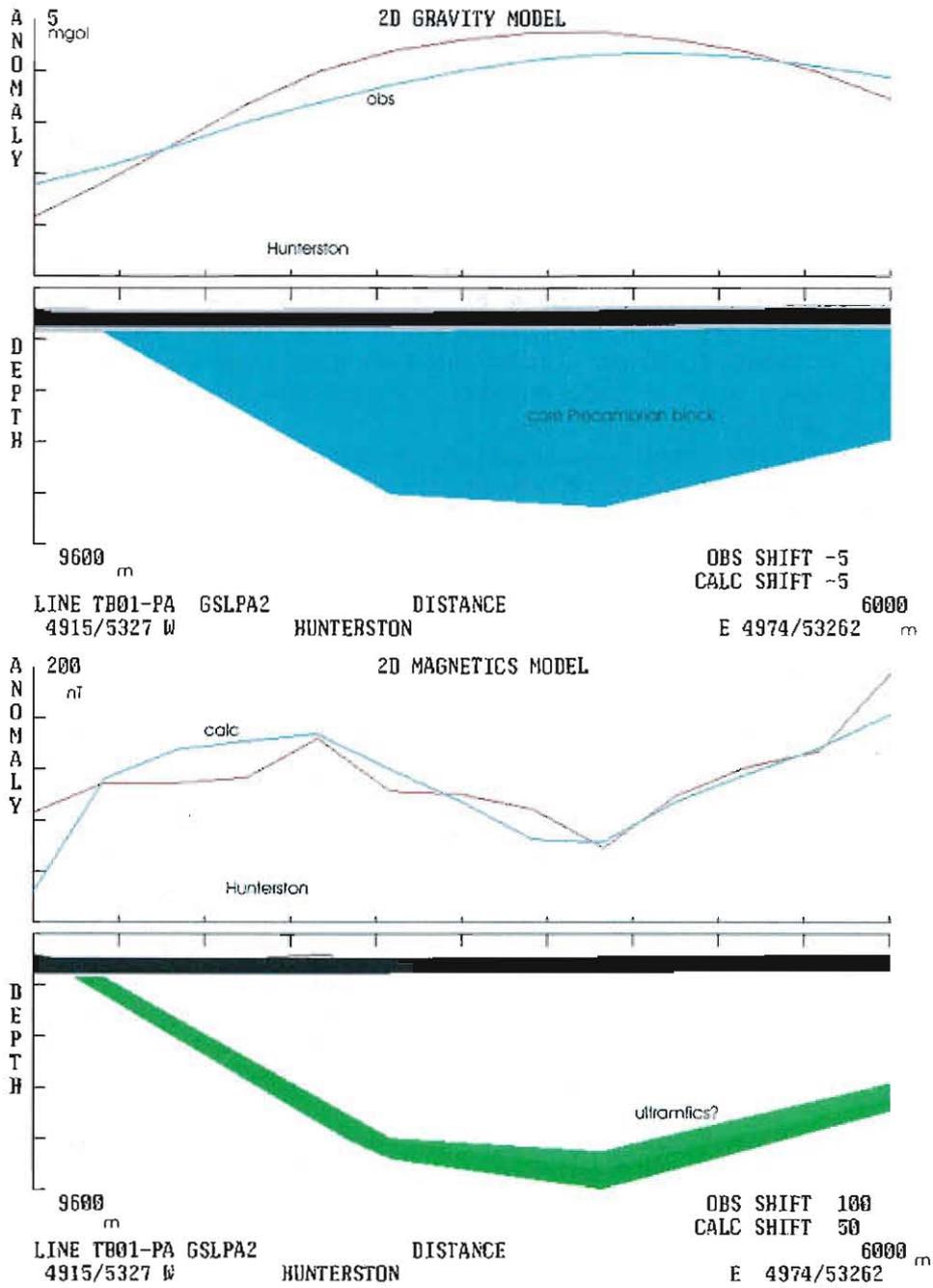


Figure 13. Interpretation of Hunterston cross line, TB01-PA.

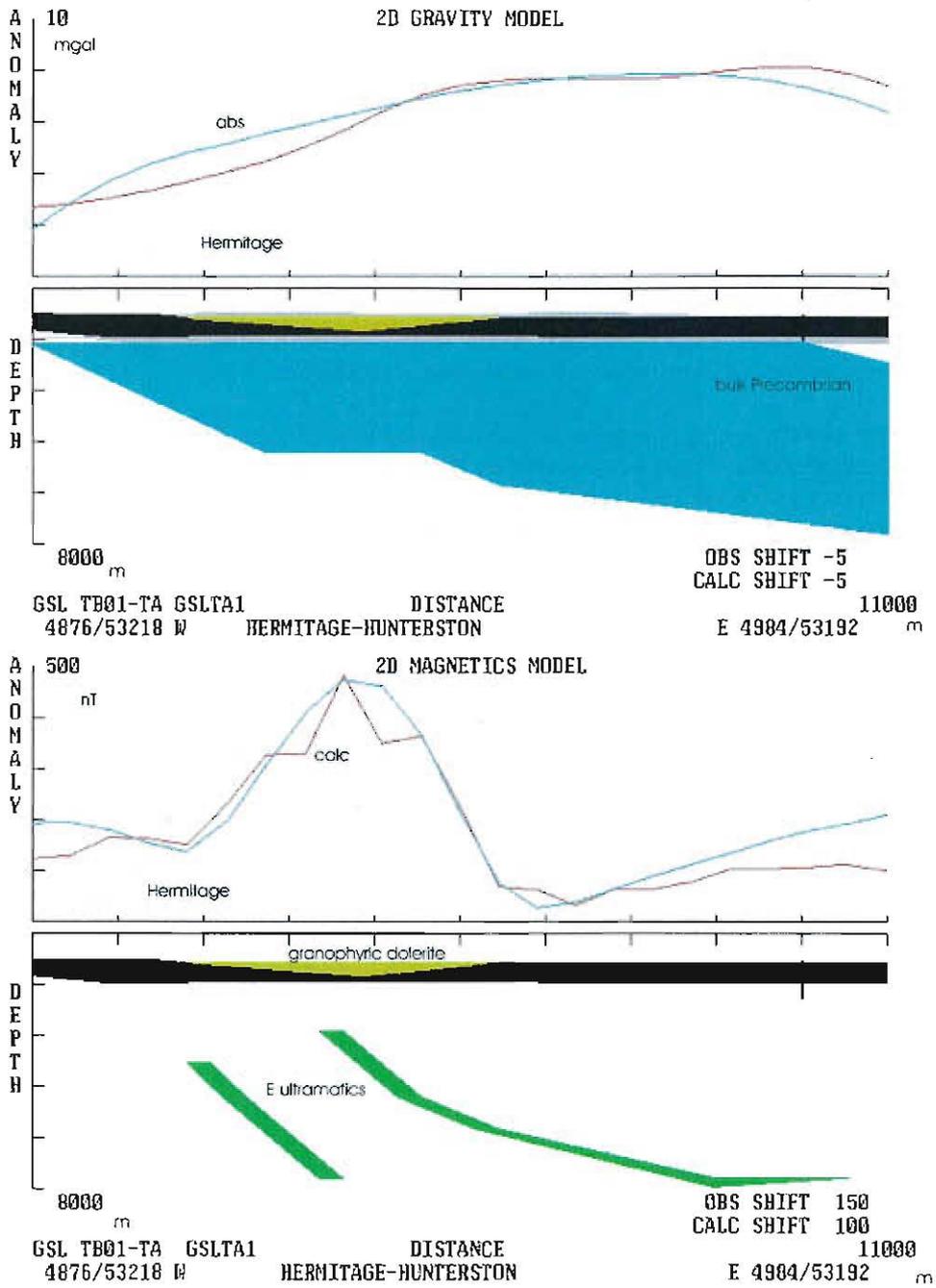


Figure 14. An interpretation of Hermitage cross line, TB01-TA.

Seismic LINE TB01-PB (2001). Part 2: Steppes to Great Lake

This segment of Line PB extends from the road junction at Steppes (4911/53388) to the Marlborough Highway junction at Great Lake (4795/53545).

The portion of the seismic record is marked by two strong reflections which dip south. Other character is very limited. There is a suggestion of a north dipping feature near Steppes and a possible sub horizontal element above it. From mid section toward Great Lake reflectors at little more than 100-1500 m below the Parmeener cover dip synformally and become multiple near Great Lake. There are very deep reflectors across this entire record segment. Some of the shallow reflectors dip into the base Parmeener unconformity about 10 km northwest of Steppes.

The modelled structures extend the previous segment of Line PB. On the basis that a moderately dense Precambrian sequence is present – and represented by the wedge of reflections just north of Steppes – it is possible to account for the pattern of major reflections with reasonable consistency across the entire model. The synformal character of reflections approaching Miena can be explained with the presence of mid Palaeozoic rocks, some of which must wedge out about 10 km north of Steppes. The large gravity anomaly near Great Lake is consistent with the presence of a more massive dolomitic sequence and the reflections in this region may represent the upper surface of this block of material. These features are shown in Figure 15.

Magnetic data provide considerable support for the structural interpretation and suggest that the southernmost south-dipping structure contains ultramafics, or the reflection is due to them, and that the other strong reflections – both midsection and near the synform – are also due to the presence of ultramafics. The structure some 4 km south of Miena is comparable with that of the Huskisson Syncline of western Tasmania and the main Precambrian block is also marked by bounding ultramafics on its upper surface. Strong reflections occur in the zone where magnetic data imply the presence of mafic slices.

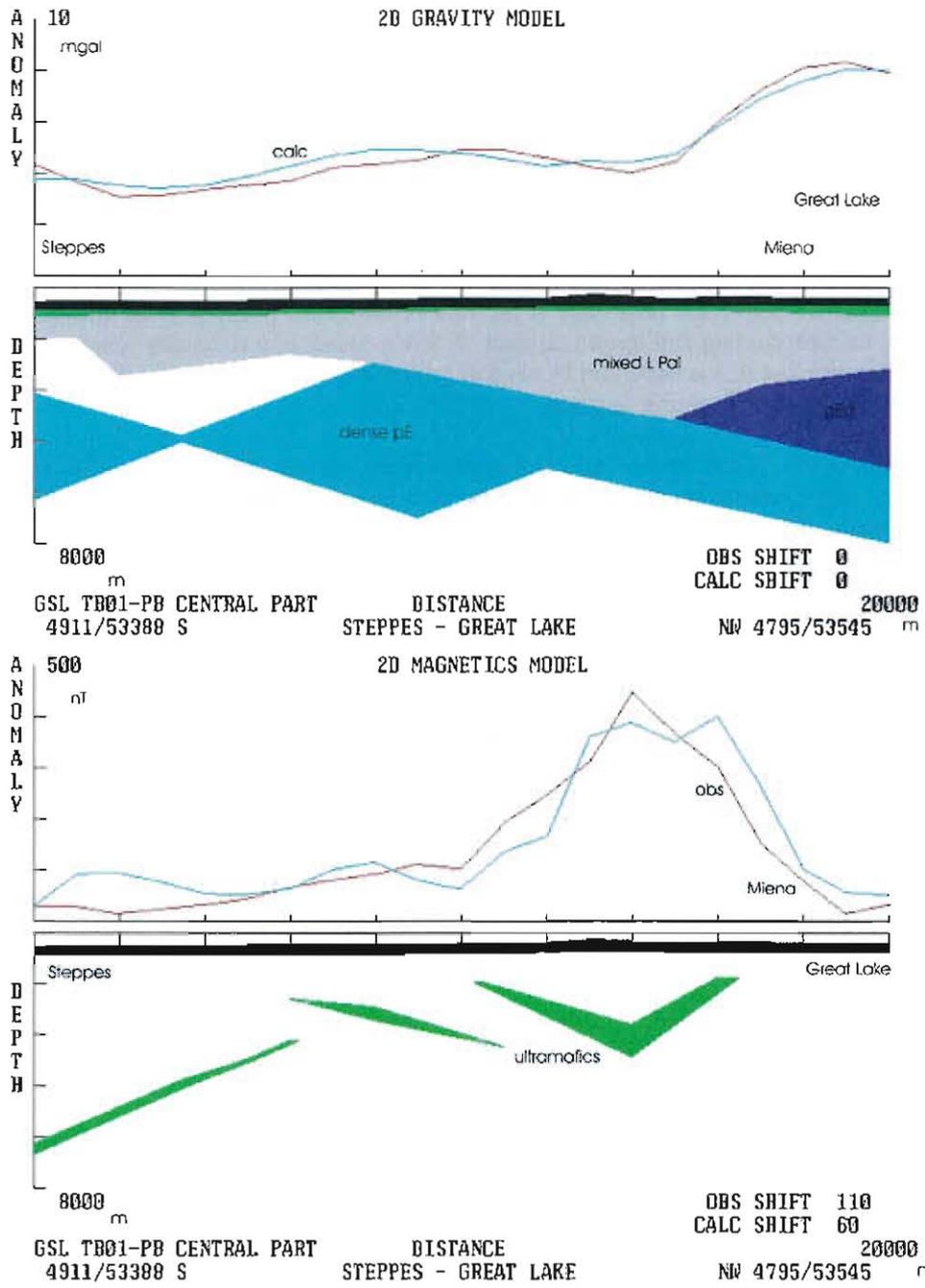


Figure 15. An interpretation of seismic line TB01-PB (Steppes to Great Lake segment)

Seismic LINE TB01-ST (2001).

Seismic line ST extends along Interlaken Road east from the Steppes (4912/53388), down the Tiers escarpment, to Tunbridge (Midland Highway, 53405/533415) to Chapel Hill near the Macquarie River (54205/53335).

Seismic data contain much character. Several interfaces dip steeply eastward from Steppes and appear to unite. The reflections are then disrupted. East of the high plateau reflectors tend to dip east and up to four can be recognised. Some possible folding may be indicated below the fault zone at the foot of the Great Western Tiers but the effect may be a processing and terrain artefact. A thick, bland, non reflecting zone is present mid section but this is underlain by several subhorizontal, and deep reflectors. There are also several out-of-section features.

Initial review of the gravity data and comparisons with regional Line 3 indicated that many of the reflections could not represent unit boundaries at which significant density contrasts were present. Most are clearly structural margins. Since part of the very low gravity field near Chapel Hill is due to batholiths at depth (just off end of section, Figure 16) some constraints may be applied to the possible solutions within the boundaries imposed by the reflectors. The bulk of the gravity field can be satisfied by slabs of moderately dense Precambrian rocks of the type encountered in Hunterston 1. These appear to be thrust-bounded. The sequence appears to include slices of modestly dolomitic material, interspersed with more siliceous rocks. The small positive anomaly near Chapel Hill may be due to a further slice of Precambrian rocks (inserted in the form of the Badger Head thrust block west of the Tamar River) or a denser version of the Mathinna Beds. The lower density sequence (magenta) is inferred to be mid Palaeozoic and is almost certainly Mathinna Beds.

The situation at Steppes is consistent with that inferred on parts 1 and 2 of Line PB, in which a sequence of siliceous rocks overlies the denser Precambrian basement. Both sequences may be Precambrian. A little east of Steppes, however, a segment of low density Palaeozoic rocks may be inferred and these are possibly Silurian or Devonian in age given other correlations. A major offset structure, dipping west extends beneath Steppes, and is the origin of the disruption in all reflection character between SPs 720 and 850.

Magnetic data offer some interesting insights on this profile. Nearly all major blocks appear to be defined by magnetic slices of high magnetisation. Ultramafics are clearly universal. These materials define the base of the main central slab and the top of the western slab. A further slice of mafics appears to lie within the possible Mathinna Beds series beneath Tunbridge but these are not accurately located with the present data and may be situated along the unit boundary inferred gravimetrically. If this is indeed the case then it would suggest that the upper block beneath Chapel Hill could be Precambrian.

The relatively flat-lying deep reflections near SP 1220 probably mark a sheared siliceous sequence beneath the slab of modelled, partly dolomitic Precambrian. East-dipping character then predominates to the east as indicated seismically. All features are either thick or widely separated.

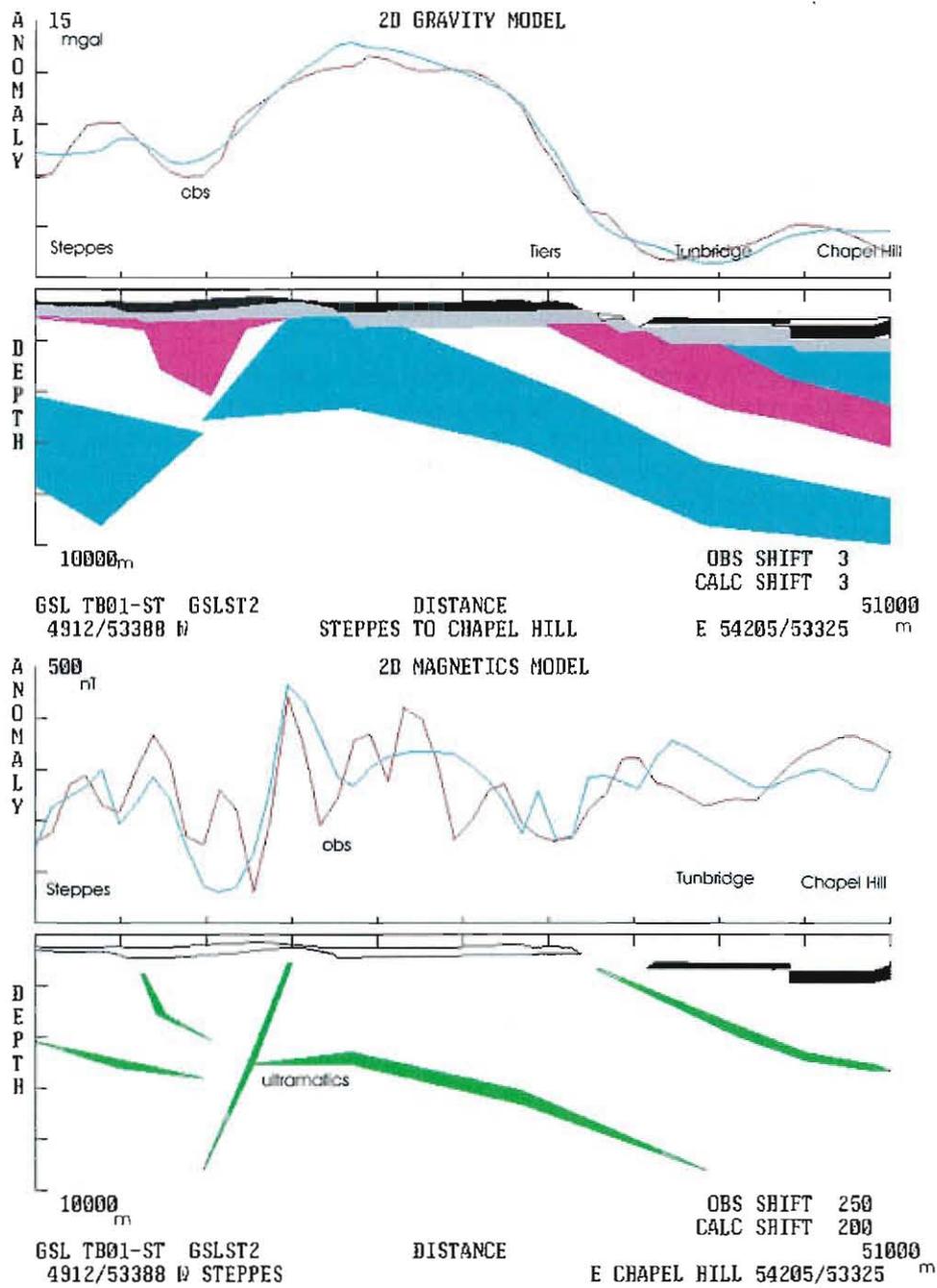


Figure 16. Interpretation for seismic line TB01-ST, Steppes to Chapel Hill.

Seismic LINE TB01-TH (2001). Great Lake to Golden Valley

Seismic Line TH seems to offer an opportunity for considerable control and inspection of the types of reflection event to be expected from exposed Palaeozoic rocks and the Parmeener sequence on the Great Western Tiers. This line presents some of the best seismic data in the surveys to date but the variability of the geology and the uncontrolled nature of the basement possibilities confounds simple assessment. The southern end of the section is at the south end of Great Lake (4733/53521) and the modelled section has been terminated near Golden Valley (4761/5392) where the basement rocks are again concealed.

Detailed inspection of the seismic data reveals some major features with continuity in depth and a number of isolated features which extend laterally. At least two erratic, wavy reflections can be identified at the Great Lake end of the section but there is a large break in character south of Breona. This feature dips northward (or eastward); between Breona and Pine Lake there are some marked events also dipping northeast, then nothing at greater depth. No specific features can be related to the Tiers or the Tiers boundary but there is a nest of both north and south-dipping features beneath the slopes of the Tiers. The principal problem is that none of the many isolated blocks can be directly correlated to any Palaeozoic suite in the section or along strike. The interpretation is thus dependent on the size and shape of the elements recognised and the possible physical properties which are consistent with these.

The common tie for three profiles (TH, PB parts 2 and 3) is along the southern shore of Great Lake and there are simpler and more direct controls from the other lines which link out less ambiguously. The real problem is that the southern part of the traverse is quite different in character from the northern part and the bounding structure is clearly major (Figure 17). Near Great Lake a sequence involving relatively low density Palaeozoic rocks, inferred to be Silurian and, or, Devonian, overlies a dense dolomitic unit and the modestly dolomitic Precambrian basement. The absence of any clear magnetic correlation suggests that the dense unit is a Precambrian dolomite. The large gravity anomaly mid section can only be explained by dolomites since the gradients are critical. The anomaly contrast to the south is striking and cannot be managed within the reflection frame unless the block is relatively low density siliceous material: the obvious candidate is west Tasmanian Silurian rocks. This would then imply major thrust dislocation to also draw in the dolomite above them. The truncation of all these blocks is unusual but there is a ghost of reflection in the required position suggesting another structure cutting into the section.

A more ordered situation can be deduced between Breona and Golden Valley in which a large fold may be mapped. This fold includes a full sequence of Lower Palaeozoic rocks and representatives of all members exposed around the region are included. Gordon Limestone must be included as one of the few positive density agents and generates the low positive bulge in the gravity profile. Note that this is not in the position inferred by Blackburn (2004): that position, with formations wedging up to the unconformity is occupied by probable Silurian rocks.

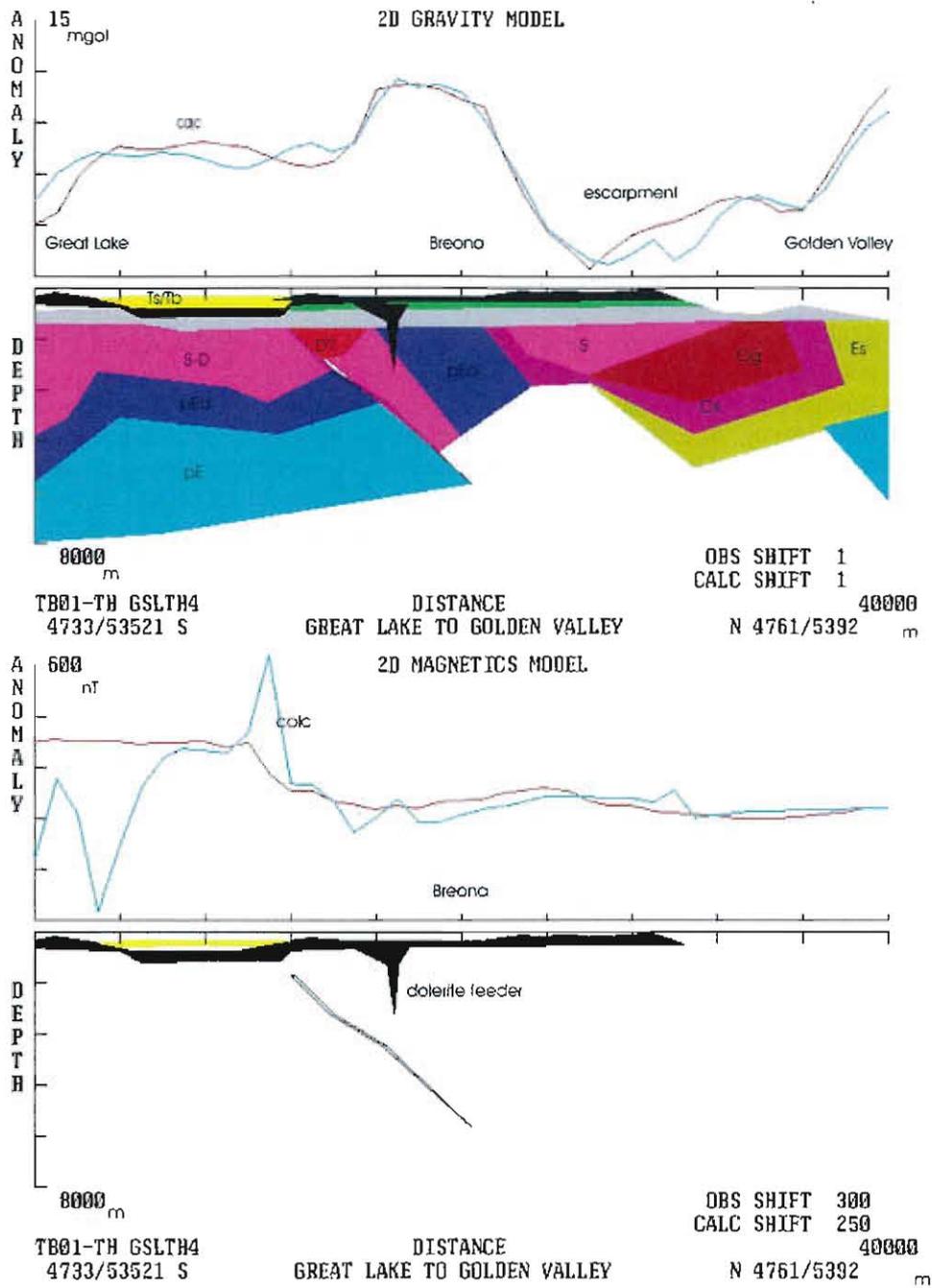


Figure 17. An interpretation of seismic line TB01-TH, Great Lake to Golden Valley.

Magnetic data define ultramafics in the main offset structure. The data are not adequate to fully assess the effect of dolerite, dolerite feeders or basalt at Liaweenee. Gravity data skirt the main dolerite feeder beneath Great Lake and the effect of this feature is to sharpen the crest of the central anomaly.

A dolerite feeder (see McDougall, 1964) has probably used the lower dolomite dislocation surface.

Seismic LINE TB01-PB (2001). Part 3: Bronte to Great Lake

The third part of Line PB extends from Bronte (457/53305) via Bellevue and cross Line TD, to Great Lake (4725/5353) via the Marlborough Highway.

This portion of Line PB contains some of the most interesting and striking reflections in the entire survey. At least four major reflections can be seen in three segments of this portion of the line. Unfortunately none of them can be traced unambiguously across the record but together they present a giant antiform effect with structures dipping both south and north and almost flat-lying in the region of Bellevue. What do these elements represent?

Other lines (PB part 2, and TH) suggest possible Silurian rocks and Precambrian dolomite overlying a modestly dense core of Precambrian rocks. This can be accepted in the present model (Figure 18) but the gravity profile suggests that the Palaeozoic component rapidly thickens to the south before shallowing toward the Bellevue area. This is consistent with the reflector dips north of Bellevue. It is possible that most members of the Lower Palaeozoic formations of western Tasmania are present – with the possible exception of Cambrian rocks. The gravity profile is not compatible with any significant volume of these units and the magnetic data do not appear to support their presence either. The central anomaly can be readily accommodated by the common Precambrian member and density consistent with the upper reflection set. Other reflections, approximately 1000, 1500 and 4500 m deeper, do not have any gravimetric or magnetic relevance and must represent structures which dip through the section.

Near Bronte the reflections can be explained by Lower Palaeozoic rocks (Ordovician to Devonian) overlying Precambrian dolomites and dolomitic sequences. There is no continuity demonstrable between the southern and central parts of the profile. A vertical offset is shown in the model but a steep dip to the south (or west) might yield a better solution. In the absence of any control information this amounts to overinterpretation. The time map (Figure 20) shows the location of this major break. Magnetic data pick out at least two horizons which may contain ultramafics, one lies within the Precambrian complex at Bronte, but may be beneath it, and the other is within the Palaeozoic sequence at Great Lake.

The apparent antiform is thus in several parts, each constituted rather individually and not in a stratigraphic stack and, when seen in conjunction with line TD, the main form is found not to be closed near this profile.

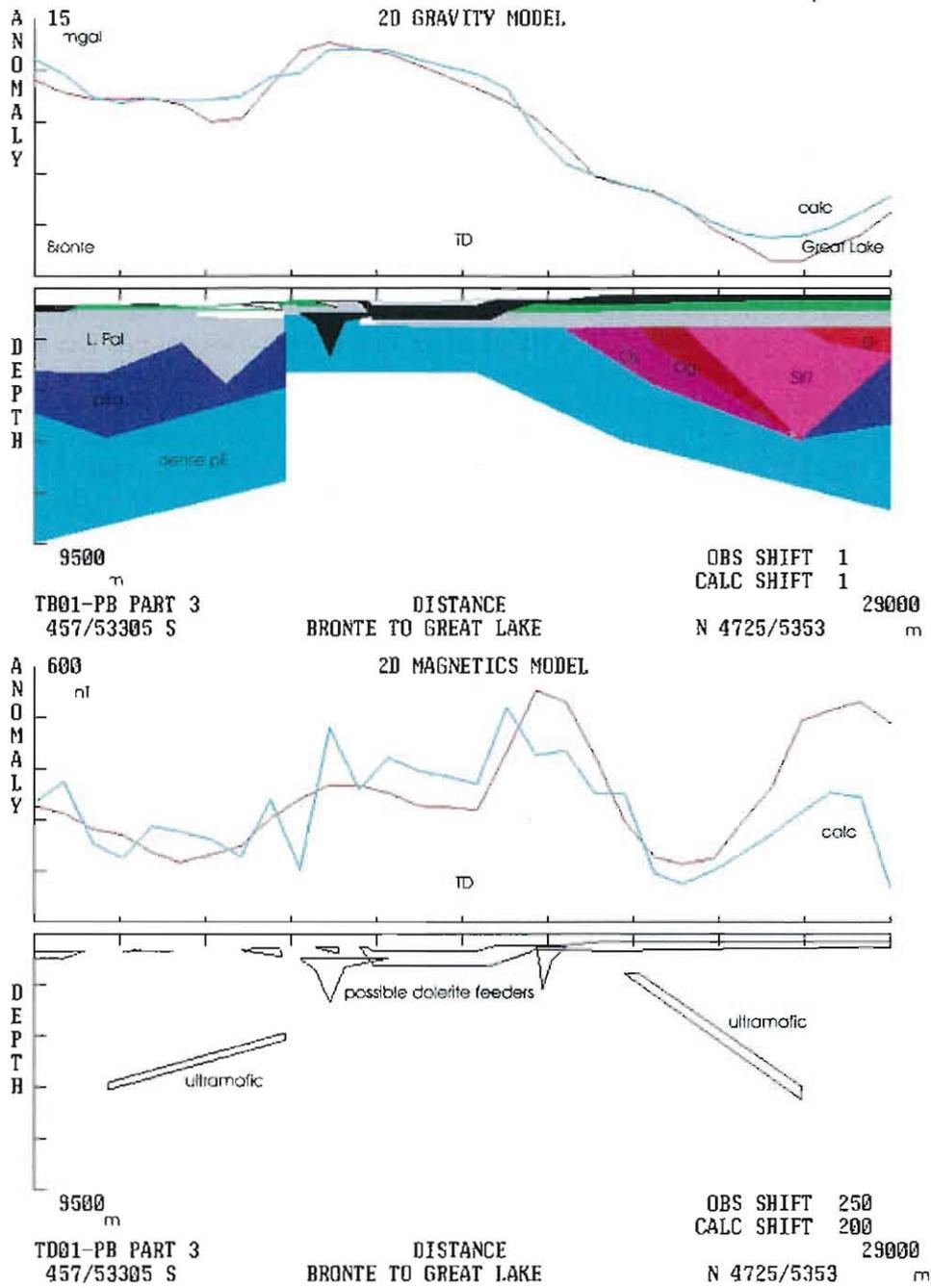


Figure 18. Interpretation of line TB01-PB, segment from Bronte to Great Lake.

Seismic LINE TB01-TD (2001).

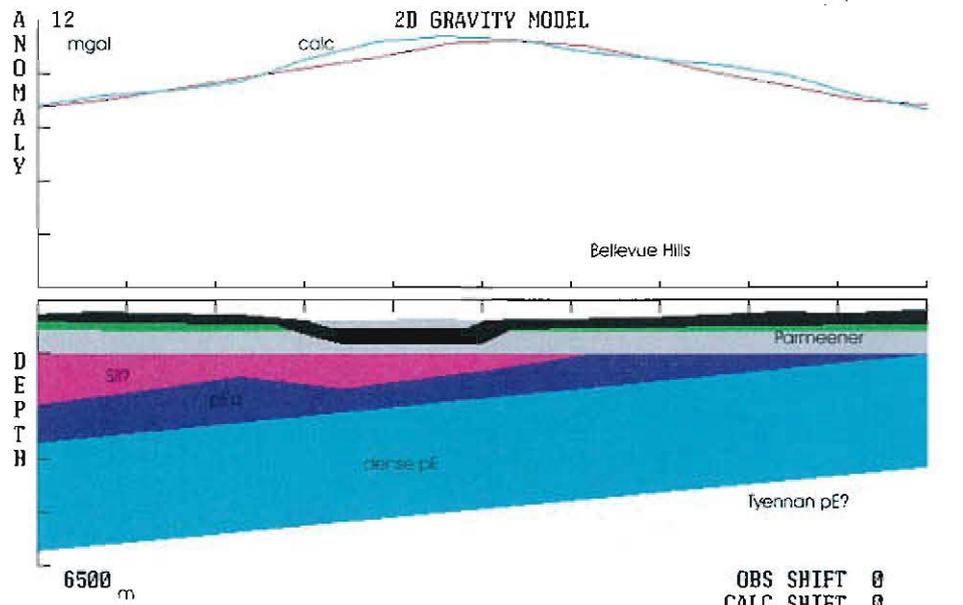
Line TD provides a useful cross line for the structure at Bellevue (Line PB part 3) and shows that all reflectors can be linked. Parts of them can be traced laterally but dislocations are evident, just as noted in the above discussion.

The modelled line extends from Great Pine Tier (457/53477) to Bellevue Tier (466/53385) and the mid point is on the Marlborough Highway and a tie with Line PB, part 3. This short line confirms the many distinctive reflectors observed on Line PB and shows that one dips to the northeast, and the others dip to the west. A crude time map is offered in Figure 20. The map is based on the direct implications of this line and PB with inferences and limitations based on TB/TL (below). No part of the seismic surveys yet undertaken by Great South Land Minerals in central Tasmania provide a satisfactory grid and any time maps must be very sketchy. If the structures mapped have any closure it is somewhere near Lake Echo. Line TD simply shows that the major reflections dip west and that some sources reach up to the base Parmeener unconformity.

Major traverse PB has been interpreted without any Palaeozoic content in mid section in the location of the apparent antiform but there are some relatively shallow reflections on this line which indicate a more complex folded environment beneath the unconformity. Further, the gravity data – which are poor and must be confirmed – imply a positive crestal anomaly and which, if real, cannot be explained by a simple slab of denser Precambrian rocks. This situation is also constrained by the dips of major blocks or units and a structural crest in the region of Lake Echo at line end, not line centre. Lower density rocks must be present at the western end of the profile and the rollover of anomaly then becomes a natural result of the gross dips. The magnitude of the gravity anomaly also indicates that the thickness of Precambrian rocks inferred on line PB is an absolute minimum and, further, that denser units must be present. This suggests that line PB samples a portion of the area in which a dolomite sequence is present only as a thin cap on the more normal basement. The three dimensional nature of the structure and its contents may be demonstrated by comparison of the two profiles.

Magnetic data are distinctive and imply the presence of ultramafics near the contact between dolomite and the lower basement rocks. The extent of this material and the depth at which it could be emplaced has been examined and it has been found that the most likely location is shown in Figure 19. It is most unlikely that the ultramafics are present at the base of the denser Precambrian segment.

Figure 20 presents a crude summary of time events in the Bellevue region. Structures run up to the base Parmeener unconformity and the importance of review of possible sources, migration paths and seals becomes evident.

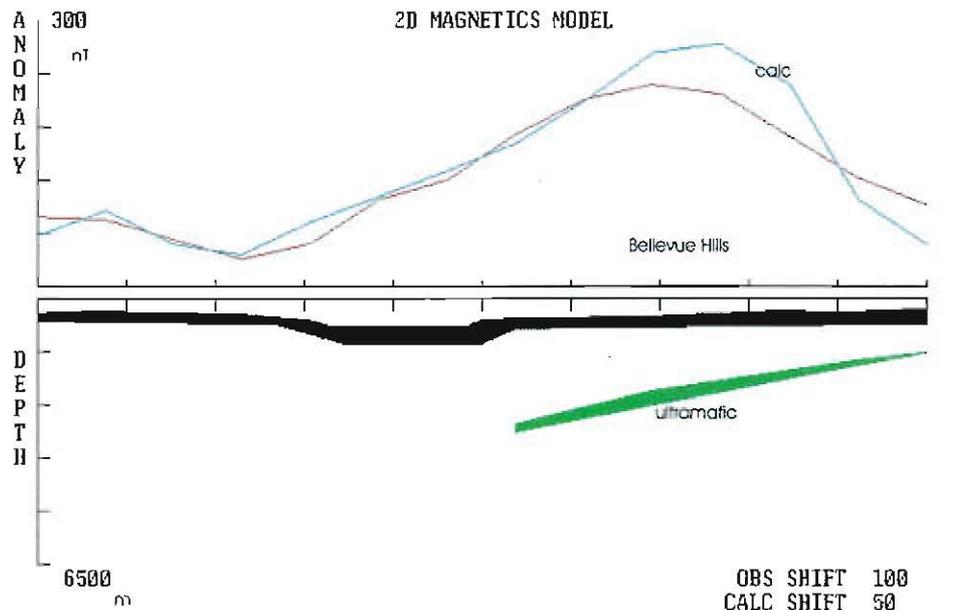


GSL TB01-TD
457/53477 W

DISTANCE
BELLEVUE CROSS SECTION

OBS SHIFT 0
CALC SHIFT 0
E 466/53385

13000 m



GSL TB01-TD
457/53477 W

DISTANCE
BELLEVUE CROSS SECTION

OBS SHIFT 100
CALC SHIFT 50
E 466/53385

13000 m

Figure 19: Gravity and magnetic models for seismic line TB01-TD, Bellevue.

Seismic LINE TB01-TB and LINE TL (2001).

The two lines TB and TL form a natural extension and extend from King William Saddle (426/5326) along the Lyell Highway through Derwent Bridge (436/5334) to Bronte junction (Marlborough Highway, 458/53323) and on to a point above Lake Echo (4678/53316). The segment from Bronte to Lake Echo is Line TL.

The problem of tying lines (PB and TB) is evident and the two solutions offered in this report can be considered as limiting possibilities. Orientation with respect to major structures is a further issue. Line PB offers a thick Palaeozoic sequence, dolomite and dense Precambrian beneath the Bronte road junction. This could be arranged in the model for line TB-TL (Figure 21) by inserting a wedge of lower density material above the Precambrian variations. However, the seismic character of Line TB is most distinctive and emphatic: there are several west-dipping structures beneath the region extending from Lake Echo toward Derwent Bridge. If these structures are accepted then a simple pattern such as shown in Figure 18 is not credible when seen in east-west alignment. It should be noted that both solutions could be correct and that Figure 18 presents the strike orientation, Figure 21 the dip orientation.

There is no doubt that the gravity field demands the presence of more than normal density Precambrian rocks and blocks of dolomite have been included in the model. These have been located consistently with seismic character.

Note the multiple reflector nature of seismic data at Bronte below the unconformity: this could be sheared Precambrian or the layered variations in the lithology of younger Silurian – Devonian rocks. The west-dipping character of the basement is demonstrated on line segment TL east of Bronte (see also Figure 20).

Very different conditions apply at the western end of the traverse, beneath Mt King William. In this zone there are arcuate reflections which are synformal and within this package there are east-dipping elements. Few of these features have any continuity and the entire suite is bounded by a large east-dipping structure or unit. The gravity model is defined by these features and scaled by them. When this is done it may be inferred that nearly all parts of the west Tasmanian sequence are present in a large fold with offsets and onlaps.

Magnetic data, although at the edge of reliable coverage, offer some important constraints and generally confirm the gravity picture. A slab of slightly magnetic material is present in the gross fold and can be presumed to be Cambrian volcanics. An alternate view would be a segment of metamorphosed Precambrian but this would not be easily fitted into the density profile required to balance the gravity field. Ultramafics are also present, partly as a slice between Precambrian blocks and partly within the main fold – at the base of the inferred volcanics. This is a pattern commonly observed in western Tasmania.

Although the location of anomalies is a little vague, and the disposition of sources producing them necessarily uncertain as a result, each west-dipping boundary to the dolomitic blocks would appear to be picked out by slices of ultramafics. This conclusion supports the general view of the interpretation that the modelled aspects of the structure, as seen near Bronte, are determined by line orientation across a complex dipping environment full of detachments.

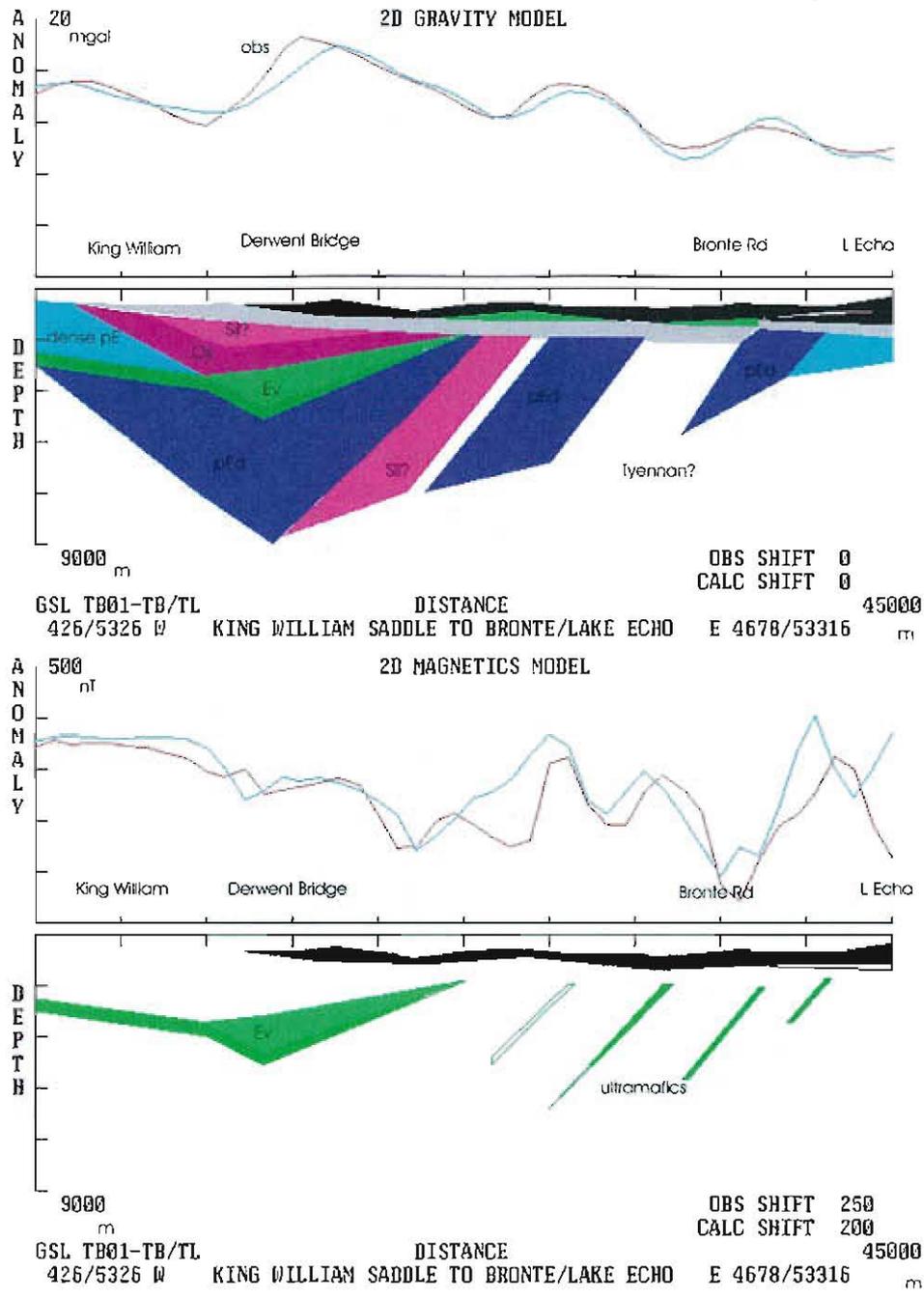


Figure 21: An interpretation of seismic lines TB and TL, Mt King William to Lake Echo.

DISCUSSION

The analysis reported above is almost wholly consistent with previous work, with some significant variations, in terms of the general structural content, gross lithology of basement, and structural style of the rocks deep beneath central Tasmania.

The use of the limited seismic coverage available has removed many interpretation options and clearly demonstrated the presence of two families of thrusts: east and west dipping.

Comparison of many modelled lines, in the few places that they overlap or intersect, will show some minor deviations or alternatives. As noted earlier this may be due to orientation and observation issues, but is generally due to incorporation of slightly different concepts where the seismic data allows or is silent. Thus, Line PB (central part) and Line ST, at Steppes (Figures 15 and 16) for example, present similar materials or sequences but a different balance of them. Much depends on the data control in each segment, the change in line orientation, and the feasible combinations of units and physical properties.

In the context of central Tasmania the cover of post Carboniferous rocks (Parmeener Supergroup and dolerite) is almost irrelevant. It is a relatively thin veneer with regional dip and distortion. Any structures within it have origins and associations in the underlying complex. This means that the Hunterston structure, as seen in the Permian rocks, is related to rejuvenation of the underlying thrusts, some of which involve Cambrian and Devonian activation and creation. Several Jurassic dolerite structures are also related to these sites and changes in sheet form seem linked. Many feeders, most of which are not accurately located by gravity or magnetic data as yet, may also be associated.

There are enough magnetic data to demonstrate that a number of structures include, or are defined by, material with ultramafic properties. This material is Cambrian in age but has been relocated structurally. Many of these structures are seismically defined due to the different properties of the ultramafics, and the sheared and fractured nature of the zones in which they now occur. The broad spread of reflections in some regions indicates highly sheared, structurally layered rocks. Few of these zones are extensive.

Precambrian rocks are, in general, at non commercial or non productive depths although a number of blocks crest to, and are overlain by, the Parmeener cover – as at Hunterston and Bellevue. Various dipping blocks have been identified which are thrust-bounded.

On the presumption that rocks younger than Cambrian are of most interest to the exploration program Figure 22 has been prepared to suggest their location and any inferred structuring. This diagram is focussed on the Central Plateau region since this is the current location of most of the seismic network. Other seismic lines straggle to the west or south and lead to Palaeozoic rocks but, until there are tie and cross lines – and more potential field data – it is not possible to infer much about the possible structures (see Recommendations).

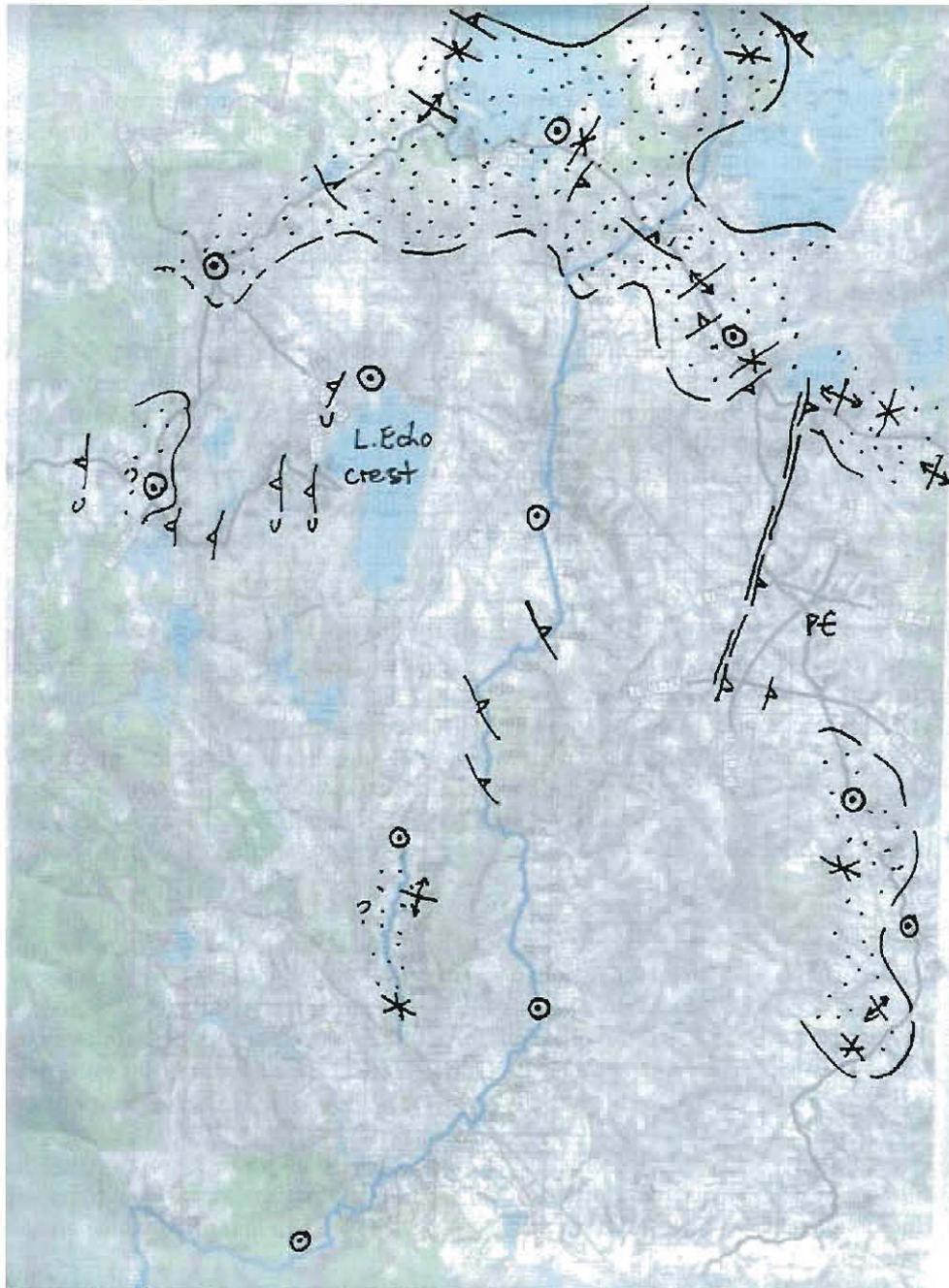


Figure 22: Inferred location of mid Palaeozoic suites.

The diagram also shows the location of major thrusts but few of these can be oriented nor connected with the present information. Dotted areas indicate inferred presence of Ordovician-Devonian rocks directly beneath the base Parmeener unconformity. Fold symbols are also marked. Circle symbols locate nominal positions of recommended control bores on the basis of present work. Basemap shows location of existing seismic traverses as heavy, coloured lines.

Figure 22 also does not consider the situation in the south-eastern part of the licence area where it is thought that the Mathinna Beds sequence predominates. This region is not adequately surveyed by any means as yet and no conclusions can be drawn. There is clear evidence of a large fold and possibly monocline at the foot of the Great Western Tiers. This structure probably involves Mathinna Beds and is also broken by a series of faults and thrusts in possible flower and rift margin structures. Such a zone may not be prospective in any event due to clear leakage possibilities and broken seals.

There are a number of other locations where ambiguity requires either more data, more analysis or review. For example:

What happens at the edge of the inferred Palaeozoic sequence which dips west from the unconformity beneath the segment Bronte to Derwent Bridge? Could traps exist in this region?

More control is needed near Bellevue. Where exactly does the shallow cover inferred to be mid Palaeozoic rocks become truncated by the unconformity? Could traps exist? Gezer-1 will answer some of these questions.

The situation near the highway junction at Bronte must be resolved. Are Palaeozoic rocks present, and what are they?

More detail is needed on the underlying section north of Breona and south of Miena. Are Palaeozoic rocks present, and what are they? Similar comments apply to the sequence between Steppes and Woods Lake.

Is there a structural closure north of Hunterston? There does not appear to be one in the post unconformity rocks but the identification or demonstration of mid Palaeozoic rocks to the north may prove important.

The situation involving possible mid Palaeozoic rocks in the region north of Ouse must be resolved: does the succession extend east of the Derwent axis?

It must be stressed that this interpretation is essentially uncontrolled and based on insufficient data for acceptable reliability risk. It must be regarded as preliminary and indicative only.

The seismic coverage, with its awkward line orientation and terrain changes, generally lacks ties and does not allow proper definition or mapping of any unit or structure over worthwhile distances (except for some parts of the Permian rocks and some dolerite sheets). The gravity coverage ranges from excellent to terrible and much weight has been placed on too few observations. The magnetic coverage is uniform but coarse and, ironically, turns out to be the best regional data set, as a data set, at the time of writing. It is simply a pity that the wide line spacing leads to limited resolution of features and locations.

This interpretation amounts to an over-interpretation in many regions and the Recommendations (below) are designed to solve this problem and advance the exploration effort.

This study includes no evaluation of the seismic or other data coverage northeast of the Great Western Tiers. A comprehensive view of that region, a view consonant with new data, was provided by Leaman (1991, 1992) and Leaman & Webster (2002). It may be commented, however, that the seismic net for that region is the minimum standard for useful judgments and the new program for the southeast is compatible.

OTHER OBSERVATIONS

The above discussion and interpretation, with its emphasis on old rocks and complex structural relationships, would seem to offer little for a petroleum exploration program. The sequences, and lithologies, inferred are of high velocity and structured. It is a thrust terrane. All formations in these circumstances are likely to be of low porosity but may be locally fractured. In such fractured zones they may form adequate reservoirs for gas or fluid and the same zones would also be critical for any fluid migration, or escape.

It is often assumed by "soft rock" explorers that hard rock terranes carry little potential for petroleum – but this is clearly not the case in some Asian provinces. The same principles, involving source, migration and storage apply: is it possible?

Various theories for potential source rocks have been presented for the Tasmania Basin – a term which might itself be of little value. This, and previous, regional interpretation indicates that the post Carboniferous rocks of the "basin" are but a veneer with very modest variation in thickness and which have been largely removed as a cover. Migration is clearly possible per the net of thrusts, faults and fractured zones and, perhaps, near unconformities.

In such situations the matter of seals becomes paramount since many fracture systems have been rejuvenated and extend to surface. The potential for leakage is high and this pattern probably accounts for the Lomavale observations of escaping oil through dolerite. Set against this negative view is the fact that nearly all media encountered in central Tasmania, and implied in the above interpretation, including Permian rocks at depths greater than 100-200 m, have velocities in excess of 5000 m/s; most in excess of 6000 m/s. It is known, for example for Permian rocks and dolerite, that this translates into a tightly sealed rock mass in which joints are filled and effectively impermeable. There is an observed velocity profile in such rocks as surface is approached representing first an opening of joints (due to unloading) and then due to increasing effect of weathering. For the dolerite the critical change occurs at depths of 40-80 m below surface. Below such depths the rock is a seal. Thus for dolerite, within section as a complete sheet, the intrusion itself represents a seal.

It might be expected that many other, older high velocity lithologies would act in a similar manner. In these terms, Lower Permian rocks deeply buried (depths > 200-500 m) would also act as seals – regardless of lithology. No such assumptions should be made for Triassic or younger sedimentary materials.

These comments mean that many units, viewed stratigraphically or as structural members, could act as seals. The issue for exploration is, could reservoir settings be developed and recognised in such situations, or with less than excellent data. In normal situations dipping reservoirs, whether structural or stratigraphic, may well display anomalous reflections: direct hydrocarbon indicators (DHIs) in which a strong horizontal reflection can be contrasted against its dipping setting. Using the currently available data, with all its limitations, there are few unambiguous stratigraphic

reflectors defining units but many structural reflectors (thrusts and fracture zones of lower velocity), and few such patterns might be identifiable.

Two possible DHIs have been observed, and each involves an association with a lower density medium, presumed to be mid Palaeozoic rocks.

These are located at SP 3380-3420, Line TB01-PB and SP 1540-1760, Line TB02-BA.

The possible feature on Line PB is illustrated in Figure 23.

There are several, horizontal high amplitude responses on the structural crest and these show slight dip contrasts to all surrounding features. Given the three dimensional nature of the structures involved (Figure 20) this character is quite unexpected.

The responses are associated with the intermediate level structure which may involve ultramafics and these materials may be implicated in the generation of the seismic changes.

The possible features on Line BA are much less definite but there are several possibilities in the particular short line section. All lie in the 0.6 to 1.3 seconds range. The sites lie south of Mt Thunderbolt near the edge of the Florentine Valley structures. All responses are relatively subtle but oppose the grain of other reflections. All effects lie within the modelled Palaeozoic section which is considered to dip up to the east toward the base Permian unconformity.

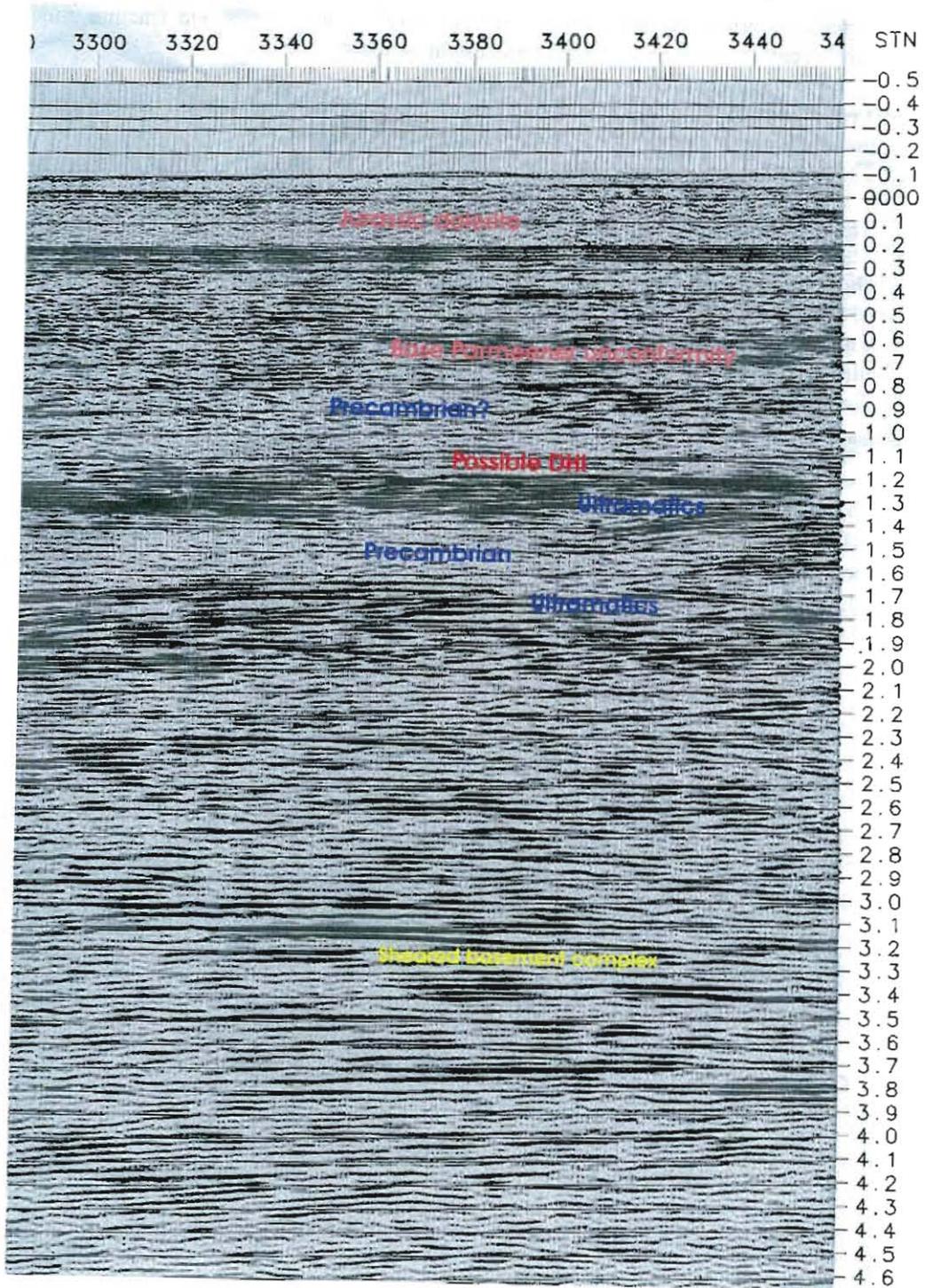


Figure 23: Portion of Line TB01-PB near Bellevue.

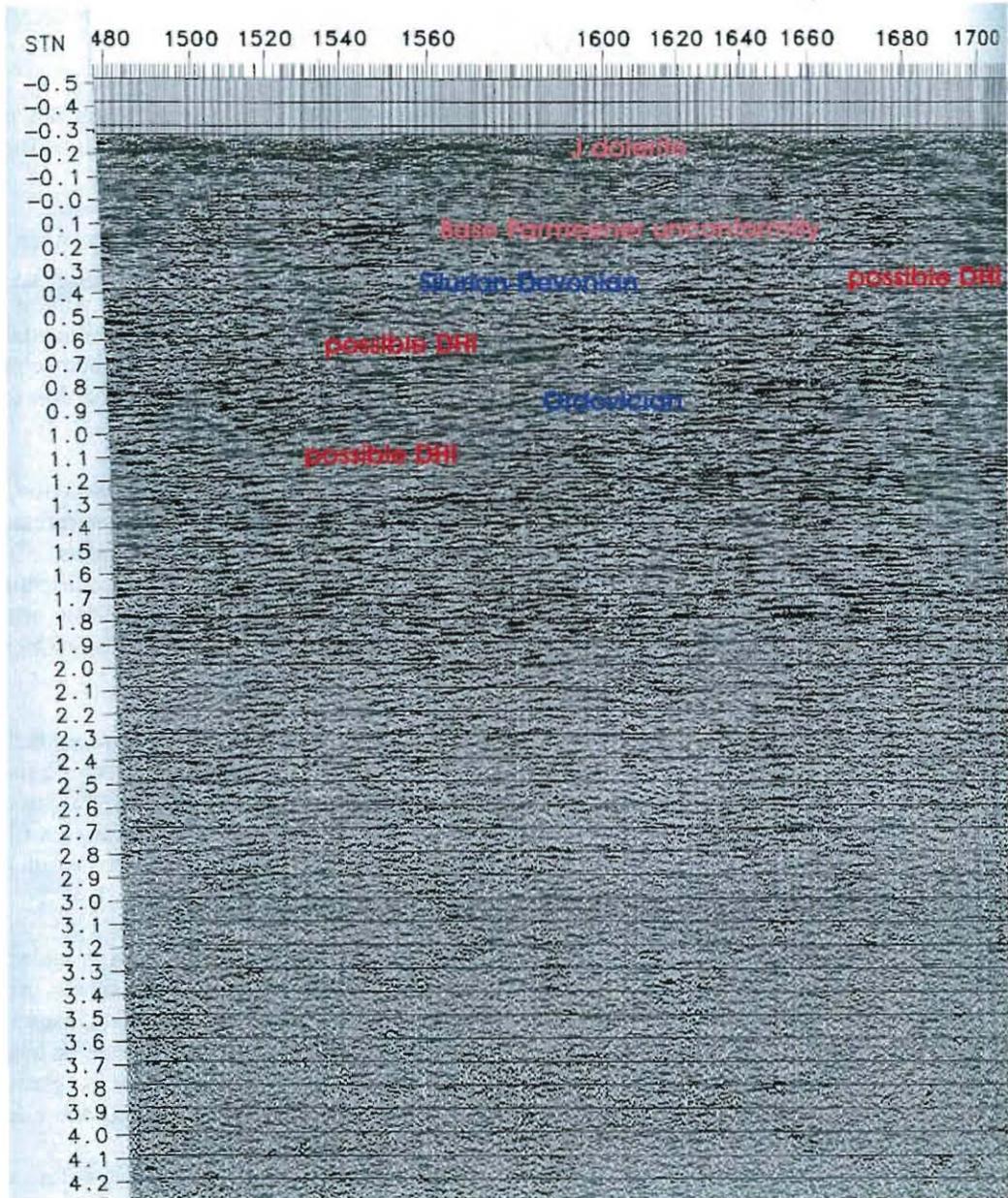


Figure 24: Portion of Line TB02-BA south of Mt Thunderbolt.

Note the cross-grained appearance of this record which may reflect hydrocarbon indicators or a combination of off-line, dipping and diffraction events. Short horizontal effects are clearly anomalous in this situation.

CONCLUSIONS

The principal conclusion drawn from the present study, which represents the most extensive analysis ever undertaken, is that the data available is quite inadequate for the guidance of a substantial exploration program. See Recommendations.

The seismic surveys completed to date are too isolated and unable to provide any comprehensive structural or stratigraphic unity. Segments of these traverses carry interesting suggestions of reflector events but their origin is not identifiable without use of other methods or well control. Most events are thought to be structural boundaries. One well, Hunterston-1, is simply not enough to provide the required control information alone: the area is too large, too complex and too variable for this to be claimed.

Gravity data, which have been used to carry major elements of this interpretation, are variable in quality and coverage and have almost certainly been over-interpreted in western regions. Magnetic data, used to test or verify certain elements of the interpretation, are only able to do so within the constraints of acquisition specifications. This data set is the most consistent regionally and it has been able to allow critical conclusions. These include the deduction that many thrusts and detachments are present and that they involve ultramafics (presumed to be Cambrian in age).

The present integrated interpretation does indicate where data must be acquired, and the nature of that data. If the implications suggested, with respect to mid Palaeozoic rocks, are correct then some useful stratigraphic holes may be drilled. There are other sites, as near Bronte and Steppes, where generally concordant interpretation allows significant variations and such sites should be drilled to establish firm control at clearly anomalous or ambiguous locations.

The interpretation generally confirms earlier views that central Tasmania is underlain by a complex overthrust terrain and that thrusts are both east and west facing. Many include coatings of ultramafics and some arcuate surfaces are completely enclosed with these materials. Precambrian rocks, including dense and dolomitic members, or largely dolomite, dominate the upper crust and siliceous Tyennan style basement is relatively limited in volume. The denser rocks may also be strongly metamorphosed and altered rocks but there is no suggestion of any significant magnetic signature.

Palaeozoic rocks can be traced into the plateau region from the southwest (Florentine valley region), the west (King William) and the north (Golden Valley). Block size, variation and limited lateral extension restricts seismic control and the other data sets can only indicate general presence and basic lithology at present. It is clear, however, that large portions of the included section are relatively low density (2.60 t/m^3 +) and indicates the presence of Silurian and Devonian rocks, perhaps with significant elements of non limestone Ordovician. Large accumulations of Cambrian rocks appear to be absent under much of the region.

This interpretation should be reviewed and models recalculated once new potential field data is available and at least some of the control wells have been drilled.

RECOMMENDATIONS

Some comments were made in Introduction which suggested that the present work would inevitably be limited. Such limitations were directly related to ground inspections of critical structures, and the quality and coverage of gravity and magnetic data. It is also clear that the generally isolated nature of the seismic coverage also retards understanding. The entire interpretation should be reviewed upon completion of these recommendations.

DRILLING

Some drilling is required regardless of acquisition of any other data, or surface evaluations. Some real control and insight into the construction of the basement is essential – and this control must be widespread.

Great South Land Minerals has nominated a number of drilling targets, mainly for stratigraphic purposes. These must be drilled, and to depths of at least 3000 m. This depth is required to ensure that the target zone thickness is properly appraised for future interpretation revision. Besides, the content of the basement to such depths may offer clues as to the source and movement of any hydrocarbons present. The already-drilled deep hole at Hunterston is not deep enough to answer some of the questions which arise from existing seismic data: hence any holes should be drilled to rig capacity and not less than 3000 m (economic depth limit?).

This study suggests that some of the current, nominated well sites are not ideally located. An example of this is offered by Gezer 1. This is clearly off structure, whatever that actually is, and would require greater depth to reach any of the primary reflectors. This site should be shifted several kilometres to the southeast, to Lake Echo. Figure 22, however, shows both sites – and both should be drilled. The nominal Gezer location would establish something of the lithology above the first major reflector and confirm or deny the absence of Palaeozoic rocks near Marlborough. The Lake Echo site is probably close to the crest of reflectors (Figure 20) and would test both the prospectivity and stratigraphy of the region.

Some other suggested sites, which would provide regional control and resolve some ambiguities, are also shown on Figure 22. These are considered the minimum necessary sites to provide appreciation of existing data and support analysis of new data infills.

An additional site near Tarraleah or Wayatinah might also prove of use.

POTENTIAL FIELD DATA

The coverage and quality of magnetic data must be improved. The only practical way to do this is to survey the entire licence area with consistent specification which allow resolution of both shallow source features and basement effects. Such a survey should have a line spacing of the order of 200-400 m maximum (closer is better) and a nominal terrain elevation clearance of 100-150 m. Significant deviations up to 300-400 m are not significant if very local, provided instrumentation fully records clearances. Tie lines of 10-20 km are advised as minimum specification. The higher range of terrain clearance tolerated means that towns and cities can be overflowed leading to a seamless final presentation. The specifications also mean that the data can be presented as a detailed map and in contoured form at some fixed height, say 1300 m asl. The

upward-continued format would be used for basement interpretation and the detailed low level form for Parmeener interpretation.

The coverage and quality of gravity data must also be improved but this is an easier and less costly exercise. Some parts of the area already possess a nominal 1 km observation spacing although the reliability of anomaly values may leave something to be desired. Many regions have a station spacing of more than 7 km, including the zone south of Bellevue, around Thunderbolt, and near Lake Echo. This explains the comments given in Conclusions: some traverses are almost certainly over-interpreted. It is recommended that every track of access which can be driven with a 4WD vehicle in these areas be traversed and observed at 500 m nominal spacing with a modern gravimeter and GPS support. This method will rapidly improve gravity coverage and reliability.

SEISMIC DATA

The present study indicates the problems with existing coverage and also suggests that the seismic coverage planned for 2007 is imperfect. Important structures and stratigraphic sections have been missed, and tie sections not considered. It is important that a net of seismic profiles be acquired since much of the difficulty with the present coverage lies with the isolation of individual traverses and the lack of cross ties. These are especially necessary in the Lake Echo region on the basis of present inferences.

Recommended coverage for the plateau region is suggested on Figure 25.

The data should be acquired using a wide frequency response and should not be filtered or altered in any way prior to processing. All traverses should be acquired with the straightest orientation and should exclude major doglegs wherever possible. Use of roads means that some orientation and elevation problems are inevitable but the proposed continuation of Line AA2, for example, is not advised. This line, essentially north-south, includes an east-west segment of some kilometres. This will degrade results. An alternative arrangement has been suggested in Figure 25 and it involves acquiring the north-south segments as proposed but using a cross traverse to acquire the other portion. This has the advantage of providing a proper and continuous setting for all segments.

Traverse planning must be carefully thought through in order to optimise results. Any seismic survey in Tasmania is very expensive and anything which diminishes the chance of good results should be avoided. Line PB, for example, is little short of a disaster for this reason. This line should have traversed from Bronte to Deloraine, not Bronte to Great Lake to Bothwell. TH should have been Great Lake to Bothwell.

Several other lines have waste segments which add nothing to the data set. It is not an advantage to use every bit of road or road curl just to advance a few hundred metres on orientation. This is evident for lines BA and TL where nothing is gained by taking a hairpin bend and following a different orientation.

Seismic presentations should be labelled for orientation and should be organised in the same way (looking north for east-west lines, and looking west for north-south lines) and shot points should be systematically laid out to achieve this. This is a planning issue but reduces confusion and rotation of data in order to put it in the manner of normal inspection. Part of this problem has arisen at the processing centre which has not been concerned with the finer points of useful, and non confusing, presentation.

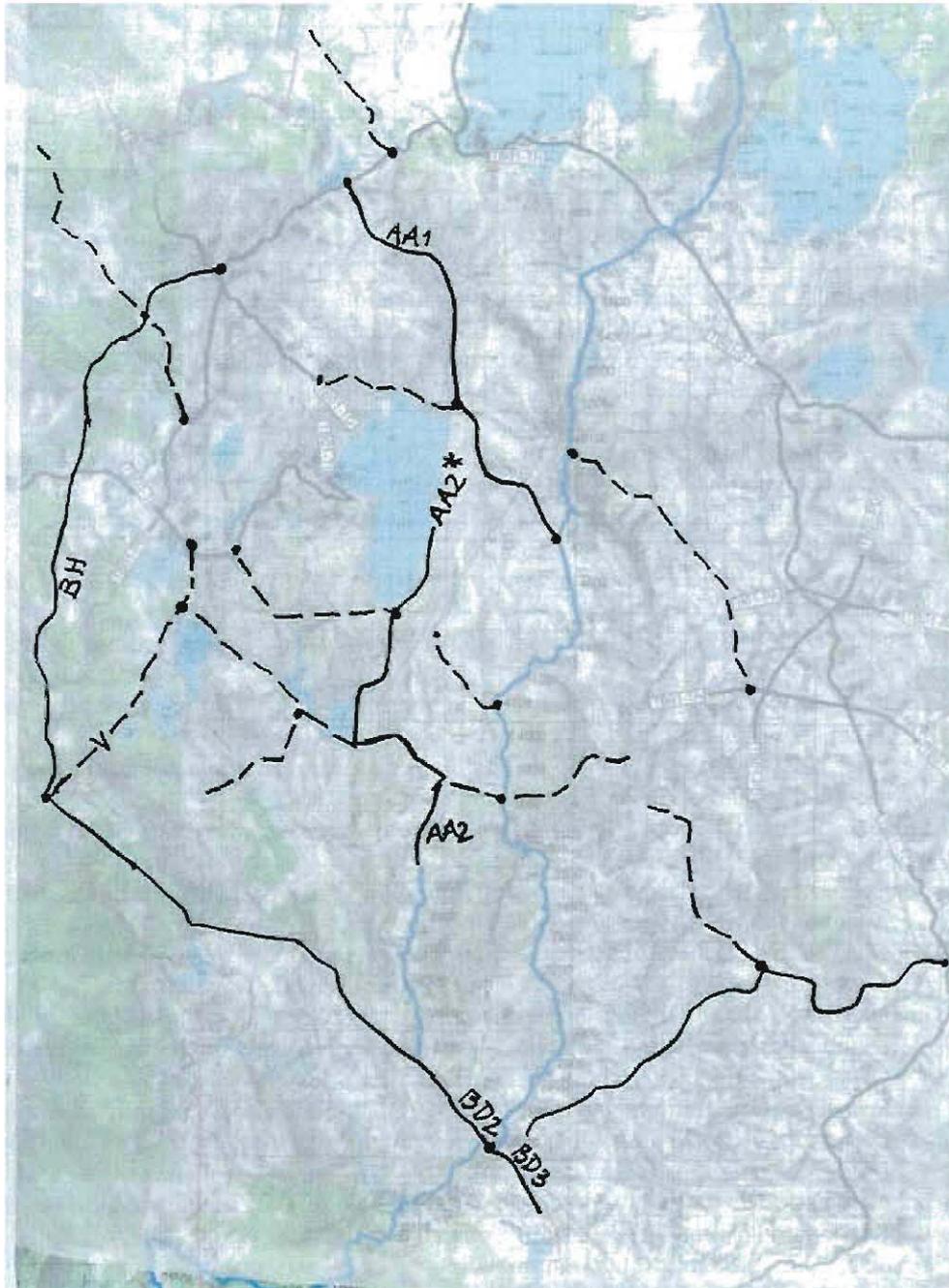


Figure 25: Recommended seismic coverage, central Tasmania.

Existing traverses are shown as coloured, heavy lines on the base map (black = survey TB01, blue = survey TB02). Firm lines on overlay are planned lines for next survey. Broken lines are the minimum recommended coverage required to provide cross ties and basic time maps.

Note AA2 has been planned with a major dogleg. This line should either be acquired in segments or as two parts and much longer cross line as shown.

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APPENDIX 1

TABLE OF ROCK PROPERTIES

Density is expressed as contrast with background and reduction density of 2.67 gm/cc

Age and unit	Density gm/cc, t/cu m	Susceptibility cgs	SI
Quaternary	-1.2	0	
Tertiary sediments	-0.7	0	
basalt	0.23	>0.001	>0.01
Jurassic dolerite	0.23	>0.004	>0.05
Triassic	-0.22	0	
Permian	-0.1 to -.13	0	
Siluro-Devonian	-0.1	0	
Mathinna Beds	-0.06 to 0.04	0	
Devonian granite	-0.05-0.07	0	
granodiorite	0.03	~0.0002	~0.0025
Ordovician Gordon Gp	0.07	0	
Denison Gp	-0.07	0	
Cambrian Tyndall/Yolande Gps	0.05-0.07	0.0002	0.0025
Dundas Gp style	0.05-0.07	<0.0002	<0.0025
sundry variations	var	var	
andesites	0.1-0.15	>0.0002	>0.0025
central volcanics	0.06-0.08	~0.0002	~0.0025
porphyry	-0.03<0.05	<0.0002	<0.0025
granite	-0.05/0.02	>0.0005	>0.006
ultramafic	var	>0.01	>0.12
Que style basalts	0.1-0.2	>0.0003	>0.0035
(note many Cambrian units exhibit variations in properties locally when altered)			
Precambrian/Eocambrian			
Crimson Creek Fm	>0.1	>0.001	>0.01
Success Creek Fm	>0.07	0	
Lineament rocks	>0.1	>0.0002	>0.0025
Oonah/Burnie Fm	0.08	<0.0005	<0.006
Forth Complex	0.1	0 var	
Tycnann/Badger/Roeky Cape	0	0	
Cradle Block var	0.1	0	
sundries/amphibolites	0.15	0.0003	0.0035
Massive dolomites	0.17	0	

APPENDIX 2

READING THE MODEL DIAGRAMS

All models have been constructed using the criteria and methodology of Leaman (1994, 1995, 1997b). This means that a family of rock units (see Appendix 1) has been consistently engaged and in ways that are known to occur.

Property ranges lie close to those observed and quoted in Appendix 1 and inferences have been used to deduce which combinations of units may actually be present, and where.

The diagrams themselves are in two parts: gravity and magnetics. The separation has been made for clarity and to indicate which units contribute to the observed or modelled effect. This is rarely apparent in compound plots which attempt to label units with properties used.

In so far as it has been possible, and hardware and software have allowed (there were some curious transformations!), the sections are colour coded and labelled in various sections so that the reader may gain a feel for what is included.

Dark blue = Precambrian dolomite, light blue = relatively dense occasionally dolomitic Precambrian, white = siliceous, possibly Tyennan Precambrian or neutral lithology (2.67 t/m^3). Dark green = Cambrian ultramafics, light green = other Cambrian rocks (volcanic or sedimentary). Red or black have been used for Devonian formations, magenta for Silurian, red for siliceous Ordovician and light red for Gordon Limestone. Devonian granitoids are shown in red.

Undifferentiated Permian cover or Permian is usually shown in light grey (occasionally blue), Triassic in green and dolerite in black. Tertiary rocks are not visible (but included in the models) at the scales plotted.

Observed data profiles are the red lines in each case. The blue profile is the calculated (modelled) profile.

The anomaly scale (top left in each diagram) shows the range of scale. Thus 20 mgal represents the entire scale, each tick is then 4 mgal.

The depth scale (bottom left) is scaled in the same way. Thus 9000 m represents the full scale, each tick is 1800 m.

The horizontal scale (bottom right, below "calc shift") is the full range of the diagram. Thus 45000 m represents the length of the section presented, although at least 15000 m more will have been included in calculation to avoid large end effects (but not displayed), and each tick will then represent 4500 m.

The values of "obs shift" and "calc shift" are important since these confirm the consistency of the modelling. The differences between the two numbers should match the base shifts or base levels of the data set. For residual gravity data, assuming the residual separation to be valid, this difference should be zero. For residual magnetic data it will depend on what base value was chosen by the contractor of the survey and its difference from the true IGRF related value at the site. Since the magnetic field is a

variable function this number can vary and must be assessed for the survey and data set. The residual field offered on magnetic maps is rarely true, since this subtlety is not appreciated by many, but it is important that it be determined and recovered consistently in modelling or magnetic interpretations become nonsense and ill-determined. In this case an assessment of the data set suggested that the true base value for the survey was 50 to 60 nT higher than the values presented. This difference should, therefore, appear in the shift values. A difference of 50 nT has been considered an adequate match.

Details of the line appear in the lower left corner of each sub plot and the title line of each plot includes some end point detail in the form of shortened AMG coordinates and some description.