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GRAVITY SURVEY EAST COAST AREAS, TASMANIA for

KUTH ENERGY LTD.

35 Smith Street, North Hobart, Tasmania 7000

Period from April 16th to May 29th 2010





Some difficult access to areas

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The Crew:

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



Brian and survey vehicle



George

GPS EQUIPMENT:

Leica 1200 dual frequency RTK for survey applications

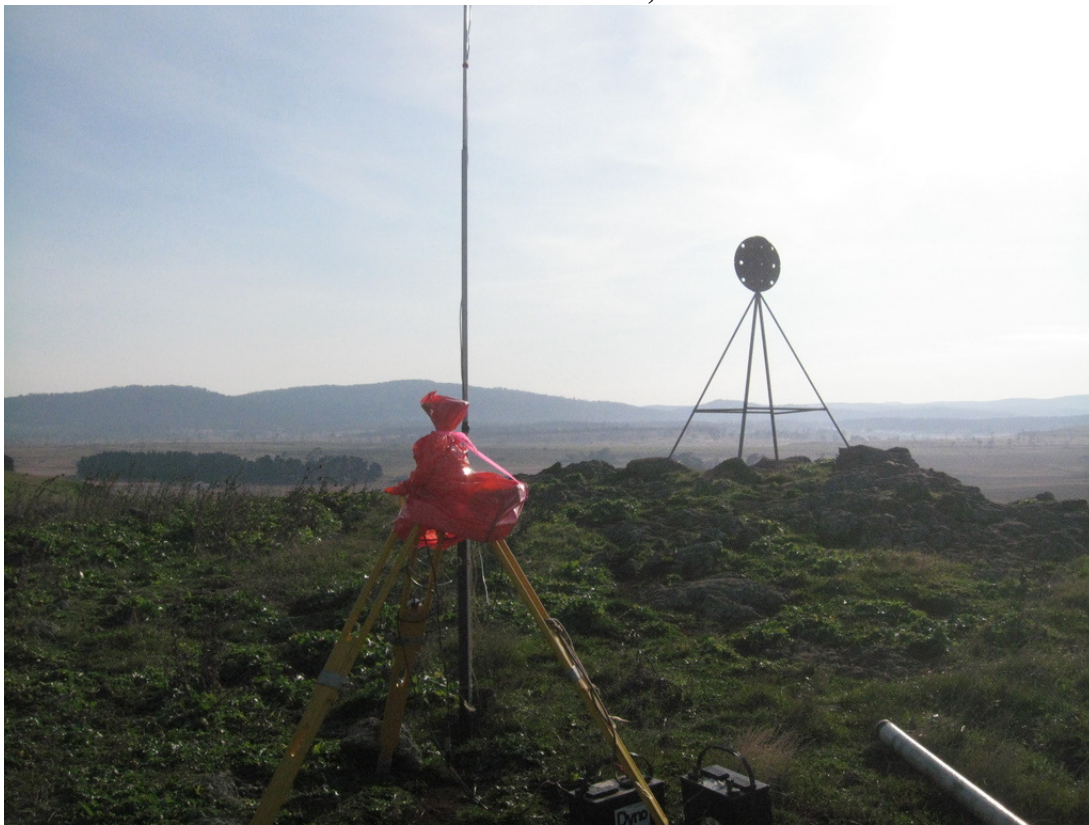
Garmin GPS60 for local activities

Radio Link 4W/25W UHF 467.075MHz frequency

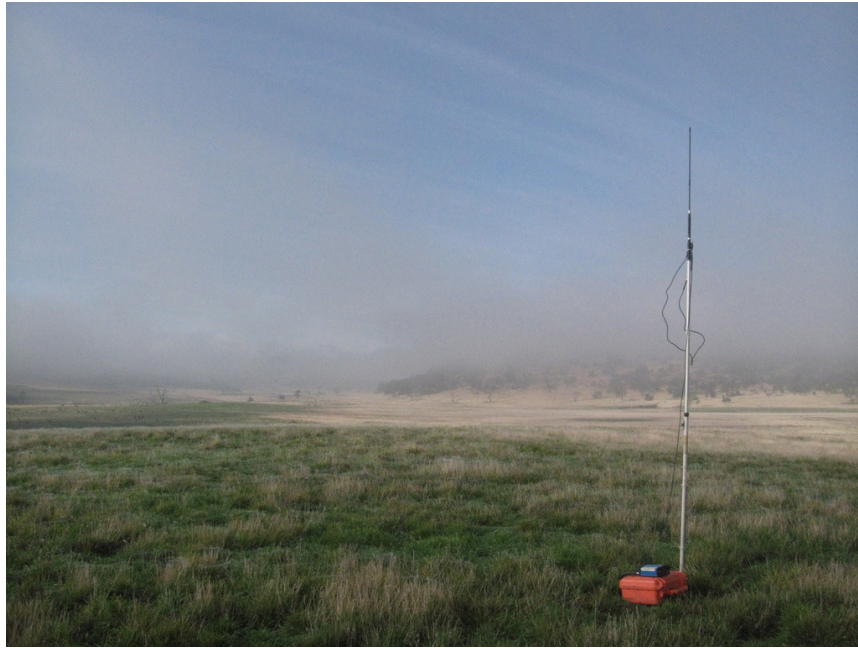
Equipment owned by Solo and maintained and upgraded by manufacturer.

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: on Casaveen Bluff, “Miena” near Lemont



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
3900	3951.96	1.01393

Equipment owned by Solo and maintained by manufacture to specification with routine services to Austin Texas.

Meter daily variations closely follow Longmans tidal calculations.

Time Zone:

Normal EST was used for the survey duration. Tidal changes are calculated by Longman formulae on UTM time plus 9 hours.

GRAVITY SURVEY CONTROL STATIONS:

Main control base site location: Hobart Airport car park
(No external security problems, Solo base established 2007)

Hobart Airport Base: no marker present



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 2007 base close up:

Value: Isogal65 980448.310 mGals

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

LOCAL BASE CONTROLS EAST COAST:



Solo Base at Oatlands in old garage. (tied to Hobart control)

Value: Isogal65 980298.55 mGals ObsGrav

Location: AGD66 Zone55 530278E 5316451N Elevn 415m by Garmin

ID 111111



Solo Base at Man O' Ross Hotel, Ross. (tied to Hobart control)

Value: Isogal65 980313.16 mGals ObsGrav

Location: AGD66 Zone55 540647E 5346515N Elevn 196m by Garmin

ID 444444



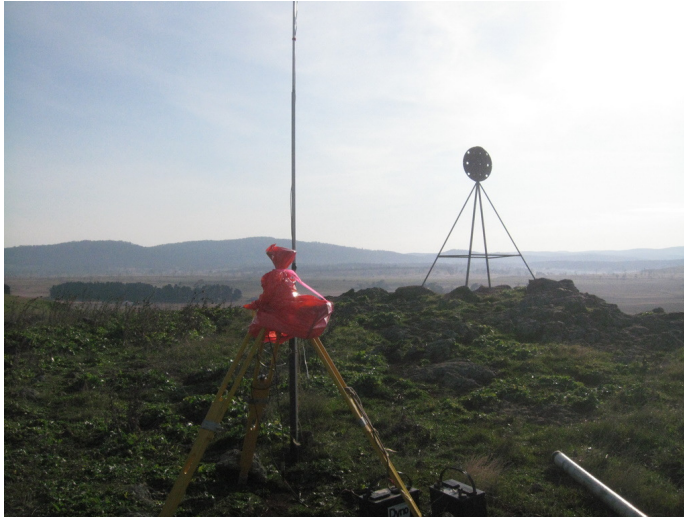
Backup at Ross Post Office(front south corner)



Value: Isogal65 980313.41 mGals ObsGrav

GPS SURVEY CONTROL STATIONS:

Lemont Area: Casaveen Bluff



Base#1

Location on hill near trig station south from Lemont.

AMG66 Zone 55

550428.70E 5316166.98N 431.17m

This control was used for gravity stations prefixed 100XXX, and transformed from GDA94 to AGD66 AMG66 Zone 55 values using the Tasmanian AGD66 transformation.

Stonehenge Area:

Base#2

AMG66 Zone 55

551842.82E 5305462.80N 288.06m



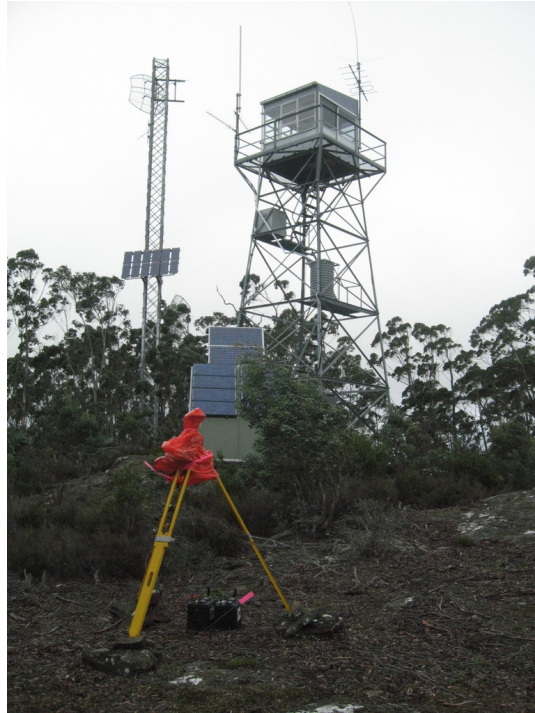
This control was used for gravity stations prefixed 200XXX, and transformed from GDA94 to AGD66 AMG66 Zone 55 values using the Tasmanian AGD66 transformation.

Moaners Tier:

Base#3

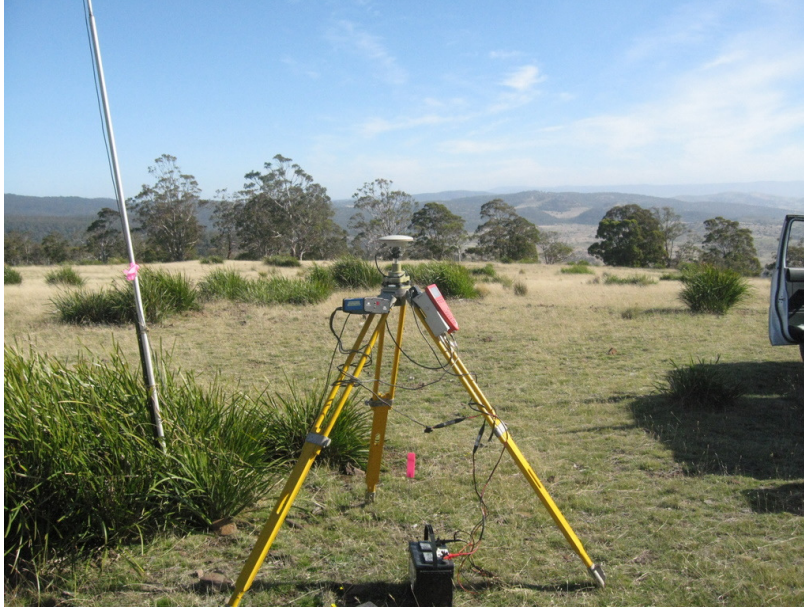
AMG66 Zone 55

571358.06E 5322926.21N 739.88m



This control was used for gravity stations prefixed 300XXX, and transformed from GDA94 to AGD66 AMG66 Zone 55 values using the Tasmanian AGD66 transformation.

Base#4
Ricky Shaw
AMG66 Zone 55
559604.83E 5327049N 525.97m



This control was used for gravity stations prefixed 400XXX, and transformed from GDA94 to AGD66 AMG66 Zone 55 values using the Tasmanian AGD66 transformation.

Base#5
Julian Von Bibra
AMG66 Zone 55
542658.46E 5343047N 263.58m

This control was used for gravity stations prefixed 500XXX, and transformed from GDA94 to AGD66 AMG66 Zone 55 values using the Tasmanian AGD66 transformation.

Base#6
Windfall
AMG66 Zone 55
555786.55E 5349934.11N 532.73m



This control was used for gravity stations prefixed 700XXX, and transformed from GDA94 to AGD66 AMG66 Zone 55 values using the Tasmanian AGD66 transformation.

Base#7
Blue Tier
AMG66 Zone 55
560590.16E 5344067.68N 700.70m

This control was used for gravity stations prefixed 800XXX, and transformed from GDA94 to AGD66 AMG66 Zone 55 values using the Tasmanian AGD66 transformation.



Base#8

Mona Vale, John Cameron

AMG66 Zone 55

542343.14E 5338524.29N 230.06m

This control was used for gravity stations prefixed 800XXX, and transformed from GDA94 to AGD66 AMG66 Zone 55 values using the Tasmanian AGD66 transformation.

Base#9

Ross60

AMG66 Zone 55

564086.25E 5336360.01N 534.86m



This control was used for gravity stations prefixed 900XXX, and transformed from GDA94 to AGD66 AMG66 Zone 55 values using the Tasmanian AGD66 transformation.

SURVEY AREA EAST COAST:

SURVEY REPORT:

The survey crew based themselves in the Kentish Hotel at Oatlands for the southern survey areas and moved north to the Man O' Rosss Hotel in Ross for the northern areas.

The rooms had easy access for early morning departures and self serve breakfast and meals at night for late arrival to take advantage of shorter daylight hours during winter.

Gravity control was carried to Oatlands and Ross from Hobart airport using re-established airport station from Mount Pleasant to Hobart. The local gravity control bases at Oatlands and Ross were occupied daily when working these areas.

GPS survey controls were acquired via internet from the State data base and initially GPS base SPM3444 north of Orford 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.

Most access from the roads and tracks in the survey area was locked with the exception of some properties and prior arrangements were made to gain access. Kuth office had made contact earlier and follow up was arranging convenient time for access when keys were not provided or collecting keys for access and returning after use.

All keys were returned after use and no keys were misplaced as some previous operators had done and we were advised of these outstanding keys. Lost keys were a security problem as shooters could come onto these properties without permission. We had one occasion to not enter properties on the weekend near end of survey as shooters were active and the owner said he could not be sure of our safety at that time, come during the week only.

Forestry Tasmania's office in Triabunna was the principal controller of logging tracks in this area with the addition of some local logging firms on private lands where additional keys were not available. Master keys supplied opened the selected areas an additional key was acquired to open some private plantation tracks with the approval of the property owners. The access to Moana Tier for a regional GPS Base was available when a key change to the lock was arranged to open with keys provided without a trip to Triabunna.



Locating private owners and acquiring keys was an additional task to be arranged at the convenience of the land owner.

Areas of dense timber reduced data acquisition by limiting satellite visibility and these were not acquired due to extra delays required. Washouts on old logging tracks prevented some additional access as these were no longer accessible.



**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 9 hours.
- 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 on east coast.
- Main roads, minor roads, forest logging tracks, and private property tracks were accessed at 1000m intervals or satellite visible areas in forests for data records.

- Topography in the area ranged from 190m to 740m and required accessing numerous suitable high areas for the radio GPS link. Some access provide by Forestry Tasmania keys.
- The base RTK GPS when on high ground was set to automatic on three day cycles between battery changes to give more time to the survey.
- Low level base control was recovered daily.
- Additional RTK coverage was gained by a mobile radio repeater link.
- The survey crew were equipped with reflective clothing and a vehicle with flashing beacons for advance traffic warning of survey crew when on forest tracks.
- All GPS readings were measured external to the vehicle with GPS head on a standard 2 meter pole.
- No incidents or accidents occurred during this survey period.

Gravity Survey:

- Gravity stations occupied were located by RTK GPS in real time in the appropriate datum at the selected 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 100001
- The first two digits identified RTK GPS base station, last number 900614
- This was reduced to a four digit number by request, the last survey number being 0614 for government data base records.
- Readings were taken in loops from established gravity base control stations at Oatlands and Ross. The loop duration was dependent on access and terrain elevation and additional control ties were also made when possible during the day.



- All meter readings were observed at ground level along roads and tracks.

- Additional delays occurred when extended periods of seismic activity predominated for three weeks and ceased after an earthquake of 7.2 magnitude at Arche in Indonesia.
- The extended period of fine weather this year was exceptional and again aided survey progress.
- Vehicle mileage for the survey totalled 7585 Km ex Adelaide.

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 Geoscience Australia 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.

Gravity Data Processing:

- All gravity stations were given a unique six digit ID
- Gravity data was recorded in loops from established town control stations, the field measurement being a relative gravity measurement referenced to the base station control.
- Additional base ties to a field 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 .
- All tidal corrections referenced UTM plus 9 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:

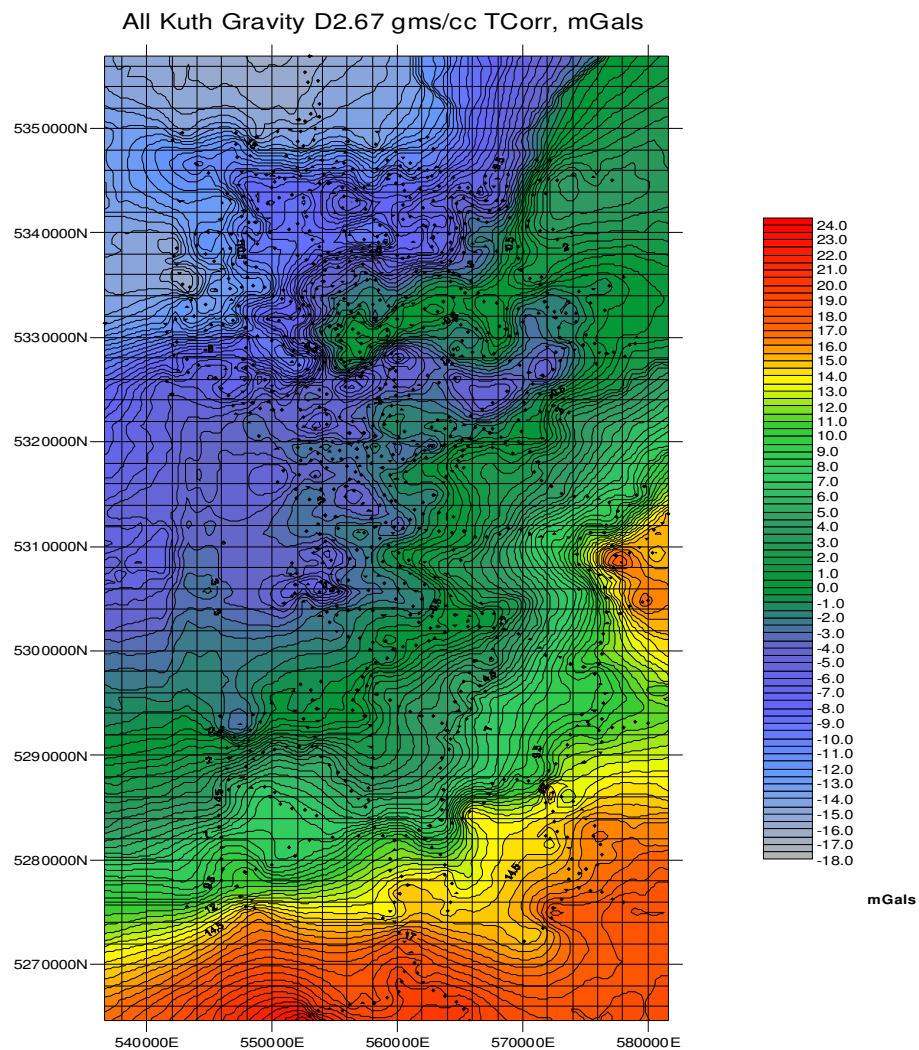
```
CLIENT: Kuth Energy
AREA: Lemont to Toon Lake
GRID: Infill stations
BASE # 01;GRAVITY:9802985.500;EAST=xxxxxx ;NORTH=xxxxxxx : Oatlands
BASE # 04;GRAVITY:9803131.600;EAST=xxxxxx ;NORTH=xxxxxxx : Ross Hotel
BASE # 08;GRAVITY:9804370.200;EAST=xxxxxx ;NORTH=xxxxxxx : Hobart Obs
BASE # 09;GRAVITY:9804483.500;EAST=xxxxxx ;NORTH=xxxxxxx : Hobart AP CPk
LAST BASE
LOOP:01;METER:556;DATE:170410;OPERATOR:B.RAU
LINE L
LINE L
000000.00 0000000001. 3816.54 803 000.00 107 -.082 01 3816.46
***** ** ***** ** 3816.54 804 ***. ** 107 -.082 111111 3816.46
550909.68 5317322.42 3825.25 832 372.62 107 -.079 222222 3825.17
550428.70 5316166.98 3813.74 1001 431.17 107 -.059 100001 3813.68
550909.68 5317322.42 3825.24 1043 372.62 107 -.049 222222 3825.19
552186.41 5316808.42 3828.91 1143 361.67 107 -.039 100002 3828.87
553385.28 5316665.42 3825.07 1219 376.93 107 -.038 100003 3825.03
550909.68 5317322.42 3825.19 1256 372.62 107 -.040 222222 3825.15
551881.46 5315511.65 3832.89 1310 347.39 107 -.042 100004 3832.85
552886.76 5315681.49 3836.62 1322 329.29 107 -.042 100005 3836.58
553886.54 5315435.69 3838.43 1331 322.65 107 -.045 100006 3838.38
554887.09 5315487.64 3837.83 1341 321.21 107 -.048 100007 3837.78
555904.62 5315774.74 3826.03 1400 379.82 107 -.052 100008 3825.98
555827.51 5314773.83 3830.17 1425 359.29 107 -.060 100009 3830.11
556200.60 5316481.81 3828.36 1448 366.48 107 -.065 100010 3828.30
East North InstRdg Time AHD jday tideC ID InstRdg tC
```

- 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.

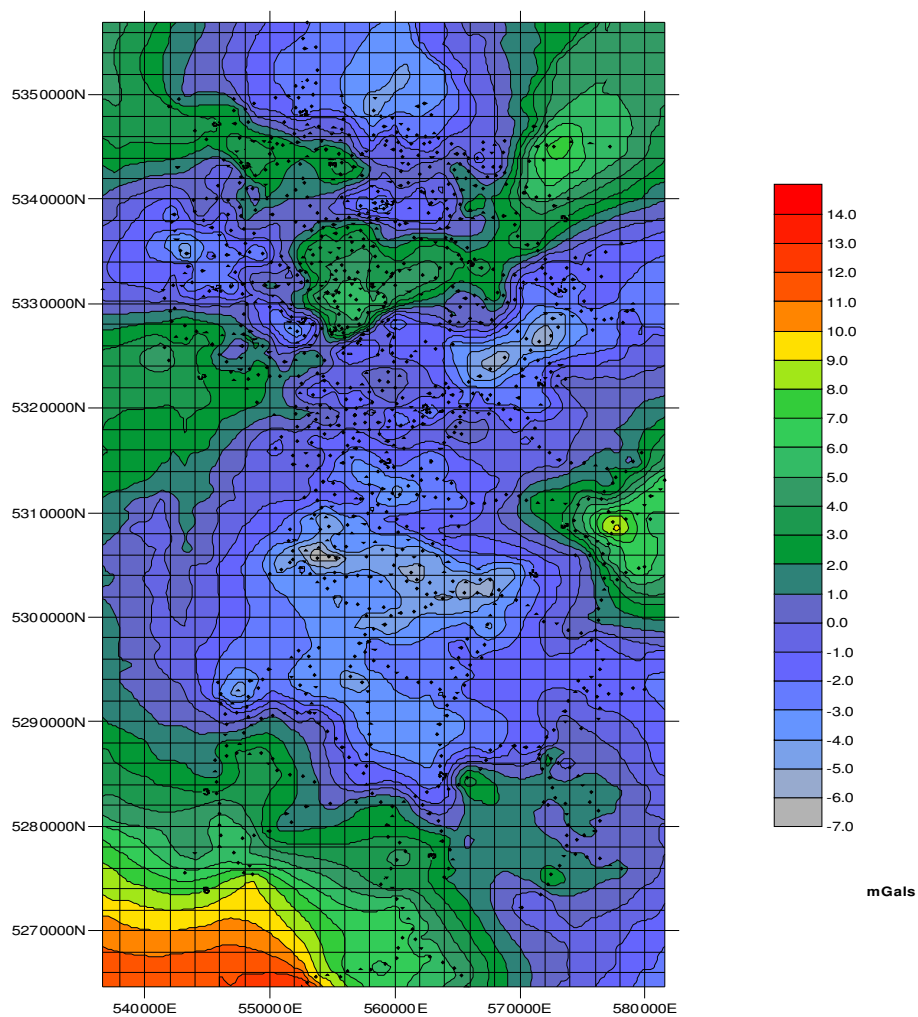
pegID	AMG66Est	AMG66Nth	Latitude	Longitude	Elvn	Observed65	D2.67	TC267
222222	550909.68	5317322.42	-42.294514	147.617573	372.62	980307.38	-4.89	00.05
100001	550428.70	5316166.98	-42.304951	147.611839	431.17	980295.73	-5.96	00.72
222222	550909.68	5317322.42	-42.294514	147.617573	372.62	980307.40	-4.87	00.05
100002	552186.41	5316808.42	-42.299059	147.633106	361.67	980311.13	-3.70	00.09
100003	553385.28	5316665.42	-42.300265	147.647663	376.93	980307.24	-4.70	00.21
222222	550909.68	5317322.42	-42.294514	147.617573	372.62	980307.36	-4.91	00.05
100004	551881.46	5315511.65	-42.310757	147.629523	347.39	980315.17	-3.53	00.07
100005	552886.76	5315681.49	-42.309160	147.641705	329.29	980318.95	-3.16	00.32
100006	553886.54	5315435.69	-42.311305	147.653858	322.65	980320.77	-2.83	00.11
100007	554887.09	5315487.64	-42.310767	147.665993	321.21	980320.17	-3.68	00.37
100008	555904.62	5315774.74	-42.308110	147.678311	379.82	980308.20	-3.87	00.36
100009	555827.51	5314773.83	-42.317129	147.677472	359.29	980312.39	-4.54	00.43
100010	556200.60	5316481.81	-42.301721	147.681833	366.48	980310.55	-3.57	00.35

- 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.

Gravity contour map, coordinates AMG66 Zone55



Residual Gravity 2.67gms/cc TCorr, mGals



Additional notes:

Gravity repeat sub base stations were used to check drift and were most useful during sustained periods of noise from remote seismic activity that lasted almost three weeks.

222222 was a common repeat at Lemont location and had established GPS controls.

The main bases 111111 and 444444 were located in the towns under cover and were not suitable for a GPS location being remote from the survey area RTK GPS base station.

The variation in repeats is shown in this noise level.

GPS base stations were established before post processing controls were established and corrections applied to data set when AUSPOS completed after changing base location. This generally required elevation adjustment approximating one metre or less from set up rough location "here" selected.

A late tie to control stations from Hobart was made as the earlier tie was during sustained noise periods at the commencement of the survey.

Oatlands base deviated by 0.02 mGals with the new tie and Ross by 0.06.

Oatlands _old	9802985.50
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Oatlands_ update	9802985.20
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Ross_ old	9803131.60
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Ross_ update	9803131.00
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A new set of data was calculated from these corrections.

This data set named "updated"

A tie was made to Triabunna memorial base from the previous 2007 survey period, this repeat 666666 in this survey has now calculated a similar value of 980413.72 mGals. This tie was made during key collection from Gunns, Triabunna.

For Solo Geophysics & Co

Brian Rau
Director