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EL 3479 / 5109

LAKE GILLES

SECOND PARTIAL SURRENDER REPORT, FOR THE PERIOD 22/12/2005 TO 13/9/2016

Submitted by
Investigator Resources Limited
2016

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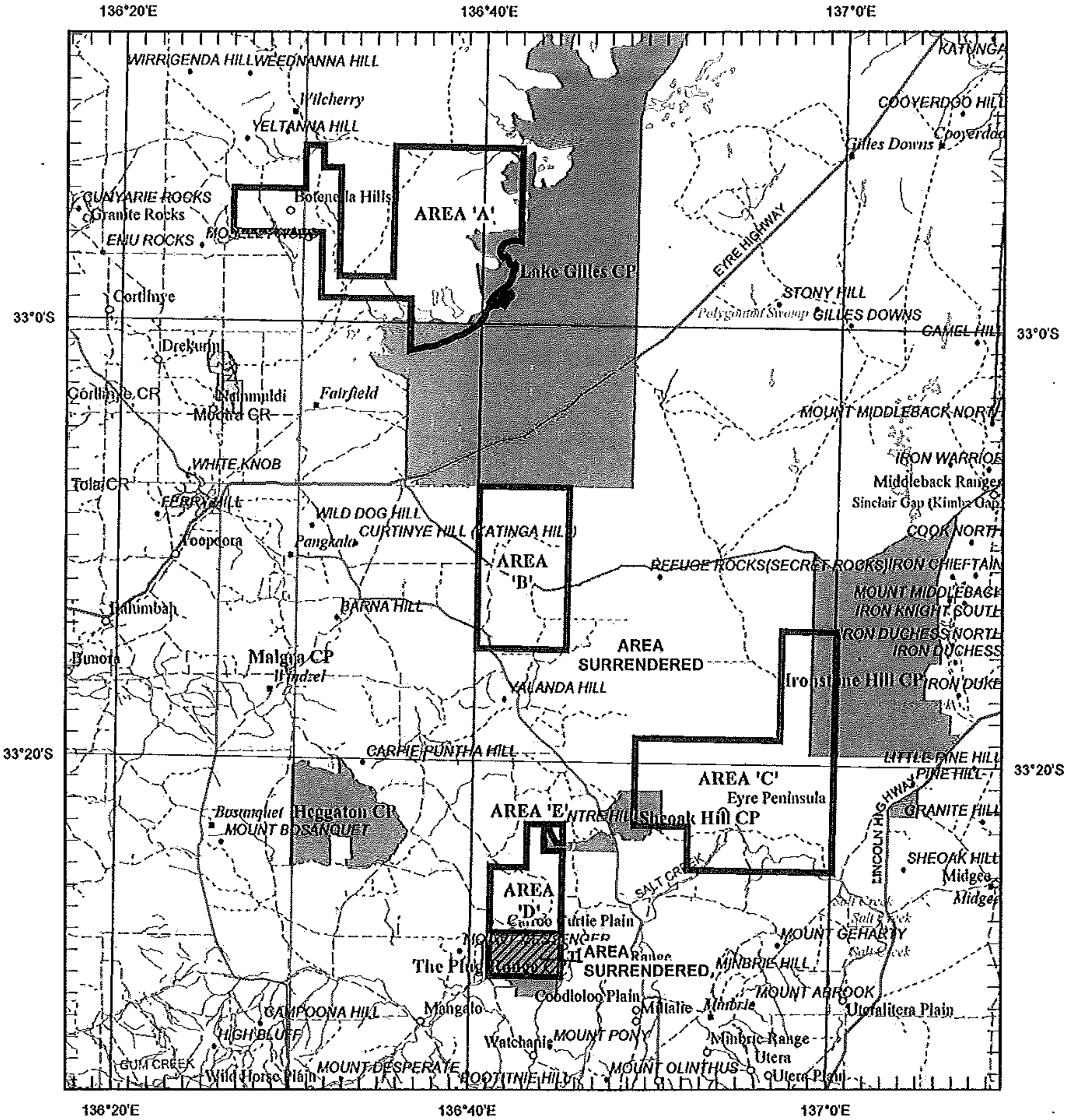
Government of South Australia
Department of State Development

SCHEDULE A



SCALE 1 : 500 000

8 0 8 16 24 32 40

Kilometres

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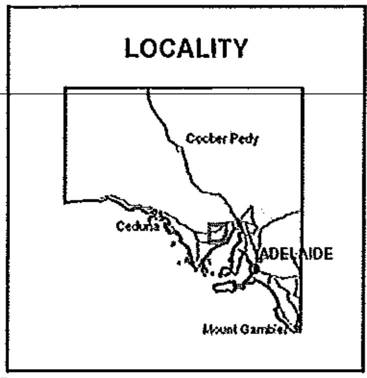

APPLICANT : GAWLER RESOURCES PTY LTD

FILE REF : 2010/00320 TYPE : MINERAL ONLY

AREA : 583 sq km (approx)

1 : 250 000 MAPSHEETS : YARDEA PORT AUGUSTA WHYALLA

LOCALITY : LAKE GILLES AREA -
Approximately 60 km WSW of Port Augusta

DATE GRANTED: 29-Nov-2012 DATE EXPIRED: 28-Nov-2016 EL NO: **5109**

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100% subsidiary of
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Ph 08 7325 2222

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web: www.investres.com.au

EL 5109 Lake Gilles, Partial Surrender Report, 13-09-16.

250,000 mapsheet-	SI 53-4, Pt. Augusta,
	SI 53-3, Yardea
	SI 53-8 Whyalla
100,000 mapsheet-	6132, Buckleboo
	6231, Barna
	6232, Uno

Coordinates (GDA94 Zone 53)

Max Easting 686000m,	Min Easting 634000m,
Max Northing 6363000m,	Min Northing 6292000m

Keywords
Partial leach, Soil geochemistry

Compiled by Richard Hill, Senior Geologist, South Australia, 10-10-2016

.

EL 5109 Lake Gilles,
Partial relinquishment Report
13-09-16.

Summary

This small area (23 km^2) of EL5109 was relinquished in lieu of a partial relinquishment of 25% of Ela2016/0008 (Barna Hill, now EL5857).

Work completed over this area consisted of regional-scale soil sampling and gravity surveys, along with all of the ususal processes which this involves.

A grand total of 28 soil samples were collected and 30 gravity stations (plus three repeats) read.

The area is mostly within the Plug Range Conservation Park, which was reproclaimed in 2012 from Conservation Reserve status.

Considering the extra effort required to explore within a Conservation Park (PEPR and compliance) and the lack of encouraging results from the soil sampling, it was agreed with DSD to relinquish this small area in lieu of part of EL5857.

Investigator Resources Ltd.
EL 5109 Lake Gilles,
Partial Relinquishment Report
10-10-2016.

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1 Introduction

The East Eyre Peninsula Project includes a number of exploration tenements on the central northern to eastern Eyre Peninsula. The Lake Gilles tenement covers an area of 583 km^2 over four separate blocks (Figure 1).

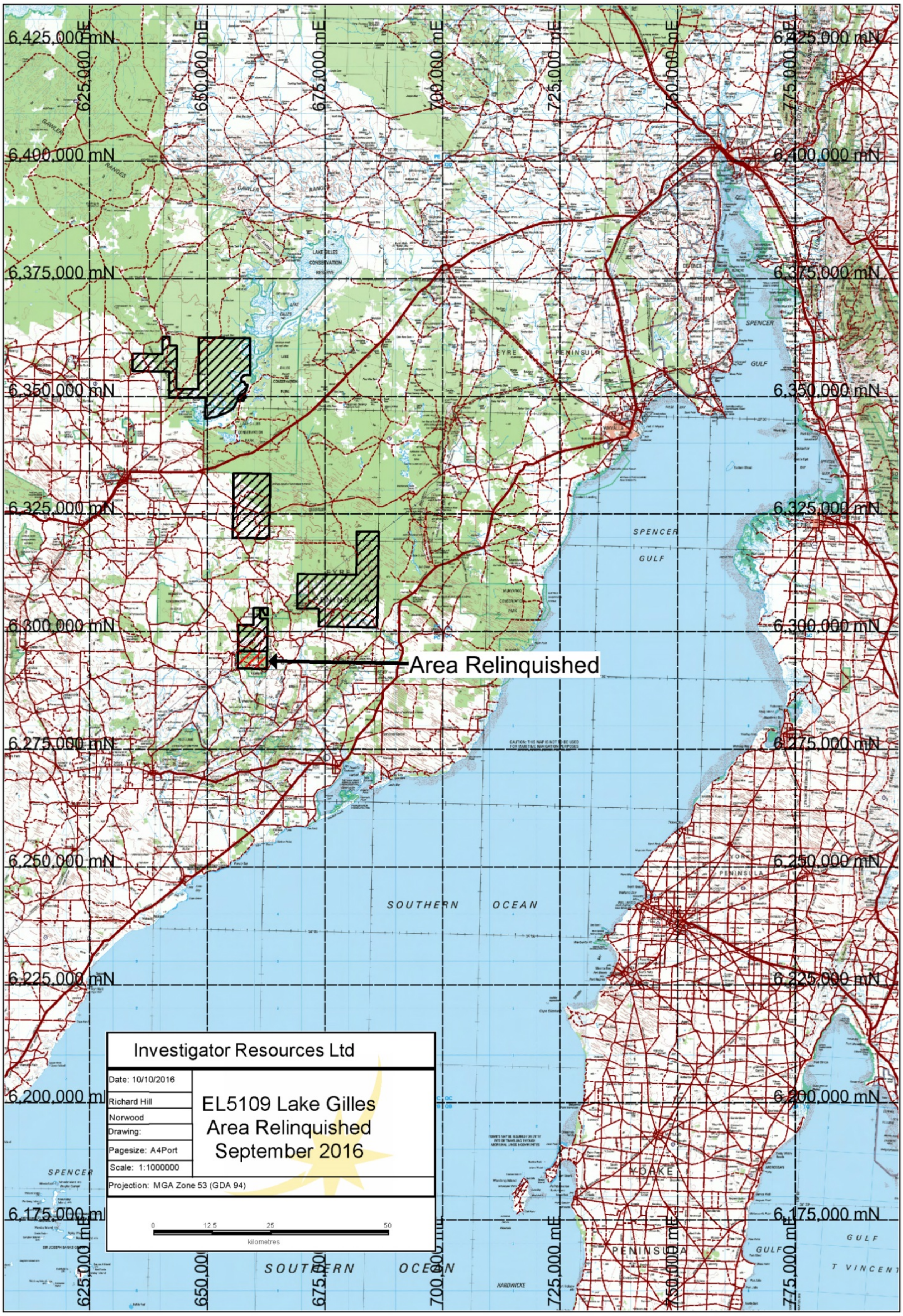
2 Tenure

The Lake Gilles tenement was granted to Southern Gold Ltd on 22/12/2005 initially for a 12 month term. This was renewed for a further 12 month term.

Operation and management of the tenement was transferred from Southern Gold Ltd to Sunthe Uranium Ltd. (100% subsidiary of Investigator Resources) on 17/07/2007. Annual expenditure commitment was $95,000.

In February 2008 Investigator Resources agreed to relinquish 66 km^2 to comply with expenditure commitments and PIRSA regulations.The tenement had been subsequently renewed to its maximum of five years, ending on 21st December 2010.

Re-application was submitted in October 2010. The Tenement was re-granted, commensing on 29th November 2012 for a two-year term, after delays of nearly two years and reapplied for in 2014 for a further two years, with an expenditure commitment of $360,000 over the two years.



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6,225,000 mN
6,200,000 mN
6,175,000 mN
625,000 mE
650,000 mE
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725,000 mE
750,000 mE
775,000 mE
Area Relinquished
SPENCER GULF
SOUTHERN OCEAN
Investigator Resources Ltd
Date: 10/10/2016
Richard Hill
Norwood
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EL5109 Lake Gilles
Area Relinquished
September 2016
Projection: MGA Zone 53 (GDA 94)
0
12.5
25
50
kilometres

3 Access

The tenement covers a number of freehold broad-acre farms, Heritage Agreement Areas, part of the Plug Range Conservation Park and parts of the Uno pastoral lease. Investigator Resources Ltd has contacted all relevant landholders and served Waivers of Exemption and Notices of Entry where applicable.A DEF was submitted and approved for low-impact exploration within the Heritage Agreement Areas and the Plug Range Conservation Reserve.

The area lies within the Barngala and Gawler Ranges Native Title claims. A limited heritage survey was undertaken in May 2008 and clearance was given for drilling activities within the surveyed areas.

An ILUA was signed with the Gawler Ranges Group in August 2008. This allows “Early Exploration Activities” (defined as activities not requiring earthworks or the clearance of vegetation) without the need for a Heritage Survey.

A more comprehensive survey was undertaken in August 2009 over the Jungle Dam area of the Gilles North block and the majority of the area given clearance for advanced exploration activities.

Physical access to the tenement is good, with a network of public roads and farm tracks across the areas. As can be seen from the figure below, apprximatly 30% of the area of the Conservation Park is still cultivated lands.

4 Geological setting

The East Eyre Peninsula project lies in the Cleve and Spencer Sub-domains of the southern Gawler Craton. The predominant crystalline basement rocks are Palaeoproterozoic in age, and include Miltalie Gneiss, Hutchison Group metasediments, pre-early syntectonic granitoids and late syntectonic granitoids. Small inliers of Archaean Sleaford Complex outcrop in places. Intruding the older basement in a roughly northwest trending belt are Mesoproterozoic Hiltaba Suite granites, thought responsible for the majority of palaeozoic minaralisation in the Gawler Craton. The northern Eyre Peninsula is bounded by the Gawler Range Volcanics, a co-eval volcanic expression of the Hiltaba thermal event. Basement outcrop is sparse, with a thin cover of Quaternary fluvial, alluvial and aeolian sediments covering much of the tenement.

5 Previous Exploration (historic)

Since 1967 the project area has attracted very active exploration activity, including seven uranium exploration campaigns and eight IOCG-Uranium campaigns, as well as exploration for other commodities. Previous activities have been summarised in the Annual Technical Reports and will not be included in this report.

6 Previous exploration (IVR/SNU/SAU)

All previous exploration on this (and the preceeding) tenement has been reported in the previous Annual Technical Reports,

Investigator Resources (and Southern Uranium) has been quite active on this tenement since aquiring management of the tenement in mid-2007. Activity has been largely focussed on the Jungle Dam Block, however the other blocks have had some work

Acitvities include

- Regional Gravity survey September 2007 (tenement-wide)
- Infill gravity survey February 2008 (Jungle Dam block)
- Soil sampling March-April 2008 (Tenement-wide)
- Heritage Clearance Survey April 2008 (Jungle Dam block)
- RC/diamond drilling, May-August 2008 (Jungle Dam block)
- Aircore drilling December 2008 (Jungle Dam block)
- Heritage Clearance survey July 2009 (Jungle Dam block)
- Aircore drilling August 2009 (Jungle Dam and Sectus Tank blocks)
- RC Drilling March-April 2010 (Jungle Dam block)
- Gravity detailed survey June 2010 (Jungle Dam block)
- Groundmag traverses September 2010, (Jungle Dam block)
- Aircore drilling November 2010 (Jungle Dam block)
- RC drilling November 2010-Februaury 2011 (Jungle Dam block)
- Aeromag/radiometric survey August 2010 (Jungle Dam block)
- Mapping and rockchip sampling (Jungle Dam block)
- Comprehensive rehabilitation and documentation of ground-disturbing activities. (Jungle Dam block)

Activities within the relinquished area have consisted of soil sampling and analysis and a gravity survey.

7 Activities Reported

7.1 Soil samples

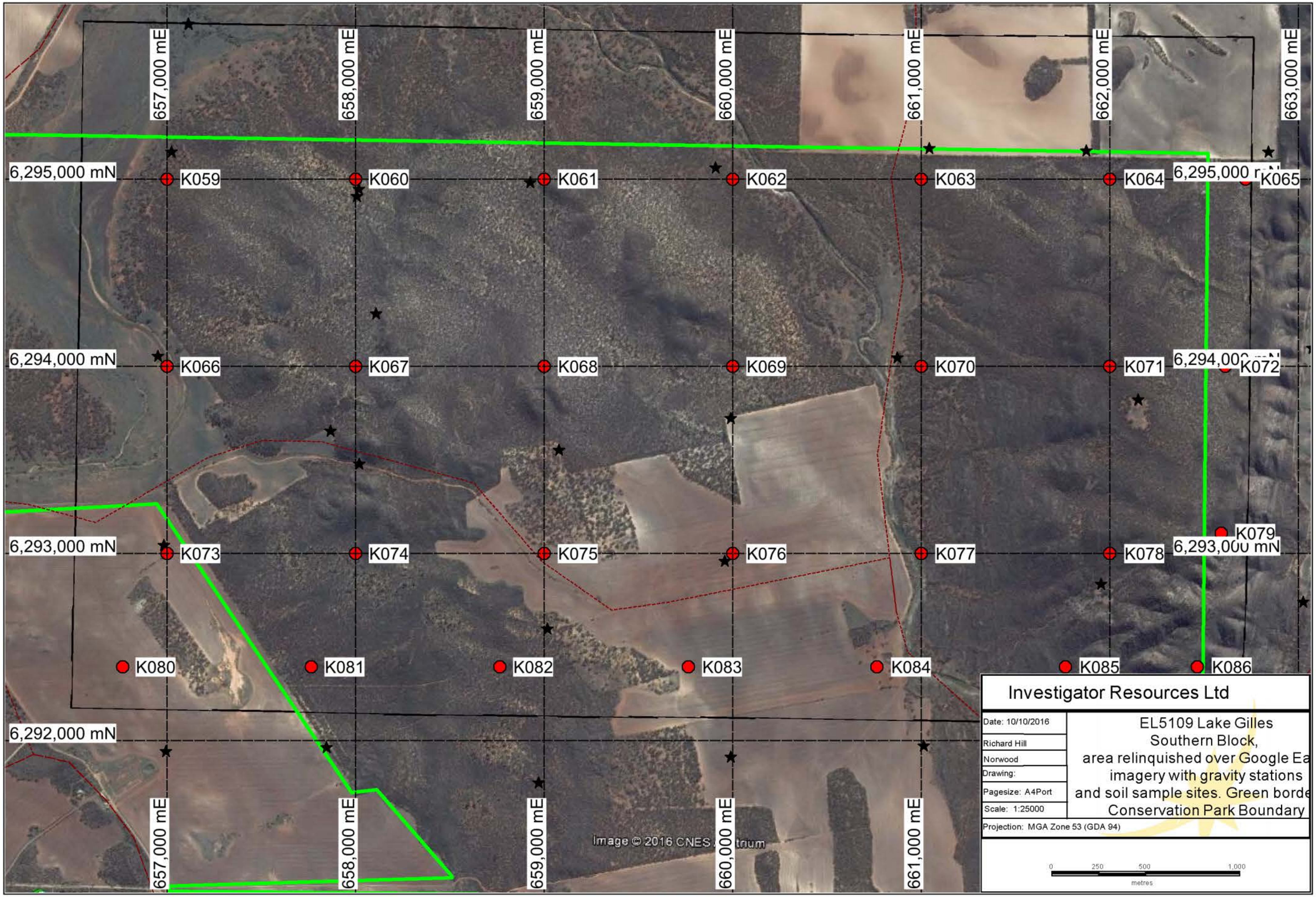
A total of 28 soil samples were collected within the relinquished area (red spots on the figure below). All assay data is included in the digital data files associated with this report. The results of this sampling program over this area are considered to be not significant.

7.2 Gravity survey

A gravity survey was conducted over the area of this report, with a grand total of 30 new stations and three repeats being read within the relinquished area (black stars on the figure below). All gravity survey data is included in the digital data files associated with this report.

8 Environmental compliance

The exploration activities conducted within the relinquished area are considered to be of very low environmental impact. Exploration in this area has had minimal short-term and virtually no long-term impact. There have been no exploration activities in this relinquished area since 2009.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Investigator Resources Ltd
Date: 10/10/2016
Richard Hill
Norwood
Drawing:
Pagesize: A4Port
Scale: 1:25000
EL5109 Lake Gilles
Southern Block,
area relinquished over Google Ea
imagery with gravity stations
and soil sample sites. Green borde
Conservation Park Boundary
Projection: MGA Zone 53 (GDA 94)
0
250
500
1,000
metres

9 File Verification Listing

Exploration Work Type	File Name	Format
AIRBORNE EXPLORATION SURVEYS		
Aeromagnetics		
Radiometrics		
Electromagnetics		
Gravity		
Digital terrain modelling		
Other (specify)		
GROUND EXPLORATION SURVEYS		
GEOLOGICAL MAPPING		
Regional		
Reconnaissance		
Prospect		
Underground		
Costean		
GROUND GEOPHYSICS		
Radiometrics		
Magnetics		
Gravity	EL5109 2016 R 03 Gravity Data	txt
Digital terrain modelling		
Electromagnetics		
SP/AP/EP		
IP		
AMT		
Resistivity		
Complex resistivity		
Seismic reflection		
Seismic refraction		
Well logging		
Geophysical interpretation		
Other (specify)		
GEOCHEMICAL SURVEYING		
Drill sample		
Stream sediment		
Soil	EL5109 2016 R 02 Soil Assays	txt

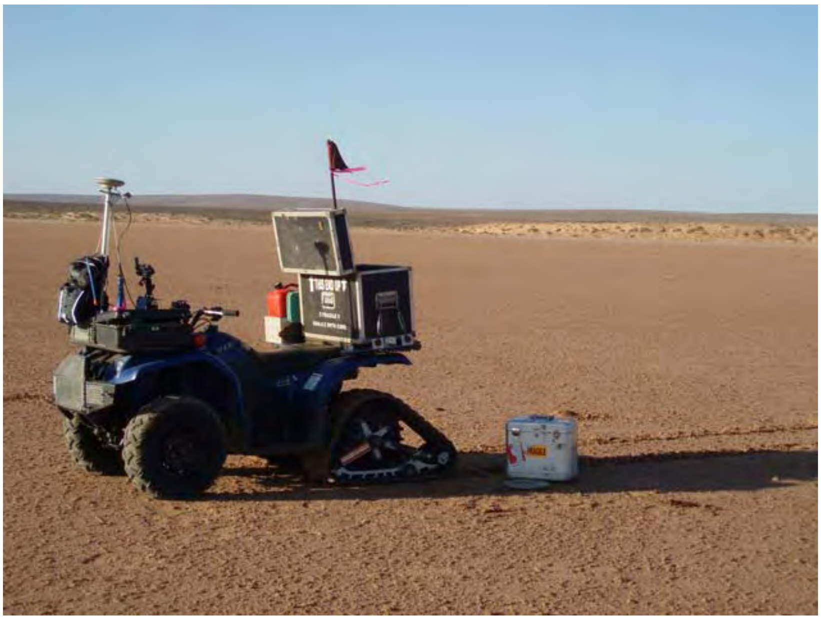
Exploration Work Type	File Name	Format
Rock chip		
Laterite		
Water		
Biogeochemistry		
Isotope		
Whole Rock		
Mineral analysis		
Other (specify)		
DRILLING		
Diamond		
Reverse Circulation		
Rotary air blast		
Air-core		
Auger		
Groundwater Drilling		
All Drilling		
OFFICE STUDIES		
Literature search		
Database compilation		
Computer modelling		
Reprocessing of data		
General Research		
Report Preparation	EL5109 2016 R 01 Report	pdf
Other (specify)		
REMOTE SENSING		
Aerial photography		
LANDSAT		
SPOT		
MSS		
Radar		
Other (specify)		

GAWLER GRAVITY SURVEYS

September – October 2006

Report Number 06025

LR Mathews



CLIENT

SOUTHERN GOLD

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1. INTRODUCTION

Precision GPS-Gravity surveys were carried out between 2nd September and 16th October 2006 for Southern Gold. A total of 2609 stations were surveyed over 3 separate areas in the Gawler Craton region of South Australia.

Gravity data were acquired using Scintrex CG5 and CG3 digital gravity meters. Position and level data were obtained using Leica System 1200 GPS units, and Ashtech Z12 GPS units to produce precise post processed GPS locations. Data were acquired using a variety of surveying methods, Daishsat quad-bike methods, Daishsat vehicle-borne methods, and Daishsat helicopter-borne methods.

Gravity data was reduced using standard reductions on the ISOGAL84 gravity network. GPS data were reduced to MGA coordinates with levels expressed as metres above the Australian Height Datum.

2. SURVEY OVERVIEW

The survey was conducted over 3 separate sections, each section containing a number of smaller areas, (see figure 1). The majority of the survey areas were completed by helicopter. Some smaller areas were completed by vehicle and quad-bike.

The first section to be completed was located near Streaky Bay. There were two separate tenements, the first – Streaky Bay – was situated south of the township and consisted of an 800m x 800m grid, including three detailed traverses. The second tenement – Corvisart Bay – was situated to the south east of the town and consisted of five north-south traverses. The station spacing on the traverses was 200m, and the traverses were spaced 400m apart. A Landcruiser utility was used for the majority of the Streaky Bay survey, however a quad-bike was utilised where vehicle access was restrictive.

The second section to be completed was the central section called East Eyre. This section consisted of seven separate tenements – Moseley Nobs, Gilles North, Gilles Central, Gilles South, Gilles East, Moonabie Central and Moonabie South – all located around the township of Kimba. These areas consisted of 1km x 1km spaced grids, with a small area of infill on the Gilles North tenement with a grid spacing of 500m. A Robinson R44 helicopter was used for the main East Eyre survey with infill being completed on foot.

The third section was located around the southern end of Lake Torrens. This section consisted of two areas, the first tenement – Harris Crossing – located on the south-eastern edge of the lake, and the second tenement – Lake Torrens – on the south-western edge of the lake. These two areas were made up of 1km spaced grids, with a small section of larger line spacing. A Robinson R44 helicopter was used for the whole Lake Torrens survey.

The survey specifications for each survey can be found in Appendix E.

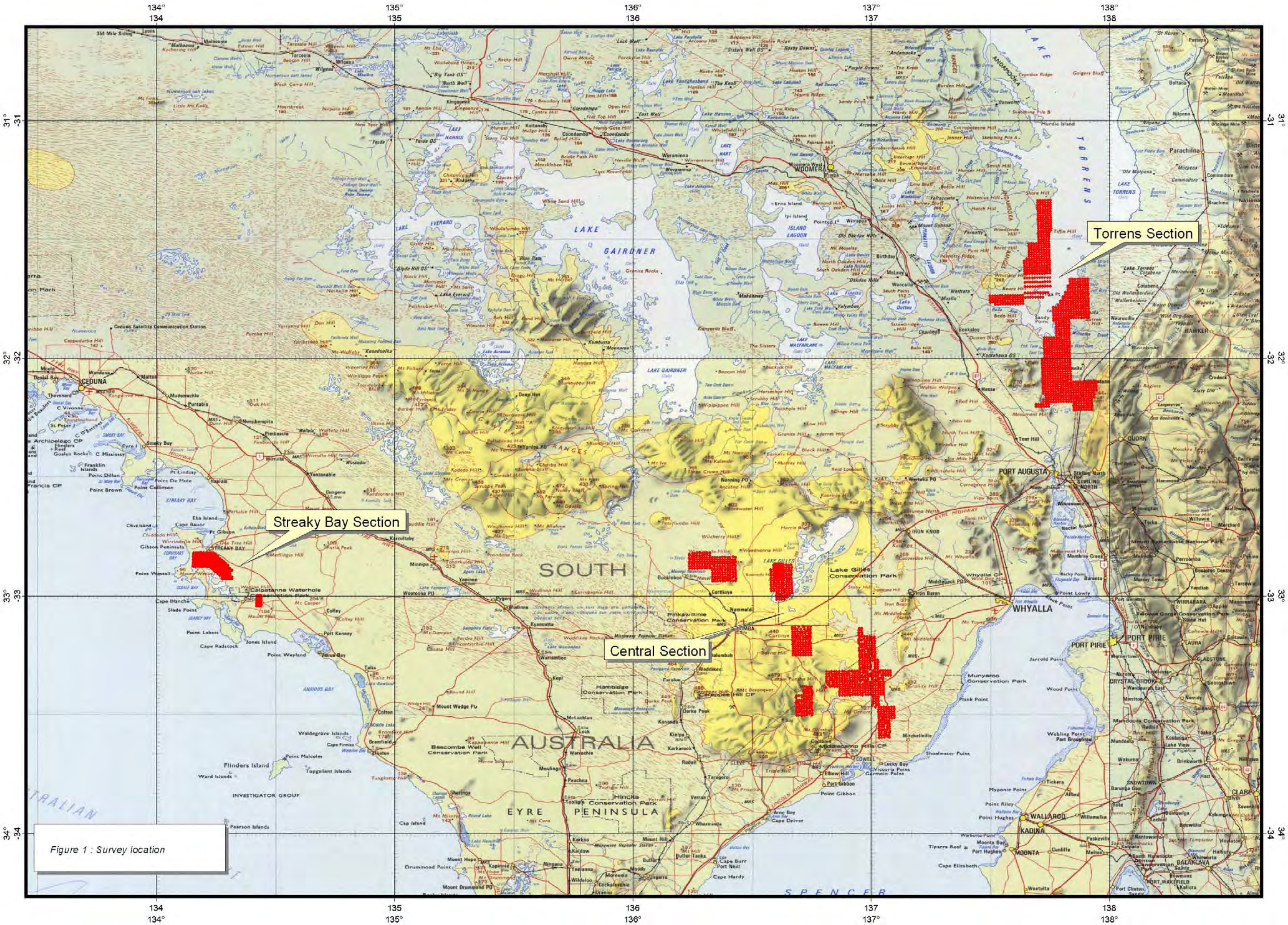

Figure 1 : Survey location

3. PERSONNEL AND EQUIPMENT

3.1 Personnel

The supervisor in charge of the ground section of the project was Mr. Leon McGarry. Leon was responsible for daily management of the job and for nightly data processing to ensure quality and integrity. Gravity and GPS measurements were carried out by:

Leon McGarry, Surveyor
Chris Allen, Surveyor
Peter Edwards, Surveyor

Three helicopter pilots were used for the helicopter surveying:

Rick Keece – Chief pilot
Scott Bowers
Nathan Ward

Final data reduction and inspection were performed by the company geophysicist, Leon Mathews.

3.2 Survey equipment

One Scintrex CG-3 digital gravity meter:
SN 9610346 C

One Scintrex CG-5 digital gravity meter:
SN 970409383 D

One Leica System 500 dual frequency GPS receivers
One Leica System 1200 dual frequency GPS receivers
Two Ashtech Z12 dual frequency GPS receivers
Garmin Handheld GPS receivers for navigation
Four Compaq notebooks for data processing and backup
Various chargers, solar cells and batteries.

3.3 Vehicles

Due to the type of terrain to be encountered, a 4wd Landcruiser vehicle was used for the duration of the Streaky Bay job. To maintain the high Daishsat safety record, vehicles were fitted with a range of safety equipment including:

One 20l jerry can of water
Dual fuel tanks
Two spare tyres
HF radio and Satellite Phone
Self-recovery equipment including a hand winch, snatch straps and rope
Tyre pliers to effect tyre repairs in the field
Tools and spares to enable field repairs as necessary
Survival kit with EPIRB emergency locator beacon

Quad-bike surveying utilized a current model 4WD Yamaha bike. The bike was equipped with:

10L jerry can of spare fuel
UHF communications
Personal First Aid Kit
Self-recovery equipment including a hand winch, snatch straps and rope
Tyre repair kit
Tools and spares to enable field repairs as necessary

Photo 1: Quad bike used for gravity surveying

3.4 Helicopter

Ferry between the gravity stations was necessitated by a Robinson R44 helicopter – call sign VH-HEM (Photo 2)

Photo 2: – Daishsat Robinson R44 Helicopter VH-HEM

3.5 Camp

For the Streaky Bay area of the survey the field crews stayed in motel type accommodation in Streaky Bay.
For the East Eyre area of the survey (including the infill) the field crews stayed in motel type accommodation in Kimba.
For the Lake Torrens area of the survey the field crews stayed in shearers quarters at Wilkatana Station.
These camps were proximal to the survey areas.

3.6 Communications

All survey crews and support vehicles were equipped with hand-held Globalstar satellite phones as well as UHF and VHF transceivers. "Omnitrack" satellite based tracking was used on all vehicles (including helicopters) to enable asset monitoring via a web interface.

Scheduled communications were made by all crews to the communications centre at the base camps at prescribed intervals. Communication with the Perth and Murray Bridge offices was ongoing for the duration of the job.

4. GPS SURVEYING AND PROCESSING

4.1 Set out of the grid

This was done concurrently with the gravity data acquisition using navigation grade receivers operating in autonomous mode. Where possible, the readings were taken as close to the ideal coordinates as possible. Some stations were offset or omitted due to the nature of the terrain, e.g. hilly or thickly vegetated areas. As the receivers were operating in autonomous mode, set out accuracy was usually better than 10m.

For the airborne section, raw kinematic GPS data were logged by a dual-frequency Ashtech Z-12 receiver inside the helicopter cabin, with the GPS antenna mounted on the rear tail shaft boom. Static GPS data were logged at each of the base stations using Ashtech Z-12 and Leica System 500 receivers for later post-processing.

At the repeat stations, a fence dropper marked with the station number was used for identification. At each station, the station number, position and RL were recorded digitally by the crew.

For the ground section gravity readings were taken as close to the square grid coordinates as possible. Some stations were offset or omitted due to the nature of the terrain, e.g. hilly or thickly vegetated areas.

Repeat gravity stations were marked with a length of flagging, washer, and/or pin flag. Upon each reoccupation of the repeats, the quad-bike was ridden alongside the marker, on the existing tracks, to achieve the same vertical level each time.

4.2 Survey datum and control

The gravity surveying, and hence any gravity reductions, used the Australian Height Datum (AHD) as the reference datum.

A number of base stations were used for control over the 8 areas. For the Waddikee and Punt Hill areas pre-existing control stations were used, for the remaining areas new base stations were established. Any new base stations were established using two days worth of static data, and connections to ITRF stations using AUSLIG's online GPS processing system, AUSPOS. For more information on this system, please visit http://www.ga.gov.au/geodesy/sgc/wwwgps/ Final deviations of better than 5mm were obtained for x, y and z, for all occupations. Appendix D contains the GPS base station information.

4.3 Surveying and processing of position and level data

Post processed methods were used to gain centimetre level positions for each gravity station. The raw GPS data were recorded on to 32 Mb CF cards in the GPS receivers and the data copied onto PC at the end of the day. Data were then processed using Waypoint GrafNav V7.00.

Waypoint combines the processing components, GrafNav and GrafNet, in a complete package.

GrafNav processes data for one baseline (e.g. one base and one remote). GrafNav is normally used for kinematic data which it is extremely well suited for. It can also process single static baselines. Receiver types can be mixed and matched via the use of a common format. This component of Waypoint was used for processing the kinematic data acquired each day.

GrafNav and GrafNet share the same processing engine that has been under continuous development since its original inception by Waypoint in 1992. The core of this robust engine is its carrier phase kinematic (CPK) Kalman filter. Some of the major advantages of Waypoint's kernel are:
Fast processing - The GrafNav kernel is one of the fastest on the market. It will process ~0.8 epochs per MHz per second on a Pentium II.
Robust Kalman filter - From experience with processing GPS data from fast jets and NASA sounding rockets, the processing kernel has become extremely robust. Efforts have been made to account for all of the various data error possibilities given the different types of GPS receivers that GrafNav/GrafNet can handle.
Reliable OTF - Waypoint's on-the-fly (OTF) algorithm, called Kinematic Ambiguity Resolution (KAR), has had years of development and stresses reliability. Variations are implemented for both single and dual frequencies, and numerous options are available to control this powerful feature
Accurate Static Processing - Three modes of static processing are implemented in the processing kernel. Fixed static is the most accurate. A quick static solution is also available as an alternative, while the float and iono-free float solution is useful for long baselines.
Dual Frequency - Full dual frequency support comes with GrafNav/GrafNet. For ambiguity resolution, this entails wide/narrow lane solutions for KAR, fixed static and quick static. Ionospheric processing is very important with the peak of the ionosphere's cycle occurring in 2000. The GrafNav kernel implements two ionospheric processing modes including the iono-free and relative models. The relative model is especially useful for airborne applications where initialization is near the base station, and this method is much less susceptible to L2 phase cycle slips.
Forward and Reverse - Processing can be performed in both the forward and reverse directions. Both GrafNav and GrafNet also have the ability to combine these two solutions to obtain a globally optimum one.
Velocity Determination - Since the GrafNav kernel includes the L1 Doppler measurement in its Kalman filter, velocity determination is very accurate. In addition to this, a considerable about of code has been added specifically for the detection and removal of Doppler errors.
Long Baseline - Because precise ephemeris and dual frequency processing is supported, long baselines accuracies can be as good as 0.1 PPM.

For more information about Waypoint processing software, and in particular, Grafnav, please visit the Waypoint http://www.waypnt.com/grafnav_d.html.

Simple transformations to MGA and AHD were done using the GPS derived WGS84 positions output from Waypoint Grafnav or from the Leica RTK dump.

MGA coordinates were obtained by simply projecting the GPS-derived GDA94 coordinates using a UTM projection with zone 53S. For all practicable purposes, the WGS84 geodetic coordinates are equivalent to GDA94 geodetic coordinates, so no transformation is necessary. For more information about WGS84, GDA94 and MGA coordinates, please visit http://www.ga.gov.au/geodesy/datums/gda.jsp.

AHD heights were calculated in real-time on the fly using Leica algorithms and the latest geoid model for Australia, AUSGEOID98. Information about the geoid, and the modeling process used to extract separations (N values) can be found at http://www.ga.gov.au/geodesy/ausgeoid/. To obtain AHD heights, the modeled N value is subtracted from the GPS derived WGS84 ellipsoidal height (Figure 2).

$$H_{AHD}=h_{WGS84}-N$$

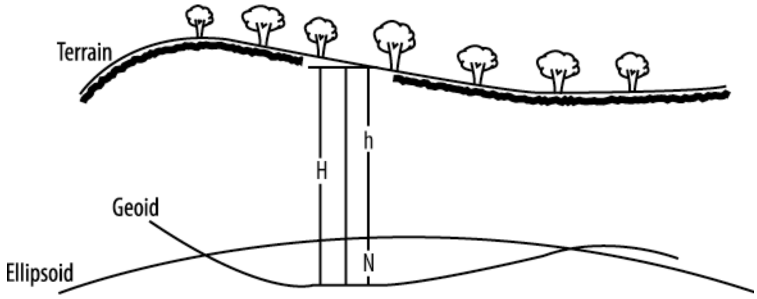

Figure 2: Geoid-Ellipsoid separation

5. GRAVITY ACQUISITION AND PROCESSING

5.1 Gravity data acquisition

Gravity observations were made simultaneously with the GPS observation (Photo 3). Two observations were made for each station so that any seismic or instrumental noise could be immediately detected. Each observation consisted of a 20-second or greater stacking time. The accepted tolerance between readings was limited to 0.03 milliGals to ensure accuracy. Vertical and horizontal levels were restricted to 5 arc seconds at all times. At each station, the station number, time and two gravity readings (in dial units) were recorded in Daishsat carbon-copy gravity field books. The Scintrex CG3 and CG5 also automatically record the station, time and readings digitally to allow for downloading to computer.

Photo 3: GPS-Gravity Acquisition Crew

5.2 Gravity base stations

Base stations proximal to each survey area allowed for calculation of absolute gravity and instrument drift. Details of the gravity bases are contained in Appendix C. A base station reading was taken in the morning before observing, and in the evening, after the last field observation. Readings were also taken at lunch time, depending on base proximity. When taking a base station reading, the gravity values were stacked over 60 seconds to ensure accuracy. Two observations of 60 seconds were taken at each base reading. Observations were repeated until the readings repeated to 0.020 of a dial reading or less.

For the Streaky Bay survey area a new base 0259 was established in the survey area. The observed gravity at this base was calculated from multiple A-B-A loops using the Fundamental Gravity Base 1994932131 located at the Streaky Bay Memorial Pavilion.

For the East Eyre survey area an existing base 0009 located behind the Kimba Service Station was used. The observed gravity for was calculated during the 2005 PIRSA survey and was lodged with the AGSO gravity network - a station number of 6131/1632 was allocated.

For the Torrens survey area a new base 0272 was established at Wilkatana Station. The observed gravity at this base was calculated from multiple A-B-A loops using the Fundamental Gravity Base 1994931127 located at the Port Augusta Public Library.

For the Gilles North infill survey a new base 0270 was established within the survey area. The observed gravity at this base was calculated from multiple A-B-A loops using base 0009 located behind the Kimba Service Station.

5.3 Gravity data processing

Raw gravity data were processed on a daily basis to check for quality and integrity. This interim process produced a set of Bouguer Gravity values which were contoured and imaged to provide a check for any anomalous readings that would need repeating. Geosoft GRAVRED software was used for the gravity reduction in the field. Upon conclusion of the job, the data were reprocessed using the BMR formulae as per PIRSA specifications. Note, the formulae below produce values in milliGals. A division factor of 10 is used to obtain millGals units from gravity units (gu).

Instrument scale factor: This correction was used to correct a gravity reading (in dial units) to a relative milliGal value based on the meter calibration.

Tidal correction: This correction was used to correct for background variations due to changes in the relative position of the moon and sun. The Scintrex calculated ETC was removed and a new ETC calculated using Geosoft Formulae and the surveyed GPS latitude. The formula is too complex to list here.

Instrument Drift: Since gravity meters are mechanical, they are prone to drift (extension of the spring with heat, obeying Hooke's law). If two base readings are taken one can assume that the drift between the two readings is linear and can therefore be calculated. The drift and tidal corrected value is referred to as the *observed gravity*.

Normal Gravity: The theoretical value of gravity was calculated using the 1967 variant of the International Gravity Formula and used to latitude correct the observed gravity.

$$g_t = 9780318 \times (1 + 0.0053024 \sin^2 \Phi - 0.0000059 \sin^2 2\Phi)$$

where Φ = GDA94 latitude

Free-Air Correction: Since gravity varies inversely with the square of distance, it is necessary to correct for changes in elevation between stations to reduce field readings to a datum surface (in this case, AHD).

$$FAC = 3.086 \times h_{AHD}$$

Bouguer Correction: This correction accounts for the attraction of material between the station and datum plane that is ignored in the free-air calculation. Values of 2.67, 2.40 and 2.20 gm/cc were used in the correction.

$$BC = 0.419 \times \rho \times h_{AHD}$$

where ρ = density (2.67, 2.40 and 2.20 gm/cc)

Free Air Anomaly: This is obtained by applying the free air correction (FAC) to the observed gravity reading.

$$FAA = G_{OBSG84} - Gn + FAC$$

Bouguer Anomaly: This is obtained when all the preceding reductions or corrections have been applied to the observed gravity reading.

$$BA267,240,220 = G_{OBSG84} - Gn + FAC - BC$$

5.4 Gravity meter calibration and scale factors

The gravity meters used have been previously calibrated over a number of calibration ranges in WA and SA. Derived scale factors from these calibrations are shown below:

SN 970409383 D	1.00185458
SN 9610346 C	1.00000000

5.5 Gravity meter drift calibration

While the survey was in progress, the meters were cycled overnight as a check on instrument drift. Changes were made to the drift constant where appropriate.

6.0 RESULTS

Raw and processed GPS and gravity data are contained on CDROM as Appendix F. Hardcopy plots of images are contained in Appendix B.

6.1 Stations Surveyed and Survey Progress

In total, 2609 new stations were acquired during the survey. A brief production summary is shown in Table 1 below. Production varied depending on terrain, tree cover and distance from the base station. The airborne crew was typically able to sustain a production rate between 140 - 200 stations/crew/day. The ground crews were typically able to sustain a production rate between 30 - 70 stations/crew/day.

Survey Summary – Streaky Bay		
Gravity stations acquired (including repeats)	383	stations
Gravity station repeats	11.0	%
New gravity stations acquired	345	stations
Total accidents	0	accidents
Total hours lost from accidents	0	hours
Survey Summary – East Eyre (Including Infill)		
Gravity stations acquired (including repeats)	1165	stations
Gravity station repeats	4.57	%
New gravity stations acquired	1114	stations
Total accidents	0	accidents
Total hours lost from accidents	0	hours
Survey Summary – Lake Torrens		
Gravity stations acquired (including repeats)	1214	stations
Gravity station repeats	5.9	%
New gravity stations acquired	1150	stations
Total accidents	0	accidents
Total hours lost from accidents	0	hours

Table 1 : Gravity Production Summary

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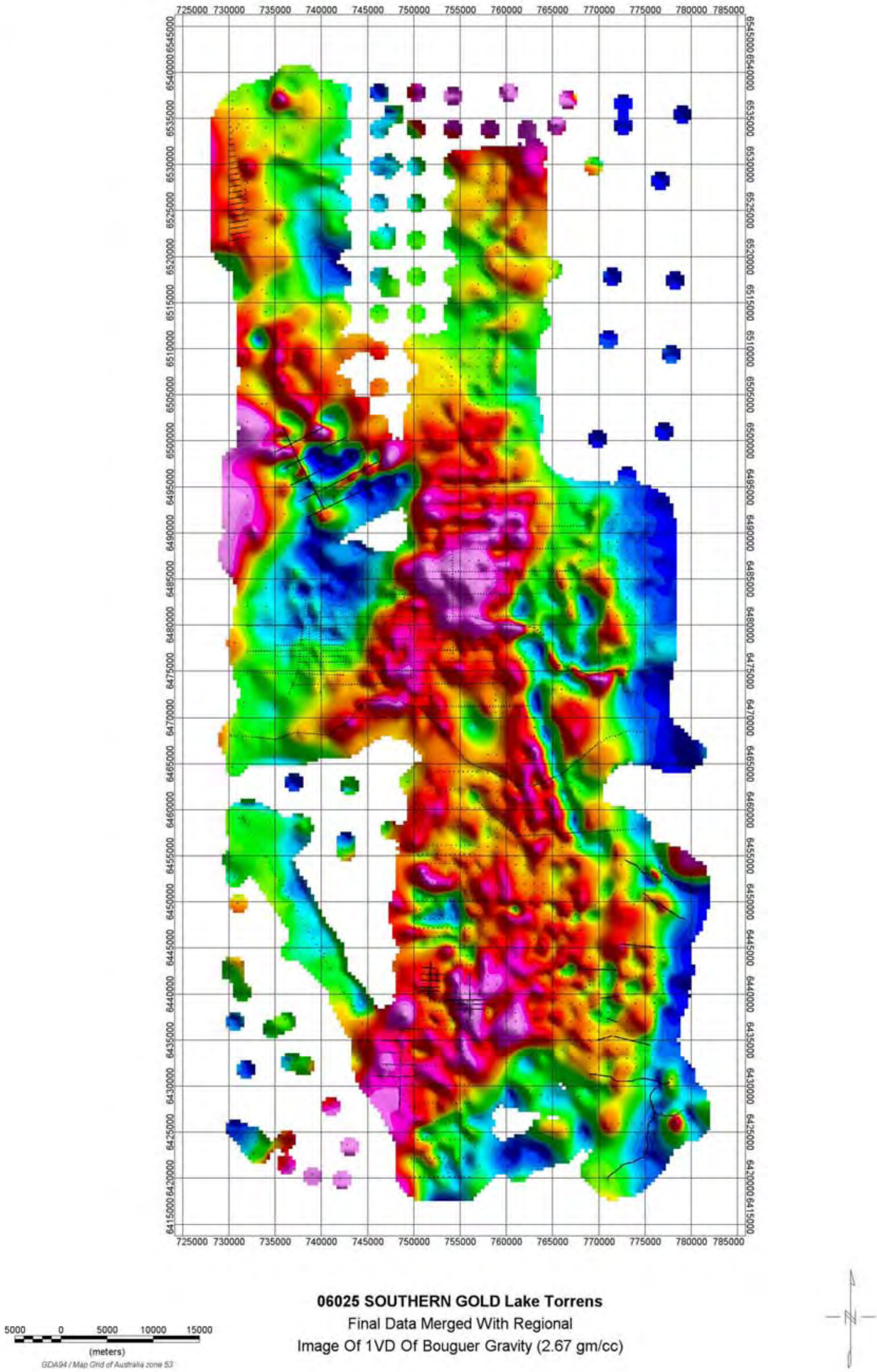
6.2 Data Repeatability

Analysis of the repeat data shows that measurement repeatability is excellent for both GPS and Gravity observations (Appendix C). An analysis for the survey is given below. Based on the repeat data, one can assume the following typical accuracies for the observables:

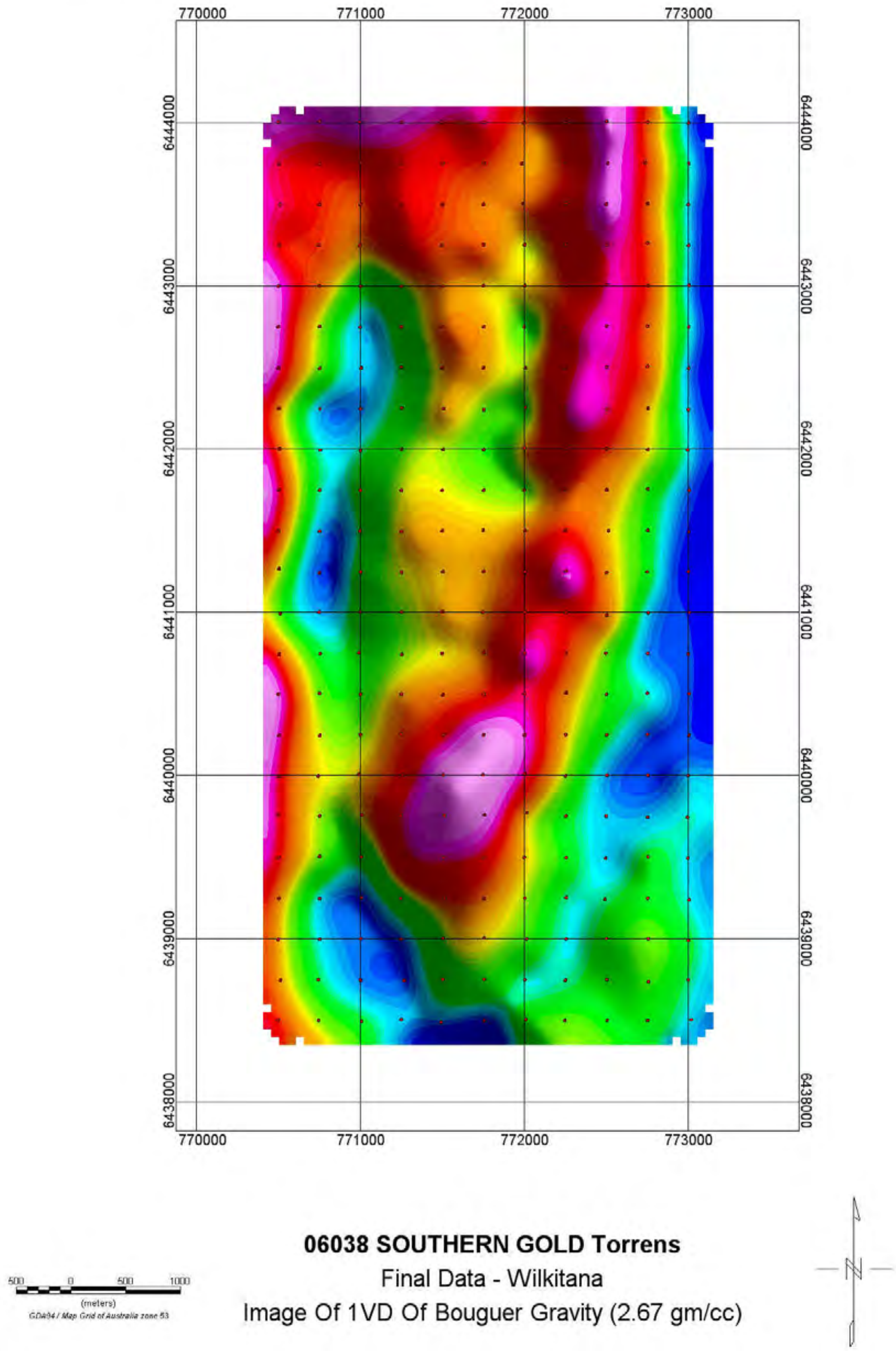
Vertical position observation : < 0.08 m
Gravity observation : < 0.05 mGals

APPENDIX A

Colour Images



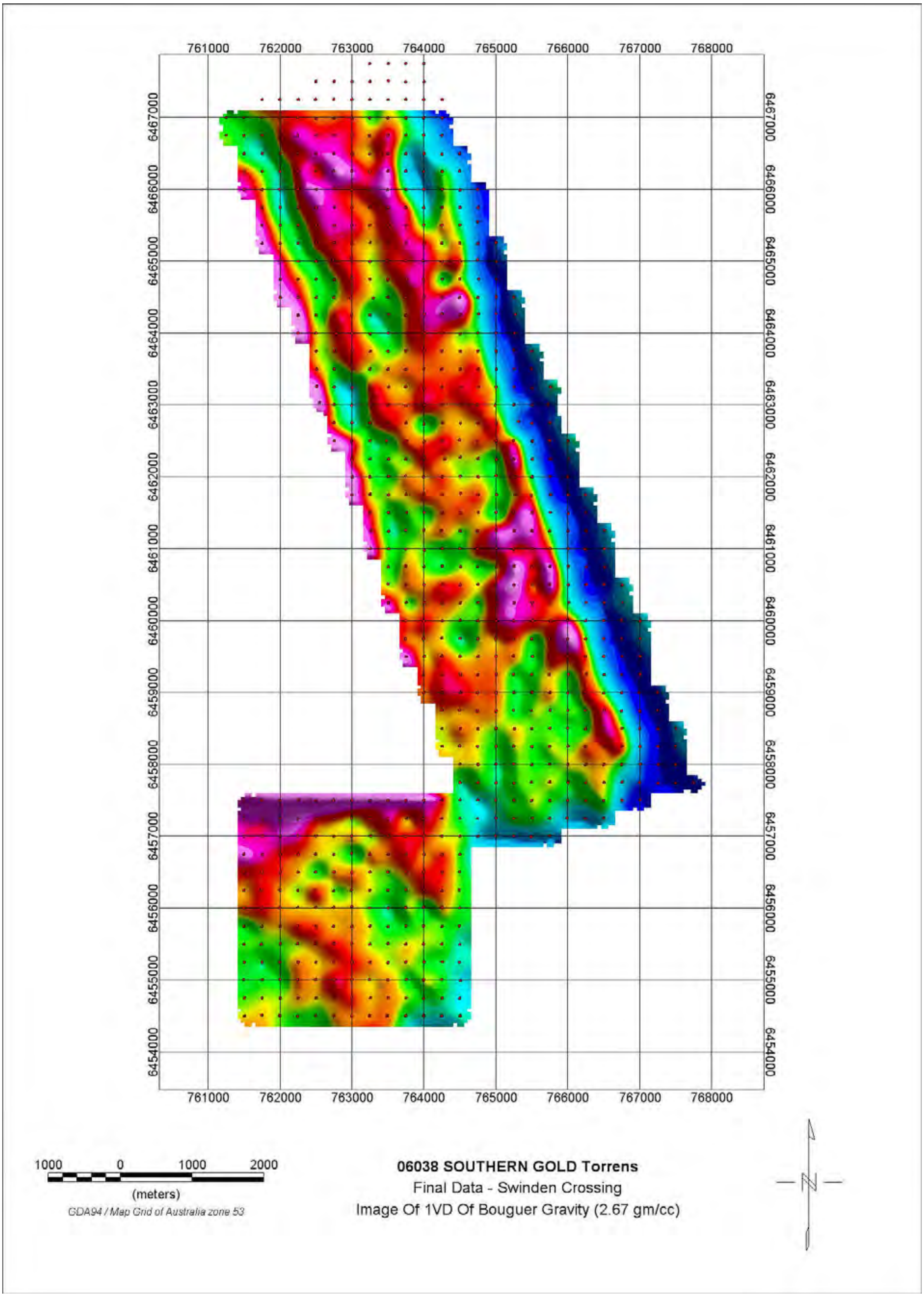
06025 SOUTHERN GOLD Lake Torrens
Final Data Merged With Regional
Image Of 1VD Of Bouguer Gravity (2.67 gm/cc)



06038 SOUTHERN GOLD Torrens

Final Data - Wilkitana

Image Of 1VD Of Bouguer Gravity (2.67 gm/cc)


761000
762000
763000
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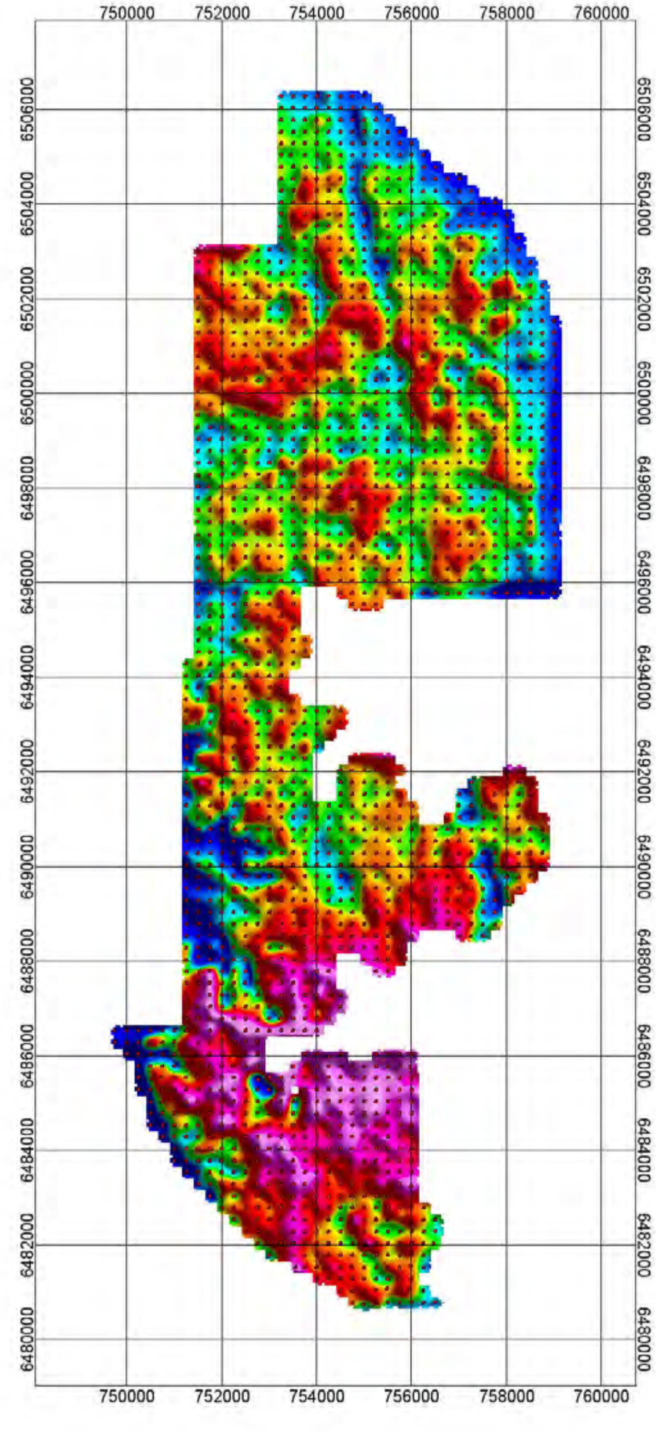
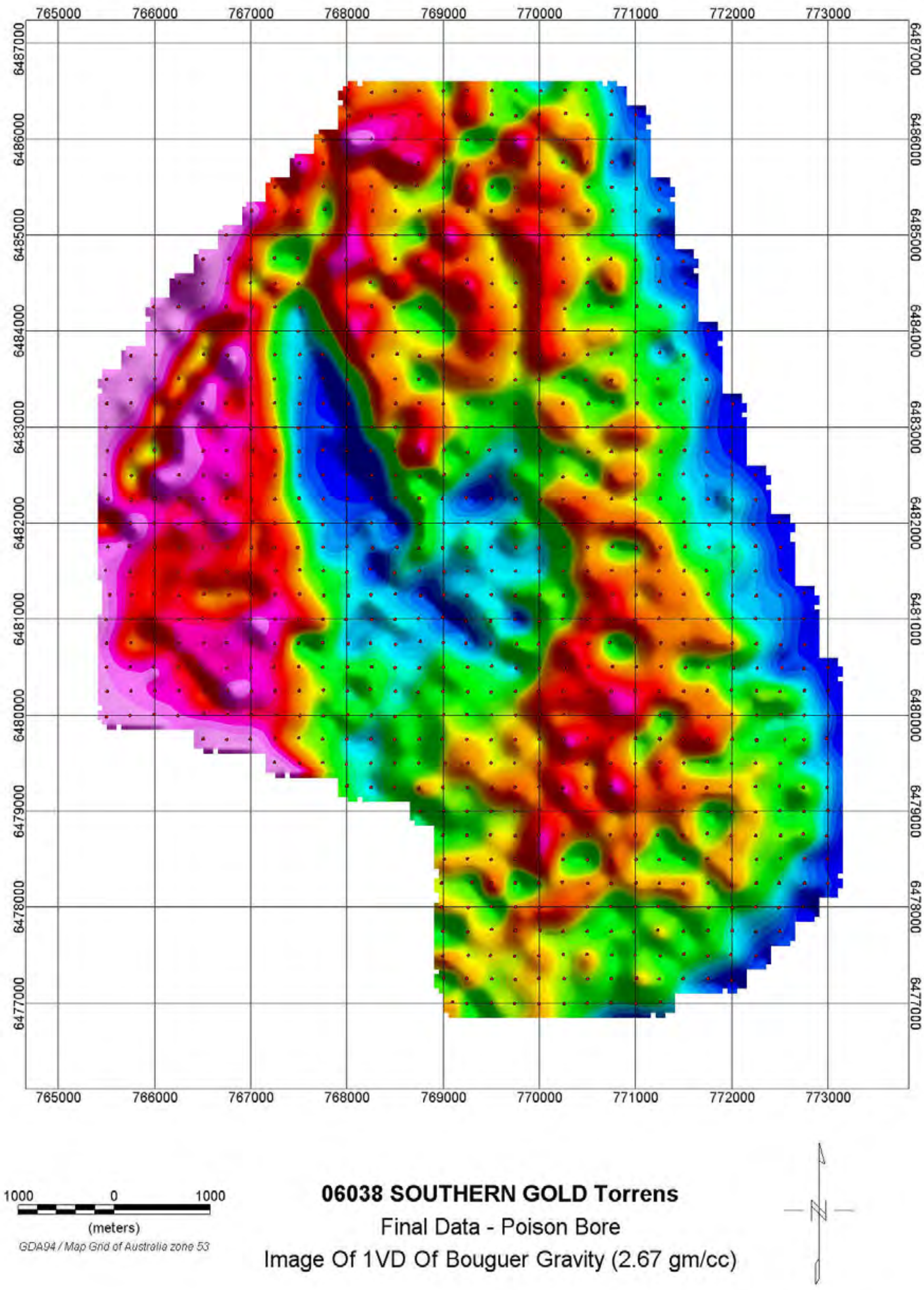
767000
768000
6467000
6466000
6465000
6464000
6463000
6462000
6461000
6460000
6459000
6458000
6457000
6456000
6455000
6454000
1000
0
1000
2000
(meters)
GDA94 / Map Grid of Australia zone 53
06038 SOUTHERN GOLD Torrens
Final Data - Swinden Crossing
Image Of 1VD Of Bouguer Gravity (2.67 gm/cc)
N



2500 0 2500
(meters)
GDA94 / Map Grid of Australia zone 53

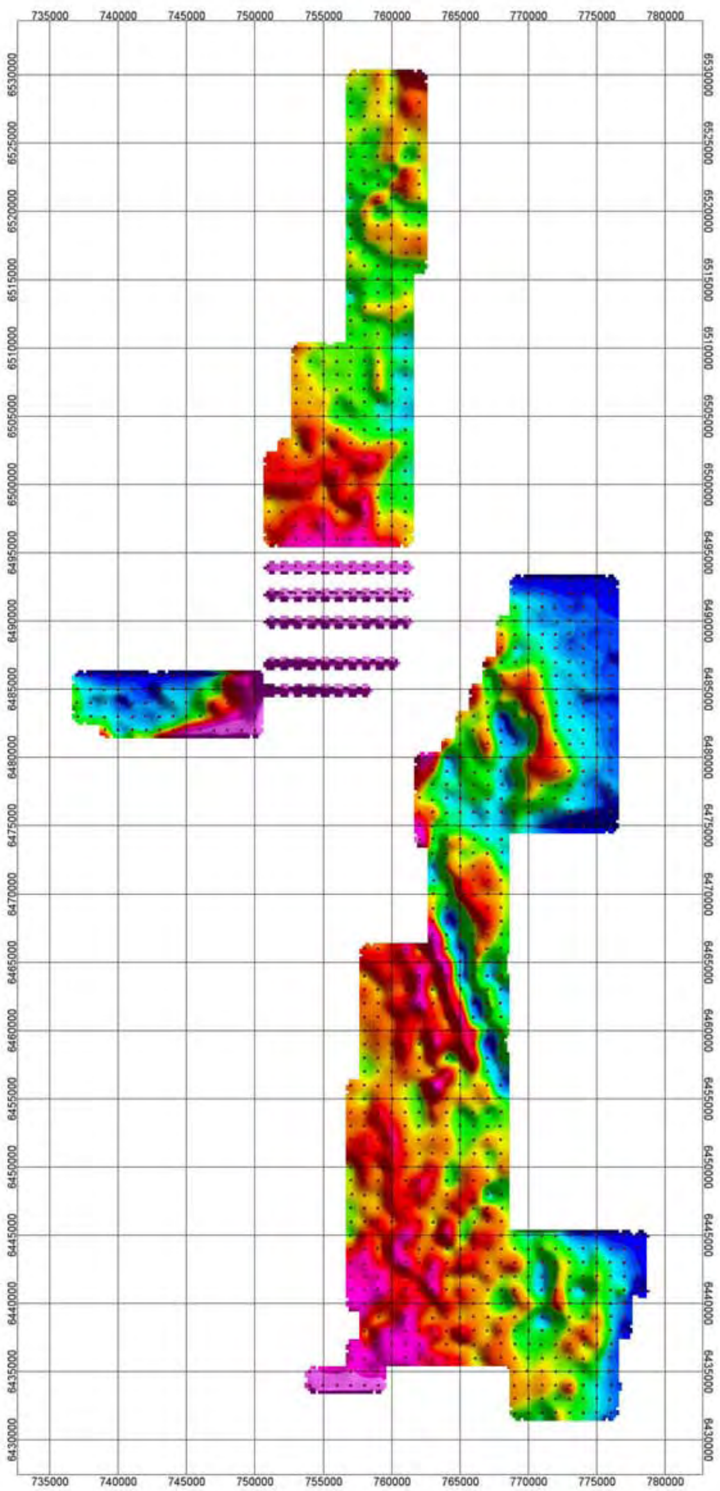
06038 SOUTHERN GOLD Torrens
Final Data - South Gap
Image Of 1VD Of Bouguer Gravity (2.67 gm/cc)



06038 SOUTHERN GOLD Torrens

Final Data - Poison Bore

Image Of 1VD Of Bouguer Gravity (2.67 gm/cc)

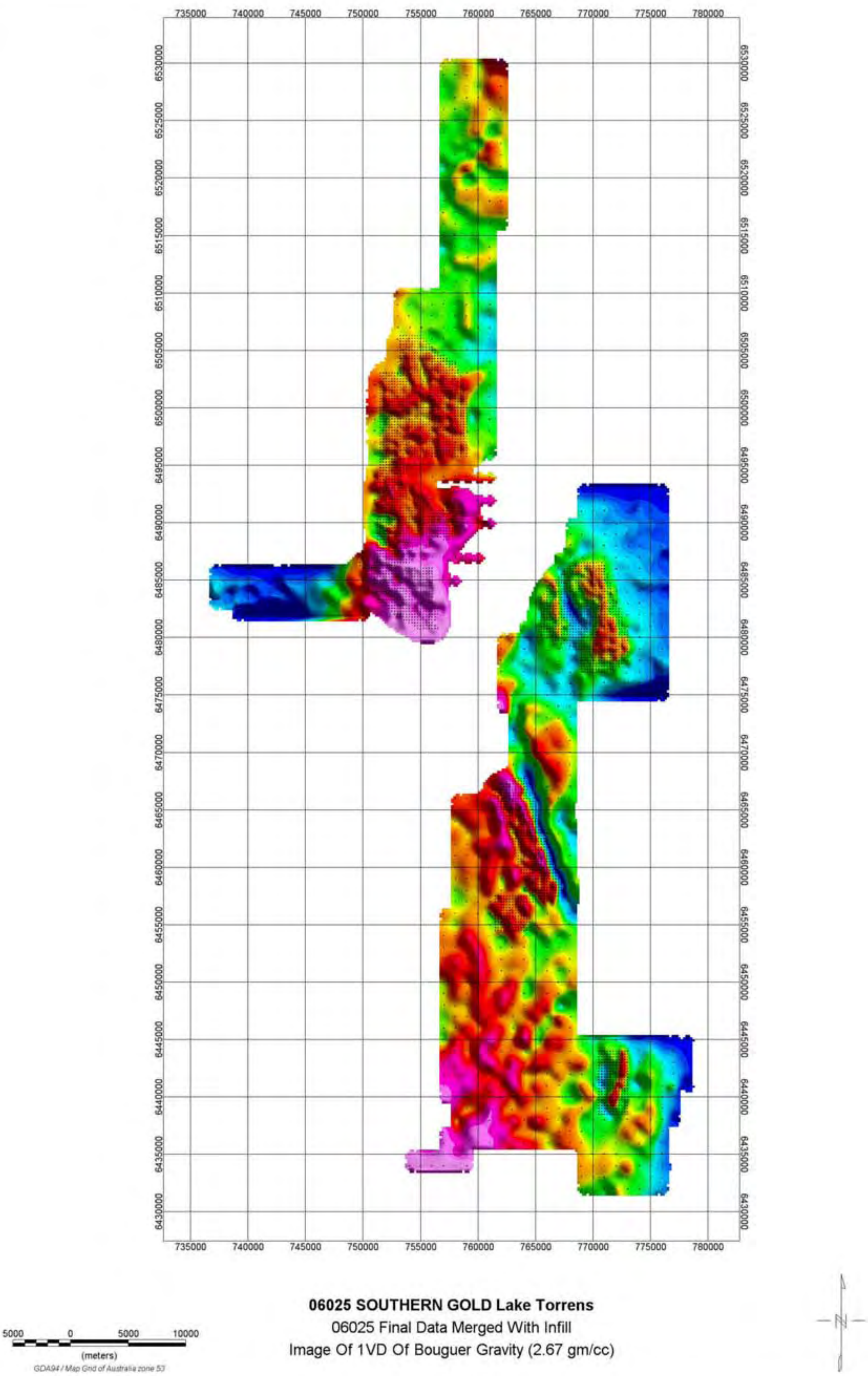


06025 SOUTHERN GOLD Lake Torrens

06025 Final Data

Image Of 1VD Of Bouguer Gravity (2.67 gm/cc)

5000 0 5000 10000
(meters)
GDA94 / Map Grid of Australia zone 53



06025 SOUTHERN GOLD Lake Torrens

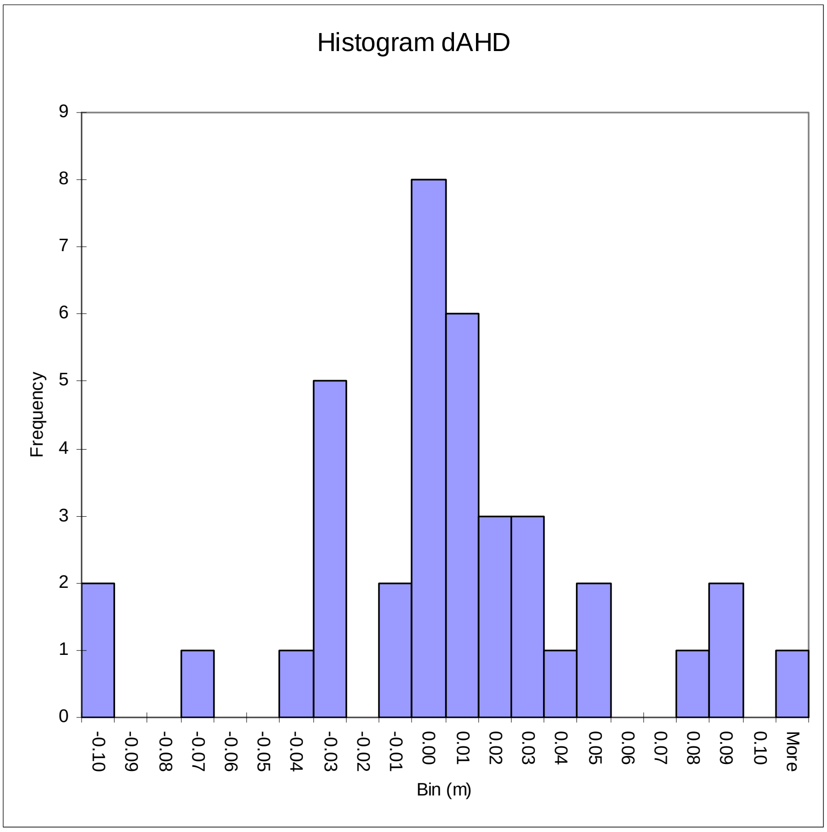
06025 Final Data Merged With Infill

Image Of 1VD Of Bouguer Gravity (2.67 gm/cc)

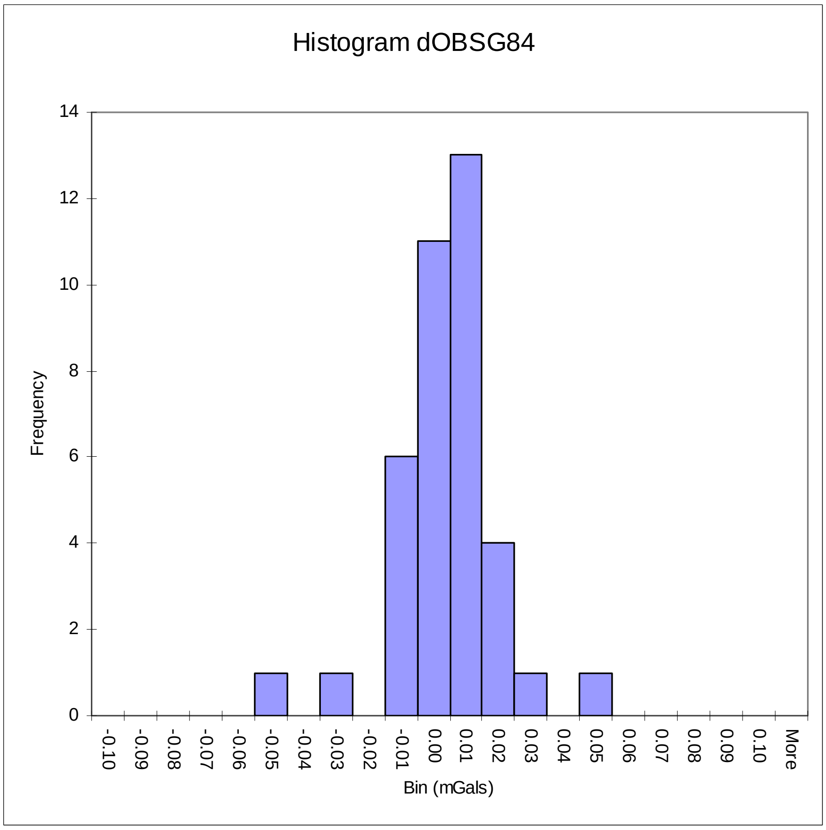
APPENDIX B

Data Repeatability

Repeatability of Height Measurement – Streaky Bay Survey



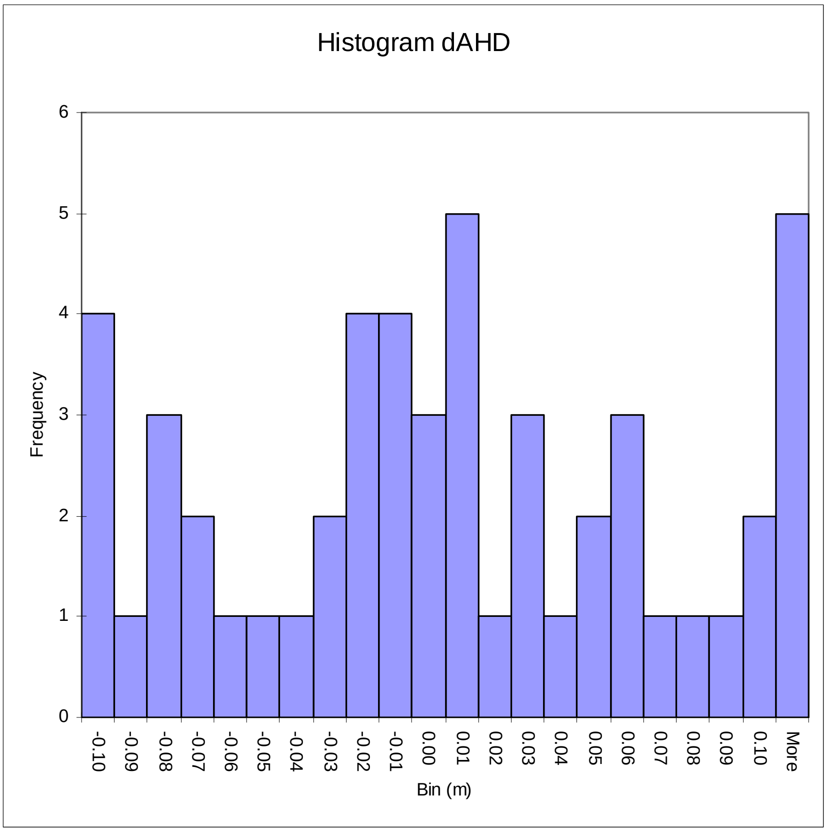
Repeatability of Observed Gravity – Streaky Bay Survey



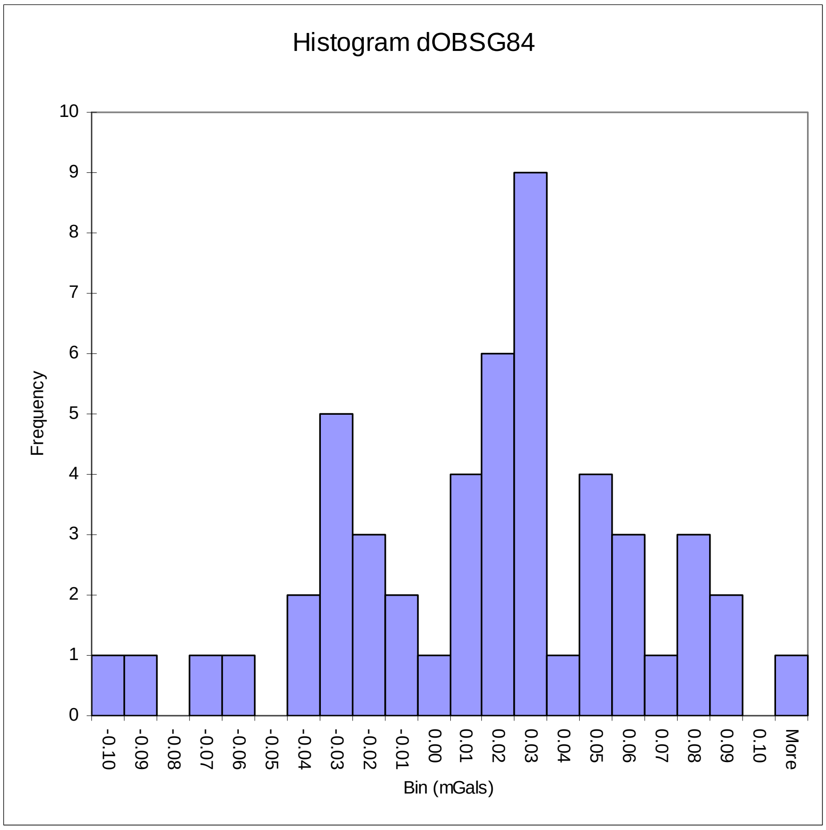
Summary Statistics Table – Streaky Bay Survey

	dAHD	*dOBSG*
Mean	0.002895	-0.00032
Standard Error	0.007788	0.002604
Median	0.0015	0.0005
Mode	0.005	0.008
Standard Deviation	0.048008	0.016049
Sample Variance	0.002305	0.000258
Kurtosis	1.82708	3.998512
Skewness	0.332702	-0.67664
Range	0.252	0.098
Minimum	-0.109	-0.056
Maximum	0.143	0.042
Sum	0.11	-0.012
Count	38	38

Repeatability of Height Measurement – East Eyre Survey (Including Infill)



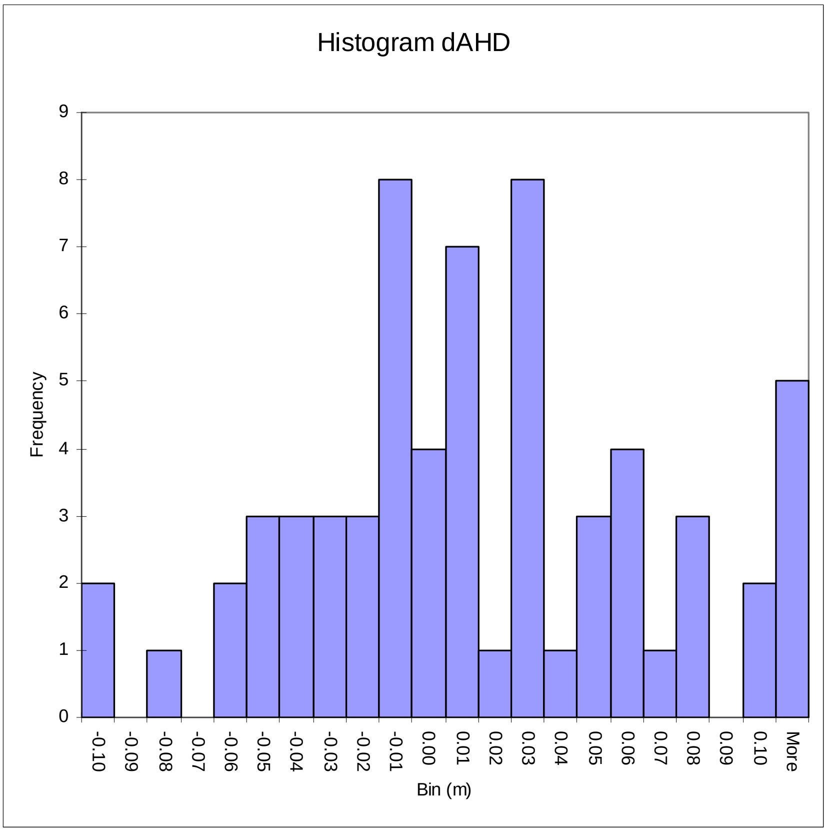
Repeatability of Observed Gravity – East Eyre (Including Infill)



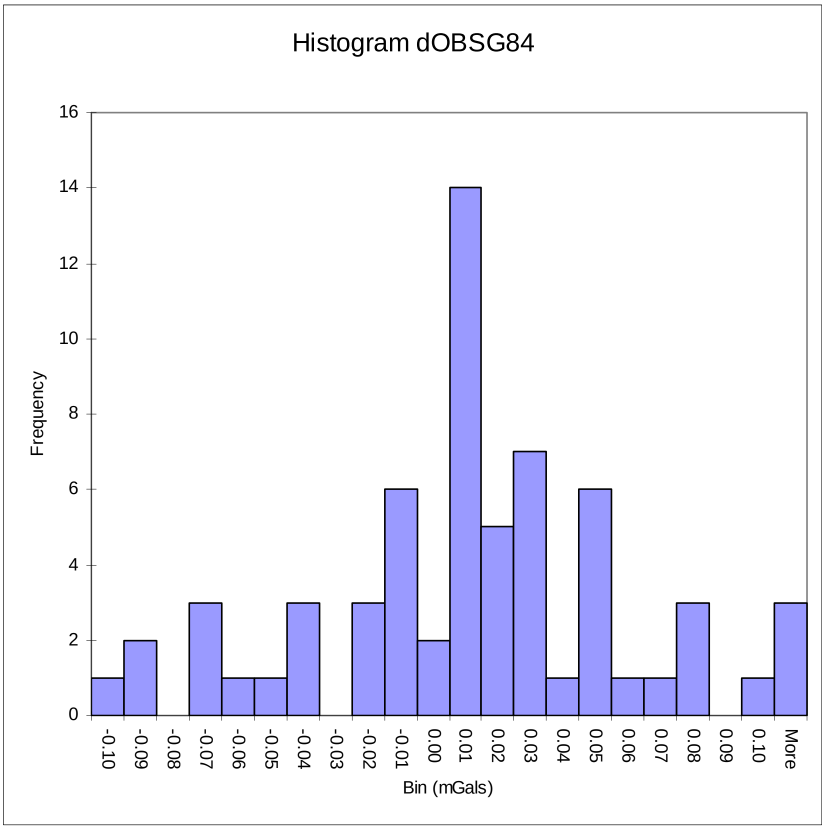
Summary Statistics Table – East Eyre Survey (Including Infill)

	dAHD	*dOBSG*
Mean	0.0038	0.0119
Standard Error	0.0105	0.0065
Median	0.0000	0.0180
Mode	0.0930	0.0080
Standard Deviation	0.0749	0.0465
Sample Variance	0.0056	0.0022
Kurtosis	0.2338	0.1893
Skewness	0.4219	-0.5136
Range	0.3470	0.2160
Minimum	-0.1460	-0.1140
Maximum	0.2010	0.1020
Sum	0.1960	0.6090
Count	51	51

Repeatability of Height Measurement – Lake Torrens Survey



Repeatability of Observed Gravity – Lake Torrens Survey



Summary Statistics Table – Lake Torrens Survey

	dAHD	*dOBSG*
Mean	0.0116	0.0069
Standard Error	0.0078	0.0069
Median	0.0040	0.0090
Mode	-0.0140	0.0090
Standard Deviation	0.0621	0.0548
Sample Variance	0.0039	0.0030
Kurtosis	1.4923	2.7443
Skewness	0.3286	-0.5714
Range	0.3420	0.3380
Minimum	-0.1500	-0.1990
Maximum	0.1920	0.1390
Sum	0.7420	0.4440
Count	64	64

APPENDIX C

Base Station Information

GPS/Gravity Base: 0259 Streaky Bay

MGA94

EASTING (m)	427493.072
NORTHING (m)	6364674.275
ZONE (UTM)	53 S
HEIGHT (AHD, m)	1.897

GDA94

LATITUDE (DMS)	-32º51'13.0416"S
LONGITUDE (DMS)	134º13'30.4068"E
GDAHT (m)	-6.556

OBSERVED GRAVITY

979553.846 (mGals)

SURVEYED BY

GPS - Daishsat using a multiple static sessions and the AUSPOS online GPS Processing system. Expected accuracy of station coordinates better than 0.005m.

Gravity – multiple ABA ties to the AFGN station 1994932131 located at the Streaky Bay Memorial Pavilion using a single meter on a single day.

MISCELLANEOUS DETAILS

The base is located approximately 200 meters Southeast of Alcannabie Well.

It can be accessed by heading southeast along the Flinders Highway from Streaky Bay. After approximately 6kms there is a turn off to the right. Follow this track south for 5kms. Arriving at Alcannabie Well turn left onto a track, heading southeast, for 200meters.

Photo of GPS/Gravity base 0259 with distinguishing features in background

GPS/Gravity Base 0009 Kimba Service Station

MGA94

EASTING (m)	631924.432
NORTHING (m)	6331742.348
ZONE (UTM)	53 South
HEIGHT (AHD, m)	268.439

GDA94

LATITUDE (DMS)	-33 08 42.1732 S
LONGITUDE (DMS)	136 24 52.1586
GDAHT (m)	268.030

OBSERVED GRAVITY

979514.374 (mGals)

SURVEYED BY

GPS - Daishsat using a multiple static sessions and the AUSPOS online GPS Processing system. Expected accuracy of station coordinates better than 0.005m.

Gravity – Base ties to the Fundamental Gravity Base 1994931508 at the KIMBA Catholic Church were completed during the PIRSA 05 work. The observed gravity for Base 009 has been lodged with the AGSO gravity network and a station number of 6131/1632 has been allocated.

MISCELLANEOUS DETAILS

The station is located in the vacant patch of land behind the Mobil service station / motel / caravan park. The Mobile service station is located on the Eyre Highway, to the west of the Kimba Township. This station consists of a survey mark set in concrete that lies just below ground level and is witnessed by a South Australian survey plaque, placed on a large star picket ~ 0.3m to the left.

Photo of GPS/Gravity base 0009 with distinguishing features in background

GPS/Gravity Base: 0272 Wilkatana Station

MGA94

EASTING	770152.780
NORTHING	6437710.846
ZONE	53
HEIGHT (AHD)	49.2325

GDA94

LATITUDE	-32 09 52.9292
LONGITUDE	137 51 53.0056
GDAHT	53.552

OBSERVED GRAVITY

979462.761 mGals

SURVEYED BY

GPS - Daishsat using a multiple static sessions and the AUSPOS online GPS Processing system. Expected accuracy of station coordinates better than 0.005m.

Gravity – multiple ABA ties to AFGN station 1994931127 located at the Port Augusta Public Library using a single meter on a single day.

MISCELLANEOUS DETAILS

The base is located about 40m to the East of the shearer's quarters, up against the fence line, about 50m to the north of the shearing yards. The shearers quarters are located approx. 3km to the NNW of Wilkatana homestead, on the other side of the access road, and the buildings are visible from the access road.

Photo of GPS/Gravity base 0272 with distinguishing features in background

GPS/Gravity Base: 0270 Gilles North

MGA94

EASTING	650677.967
NORTHING	6361498.593
ZONE	53
HEIGHT (AHD)	242.182

GDA94

LATITUDE	-31 12 23.9802
LONGITUDE	134 50 00.8427
GDAHT	83.805

OBSERVED GRAVITY

979318.174 mGals

SURVEYED BY

GPS - Daishsat using a multiple static sessions and the AUSPOS online GPS Processing system. Expected accuracy of station coordinates better than 0.005m.

Gravity – multiple ABA ties to base station 0009 located at the Kimba Service Station using two meters on a single day.

MISCELLANEOUS DETAILS

The station is located on Uno station, about 7km past Moora Dam, about 30m to the West of the T-junction at the end of the track driven in on.

Access:
From Kimba, drive past the aerodrome up to a 5-way intersection approx 8km from Kimba and take the road heading North. Follow this road to its end at a closed gate, go through this and drive for about 1km to another gate on the right with a private access sign on it and go through it.
Continue along this road until a northing of about 6365000, where there is a poorly marked turn to the right just before a fence. Follow this track for about 25 minutes until a T-intersection is reached. The base is located approximately 30m to the West of the junction, 5m from the road.

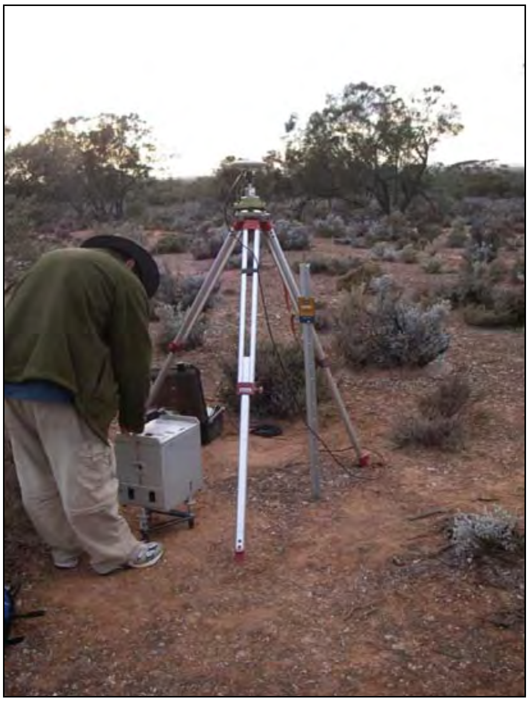


Photo of GPS/Gravity base 0270 with distinguishing features in background

APPENDIX D

Survey Specifications

Survey Name	**Streaky Bay**
Operators	LMg, PE
Techniques Employed	GPS, Gravity
Station Spacing	800 m, 200 m
Line Spacing	800 m, 400 m

Survey Name	**Kimba**
Operators	DD, SB, CA, LMg, RK, NW
Techniques Employed	GPS, Gravity
Station Spacing	1000 m
Line Spacing	1000 m

Survey Name	**Lake Torrens**
Operators	DD, SB, CA, LMg, RK, NW, PE
Techniques Employed	GPS, Gravity
Station Spacing	1000 m
Line Spacing	1000 m

Survey Name	**Kimba Infill**
Operators	CA, PE
Techniques Employed	GPS, Gravity
Station Spacing	500 m
Line Spacing	500 m