Atlas Geophysics Quotation Number Q2011021

Tasmania Gravity Surveys

TNT Mines Limited

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1.0 Company Overview

Atlas Geophysics Pty Ltd is an Australian company based in Morley, Western Australia, whose mission is to provide the highest quality geophysical resource data to the mining, petroleum and exploration industry in a safe and timely manner. Through experience, innovation and excellence, the company will exceed its client's expectations and will continually develop its technologies and methodologies to maintain its reputation for being the best in the business.

The company specialises in the acquisition, processing and interpretation of potential field datasets, with particular emphasis on gravity. The director of the company, Leon Mathews B.Sc. Hons (Geophysics), has over 12 years experience in the field of gravity and brings to the company, a young, vibrant and motivated approach to project management. Strategically, through development and research, the company aims to expand into other geophysical acquisition markets that encompass methods such electrical, electromagnetic, induced polarisation and reflection seismic. The company also has interests in developing an airborne platform capable of acquiring high quality magnetic and radiometric data so it can offer its clients a complete airborne and ground geophysical solution.

Atlas Geophysics Pty Ltd is committed to the values and principles of Occupational Health and Safety and Environment. To this end, the company aims to prevent injuries and occupational illness to its employees and minimise any adverse environmental impact its activities may have.

2.0 Scope of Project

The proposed Tasmania gravity project requires the acquisition and processing of a potential 6,400 detailed gravity stations over four separate areas. The survey areas are located in northern Tasmania, both in the east and west (see Figure 1 overleaf).

Atlas Geophysics Pty Ltd proposes to complete the gravity survey using foot borne gravity techniques with multiple survey crews.

2.1 Location, Access and Survey Configuration

	Moina	Great Pyramid	Storeys Creek - Aberfoyle	Anomaly 370
Centre of grid (GDA94)	423250mE	600000mE	561700mE	360700mE
	5406600mN	5413300mN	5389300mN	5366650mN
Access	All weather	All weather	All weather	2km walk
Terrain	Gentle to steep	Very steep	Moderate with some steep gullies	Flat to gentle
Vegetation cover	Mostly tall eucalypt with scrubby understory. Some paddocks.	Open dry sclerophyll, 30m eucalpyts	Mixed. Tall wet sclerophyll, scubby gullies, open ground	Thick scrub
Area of survey	2 sq km	2 sq km	10 sq km	2 sq km
Grid spacing	50x50	50x50	50x50 or 100x100	50x50
Total stations	800	800	4000 or 1000	800

Table 1: Overview of Survey Areas

Figure 1 : Location of 2011 Tasmania Gravity Surveys

3.0 Proposed Personnel and Subcontractors

Atlas Geophysics Pty Ltd engages only fit, motivated and safe working professionals to conduct its gravity operations. Acquisition staff members are from a range of backgrounds, usually from the geoscience or geotechnical fields, and all are trained in senior first aid, bush survival, and advanced four wheel driving. Overseeing the acquisition and processing is the company's team of geophysicists – a team with a combined total of over fifteen years experience in the acquisition, processing and quality analysis of gravity data.

3.1 Project Supervision

Supervising the project from Perth Operations would be company director Leon Mathews, B.Sc. Hons. (Geophysics). Leon has been involved in the acquisition, processing and interpretation of potential field data for over ten years and has directly overseen the acquisition and processing of over 700,000 gravity stations.

Leon will be responsible for project supervision as well as processing, quality analysis and final data delivery.

3.2 Acquisition/Other Personnel

Other Atlas personnel participating in field acquisition of the gravity data will be:

Crew 1

Jordan Olsen	*Senior Field Geophysicist / Project Leader*
Luke Sneddon	*Field Technician*

Crew 2 (Survey or Chain and Level Support)

Octavian Varga	*Field Geophysicist / Crew Leader*
Ashley Cordisco	*Field Technician*

3.3 Subcontractors

No subcontractors will be engaged on this project.

4.0 Proposed Equipment and Instrumentation

4.1 GPS/Glonass Receiver and Instrumentation

Leading-edge dual-frequency GPS technologies from Leica Geosystems such as the GPS1200 will be utilised on the project to allow for post-processed and real-time centimetre level accuracy 3D positions. Technical specifications for the system can be found in the attached brochures (Figures 2-4). Atlas Geophysics Pty Ltd is the first gravity acquisition company in Australia to utilise GNSS technology enabled receivers. The GPS1200 system is equipped with future proof GNSS technology which is capable of tracking all available GNSS signals including the currently available GLONASS. These new generation receivers, in conjunction with full GNSS tracking and processing, offer a new level of unmatched solution accuracy and reliability, especially when compared to existing conventional L1L2 GPS technologies.

The use of Glonass technology in addition to GPS provides very significant advantages:

- Increased satellite signal observations
- Markedly increased spatial distribution of visible satellites
- Reduced Horizontal and Vertical Dilution of Precision (DOP) factors
- Improved post-processed-kinematic (PPK) performance
- Decreased occupation times means faster acquisition

Four Leica GPS1200 geodetic grade receivers will be utilised to conduct the survey. Two receivers will operate as base stations and two as kinematic rovers. All receivers have recently been purchased new (post 2006) and all are covered under comprehensive maintenance agreements with Leica Geosystems.

4.2 Chain and Level Instrumentation

As thick, heavy tree canopy will be present, and steep terrain will undoubtedly degrade RTK radio performance, it will not be possible to survey accurately using GPS alone over some survey areas.

In challenging environments, GPS cannot be relied on 100% for accuracy, even if multiple shots are taken.

Atlas has had much experience in such environments, e.g. Victorian Highlands, Victoria and Bell Bay, Tasmania. In these areas, GPS ambiguity resolution is difficult, sometimes impossible. The GPS fixes are often erroneous if the proper checks and processing are not carried out correctly. It is not unusual to see errors in the order of 1-2m where RTK/PPK GPS solves wrong. These errors are obviously not acceptable for gravity surveys as heights should be accurate to better than 5cm, else they result in noisy or erroneous gravity stations which can lead to interpretation and modelling difficulties. For every 3cm change in elevation, there is a 0.01 mGal change in gravity. Anomalies attributable to mineralisation may be as small as 0.03-0.05 mGal, so it is therefore important to achieve centimetre accuracy at all times, else anomalies may be masked.

In addition to accuracy issues, surveying with GPS in thick scrub or under canopy can be very slow and tedious. It is not uncommon to have to wait up to 30mins per station to achieve a GPS fix and there is no guarantee that the fix will be correct. If a fix takes more than 5 minutes, it is usually incorrect and it is important to take multiple fixes and compare the solution; this also obviously takes time.

Because of the accuracy and production issues outlined above, Atlas proposes to supply and utilise a chain and level system (Photo 1) to complement the GPS acquisition where canopy and/or terrain is inhibitive to production and/or data accuracy. Where the survey area is open and survey accuracy can be maintained, then GPS alone will be utilised.

The system works by accurately measuring pressure differentials between gravity stations and can provide differences in elevation with an absolute accuracy of better than 2cm. Production using this system can be up to five times faster than using conventional surveying techniques where heavy canopy cover is prevalent.

Atlas Geophysics Pty Ltd is the only company in Australia to own and operate such a system.

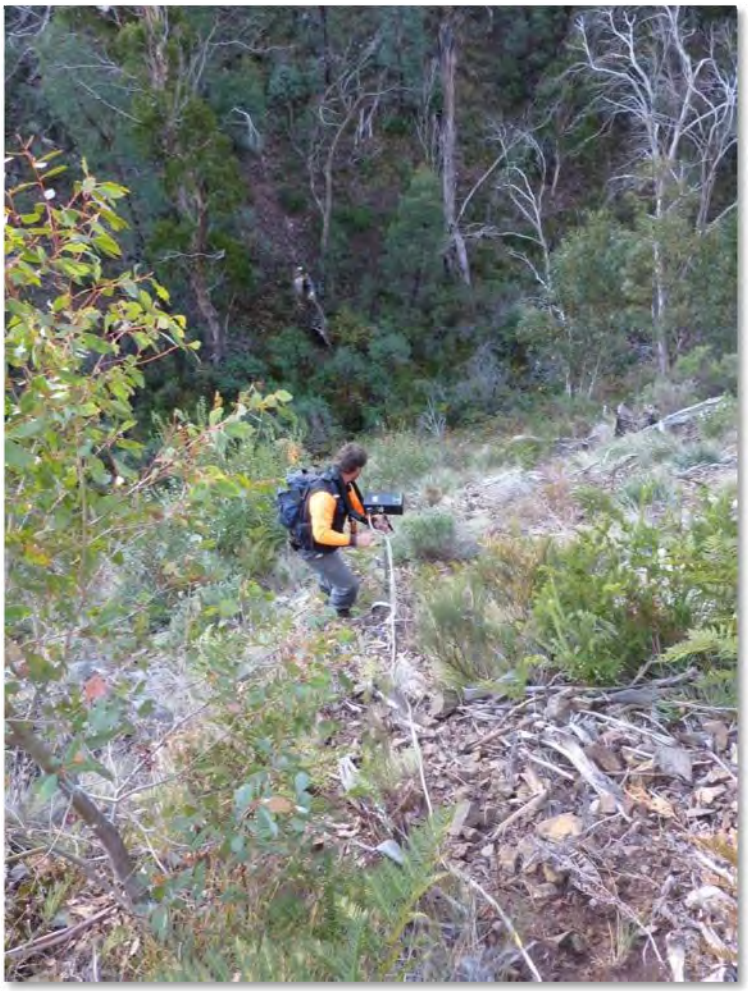


Photo 1: Chain and Level measurement in steep, vegetated country

4.3 Gravity Instrumentation

Complementing the company's positioning technologies is the latest in gravity instrumentation from Scintrex Ltd, the Scintrex CG-5 (Figure 5). The CG-5 digital automated gravity meter offers all of the features of the low noise industry standard CG-3M micro-gravity unit, but is smaller and lighter. It also offers improved noise rejection. By constantly monitoring tilt sensors electronically, the CG-5 automatically compensates for errors in gravity meter tilt. Due to a low mass and the excellent elastic properties of fused quartz, tares are virtually eliminated.

The CG-5 can be transported over very rough terrain, on ATVs, foot, vehicle or helicopter without taring or drifting. In terms of repeatability, the CG-5 outperforms all existing gravity meter technologies, with a factory quoted repeatability of better than 0.005 mGal.

One CG-5 gravity meter will be supplied to the project.

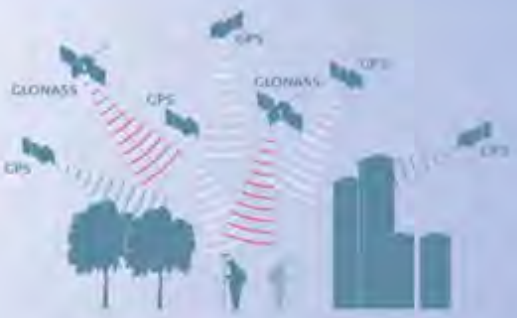
4.4 Other Equipment

The company utilises the following additional equipment to fully support GPS-Gravity operations:

- HP Laptop computers for data download and processing
- Magellan FX324 autonomous GPS receivers for navigation
- Iridium and Thuraya satellite phones for long distance communications
- Personal Protective Equipment for all personnel
- Batteries, battery chargers, solar cells, UPS System
- Survey consumables
- First aid and survival kits

Leica GPS1200

Fast, accurate, rugged and reliable



GNSS technology
GPS1200's SmartTrack+ measurement engine now utilizes two global navigation satellite systems increasing the number of tracked satellites. The new SmartTrack+ measurement engine tracks all available GNSS signals (L2C and GLONASS). More satellites means higher productivity, accuracy and reliability. SmartTrack+ acquires satellites within seconds, is ideal in urban canyons and obstructed areas where other receivers often fail. GPS1200 with SmartTrack+ is designed to support the future signals GPS L5 and Galileo.

SmartCheck+
Continuously checking provides the highest possible reliability. A unique, built-in integrity monitoring system checks all results immediately. SmartCheck+ now processes GPS and GLONASS measurements simultaneously for centimeter-accuracy, 20 Hz RTK at 30 km and more. Initialize within seconds and survey in obstructed areas with a GX1230/ATX1230 (GPS only) sensor or increase productivity with a GX1230 GG/ATX1230 GG (GPS and GLONASS).

GLONASS
For many years the GLONASS system was not reliable enough in terms of satellite availability and system performance. With recent launches and commitment from the Russian government, reliability and availability are significantly improved. Under normal conditions there are 2 to 5 additional satellites compared to a GPS only constellation – and even more satellites will be available over the next two years. Now is the time to invest in hybrid GNSS technology.

"The GLONASS system should be created before 2008, as it was originally planned ... We have the possibility. Let us see what can be done in 2006 – 2007"

(Russian President Vladimir Putin December 26th 2005).

Exceptionally rugged
Don't worry about how your crews handle GPS1200. It's built to MIL specs to withstand the roughest use. With its strong, precision-machined magnesium housing, GPS1200 stands up to drops and falls and the jolts and vibrations of machines.

Immune to bad weather
Designed for temperatures from –40° C to +65° C (storage +80° C). GPS1200 shrugs off arctic cold and blistering heat. Fully waterproof – withstands immersion to 1 m – sand and dustproof, it operates perfectly in any conditions from tropical rainfall to desert sandstorms. GPS1200 just keeps on working.

High contrast touch screen
The high quality 1/4 VGA (11 lines by 32 characters) with optional colour option (RX1250) touch screen guarantees perfect clarity and contrast. Whether in fading light or bright sunshine, you can always read the display perfectly. Operate using the touch screen or the QWERTY keyboard, which-ever you prefer.

With or without controller
Connect the controller to the receiver when you need to input information and make full use of the on-board functions and programs.

RTK/DGPS communication
Radio modems, GSM, GPRS and CDMA modules fit in waterproof housings attached to the receiver. Attach either one or two devices for RTK/DGPS reference and rover applications.

With *Bluetooth*® Wireless-Technology built in to the RX1250 controller complete cable free operation and connectivity to compatible wireless products is available.

Figure 2: Leica GPS1200 product brochure

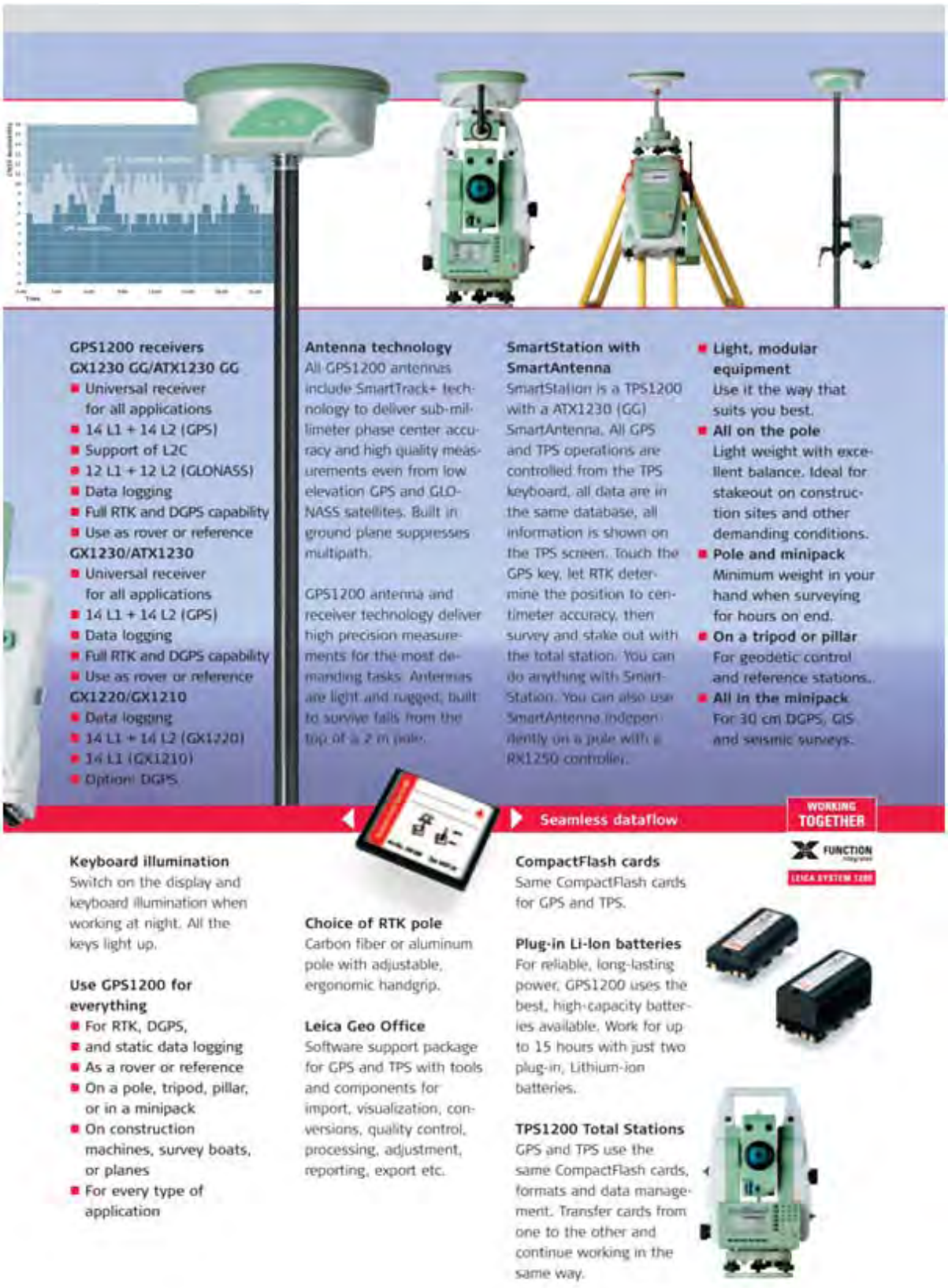


Figure 3: Leica GPS1200 product brochure

Leica GPS1200
Technical specifications and system features

GPS1200 receivers	GX1230 GG/ATX1230 GG	GX1230/ATX1230	GX1220	GX1210
GNSS technology	SmartTrack+	SmartTrack	SmartTrack	SmartTrack
Type	Dual frequency	Dual frequency	Dual frequency	Single frequency
Channels	14 L1 + 14 L2 GPS 2 SBAS 12 L1 + 12 L2 GLONASS 72 Channels	14 L1 + 14 L2 GPS 2 SBAS	14 L1 + 14 L2 GPS 2 SBAS (with DGPS option)	14 L1 2 SBAS (with DGPS option)
RTK	SmartCheck+	SmartCheck	No	No
Status indicators	3 LED indicators: for power, tracking, memory			

GPS1200 receivers	GX1230 GG/GX1230/GX1220	GX1210	ATX1230 GG/ATX1230
Ports	1 power port, 3 serial ports, 1 controller port, 1 antenna port		1 power/controller port, Bluetooth® Wireless-Technology port
Supply voltage, Consumption	Nominal 12 VDC 4.6 W receiver + controller + antenna		Nominal 12 VDC 1.8 W
Event input and PPS	Optional: 1 PPS output port 2 event input ports	Optional: 1 PPS output port 2 event input ports	
Standard antenna Built-in groundplane	SmartTrack+ AX1202 GG Built-in groundplane	SmartTrack AX1201 Built-in groundplane	SmartTrack+ ATX1230 GG Built-in groundplane

The following apply to all receivers except where stated.

Power supply	Two Li-Ion 3.8 Ah/7.2 V plug into receiver. One Li-Ion 1.9 Ah/7.2 V plugs into ATX1230 and RX1250.
Plug-in Li-Ion batteries Same for GPS and TPS	Power receiver + controller + SmartTrack antenna for about 15 hours (for data logging). Power receiver + controller + SmartTrack antenna + low power radio modem or phone for about 10 hours (for RTK/DGPS). Power SmartAntenna + RX1250 controller for about 5 hours (for RTK/DGPS).
External power	External power input 10.5 V to 28 V.
Weights	Receiver 1.20 kg. Controller 0.48 kg (RX1210) and 0.75 kg (RX1250). SmartTrack antenna 0.44 kg. SmartAntenna 1.12 kg. Plug-in Li-Ion battery 0.09 kg (1.9 Ah) and 0.19 kg (1.9 Ah). Carbon fiber pole with SmartTrack antenna and RX1210 controller: 1.80 kg. All on pole: carbon fiber pole with SmartAntenna, RX1250 controller and plug-in batteries: 2.84 kg.

Temperature ISO9022 MIL-STD-810F	Operation: Receiver Antennas Controllers Controller RX1250c Storage: Receiver Antennas Controllers Controller RX1250c	-40° C to +65° C -40° C to +70° C -30° C to +65° C -30° C to +50° C -40° C to +80° C -55° C to +85° C -40° C to +60° C -40° C to +80° C
Humidity ISO9022, MIL-STD-810F	Receiver, antennas and controllers Up to 100 % humidity	
Protection against water, dust and sand IP67, MIL-STD-810F	Receiver, antennas and controllers: Waterpoof to 1 m temporary submersion. Dust tight	
Shock/drop onto hard surface	Receiver: withstands 1 m drop onto hard surface. Antennas: withstand 1.5 m drop onto hard surface.	
Topple over on pole	Receiver, antennas and controllers: withstand fall if pole topples over.	
Vibrations ISO9022 MIL-STD-810F	Receiver, antennas and controllers: withstand vibrations on large construction machines. No loss of lock.	

Figure 4: Leica GPS1200 technical specifications

SPECIFICATIONS

Sensor Type
Fused Quartz using electrostatic nulling

Reading Resolution
1 microGal

Standard Field Repeatability
< 5 microGal

Operating Range
8,000 mGal without resetting

Residual Long-Term Drift (static)
Less than 0.02 mGal/day

Range of Automatic Tilt Compensation
± 200 arc sec

Tares
Typically less than 5 microGals for shocks up to 20 G.

Automated Corrections
Tide, Instrument Tilt, Temperature, Noisy Sample, Seismic Noise Filter.

Dimensions
31 cm (H) x 22 cm x 21 cm
12 in (H) x 8.5 in x 8 in

Weight (including batteries)
8 kg, (17.5 lbs.)

Battery Capacity
2 x 6Ah (10.8V) rechargeable Litium-Ion Smart Batteries. Full day operation in normal survey conditions with two fully charged batteries.

Power Consumption
4.5 Watts at 25°C

Standard Operating Temperature Range
-40°C to +45°C

Ambient Temperature Coefficient
0.2 microGal/°C (typical)

Pressure Coefficient
0.15 microGal/kPa (typical)

Magnetic Field Coefficient
1 microGal/Gauss (typical)

Memory
Flash Technology (data security)
Standard 12 MBytes

Digital Data Output
RS-232 C and USB interface
Is optimized for Win XP™

Analog Data Output
Strip-Chart Recorder

Display Screen
¼ VGA 320 x 240 pixels

Keypad
27 key alpha/numeric

Standard System
- CG-5 Console
- Tripod base
- 2 rechargeable batteries
- Battery Charger, 110/240 V
- External Power 110/240 V
- RS-232 and USB Cables
- Carrying Bag
- Data dump and utilities software
- Operating Manual (CD)
- Transit Case

GPS
Enables GPS station referencing from an external 12 channel smart GPS antenna being connected via the RS-232 port. Standard GPS accuracy: <15m DGPS (WAAS) < 3m. Client has the option to use other higher accuracy GPS receivers outputting NMEA data string through the serial port.

OPTIONS

High Temperature Option
For use in climates that may exceed the normal operating temperate of 45°C. Allows operating temperatures of up to 55°C. This option is intended to be used in climates above freezing and needs to be ordered at the time of purchase.

Battery Belt
Suggested for cold weather operation.

COMPLETE GRAVITY SOLUTIONS

Special Applications
Please contact LRS Scintrex or your local representative.

Training Programs
LRS Scintrex can provide training programs at our office in Canada or at your location.

Application Software
LRS Scintrex can provide software packages to support your data processing, interpretation and mapping needs.

An ISO 9001:2000 registered company

* All specifications are subject to change without notice.

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Figure 5: Scintrex CG-5 specifications

5.0 Vehicle Transportation

5.1 Support Vehicles

Supporting the operations will be a Toyota Landcruiser or similar.

This support vehicle will be fitted with:

- Iridium or Thuraya satellite phone
- Magellan FX324 navigation grade GPS receiver
- Spare navigation grade GPS receiver with batteries
- First aid and survival kit
- Two spare tyres
- Recovery equipment for tyre repair
- Recovery equipment including winch for bogging, stranding.
- Comprehensive tool-kit to effect in field repairs
- 10L of drinking water
- Flashing rotating beacon

All vehicles to be utilised on the project will be supplied, serviced and maintained by Budget Car Rentals.

Daily pre-start checks will be carried out on all vehicles and these shall be documented in Atlas Geophysics pre-start log books.

6.0 Camping / Accommodation

No camping will be required as local accommodation proximal to each of the survey areas will be utilised.

7.0 Communications, Internet and Scheduled Calls

For the gravity operations, the primary method of communication will be via Iridium or Thuraya or Next G phones.Scheduled calls will be made at prescribed intervals as outlined in the project Field Operations Plan.

All Atlas vehicles are also fitted with Tracertrak units and their location can be tracked via a web-based interface. All crews will also be supplied with at least one GeoPro Messenger portable messaging device to allow for personal satellite tracking and two way messaging. This revolutionary device allows for several weeks of tracking and messaging off a single battery charge and can be carried easily in a backpack or on an operator's belt. Further details concerning the device can be found in the brochure overleaf (Figure 7).

Internet connections for client contact and data server access will be established using NextG terminals.

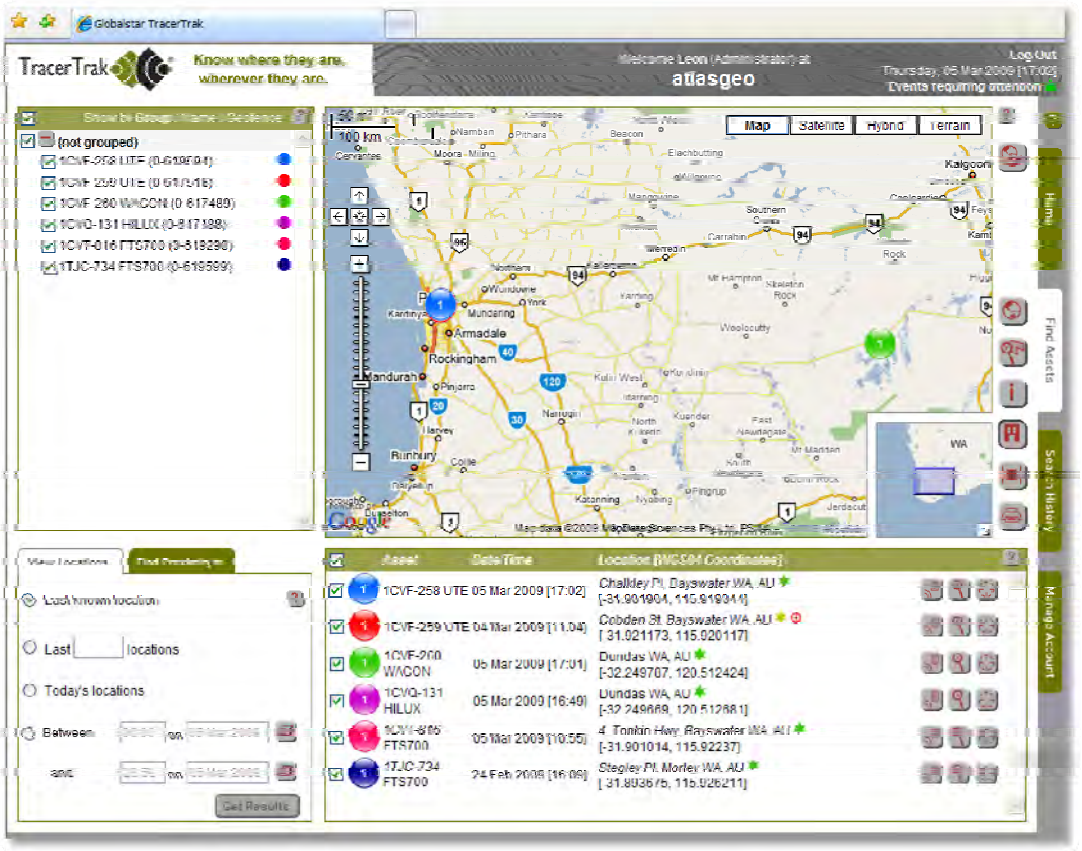


Figure 6: Tracertrak tracking interface

Figure 7: GeoPro Messenger brochure

8.0 Proposed Survey Methodology

All gravity data will be acquired using proprietary Atlas Geophysics Pty Ltd foot-borne techniques. These techniques, which utilise concurrent GPS and gravity acquisition, allow for acquisition of very high quality data.

8.1 Gravity and GPS Control Establishment

GPS and gravity control stations will be established in each of the survey areas if control does not already exist. At each station, a permanent monument will be erected to mark and witness the station. Each monument would consist of a 30cm star picket driven into the ground with about 10cm protruding alongside a small (30cm diameter) circular concrete slab also set in concrete. The star picket will mark the position of the GPS control station and the concrete slab the position of the gravity control station. A steel star picket of 1.25m length will be placed within 0.5m of each station and carries an Atlas Geophysics Pty Ltd witness plaque numbered with a unique station number (Figure 8).

The details of all Atlas Geophysics Pty Ltd control stations are recorded on Atlas Geophysics Pty Ltd control station summary sheets (see Appendix A for an example). This sheet includes the geodetic coordinates, observed gravity value, station description, locality sketch, locality map and digital photo of the station.

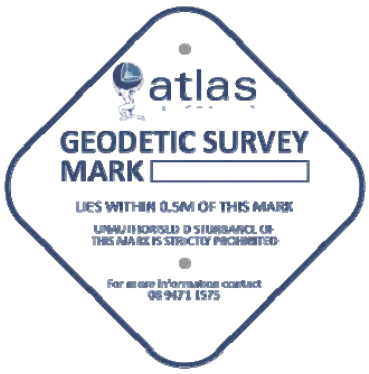


Figure 8: Atlas Geophysics Pty Ltd survey witness plaque

8.1.1 GPS Control

Primary GPS control will be established for all control stations within the survey area and will allow all position and height information obtained from the gravity survey to be tied to the Geocentric Datum of Australia (GDA94), the Geodetic Reference System 1980 (GRS80) and the Australian Height Datum (AHD).

Coordinates for the control stations will be derived from the 5 second static GPS data logged at the station whilst gravity surveying is underway. The static data will be submitted to Geoscience Australia's AUSPOS processing system to produce first-order geodetic control station coordinates accurate to better than 10mm for the x, y and z observables. Multiple

days of static GPS data using different GPS antenna heights will be submitted to ensure accuracy and reliability of the solution.

Initial surveying is usually conducted using adopted control station coordinates since the AUSPOS system requires approximately two weeks before a Final Ephemeris Solution can be delivered. The adopted coordinates are derived from an autonomous GPS measurement at the control station giving an accuracy of better than 0.5m for x, y coordinates and better than 10m for the z coordinate. Once the final ephemeris solution for control station coordinates has been delivered by AUSPOS, all control and field GPS measurements have the necessary DC shift applied to give accurate, absolute positions for east, north and elevation.

8.1.2 Gravity Control

Primary gravity control stations will be established at the same location as the primary GPS control stations. Once tied to the Australian Fundamental Gravity Network (AFGN), the gravity control stations allow all field gravity observations to be tied to the AAGD07 gravity datum employed by Geoscience Australia.

An accurate observed or absolute gravity value for the control stations will be established via "ABABABA" ties with all of the project gravity meters to nearby AFGN stations. Expected accuracy of the individual tie surveys would be better than 0.1 gu (or 0.01 mGal).

8.2 GPS Data Acquisition, Processing and Quality Analysis

GPS-Glonass data will be collected in static mode at the control stations. On the rovers, data will be collected using both Real Time Kinematic (RTK) and post-processed kinematic (PPK) mode. In open ground with little canopy, rigorous post-processing of the recorded kinematic data and a comparison with the RTK solutions will allow for excellent GPS-Glonass ambiguity resolution and 3-D solution coordinate qualities better than 3cm for each of the gravity station locations.

Atlas Geophysics quality analysis (QA) procedures will ensure that all data will meet and exceed industry standards for data quality.

8.2.1 GPS-Glonass Acquisition

Each gravity station location (GSL) will be positioned using Leica GPS1200 receivers operating in stakeout real-time kinematic mode. Accuracy of the real-time positioning system will be better than 0.5m, and where possible, the crew will position the station as close to the programmed location as possible. Some stations may need to be offset or omitted where it is not possible to find a suitable spot e.g. heavily vegetated, hilly and built up areas.

For the walking operations, the GPS-Glonass sensor will be mounted on a telescoping pole (max 5m) carbon fibre survey staff. The antenna height can be adjusted depending on the height of the canopy.

Both RTK and PPK kinematic GPS-Glonass data are logged by the GPS receiver carried by the operator in a protective backpack. Static data will also be concurrently logged at the primary GPS control station(s) to allow for later AUSPOS submission.

8.2.2 GPS-Glonass Processing

To verify each RTK/Chain and Level position, the acquired raw kinematic GPS-Glonass data will also be processed nightly using Novatel Waypoint Grafnav v8.3 post-processing software (Figure 9). GrafNav is a fully-featured kinematic and static GPS/Glonass post-processing package that uses Waypoint's robust GPS/Glonass processing carrier phase kinematic (CPK) filter engine. The software is capable of processing raw kinematic GPS/Glonass data from most GPS/GNSS receivers and allows the user to process the roving data from as many as eight separate control stations to achieve accuracies at the centimetre level. The software can automatically switch from static to kinematic processing and has a fixed static solution for static initialisation of short or medium baselines that are below 30km. A float static solution is available for baselines longer than this. Kinematic Ambiguity Resolution (KAR) allows the session to start in kinematic mode and can help fix otherwise unrecoverable cycle slips. Ionospheric processing and modelling is also included with the software and can help improve accuracy, especially over long baselines. Advantages of the Waypoint processing engine over other packages include:

- *Fast Processing* – The Grafnav engine is one of the fastest on the market. For a single base station, a 2.40 Mhz PIII CPU can expect to process GPS data at 670 epochs/second. This means that a 4-hour 2 Hz data set will process one direction in 22 seconds. For two bases, processing takes 250 epochs/second or about 1 minute for the same 4-hour data set. For 4 bases, these times are 50 epochs/second or about 5 minutes.
- *Reliable OTF Processing* – Waypoint's on-the-fly KAR algorithm has had years of development and testing. Various implementations and numerous options are available to control this powerful feature.
- *Multi-Base (MB) processing* – With Version 7.80, GrafNav now supports true multiple control station processing where all of the baselines are incorporated into one sophisticated Kalman filter. This can spatially decorrelate some of the error sources while also allowing integer ambiguity determination using the closest base station. Satellite drop-outs at one base will also be compensated by the others. The two biggest advantages are improved overall accuracies and much less operator effort required to process and QC such data.
- *Accurate Static Processing* – Three modes of static processing are implemented in the main processing kernel.
- *Dual Frequency Support* – Full dual frequency GPS processing comes with the software. For ambiguity resolution, this entails wide/narrow lane solutions for KAR, fixed static and quick static. 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. GrafNav also has the ability to combine these two solutions to obtain a globally optimum one.
- *GPS + GLONASS* – The GrafNav kernel has the ability to also process GPS+GLONASS data. This is especially advantageous for applications in forested areas, where the additional satellite coverage can improve accuracies.
- *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 amount of code has been added specifically for the detection and removal of Doppler errors.
- *High Dynamics* – The GrafNav kernel can handle extremely high dynamics from missiles, rockets, dropped ordinances, and fast flying aircraft.
- *Long Baseline* - Because precise ephemeris and dual frequency processing is supported, long baselines accuracies can be as good as 0.1 PPM.

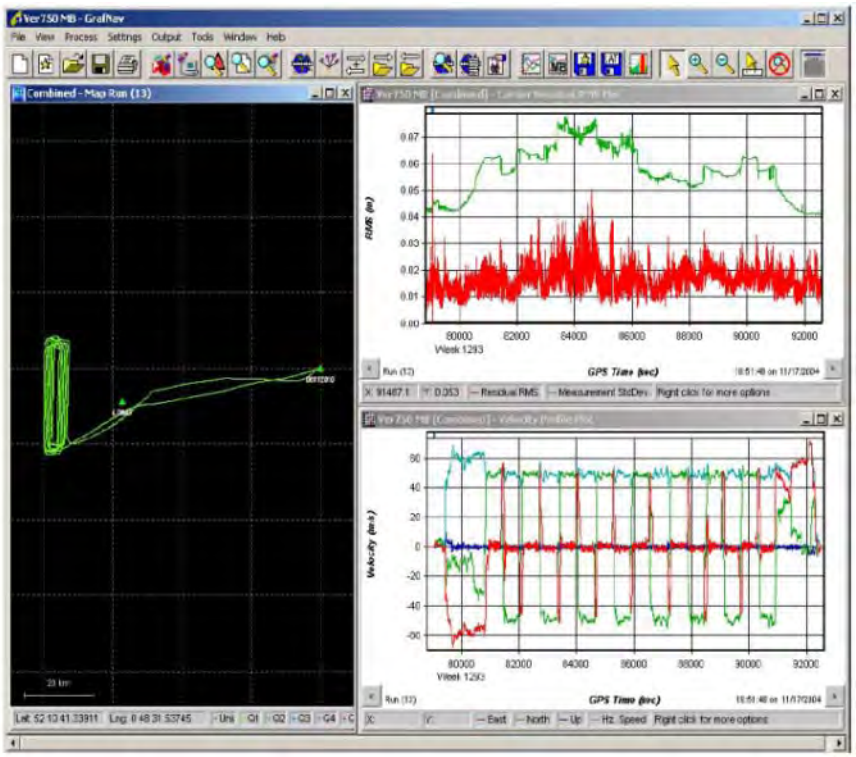


Figure 9: Waypoint Grafnav Processing Software

Once each epoch is processed to give a solution for the WGS84 position and elevation at ground level (i.e. corrected for sensor height), projection between GPS-Glonass derived WGS84/GDA94 coordinates to Map Grid of Australia (MGA) coordinates are conducted within Waypoint. For most practical applications, where a horizontal accuracy of only a

metre or greater is required, GDA94 coordinates can be considered the same as WGS84. MGA94 coordinates are obtained by projecting the GPS-derived WGS84 coordinates using a Universal Transverse Mercator (UTM) projection with the relevant zone.

Elevations above the Australian Height Datum (AHD) are modelled using Waypoint and the latest geoid model for Australia, AUSGEOID09. GRS80 elevations are equivalent to WGS84 elevations for the purpose of gravity survey.

8.2.3 GPS/Glonass Quality Analysis

Rigorous quality analysis procedures will be routinely applied to the acquired GPS-Glonass data on a daily basis using Waypoint Grafnav's built in QA tools. Some of the tools that may be employed on the project include:

- *Combined Separation Plot*: This plot shows the difference between the forward and reverse solutions (Figure 10). A perfect solution would have a separation of zero as this indicated the carrier phase ambiguities have been determined to be exactly the same value in both directions. A separation of better than 0.1m on a quad-bike survey would indicate that the data is of high quality.

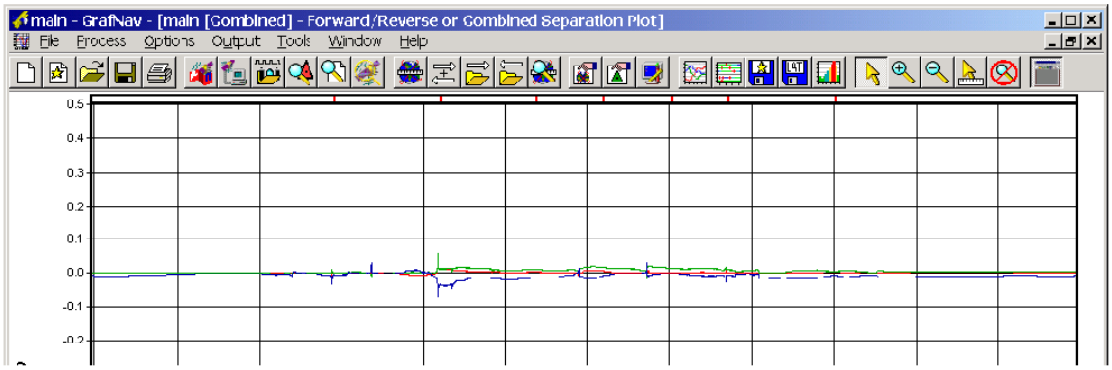


Figure 10: Combined Separation Plot

- *Float or Fixed Ambiguity Status Plot*: This plot shows if the final solution is float or fixed (Figure 11). Fixed integer ambiguities generally have better accuracies (usually < 10cm accuracy). Ideally the plot should show fixed as this indicated an integer ambiguity fix on both forward and reverse directions.

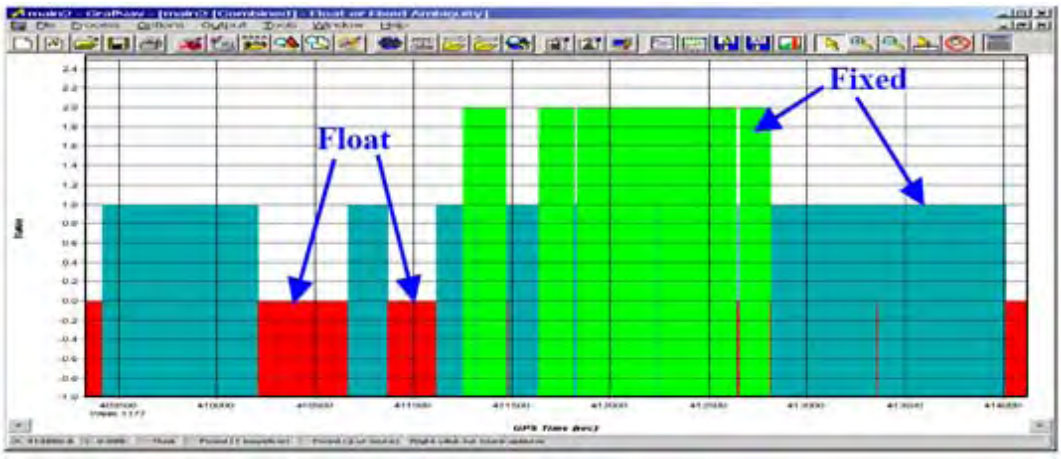


Figure 11: Float or Fixed Ambiguity Status Plot

- *Quality Factor Plot*: This plot shows the quality of the final solution (Figure 12). There are five different quality factors plotted and these factors are also output in the Atlas Geophysics Pty Ltd GPS data file.

  Quality 1 – Fixed Integer (Green)
  Quality 2 – Stable Float (Aqua)
  Quality 3 – Converging Float (Blue)
  Quality 4 – DGPS or worse (Red)
  Quality 5 – Single Point (Yellow)

Increasing quality factors indicate a worse solution. This is not a perfect indication, but it can be useful to isolate problems.

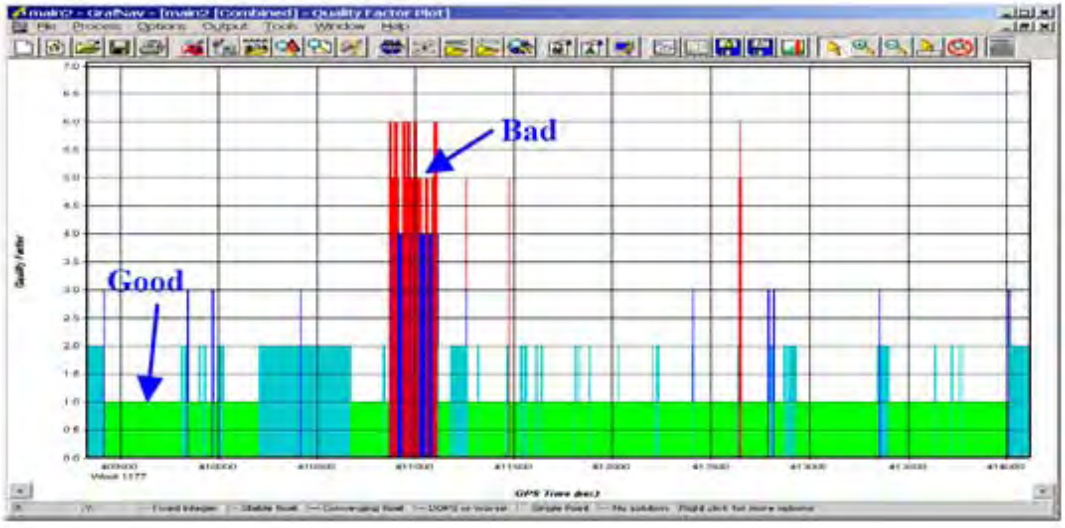


Figure 12: Quality factor plot

Complementing Waypoint GrafNav QA tools is the company's own in-house GPS quality analysis software. A module built into AGRIS (Atlas Geophysics Reduction and Information Software) allows the user to import the Waypoint output files and examine quality factors such as station repeatability, coordinate velocity, dilution of precision, coordinate quality

factor and standard error for each gravity station location. The procedure is carried out before merging the positional data with gravity data for final reduction to Bouguer Anomaly. Comprehensive statics, repeatability analysis and histogram plotting are also performed.

Any gravity stations not conforming to contract/project specifications for GPS repeatability will be repeated by the company at no cost to the client.

8.3 Chain and Level Data Acquisition and Processing

Complementing the GPS acquisition will be acquisition of chain and level elevation only data. This will enable heights to be triple checked where GPS ambiguities have been resolved. Where GPS ambiguities cannot be resolved due to thick canopy, then the horizontal position from the GPS (< 0.5m accuracy) will be used with the elevation derived from the chain and level. This will ensure *every* gravity station has centimetre level accuracy for elevation.

Acquisition of the data is very simple, with the system consisting of a digital reading unit and two pressure sensors connected by a flexible 50m chaining cable containing a special fluid (Figure 13). Three other sensors measure temperature and density variations in the fluid. Readings are quick, and the meter indicates true elevation differences with high precision at any outside temperature.

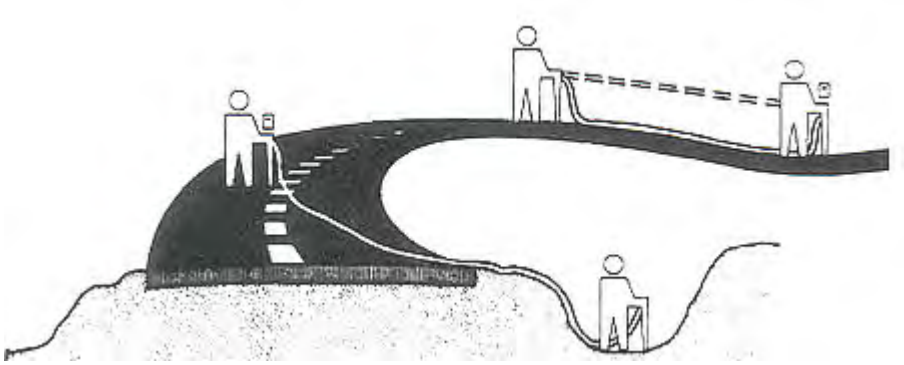


Figure 13: Chain and Level Survey

The sensor rods at each end of the cable are placed on the stations to be acquired. The digital reading of the difference of elevation is obtained instantly through interfacing with a rugged PDA. The rods are then transferred to new positions to read successive differences in elevation. No visual contact is ever needed between the points to be measured.

For a one kilometre profile, typical closure errors are less than 10cm. The error on each station is less than 2cm. Closure error will be reduced by utilising GPS positions at regular intervals along each survey line where there is an open canopy.

Processing of the chain and level data will be done on a profile basis using Microsoft Excel.

8.3 Gravity Data Acquisition, Processing and Quality Analysis

Gravity data will be gained using the company's rapid acquisition, high accuracy foot borne techniques. The company's own in-house reduction and QA software will be used to reduce the data on a daily basis to ensure quality and integrity.

8.3.1 Calibration of the Gravity Meters

All gravity meters to be used on the project have recently been recently calibrated on the calibration range at Helena Valley, Western Australia. The calibration process has validated each gravity meter's scale factor to ensure reduction of the survey data produces correct Observed Gravities from measured dial reading values.

Weekly tilt-tests and cycles will be conducted to ensure meter drift and tilt correction factors are valid. Gravity meter drift rates will be monitored on a day to day basis.

8.3.2 Acquisition of the Gravity Data

Gravity data will be acquired concurrently with positional data using Scintrex CG5 gravity meters (Photo 2). Data will be acquired in a single shift of 10 hours duration, with each shift consisting of a single loop controlled by observations at the gravity control stations. Each loop will contain a minimum of two repeated readings so that an interlocking network of closed loops is formed. A minimum of **3% repeats** will be acquired for quality control purposes. Repeat readings will be evenly distributed on a time-basis throughout each of the gravity loops. All gravity operators are experienced and trained in identifying spurious or bad data. If wind or seismic conditions prevent the operator from gaining the highest quality data, then the gravity survey can be suspended until conditions improve.

For the walking acquisition, the crew will consist of one gravity operator and one GPS operator working a nominal ten hour day. Another pair of operators will operate the chain and level device.

When acquiring data on foot, the GPS operator will safely navigate to the station using the GPS receiver's stake-out function. The gravity operator will follow the GPS operator to the station and take readings at the base of the GPS survey pole, on flat, level ground.

At each GSL, the gravity operator will take a minimum of two gravity readings of 20 second duration so that any seismic or wind noise can be detected. Control station readings will be set to 60 second duration. Before taking a reading, the operator will ensure that the instrument tilt-reading is restricted to less than 5 arc-seconds and after the reading, not higher than 20 arc-seconds. In some instances in very soft sand or mud, it is impossible to keep tilt-readings under 50 arc seconds due to the soft nature of the ground. This is not found to adversely affect the quality of the data since the gravity meter is equipped with online tilt correction. All meters will be tilt tested before the project commences.

If two separate readings do not agree to better than 0.03 mGal (0.01 mGal for control station readings), then the operator will continue taking readings until the tolerance between consecutive readings is achieved. At the conclusion of the gravity reading, the final data display on the gravity meter will be analysed to ensure the instrument is performing to specification, and that the station observation provides data conforming to the project specifications. The operator will also verify that the temperature, standard deviation and rejection values are within required tolerance before recording the reading. At each station, the operator will record the data digitally in the gravity meter as well as in an Atlas Geophysics Pty Ltd field book so that instrument drift and reading repeatability can be analysed easily whilst in the field. Data recorded at each GSL is assigned a unique station code and station number.

Repeat stations will be marked with a biodegradable flagging tape for subsequent reoccupation. Repeat stations are always laid on flat, level ground. When reoccupying GSL's on foot, the operator will position the gravity meter as close to the original location as possible. A kick mark is used to mark the exact location of the gravity reading.

Photo 2: Gravity observation on foot in the Victorian Highlands

8.3.3 Processing of the Gravity Data

The acquired gravity data will be processed using the company's in-house gravity pre-processing and reduction software, AGRIS. This software allows for full data pre-processing, reduction to Bouguer Anomaly, repeatability and statistical analysis, as well as full quality analysis of the output dataset.

The software is capable of downloading Scintrex CG3/CG5, Burris and Lacoste Romberg gravity data. Once downloaded, the gravity data is analysed for consistency and preliminary QA is performed on the data to check that observations meet specification for standard deviation, reading rejection, temperate and tilt values. Once the data is verified, the software averages the multiple readings and performs a merge with the positional data (which it has also previously verified) and performs a linear drift correction and earth tide correction. Calculation of Free Air and Bouguer Anomalies is then performed using Geoscience Australia preferred formulae with both Spherical Cap and Geoidal Bouguer corrections on the AAGD07 and ISOGAL84 gravity datums.

Data can be supplied to the client in a wide variety of formats including ASEG-GDF2 format.

8.3.4 Quality Analysis of the Processed Gravity data

Following reduction of the data to Bouguer Anomaly, repeatability and QA procedures will be applied to both the positional and gravity observations using AGRIS software. AGRIS checks the following as part of its QA processing:

- Easting Observation Repeatability and Histogram

- Northing Observation Repeatability and Histogram
- Elevation Observation Repeatability and Histogram
- Gravity Observation Repeatability and Histogram
- Gravity SD, Tilt XY, Temperature, Rejection, Reading Variance
- Gravity meter drift / closure
- Gravity meter loop time, drift per hour
- GPS Dilution of Precision, Coordinate Quality Factor, Standard Error
- Variation of surveyed station location from programmed location.

QA procedures will be applied to the gravity data on a daily basis and any gravity stations not conforming to contract specifications will be repeated by the company at no cost to the client.

8.3.5 Additional Processing, Gridding and Plotting

Complementing the QA procedures will be additional daily gridding, imaging and plotting of the elevation and gravity data. Once processed to Bouguer Anomaly and assessed for QA, data are imported into Geosoft Oasis Montaj or ChrisDBF software for gridding at 1/5th the station spacing to produce ERMapper compatible grid files. Resultant grids are contoured, filtered and interpreted using ERMapper and ArcMap software to check that data is smoothly varying and that no spurious anomalies are present. A first vertical, tilt angle and horizontal derivative filter are routinely applied to the data as these filters allow for excellent noise recognition. Once identified, any spurious stations can be field checked by the field crew the following day and repeated if required.

Plotting of the acquired stations on a daily basis allows for identification of any missed stations which can then be gained the following day.

At the conclusion of the project, Atlas Geophysics can offer additional processing services including:

- Rigorous terrain correction using laser, photographic or SRTM derived digital elevation models
- Reprocessing, merging and QA of historical datasets
- Gravity database establishment and administration
- Geophysical imaging using ERMapper and Geosoft software
- GIS compilation and maintenance (Arcmap or Mapinfo)
- Modelling and inversion
- Large format plotting (photo quality).

9.0 Precision and Accuracy of the Gravity Survey

9.1 Gravity Observations

Gravity data will be measured to Scintrex CG5 gravity meter precision of 0.001 mGal or 0.01 gu (μms^{-2}). The standard deviation of all repeat gravity station differences, after drift and tidal correction, will be better than **0.02 mGal** or 0.2 gu (μms^{-2}). The company will resurvey any gravity loop containing a repeat difference greater than two standard deviations.

9.2 Positional Observations

All positions x, y and z will be measured by GPS-Glonass or Chain and Level to a precision of better than 0.01 m. The standard deviation of all elevation repeat station differences will be better than **0.05 m**. The company will resurvey any gravity loop containing a repeat difference greater than two standard deviations.

10.0 Survey Deliverables

10.1 Preliminary Data

Whilst the survey is underway, preliminary data can be delivered to the client on a daily basis. Data can be delivered via email or uploaded to the Atlas Geophysics secure FTP server. Daily deliverables would include, but not be limited to:

- Raw gravity data in Scintrex CG5 format (.grv files)
- Raw GPS-Glonass data in Atlas AGRIS format (.gps files). Raw phase data in Waypoint binary format can be provided on request
- Reduced gravity data in Atlas AGRIS format (.csv files)
- Ermapper compatible grids (.ers) of GPS derived elevation, Bouguer Anomaly and 1st vertical derivative of Bouguer Anomaly
- GIS compatible images of the above grids (A3 size, 300dpi)
- Daily production report detailing production, repeatability and survey cost.

10.2 Final Data

Final data is typically delivered within two weeks of survey completion. Timing is usually dependant on the delivery of final ephemeris solution coordinates for GPS control stations from AUSPOS. If control already exists on site, then final data can be delivered the day after survey completion. Final data delivery would include, but not be limited to:

- Raw gravity data in Scintrex CG5 format (.grv files)
- Raw GPS-Glonass data in Atlas AGRIS format (.gps files). Raw phase data in Waypoint binary format can be provided on request
- Reduced gravity data in Atlas AGRIS format (.csv files) or in a client specified format
- Ermapper compatible grids (.ers) of GPS derived elevation, Bouguer Anomaly and 1st vertical derivative of Bouguer Anomaly
- GIS compatible images of the above grids (A3 size, 300dpi)
- Daily production report detailing production, repeatability and survey cost
- Hardcopy acquisition report or memorandum with all of the above supplied on IBM compatible CD or DVD.

11.0 Pricing Schedule

11.1 Daily Rate for Acquisition and Processing (GPS Only, Two Person Walking Crew)

Atlas Geophysics would like to offer the following Daily Rate for foot-borne gravity acquisition and processing where only GPS is supplied and utilised. The price includes processing to Bouguer Anomaly, acquisition of 3% repeats and all communications.

Station Spacing	Daily Rate (ex GST)
50m or 100m	**$A .00**

11.2 Daily Rate for Acquisition and Processing (C & L and GPS, Four Person Walking Crew)

Atlas Geophysics would like to offer the following Daily Rate for foot-borne gravity acquisition and processing where both GPS and Chain and Level units are supplied and utilised. The price includes processing to Bouguer Anomaly, acquisition of 3% repeats and all communications.

Station Spacing	Daily Rate (ex GST)
50m or 100m	**$A .00**

11.3 Fixed Price for Crew Mobilisation and Demobilisation (Two Person Walking Crew)

Atlas Geophysics would like to offer the following fixed price for gravity crew mobilisation and demobilisation ex Perth for two crew members. The price includes flights, baggage, all vehicle fuel and oils, as well as meals and accommodation.

Mobilisation and Demobilisation each way (ex GST)
$A .00

11.4 Standby

Standby will be charged where the following prevent the crew from working a full day:

- Inclement weather: Rain, thunderstorms, high wind or fire danger
- Client inductions and other site specific training
- Camp or operations base moves
- Mobilisation between survey areas
- Stop work at client /landholder request
- Gravity control.

Standby at the following rate will always be charged out as a percentage of the day worked and on a per crew basis.

Standby per crew per day (ex GST)
$A

11.5 Reporting and Additional Processing

A brief survey acquisition memorandum or a comprehensive acquisition report can be supplied at the following charge:

Acquisition Memorandum (ex GST)
$A .00

Acquisition Report (ex GST)
$A .00

If requested, additional processing such as terrain corrections, regional removal, filtering and digital imaging can be conducted at the hourly rate below.

Additional Processing (ex GST)
$A .00 / hour

11.6 Ancillary Charges

All vehicle fuels, meals, communications and accommodation will be supplied by Atlas Geophysics at the fixed rate below. There will be no further charges to the client at the completion of the project.

Ancillary Charges (ex GST)	
$A .00	**per person per day**

11.7 Estimate of Total Time and Fixed Cost (Single Crew Production)

Given good weather conditions, it is envisaged that the survey would take between 60 and 76 days to complete if all survey areas are acquired at 50m spacing. The production *estimates* below are very, very conservative due to the challenging nature of the project areas. The crew may well be able to double the production quoted below, but this is very hard to say until we have visited the survey areas.

The company would be happy to first survey the smaller areas so as to get an idea of expected production rates at Storeys Creek – Aberfoyle. TNT Mines could then make a decision on whether or not to proceed with 50m or 100m spacing at this area.

The estimates below are given for GPS only survey to allow for comparison against other operators quotes. Should TNT Mines wish to utilise the Chain and Level (C & L) system, an extra charge will apply to cover the wages costs of extra operators required to run the system. The use of the C & L will definitely speed up production and will result in better data quality. It is expected that GPS only survey may be sufficiently accurate for some of the areas, but the C & L should definitely be utilised for others, especially under thick canopy and in steep terrain. Atlas will assess each area for suitability prior to commencement to ensure the cheapest, most accurate solution. One possibility is that an extra crew AND gravity meter could be supplied and two GPS production crews utilised where C & L survey is not required. This would reduce the total survey duration.

11.7.1 Station Spacing 50m all areas

Charge	Cost $A ex GST
Mobilisation of gravity crew to site	$.00
MOINA : Survey 800 stations at 50m x 50m spacing *Ground Survey @ $.00 per day* *Estimate – 8 days to complete the survey*	$.00
GREAT PYRAMID : Survey 800 stations at 50m x 50m spacing *Ground Survey @ $.00 per day* *Estimate – 14 days to complete the survey*	$.00
STOREYS CREEK : Survey 4000 stations at 50m x 50m spacing *Ground Survey @ $.00 per day* ***Estimate** – 40 days to complete the survey*	$.00
ANOMALY 370: Survey 800 stations at 50m x 50m spacing *Ground Survey @ $.00 per day* ***Estimate** – 14 days to complete the survey*	$.00
Demobilisation of gravity crew from Site	$.00
Connection to AUSPOS	$0.00
Communications and Internet	$0.00
Acquisition memorandum	$0.00
Travel between areas (4 days standby @ $ per day)	$.00
Fuel, meals and accommodation *76 days @ $.00 per person per day*	$.00
TOTAL COST OF SURVEY (ex GST)	**$.00**

11.7.2 Station Spacing 50m all areas except Storeys Creek – Aberfoyle

Charge	Cost $A ex GST
Mobilisation of gravity crew to site	$.00
MOINA : Survey 800 stations at 50m x 50m spacing *Ground Survey @ $.00 per day* *Estimate – 8 days to complete the survey*	$.00
GREAT PYRAMID : Survey 800 stations at 50m x 50m spacing *Ground Survey @ $.00 per day* *Estimate – 14 days to complete the survey*	$.00
STOREYS CREEK : Survey 1000 stations at 100m x 100m spacing *Ground Survey @ $.00 per day* ***Estimate** – 20 days to complete the survey*	$.00
ANOMALY 370: Survey 800 stations at 50m x 50m spacing *Ground Survey @ $.00 per day* ***Estimate** – 14 days to complete the survey*	$.00
Demobilisation of gravity crew from Site	$.00
Connection to AUSPOS	$0.00
Communications and Internet	$0.00
Acquisition memorandum	$0.00
Travel between areas (4 days standby @ $ per day)	$.00
Fuel, meals and accommodation *56 days @ $.00 per person per day*	$.00
TOTAL COST OF SURVEY (ex GST)	**$.00**

12.0 Project Timing and Availability

Atlas Geophysics will make all crews available within three weeks of receiving notice that this quotation has been accepted. The crews may be able to mobilise sooner, but this will be subject to the company's workload at the time. A purchase order, contract or letter of agreement will need to be supplied by the client before the company makes plans to mobilise.

13.0 Occupational Health, Safety, and Environment

Atlas Geophysics Pty Ltd is recognises that excellence in managing Occupational Health and Safety and Environment (HSE) responsibilities is essential to the long term success of the company. To this end, the company aims to prevent injuries and occupational illness to its employees and minimise any adverse environmental impact its activities may have. Copies of the company's HSE and Drug and Alcohol policies are contained in Appendix B.

Risks associated with Atlas Geophysics business activities have been identified using the Atlas Geophysics Risk Rating procedure and a HSE risk management register has been established. Medium and High risk activities identified in the register triggered the need for documented controls. These controls, based on the accepted hierarchy of control, are documented in both an Atlas Geophysics Field Manual and Atlas Geophysics HSE Standard Operating Procedures. These documents can be provided to the client upon request along with a copy of the company's Health Safety and Environment Management Plan (HSEMP).

In establishing the Atlas Geophysics HSE system, potential and existing clients were approached to supply their Contractor HSE requirements. These requirements were factored into aspects of the HSE management system. To monitor performance of the system, a constant improvement and review process was incorporated; this review process includes feedback from regular workplace observations, outcomes from hazard/incident reports and an annual audit /review process.

Atlas Geophysics is committed to meeting client HSE requirements and if required, will work to client requested HSE procedures, provided they exceed Atlas Geophysics minimum requirements. The company has recently had its HSE management systems audited by Rio Tinto/Pilbara Iron and were successfully appointed as an Approved Contractor.

Prior to survey commencement, the company shall conduct a full risk assessment to evaluate any HSE risks pertaining to the project and will take appropriate action to minimise any potential risks. The risk assessment shall be documented and included with a comprehensive Field Operations Plan. This field planning document will detail all staff member details, contact telephone numbers, daily field itinerary with scheduled call timetable, and procedures in the event of an emergency.

14.0 Insurances

The company carries extensive insurance to cover all of its Australian and overseas operations. Copies of the policies and certificates of currency can be provided to the client upon request. Details of the relevant insurances are listed below:

Professional Indemnity
Limit of Indemnity: $
Insurer:
Policy Number:
Expiry Date:

Public Liability
Limit of Indemnity: Section A - Public Liability: $ any one occurrence, but limited to $ for property in the care custody or control of the Insured.

Section B - Pollution Liability: $ any one occurrence and in the aggregate during any one period of insurance.

Section C - Products Liability: $ in the aggregate during any one period of Insurance.

Insurer:
Policy Number:
Expiry Date:

Workers Compensation
Limit of Liability: Benefits as under the local Workers' Compensation Act
Common Law Liability - $
Insurer:
Policy Number:
Expiry Date:

General Property
Interest Insured:
Sum Insured: $
Insurer:
Policy Number:
Expiry Date:

15.0 Company Experience and Referees

Although Atlas Geophysics is a relatively new company, we have successfully completed numerous large surveys in both the private and public sector and are now the preferred contractor for such companies as Rio Tinto Exploration, Rio Tinto Iron Ore, Barrick Gold of Australia and Goldfields.

In 2007, we safely completed Australia's largest ever helicopter gravity survey, the PIRSA PACE Northern G2 survey consisting of over 38,000 regional spaced stations (1.5km spacing). Testimonials concerning our performance on this survey can be found in Appendix C. The company also recently completed the Northern Territory's largest gravity survey consisting of over 13,000 regional spaced stations. Figure 14 below contains a plot of government funded stations acquired by Atlas Geophysics overlain on a map of Australia. Since inception in January 2007, Atlas Geophysics has safely acquired 139,025 new regional gravity stations by helicopter, more than any other contractor in Australia.

Adding to our vast experience with helicopter based gravity surveys are many ground based surveys in a multitude of environments and locations, with varying survey configurations ranging from walking microgravity to regional UTV/ATV gravity.

Referees that can attest to the company's performance in executing many types of gravity survey include:

Helicopter Gravity Surveys
Ray Tracey – Geophysicist, Head of Australian Fundamental Gravity Network Project
Geoscience Australia
T 02 6249 9279
email: ray.tracey@ga.gov.au

High Resolution Gravity Surveys
Amanda Butt - Business Planning Analyst, previously Superintendent Geophysics
Rio Tinto Iron Ore / Pilbara Iron
T 08 9327 2505
email: amanda.butt@riotinto.com

Regional Gravity Surveys
Brendan Howe - Geophysicist
Barrick Australia Pacific
T 08 9212 5777
email: brhowe@barrick.com

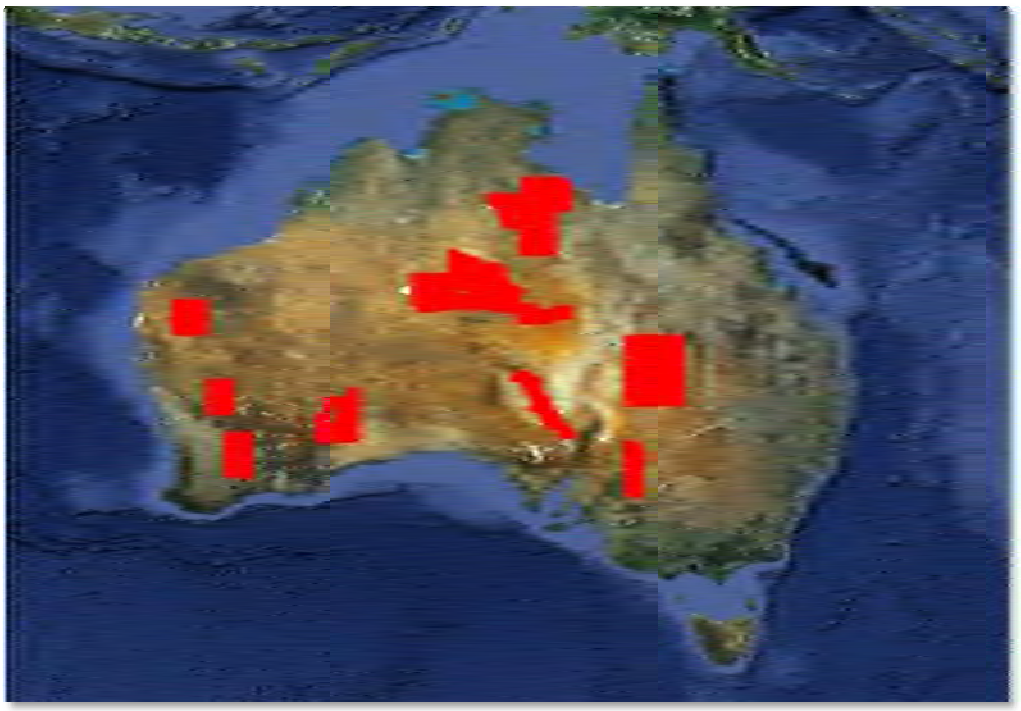


Figure 14: Government funded gravity stations acquired and processed by Atlas

16.0 General Terms and Conditions

16.1 Contractor Details

Invoices for services rendered will be issued by:

Atlas Geophysics Pty Ltd
PO BOX 1049
MORLEY WA 6943
ABN 68 123 110 243

16.2 Payment Terms

Services will be invoiced upon delivery of the final data and acquisition report. On large projects, progressive invoices may be submitted fortnightly. Payment terms will be strictly 14 days net from invoice date.

16.3 Currency of Quotation

This quotation shall remain current for a period of two months. After that date, Atlas Geophysics may alter the costs of the submitted quotation accordingly.

16.4 Project Schedules

All project schedules indicated in this quotation will be subject to confirmation by Atlas Geophysics depending on current project commitments at the time of quotation acceptance. If additional projects have been awarded to Atlas Geophysics before this quotation is accepted, then Atlas Geophysics reserves the right to undertake the work. The company will take all steps to avoid project conflicts through liaison with the interested parties.

APPENDIX A
Example Control Station Description

GRVGPS0045 – Mount Magnet A/S

GDA 94/GRS80		MGA Z50		AMG Z50	
Latitude	-28°07'03.2070"	***Easting***	582,878.316	***Easting***	582,738.710
Longitude	117°50'37.7644"	***Northing***	6,889,487.436	***Northing***	6,889,335.800
Ellipsoidal Height	386.600	***Orthometric Height***	405.826	***Orthometric Height***	405.826

OBSERVED GRAVITY

AAGD07 gu	9790577.13

Occupation Method/Location Details

The GPS control point consists of a dumpy steel picket driven into the ground to a height of 10cm above ground level. The gravity control point consists of a small concrete slab (30cm square) concreted into the ground, opposite the GPS control point. The control station is witnessed by an Atlas Geophysics survey plaque attached to a 1.5 metre steel picket placed within 0.5m of both control points.

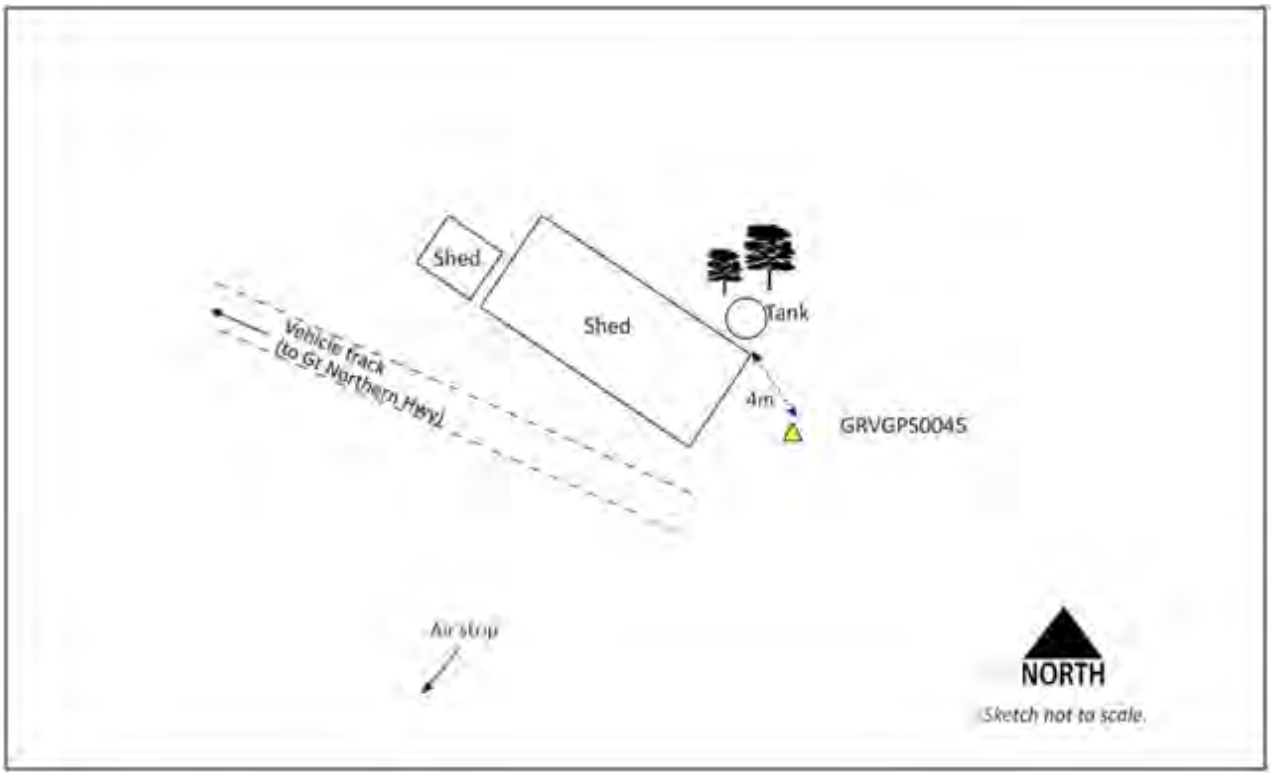
Gravity Control was established via an ABABA loops to AFGN gravity base station 1967920221 located at the Mount Magnet Airstrip Shed. Expected accuracy would be better than 1gu.

GPS Control was established using AUSPOS. Three separate +10 hour sessions were submitted to AUSPOS's online processing system where returned coordinates were accurate to better than 0.01m.

This control station is located within the grounds of the Mount Magnet Airstrip, nearby to a light brown metal storage shed. The storage shed lies between the airstrip (to the south) and the Great Northern Highway (to the north). Access to the shed is via an access track running south-east from the airstrip access road. The base station is located on the southern side of the shed, about 4m from the window. Access to the airstrip is via the Great Northern Highway, approximately 10km south of Mount Magnet township. Permission to access to the station should be sought from Jerry at the Mount Magnet shire on telephone 0427 634 241.

Photograph of Control Station GRVGPS0045 and surrounds

Location of Control Station GRVGPS0045



Locality Sketch of Control Station GRVGPS0045

APPENDIX B

HSE and Drug and Alcohol Policy

HEALTH, SAFETY AND ENVIRONMENT POLICY

Atlas Geophysics Pty Ltd recognises that it is essential to the long term success of the company, that the health and safety of its employees, as well as its impact on the environment must be managed in an excellent manner. Atlas Geophysics Pty Ltd will meet all legal obligations and constantly strive to improve our HSE performance. Our aim is to prevent injuries and occupational illness to our employees, and to minimise any adverse environmental impact our activities may have. This aim will be achieved through effective procedures and the implementation of a HSE management system incorporating continuous review and improvement.

Atlas Geophysics Pty Ltd actions to achieve our goal are:

- Evaluate all activities with respect to HSE and take appropriate action to manage risks associated with these activities before they are carried out.
- Adopting a long term strategy for managing OHS and Environmental issues, incorporating regular reviews, research into improved technologies, and obtaining regular feedback from clients and employees in regard to HSE matters.
- Establishing procedures to ensure that proper and consistent implementation of the HSE policy.
- Ensure the efficient use of energy and water, so as to avoid excess pollution, and reduce the environmental impact of any activities carried out by Atlas Geophysics Pty Ltd.
- Ensure all employees are aware of our HSE policy and procedures, and are mindful of these when approaching and carrying out any routine or non routine task.

Leon Mathews
Director

DRUG AND ALCOHOL POLICY

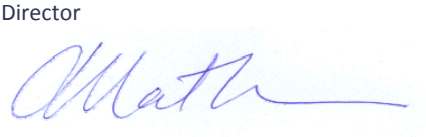
Our aim is to prevent injuries and occupational illness to our employees and minimise any adverse environmental impact our activities may have.

Atlas Geophysics Pty Ltd recognizes that it is essential for the health and safety of all employees that an effective drug and alcohol policy is in place.

All Employees of Atlas Geophysics Pty Ltd must comply with the following requirements in respect to the presence and use of Drugs and Alcohol in the workplace.

- No employee will conduct work for Atlas Geophysics Pty Ltd if they have a blood alcohol level above 0.0%.
- No employee will conduct work for Atlas Geophysics Pty Ltd under the influence of illicit drugs
- All employees must inform Atlas Geophysics Pty Ltd of any medication (prescription and non-prescription) they are taking, so a risk assessment can be conducted for their proposed work program.
- Atlas Geophysics Pty Ltd will establish procedures to ensure that proper and consistent implementation of the Drug and Alcohol policy occurs.
- Atlas Geophysics Pty Ltd will implement disciplinary action based on the Three Strikes rule if this policy is breached.
- All employees are to be aware of the drug and alcohol policy, and will be kept informed of any changes to this policy.
- Atlas Geophysics Pty Ltd will comply with any client drug and alcohol policy requirements that exceed those of Atlas Geophysics Pty Ltd.

Leon Mathews
Director



APPENDIX C
Testimonials

Government of South Australia
Primary Industries and Resources SA

Our reference: 2007/00067-V02
Telephone No: 8463 3033

MINERALS AND ENERGY RESOURCES
Executive Office
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Adelaide SA 5000
GPO Box 1671
Adelaide SA 5001
DX 667
Tel (08) 8463 3201
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www.pir.sa.gov.au

8 November 2007

Mr Leon Mathews
Director / Geophysicist
Atlas Geophysic Pty Ltd
PO Box 1049
MORLEY WA 6943

Dear Leon and Mark

I write to you to congratulate you on the outstanding contracting work you have recently completed for Primary Industries and Resources South Australia under the Plan for Accelerating Exploration (PACE) initiative.

PIRSA considers that the gravity data you have delivered under the terms of our Agreement for the Provision of Gravity Survey Services in the Northern G2 Region will set the benchmark for future government-sponsored gravity surveys in the State, and across Australia.

I would also like to praise you on your operational processes and your company's level of attention to safety. In PIRSA's view this survey was executed in an exemplary fashion.

I would be happy for you to use the PACE gravity dataset in your company's promotions. I would also be pleased to provide Atlas Geophysics with a reference in support of any future Government tenders in other states.

The PACE gravity data was released on 1st November at the Mining 2007 conference in Brisbane.

Once again, congratulations on a great job on this project. We look forward to working with your company in the future.

Yours sincerely

Edward Tyne

Dr Edward Tyne
DIRECTOR, MINERAL RESOURCES

Government of South Australia
Primary Industries and Resources SA

To Whom It May Concern:

Atlas Geophysics conducted a helicopter-borne gravity survey for Primary Industries and Resources South Australia, Minerals and Energy Resources in the Northern Olympic Domain of South Australia during 2007. The survey comprised of approximately 38,893 new gravity stations at a varying grid spacing of 750m by 750m to 1.5km by 1.5km.

I was the supervisor of this survey and I was greatly impressed at all aspects of the survey in which was carried out with a high level of competence. The professionalism and expertise shown by all members of the field crew was of the highest standard. The survey area was in remote locations of South Australia in which Atlas Geophysics showed that they were well experienced in such environments. Production rates far exceeded that specified in the contract with two helicopters in operation they were able to regularly obtain more than 200 readings a day per helicopter. Gravity data updates and progress reports were provided to me throughout the duration of the survey regularly and the final data was provided promptly at the completion of the field survey. Final GPS and gravity survey data met or exceeded contract specifications.

The directors and field staff of Atlas Geophysics are highly competent with a great deal of experience in gravity surveying. They are more than capable of handling harsh and difficult environments and are able to carry out any type of gravity survey because of these reasons. I have no hesitation in highly recommending Atlas Geophysics and their services.

Daniel Gray
State Gravity Coordinator
Minerals and Energy Resources
Primary Industries and Resources South Australia

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