

Atlas Geophysics Quotation Number Q2013064

Nobles Nob and Juno Gravity Survey

Truscott Mining / Excalibur Mining

Attention: Jude Hanson

Quotation submitted by:



ABN 68 123 110 243

Leon R Mathews

Geophysicist/Director

T 08 6278 2898

F 08 6278 1595

PO BOX 1049

MORLEY WA 6943

AUSTRALIA

info@atlasgeo.com.au

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atlas
G E O P H Y S I C S

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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 15 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 as 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 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

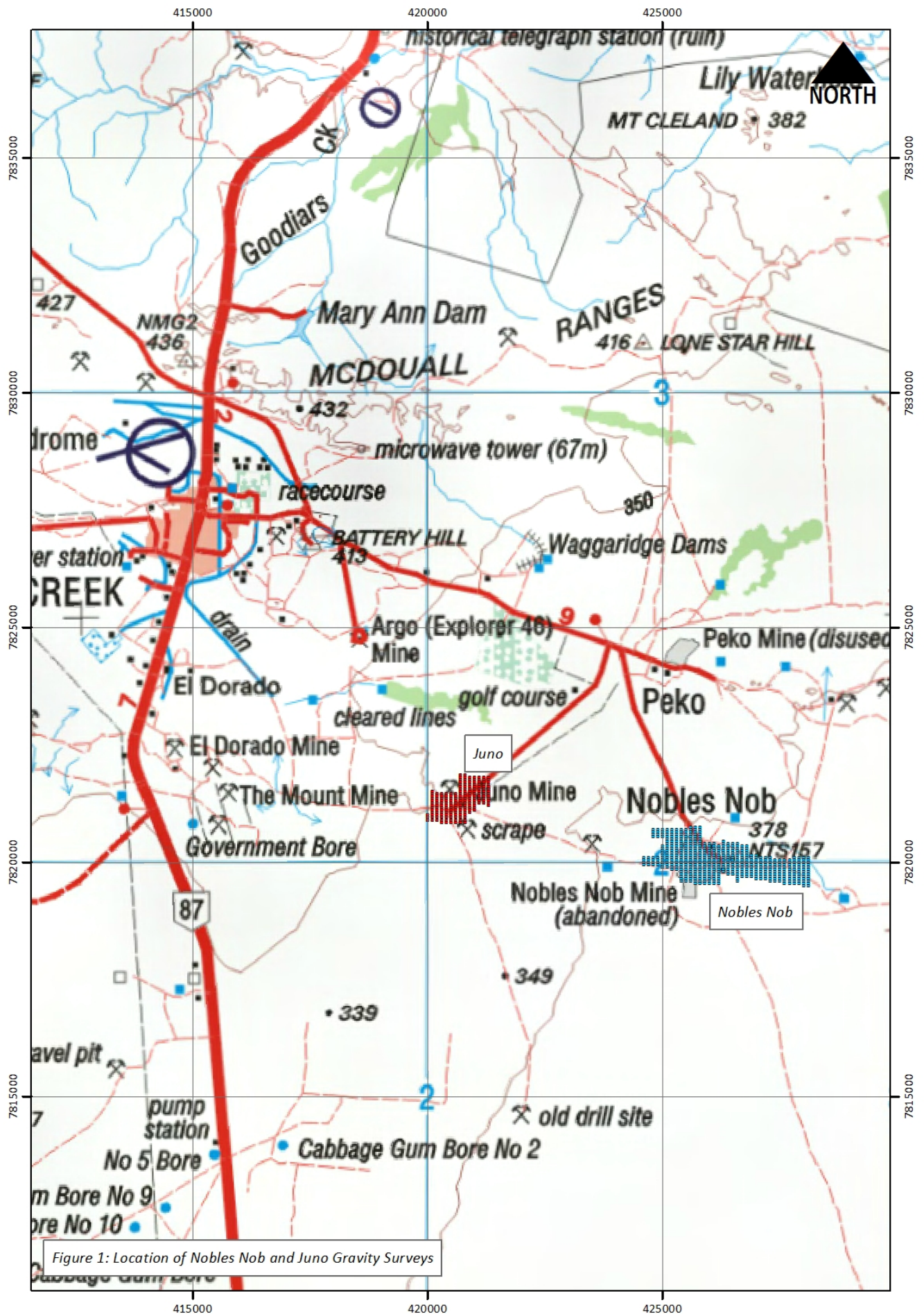
The proposed gravity project requires the acquisition and processing of a potential 703 detailed gravity stations located over tenements held Truscott and Excalibur Mining. The tenements are located about 10km south-east of Tennant Creek, in the Northern Territory.

Atlas Geophysics Pty Ltd proposes to complete the gravity survey using a single, two person walking crew supported by a Toyota Landcruiser vehicle. The small program should easily be completed within 4-5 days.

2.1 Location, Access and Configuration

The two project areas, Nobles Nob and Juno can be accessed easily from Tennant Creek using existing mine and exploration tracks (Figure 1). Both areas appear to be flat and open and easily traversable on foot.

For both areas, stations will be acquired using a 50m station spacing with north-south lines spaced 100m apart. Infill may be carried out after initial supply of preliminary data.



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 20 years experience in the acquisition, processing and quality analysis of gravity data.

3.1 Project Supervision

Supervising the project from Perth Operations would be director Leon Mathews, B.Sc. Hons. (Geophysics). Leon has been involved in the acquisition, processing and interpretation of potential field data for over 15 years and has directly overseen the acquisition and processing of over 1,000,000 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:

Phillip Saul	<i>Supervising Field Technician</i>
Russell Fitzgerald	<i>Field Technician</i>

3.2 Subcontractors

No subcontractors will be used on this project.

4.0 Proposed Equipment and Instrumentation

4.1 GPS/Glonass Receiver Instrumentation

Leading-edge dual-frequency GPS technologies from Leica Geosystems such as the GPS1200 will be utilised on the project to allow for real time kinematic centimetre level accuracy 3D positions. Specifications for this 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

Two GPS1200 geodetic grade receivers will be utilised to conduct the survey. One receiver will operate as a base station, with the other receiver operating as a real-time-kinematic rover. All receivers have recently been purchased new (post 2006) and all are covered under comprehensive maintenance agreements with Leica Geosystems.

4.2 Gravity Instrumentation

Complementing the company's GNSS/GPS 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 quad bikes, 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.

A single CG5 gravity meter will be supplied to the project. In the event of malfunction or failure, Atlas has on stock multiple spare meters (CG5 and CG3-M) which can be despatched overnight by courier.

4.3 Other Equipment

The company utilise 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
- Tools, engineering and maintenance equipment for vehicle servicing
- First aid and survival kits
- Tyres and recovery equipment

Leica GPS1200

Fast, accurate, rugged and reliable

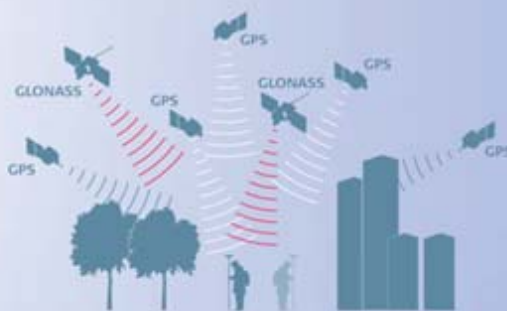


GNSS technology

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, whichever you prefer.

With or without controller

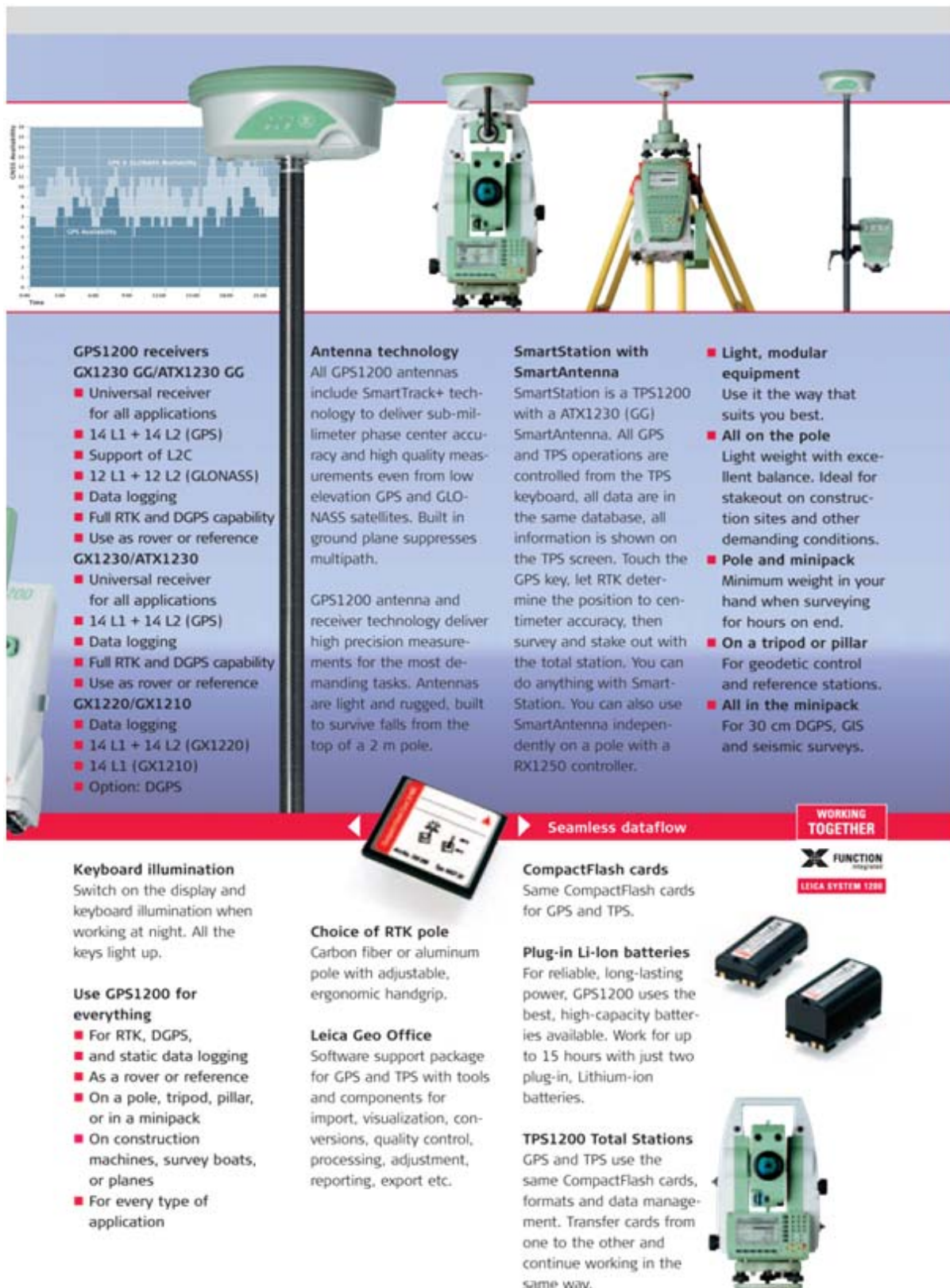
Connect the controller to the receiver when you need to input information and make full use of the on-board functions and programs.

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



The brochure features a top section with four images of the Leica GPS1200 system in different configurations: a pole-mounted antenna, a total station with a pole-mounted antenna, a total station on a tripod with a pole-mounted antenna, and a pole-mounted antenna with a separate controller. Below these images are several columns of text detailing the capabilities and features of the GPS1200 receivers, antenna technology, SmartStation with SmartAntenna, and various accessories like batteries, cards, and poles. A red banner at the bottom contains the text 'Seamless dataflow' and 'WORKING TOGETHER' with the Leica logo.

GPS1200 receivers
GX1230 GG/ATX1230 GG
 ■ Universal receiver for all applications
 ■ 14 L1 + 14 L2 (GPS)
 ■ Support of L2C
 ■ 12 L1 + 12 L2 (GLONASS)
 ■ Data logging
 ■ Full RTK and DGPS capability
 ■ Use as rover or reference
GX1230/ATX1230
 ■ Universal receiver for all applications
 ■ 14 L1 + 14 L2 (GPS)
 ■ Data logging
 ■ Full RTK and DGPS capability
 ■ Use as rover or reference
GX1220/GX1210
 ■ Data logging
 ■ 14 L1 + 14 L2 (GX1220)
 ■ 14 L1 (GX1210)
 ■ Option: DGPS

Antenna technology
 All GPS1200 antennas include SmartTrack+ technology to deliver sub-millimeter phase center accuracy and high quality measurements even from low elevation GPS and GLONASS satellites. Built in ground plane suppresses multipath.

GPS1200 antenna and receiver technology deliver high precision measurements for the most demanding tasks. Antennas are light and rugged, built to survive falls from the top of a 2 m pole.

SmartStation with SmartAntenna
 SmartStation is a TPS1200 with a ATX1230 (GG) SmartAntenna. All GPS and TPS operations are controlled from the TPS keyboard, all data are in the same database, all information is shown on the TPS screen. Touch the GPS key, let RTK determine the position to centimeter accuracy, then survey and stake out with the total station. You can do anything with SmartStation. You can also use SmartAntenna independently on a pole with a RX1250 controller.

■ **Light, modular equipment**
 Use it the way that suits you best.

■ **All on the pole**
 Light weight with excellent balance. Ideal for stakeout on construction sites and other demanding conditions.

■ **Pole and minipack**
 Minimum weight in your hand when surveying for hours on end.

■ **On a tripod or pillar**
 For geodetic control and reference stations.

■ **All in the minipack**
 For 30 cm DGPS, GIS and seismic surveys.

Keyboard illumination
 Switch on the display and keyboard illumination when working at night. All the keys light up.

Use GPS1200 for everything
 ■ For RTK, DGPS, and static data logging
 ■ As a rover or reference
 ■ On a pole, tripod, pillar, or in a minipack
 ■ On construction machines, survey boats, or planes
 ■ For every type of application

Choice of RTK pole
 Carbon fiber or aluminum pole with adjustable, ergonomic handgrip.

Leica Geo Office
 Software support package for GPS and TPS with tools for import, visualization, conversions, quality control, processing, adjustment, reporting, export etc.

CompactFlash cards
 Same CompactFlash cards for GPS and TPS.

Plug-in Li-Ion batteries
 For reliable, long-lasting power, GPS1200 uses the best, high-capacity batteries available. Work for up to 15 hours with just two plug-in, Lithium-ion batteries.

TPS1200 Total Stations
 GPS and TPS use the same CompactFlash cards, formats and data management. Transfer cards from one to the other and continue working in the same way.

Seamless dataflow

WORKING TOGETHER
 FUNCTION
 LEICA SYSTEM 1200

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	SmartTrack+ AX1202 GG	SmartTrack AX1201	SmartTrack+ ATX1230 GG
Built-in groundplane	Built-in groundplane	Built-in groundplane	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.	Temperature	Operation: Receiver -40° C to +65° C Antennas -40° C to +70° C ISO9022 MIL-STD-810F Controllers -30° C to +65° C Controller RX1250c -30° C to +50° C Storage: Receiver -40° C to +80° C Antennas -55° C to +85° C Controllers -40° C to +80° C Controller RX1250c -40° C to +80° C
Plug-in Li-Ion batteries	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)	Humidity	Receiver, antennas and controllers ISO9022, MIL-STD-810F Up to 100% humidity.
External power	External power input 10.5 V to 28 V.	Protection against water, dust and sand	Receiver, antennas and controllers: Waterproof to 1 m temporary submersion. IP67, MIL-STD-810F Dust tight
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.	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	Receiver, antennas and controllers: withstand vibrations on large construction machines. No loss of lock. ISO9022 MIL-STD-810F

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 Lithium-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 temperature 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.



CANADA
Scintrex
222 Snidercroft Road
Concord, Ontario, Canada L4K 2K1
Telephone: +1 905 669 2280
Fax: +1 905 669 6403
e-mail: scintrex@scintrextd.com
Website: www.scintrextd.com



USA
Micro-g LaCoste
1401 Horizon Avenue
Lafayette, CO 80026
Telephone: +1 303 828 3499
Fax: +1 303 828 3288
e-mail: info@microglaacoste.com
website: www.microglaacoste.com

Figure 5: Scintrex CG-5 specifications

5.0 Vehicle Transportation

5.1 Support Vehicle

Supporting the operations will be a single Landcruiser wagon.

The support vehicle shall be fitted with:

- Iridium or Thuraya satellite phone
- Navigation grade GPS receiver
- Spare navigation grade GPS receiver with batteries
- First aid and survival kit
- Two spare tyres
- 10L of drinking water
- Flashing rotating beacon
- Trackstick data logger

All vehicles to be utilised on the project will be supplied, serviced and maintained by Atlas Geophysics. 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

The crew can be accommodated and messed at client supplied accommodation in Tennant Creek.

7.0 Communications, Internet and Scheduled Calls

For the gravity operations, the primary method of communication will be via Iridium or Thuraya satellite phone. All crews will be equipped with a satellite phone and UHF transceiver.

Scheduled calls/check-in will be made to Perth Operations at prescribed intervals as outlined in the project Field Operations Plan.

All Atlas light vehicles and trucks are fitted with [Tracertrak](#) units and their location can be tracked via a web-based interface (Figure 6). In addition to this, all crews, whether they are on foot or utilising vehicles, 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 8).

Internet connections for client contact and FTP data server access will be established using a Telstra Next G terminal.

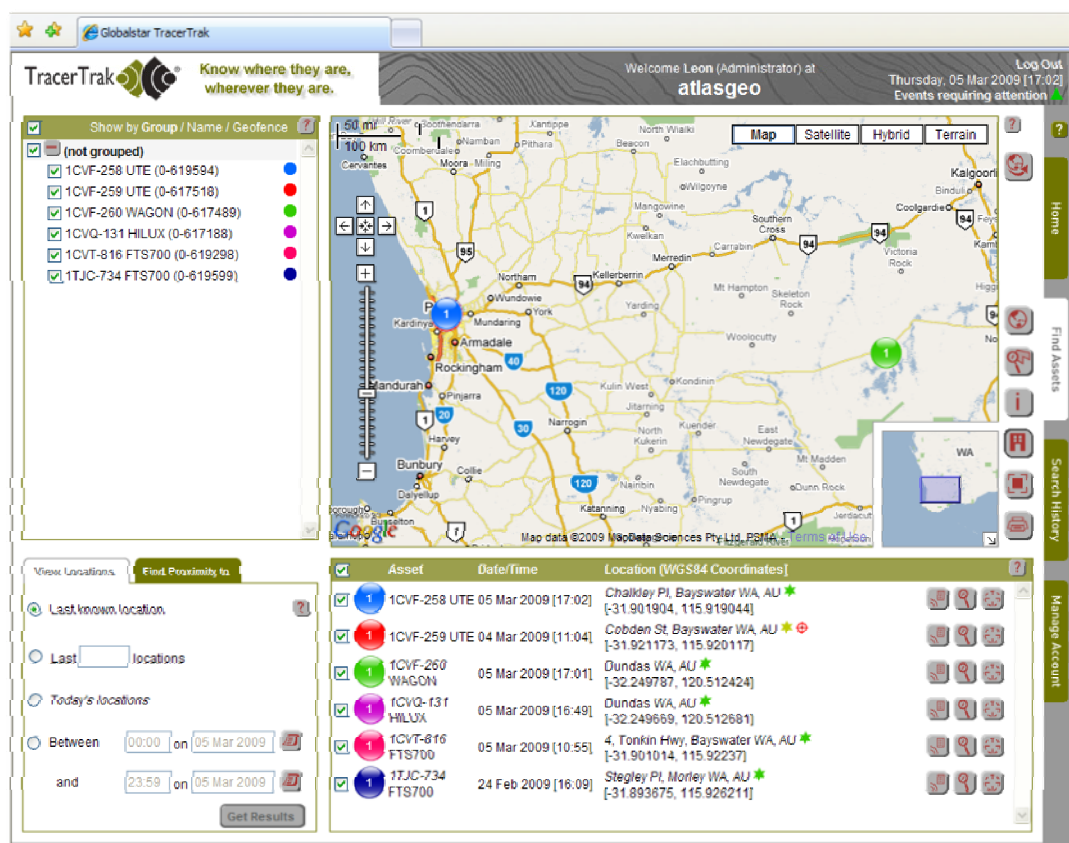


Figure 6: Tracertrak tracking interface



GeoPro Web Application

- Anywhere browser access to the secure hosted GeoPro Web Application
- Easily configure:
 - Role-based user permissions
 - User-based rules for emergency, check-in, and tracking including organization defined response teams
 - Enterprise-wide predefined message and address books
 - Assignment of workers into organizations and groups
- Mark dynamic or static waypoint locations specific to enterprise needs
- Flexible mapping solutions:
 - Bing™ or imported custom maps
 - User-defined bookmarks for quick access to key map areas
 - Support for multiple co-ordinate systems
 - View historical location message trail with the click of a button
- Device Manager – to view and configure personal data
- Comprehensive message and event audit trail

Network

Iridium®

- Two-way global satellite coverage with low message latency
- Highly reliable mesh network

GeoPro

- Multiple Tier 1 backbone connections
- HTTPS secure communication
- Multiple load balanced redundant server architecture
- Clustered database and storage area network (SAN) for data assurance and availability
- 24/7 network and application monitoring



GeoPro Messenger

Features

- Rugged two-way satellite/GPS messaging device
- Dedicated two step emergency button
- One handed non-slip form factor
- Easy to use and intuitive interface
 - Joystick to navigate on-display menus and keyboard
 - Dynamic softkeys for quick selection and response
- Automated tracking reports with flexible intervals
- Network/power optimized push messaging¹
- Multiple messaging options including free form text and predefined messages
- LED and audio alerts
- USB sync for predefined messages, address book and waypoints

Specifications

- Dimensions: 12.5 cm x 6.3 cm x 3.7 cm (5" x 2.5" x 1.5")
- Weight: 380 g (13.4 oz)
- Battery: Lithium-ion, field replaceable, field rechargeable
- Battery Life: Up to 1000 message reports (usage and condition dependent)
- Operating Temperature: -10°C to + 50°C (14°F to 122°F)
- Display: Monochrome, backlit, anti-glare
- IP66: Protected against powerful water jets and dust ingress
- GPS: U-blox chipset. Best in class acquisition and tracking sensitivity
- High Precision GPS (4 digits): Latitude, longitude, altitude, velocity, direction

¹ Patent pending.

Figure 7: GeoPro Messenger brochure

8.0 Proposed Survey Methodology

All gravity data will be acquired using proprietary Atlas Geophysics Pty Ltd foot borne gravity techniques. These techniques which utilise concurrent GPS and gravity acquisition allow for rapid 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 allowed 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 station and in real time kinematic mode on the rover using geodetic grade Leica GPS1200 receivers. All GPS data are recorded in real-time, to centimetre accuracy, so no further post-processing is required. 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 RTK mode. Accuracy of the RTK positioning system will be better than 5cm and where possible, the crew will position the station as close to the programmed location as possible. Where it is not possible to locate a station at the programmed location, the station may need to be offset or omitted e.g. heavily vegetated, hilly and built up areas.

For the walking operations, the GPS-Glonass sensor will be mounted on a fixed length (2m) carbon fibre survey staff to ensure sensor height consistency regardless of the operator. RTK GPS data are logged by the receiver which is 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

All GPS/Glonass data are recorded in real time so no further post-processing is required in the field, other than simple transformations and geoid modelling. The Leica Geo Office software suite is used to import the data, apply a geoid correction and transformations, and then output the data into Atlas Geophysics LGO standard format. The formatted data are then imported into Atlas Geophysics data processing software “AGRIS” (Atlas Geophysics Reduction and Information Software) and combined with gravity data to produce a gravity database for the project.

8.2.3 GPS/Glonass Quality Analysis

Rigorous quality analysis procedures are applied to the acquired GPS data on a daily basis using the company’s in-house AGRIS software. The GPSQA module within AGRIS is used to analyse such factors as the recorded positional data, baseline distance, number of satellites, coordinate quality (CQ), standard deviation and dilution of precision (DOP) to ensure that final positional data used for gravity processing meets stringent quality specifications. In the event that GPS data recorded at a station does not conform to contract specifications, then the station shall be re-occupied by the company at no cost to the client.

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 using AGRIS software.

8.3.2 Acquisition of the Gravity Data

Gravity data will be acquired concurrently with GPS-Glonass data using a Scintrex CG5 gravity meter (Photo 1). 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.

On foot-borne operations, the crew will consist of one gravity operator and one GPS operator working a nominal 12 hour day including travel time and data processing.

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 1: Gravity observation on foot

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 ISO GAL84 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 project 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 ERMMapper compatible grid files. Resultant grids are contoured, filtered and interpreted using ERMMapper 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 ERMMapper 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 0.025 mGal or 0.25 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 to a precision of 0.001m. The standard deviation of all elevation repeat station differences will be better than 0.05m. 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 Fixed Price per Station vs. Daily Rate and Estimate

This quotation has been provided on a fixed price per station basis. Atlas Geophysics believes that a fixed rate per station basis is a fairer option for its clients when compared to a daily rate charge where the total survey cost estimate is based on anticipated production rates. **If preferred, a daily rate quote can be provided on request.**

Typically, clients have a fixed exploration budget that can be expended on a gravity survey. The uncertainty associated with a daily rate/production estimate quotation can cause budgeting issues if the final survey cost exceeds or comes in (rarely) under budget. A fixed price per station puts the pressure onto Atlas Geophysics and its crews to perform efficiently whilst on survey. If the survey crew encounters problems whilst surveying e.g. thick trees, poor access or steep terrain, then it is Atlas Geophysics who suffers the consequences of lower than anticipated production rates, not the client.

The total survey cost indicated overleaf will be the amount charged to the client, except for a possible variance in final accommodation and meal costs due to the inherent difficulty in estimating project duration. There may also be the possibility of standby charges due to inclement weather or necessary on-site crew inductions. **There will be no hidden costs due to satellite calls and/or internet communications, AUSPOS connections, fuel, meals or extra charges during mobilisation/demobilisation.**

Every project costing is assessed independently and the fixed price per station will be commensurate with expected production rates, project size, and crew availability.

11.2 Fixed Price per Station for Acquisition and Processing

Atlas Geophysics would like to offer the following **fixed price per station** for acquisition and processing. The price includes processing to Bouguer Anomaly, 3% repeats, all communications and crew changeover costs. Client is to provide fuel, meals and accommodation in Tennant Creek or this will be charged at cost +10%.

Station Spacing	Fixed Price Per Station (ex GST)
50m	\$A 15.00

11.3 Fixed Price for Crew Mobilisation and Demobilisation

Atlas Geophysics would like to offer free mobilisation and demobilisation should the company be able to carry out the work in late September/first week of October. If this timing is not suitable, then mobilisation will be charged out at standby rates ex Adelaide.

Mobilisation and Demobilisation each way (ex GST)
\$A FREE

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
- Vehicle bogging
- Client inductions and other site specific training
- Camp setup/pack down
- Camp or operations base moves
- Mobilisation between survey areas
- Stop work at client /landholder request
- Setup of GPS and/or gravity control stations

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 1,290.00

11.5 Reporting and Additional Processing

A brief survey acquisition memorandum will be supplied free of charge.

Acquisition Memorandum (ex GST)
\$A FREE

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 100.00 / hour

11.6 Estimate of Total Time and Fixed Survey Cost

Given good weather conditions, the survey should be completed within 4-5 days.

Charge	Cost \$A ex GST
Mobilisation of crew to site	\$0.00
JUNO: Survey 191 new stations at 100m x 50m spacing <i>Foot-borne survey @ \$15.00 per station</i>	\$2,865.00
NOBLES NOB: Survey 513 new stations at 100m x 50m spacing <i>Foot-borne survey @ \$15.00 per station</i>	\$7,695.00
Demobilisation of crew from site	\$0.00
Fuel, meals and accommodation (client supplied)	\$0.00
TOTAL FIXED COST OF SURVEY (ex GST)	\$10,560.00

12.0 Project Timing and Availability

Atlas will make available a two person crew no later than September end 2013. 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 Health, Safety, and Environment

Atlas Geophysics Pty Ltd recognises that excellence in managing 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: \$1,000,000

Insurer: Lumley General Insurance/Dual Australia Pty Ltd

Policy Number: SI/05526/000/08/Z

Expiry Date: 27/02/2014

Public Liability

Limit of Indemnity: Section A - Public Liability: \$10,000,000 any one occurrence, but limited to \$250,000 for property in the care custody or control of the Insured.

Section B - Pollution Liability: \$10,000,000 any one occurrence and in the aggregate during any one period of insurance.

Section C - Products Liability: \$10,000,000 in the aggregate during any one period of Insurance.

Insurer: Certain Underwriters at Lloyd's

Policy Number: ROLF-07-0040

Expiry Date: 27/02/2014

Workers Compensation

Limit of Liability: Benefits as under the local Workers' Compensation Act

Common Law Liability - \$50,000,000

Insurer: QBE Insurance (Australia) Limited

Policy Number: 710004905GWC

Expiry Date: 27/02/2014

General Property

Interest Insured: Specified tools of trade

Sum Insured: \$500,000 per list supplied

Insurer: QBE Insurance (Australia) Limited

Policy Number: 710004905GEN

Expiry Date: 27/02/2014

15.0 Company Experience and Referees

Atlas Geophysics is a global leader when it comes to delivering safe, accurate and on-time geophysical surveys to its clients. The company has successfully completed numerous large surveys in both the private and public sector and are now the preferred contractor for many of Australia's leading mining and exploration companies. We have travelled the globe, acquiring data in Africa, India, Canada, New Zealand and the United States. The director of the company has directly overseen the acquisition and processing of over 1,000,000 new gravity stations.

In 2007, Atlas safely completed Australia's largest ever helicopter gravity survey, the PIRSA PACE Northern G2 survey consisting of over 37,000 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 West Murchison helicopter gravity survey consisting of over 12,000 regional spaced stations (November 2012) and in 2013, has been contracted to date to complete over 13,000 stations on behalf of Geoscience Australia. Since inception, Atlas Geophysics has safely acquired more than 170,000 new regional gravity stations by helicopter - more than any other contractor in Australia! Figure 9 contains a plot of the stations acquired to date.

Adding to our vast experience with helicopter based surveys are hundreds of ground based surveys in a multitude of environments and locations, with varying survey configurations ranging from foot-borne 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

Phill Wynne – Geophysicist, Head of Australian Fundamental Gravity Network Project
Geoscience Australia

T 02 6249 9279

email: phill.wynne@ga.gov.au

High Resolution Gravity Surveys

Geoff Garton – Superintendent, Geophysics
Rio Tinto Iron Ore – Resource Evaluation

T 08 6213 0731

email: geoffrey.garton@riotinto.com

Regional Gravity Surveys

Lee Sampson – Regional Geophysicist Australia-Pacific
Barrick Australia Pacific

T 08 9212 5777

email: lsampson@barrick.com

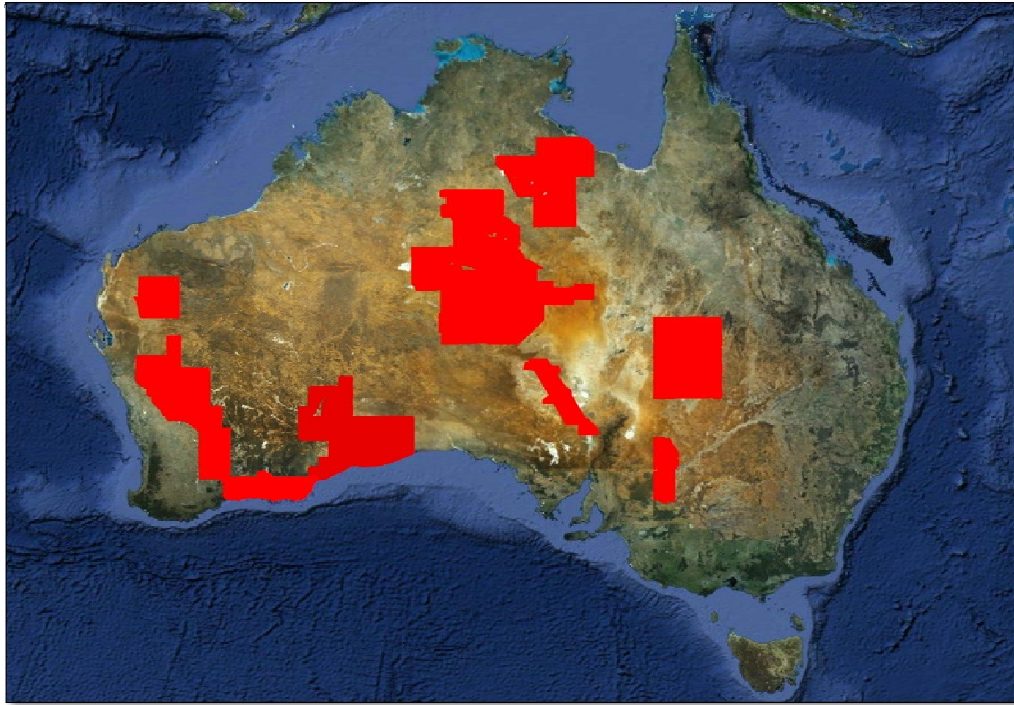


Figure 9: Government funded gravity stations acquired and processed by Atlas

16.0 Why Choose Atlas for Your Geophysical Survey?

- ✓ Safety is our highest priority and when you choose Atlas, you are guaranteed a safe and professionally executed survey. We feel that our safety management system is the best in the geophysical industry and that experience, common sense and a deep respect for safety itself is critically important, both from our field crews and upper management.
- ✓ The company director has been involved in conducting geophysical surveys for over 15 years. Not only has he been responsible for quoting and estimating projects, but he has had extensive field experience and is familiar with every type of terrain encountered in Australia and overseas. He understands the challenges and complexities his field crew face on a daily basis.
- ✓ The director of the company is a geophysicist, not a surveyor or engineer. He oversees every project and ensures an honest, personalised service is delivered to the client at all times.
- ✓ The director is backed up by an experienced, motivated and extremely hardworking team of geophysicists, supervisors and technicians that, more often than not, easily meet production expectations safely and efficiently whilst collecting the highest quality data possible.
- ✓ The company utilises and maintains only the latest in GPS / GNSS and instrument technologies – you won't find us using old Trimble receivers from the mid to late nineties! A large fleet of spares and components allows the company to quickly effect malfunction or failures to reduce downtime in the field.
- ✓ Ongoing research and development into new and existing technologies, software and methodologies gives us the competitive advantage over our competitors.
- ✓ We prefer fixed price per station surveys, not daily rate surveys with rough estimates. With us, you don't get a fright come invoice time! You get charged what we quote, that's it!
- ✓ We don't just collect the data like the others. We drive it further and can process it, image it, model it and invert it. You name it, we can do it.
- ✓ We have logistical bases in Perth and Adelaide to enable rapid and cost effective deployment to all locations throughout Australia.
- ✓ We are happy to merge and reprocess your existing datasets from other contractors and correct them if necessary. Why repeat perfectly good data at great expense?
- ✓ **And last of all, being a small, client focussed company, we are responsive, reactive and flexible when it comes to our client's needs; it's our job!**

17.0 General Terms and Conditions

17.1 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

17.2 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.

17.3 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.

17.4 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

201104200001 (GA 20116400001) – FORREST A/S WINDSOCK

GDA94/GRS80		MGA Z52		AMG Z52	
Latitude	-30 50 44.1815	Easting	415,349.151	Easting	415,215.933
Longitude	128 06 53.0226	Northing	6,587,173.276	Northing	6,587,008.886
Ellipsoidal Height	135.938	Orthometric Height	155.474	Orthometric Height	155.474

OBSERVED GRAVITY

AAGD07 $\mu\text{m/s}^2$ 9792920.79

Occupation Method/Location Details

The GPS control point consists of a dumpy steel star 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.

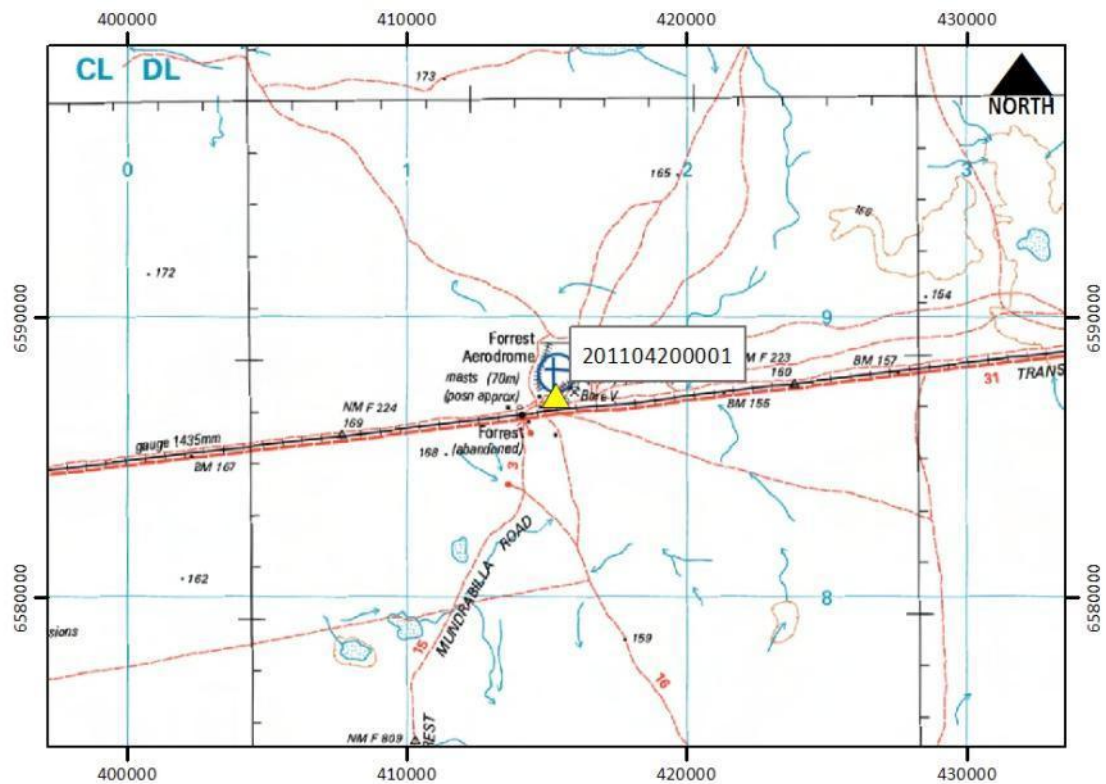
Gravity Control was established by Atlas Geophysics via multiple ABA loops with four gravity meters to AFGN station 1950999912 Forrest A/S Hangar on foot. Expected accuracy would be better than $0.1 \mu\text{m/s}^2$.

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

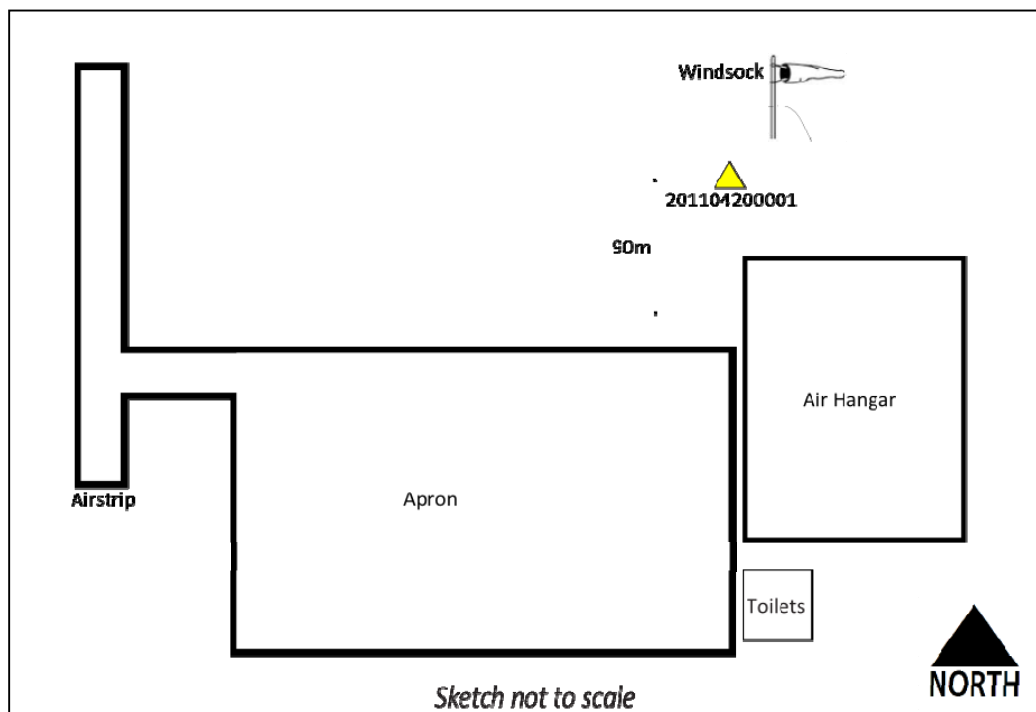
The control station is located near the windsock that is closest to the airport hangar, approximately 90m from the north eastern edge of the apron. The control station itself is located within 5m of the bitumen ring surrounding the windsock.



Photograph of Control Station 201104200001



Location of Control Station 201104200001



Locality Sketch of Control Station 201104200001

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

8 November 2007

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

MINERALS AND ENERGY
RESOURCES
Executive Office
Level 7
101 Grenfell Street
Adelaide SA 5000
GPO Box 1671
Adelaide SA 5001
DX 667
Tel (08) 8463 3201
Fax (08) 8463 4155
www.pir.sa.gov.au

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

Dr Edward Tyne
DIRECTOR, MINERAL RESOURCES



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.

A handwritten signature in blue ink, appearing to read "D. Gray".

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

Ph: +61 8 8463 3087
Fax: +61 8 8463 3048
Email: gray.daniel@saugov.sa.gov.au



Australian Government

Geoscience Australia

Cnr Jerrabomberra Avenue
and Hindmarsh Drive,
Symonston ACT 2609

GPO Box 378,
Canberra, ACT 2601 Australia

Phone: +61 2 6249 9111

Facsimile: +61 2 6249 9999

Email: Ray.Tracey@ga.gov.au

Web: www.ga.gov.au

ABN 80 091 799 039

Atlas Geophysics is one of five companies that Geoscience Australia employs under contract for the acquisition and supply of gravity data. Since 2007, Atlas has acquired over 100,000 gravity stations in the course of 12 projects managed by Geoscience Australia. These projects have required the acquisition and processing of gravity data at station spacings ranging from 1 to 4 kilometres in all areas of Australia and in a variety of terrains. The projects have ranged from regional projects where the main objective of the gravity acquisition was to assist in the geological understanding of the area for regional mapping and sedimentary basement delineation, to more detailed projects such as for those for groundwater studies. In all cases, Atlas has completed these projects successfully and to the required specifications.

Ray Tracey

Senior Geophysicist

Continental Geophysics

Minerals and Natural Hazards Division

Geoscience Australia

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