Alice Springs, Northern Territory TEMPEST Geophysical Survey

Acquisition and Processing Report

for

NuPower Resources Limited

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		…………………………..

Survey flown: June - July 2007

by

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FAS JOB # 1885

CONTENTS

1. SURVEY OPERATIONS AND LOGISTICS 4
 1.1 INTRODUCTION 4
 1.2 SURVEY BASE 4
 1.3 SURVEY PERSONNEL 4
 1.4 AREA MAP 5
2. SURVEY SPECIFICATIONS AND PARAMETERS 6
 2.1 AREA CO-ORDINATES 6
 2.2 SURVEY AREA PARAMETERS 7
 2.3 FLIGHT PLANS 7
 2.4 JOB SAFETY PLAN 7
3. AIRCRAFT EQUIPMENT AND SPECIFICATIONS 8
 3.1 AIRCRAFT 8
 3.2 TEMPEST SYSTEM SPECIFICATIONS 8
  3.2.1 EM Receiver and Logging Computer 8
  3.2.2 TEMPEST Transmitter 9
  3.2.3 TEMPEST 3-Axis Towed Bird Assembly 9
 3.3 PDAS 1000 SURVEY COMPUTER 9
  3.3.1 Cesium Vapour Magnetometer Sensor 9
  3.3.2 Magnetometer Processor Board 9
  3.3.3 Fluxgate Magnetometer 9
  3.3.4 GPS Receiver 9
  3.3.5 Differential GPS Demodulator 9
 3.4 NAVIGATION SYSTEM 10
 3.5 ALTIMETER SYSTEM 10
  3.5.1 Radar Altimeter 10
  3.5.2 Barometric Altimeter 10
 3.6 VIDEO TRACKING SYSTEM 10
 3.7 DATA RECORDED BY THE AIRBORNE ACQUISITION EQUIPMENT 10
4. GROUND DATA ACQUISITION EQUIPMENT AND SPECIFICATIONS 11
 4.1 MAGNETIC BASE STATION 11
 4.2 GPS BASE STATION 11
5. EM AND OTHER CALIBRATIONS AND MONITORING 12
 5.1 PRE-FLIGHT BAROMETER CALIBRATION: LINE C1511 12
 5.2 PRE-FLIGHT ZERO: LINE C9001 12
 5.3 PRE-FLIGHT SWOOPS: LINE C9002 12
 5.4 POST-FLIGHT ZERO: LINE C9003 12
 5.5 POST-FLIGHT BAROMETER CALIBRATION: LINE C1611 12
 5.6 ADDITIVE EM MEASUREMENTS: LINES C9004, C9005, AND C9007 12
 5.7 DYNAMIC MAGNETOMETER COMPENSATION 12
 5.8 PARALLAX CHECKS 13
 5.9 RADAR ALTIMETER CALIBRATION 13
 5.10 HEADING ERROR CHECKS 13
6. DATA PROCESSING 14
 6.1 FIELD DATA PROCESSING 14
  6.1.1 Quality Control Specifications 14
  6.1.2 In-Field Data Processing 14
 6.2 FINAL DATA PROCESSING 14
  6.2.1 Magnetics 14
  6.2.2 Derived Topography 15
  6.2.3 Electromagnetic Data Processing 16

6.2.4 Conductivity Depth Images (CDI) ... 19
6.2.5 System Specifications for Modelling TEMPEST Data ... 19
6.2.6 Delivered Products ... 20

7. REFERENCES ... 21

APPENDIX I – FLIGHT PLAN ... 22

APPENDIX II – WEEKLY ACQUISITION REPORTS ... 26

APPENDIX III – FLIGHT SUMMARY (LINE LISTING) ... 31

APPENDIX IV – LOCATED DATA FORMAT ... 36

APPENDIX V – LIST OF ALL SUPPLIED DATA AND PRODUCTS ... 62

1. SURVEY OPERATIONS AND LOGISTICS

1.1 Introduction

Between the 18th of June 2007 and the 21st of July 2007, Fugro Airborne Surveys Pty. Ltd. (FAS) undertook an airborne TEMPEST electromagnetic and magnetic survey for NuPower Resources Limited, over the Alice Springs Project areas in the Northern Territory. The survey consisted of five areas located NW of Alice Springs, and covered 6648.2 line kilometres. The survey was flown in 25 flights. The survey was flown using a CASA C212-200 Turbo Prop aircraft, registration VH-TEM owned and operated by FAS. This report summarises the procedures and equipment used by FAS in the acquisition, verification and processing of the airborne geophysical data.

1.2 Survey Base

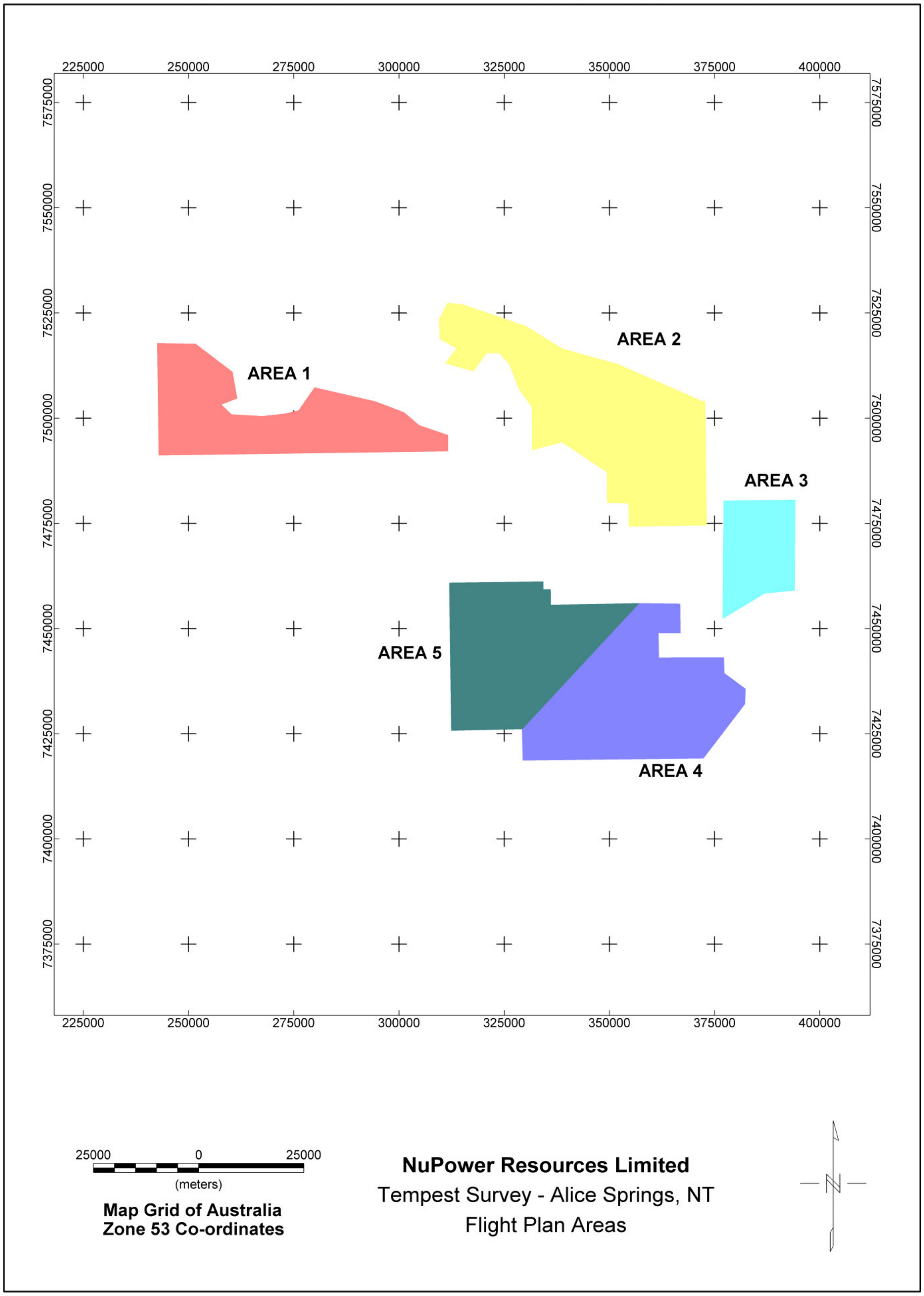
The survey was based out of Alice Springs, Northern Territory. The survey aircraft was operated from the Alice Springs airports with the aircraft fuel available on site. A temporary office was set up in a room at the Diplomat Hotel, Alice Springs, where all survey operations were run and the post-flight data verification was performed.

1.3 Survey Personnel

The following personnel were involved in this project:

Project Supervision - Acquisition	Bart Anderson
- Processing	Matthew Owers,
On-site Crew Leader	Grant Hamilton
Pilot/s	Grant Hamilton, Gabriel Kalotay
System Operator/s	Danial Green
Aircraft Engineer	Richard Carden
Field Data Processing	Martyn Allen
Office Data Processing	Stuart Baron-Hay

1.4 Area Map


225000
250000
275000
300000
325000
350000
375000
400000
7575000
7550000
7525000
7500000
7475000
7450000
7425000
7400000
7375000
AREA 1
AREA 2
AREA 3
AREA 4
AREA 5
25000
0
25000
(meters)
Map Grid of Australia
Zone 53 Co-ordinates
NuPower Resources Limited
Tempest Survey - Alice Springs, NT
Flight Plan Areas

2. SURVEY SPECIFICATIONS AND PARAMETERS

2.1 Area Co-ordinates

The survey area was located within UTM Zone 53S, Central Meridian = 135
(Note - Co-ordinates in WGS84 Zone 53)

Area 1 - West

Easting	Northing
251747	7517912
260650	7511111
261813	7504568
258234	7503136
260298	7501129
267456	7500723
272770	7501270
276009	7502063
279842	7507569
294227	7504274
297150	7503196
301385	7501568
304933	7498518
311917	7496138
311917	7491894
242650	7490926
242326	7518087

Area 2 - North

Easting	Northing
314959	7527302
330285	7522055
338804	7516764
352253	7512996
372155	7504208
372998	7504302
373350	7474331
354453	7474021
354315	7479532
349238	7479661
349159	7487087
338705	7494022
331404	7492109
331334	7502617
328231	7507004
326006	7512733
323723	7515213
320953	7515214
317760	7510909
310671	7512924
313335	7516500
309483	7518692
309267	7523379
311374	7527593

Area 3 - East

Easting	Northing
394393	7480839
394246	7458853
386983	7458147
376720	7451946
376899	7474301
376899	7480565

Area 4 - South

Easting	Northing
367017	7456114
367091	7448647
361868	7448715
361982	7443315
377392	7443346
377534	7439502
382564	7435783
382435	7431992
372453	7418947
329223	7418444
329001	7426263
356833	7456207

Area 5 - Central

Easting	Northing
334710	7461579
334730	7459734
336439	7459753
336480	7456064
358046	7456424
329483	7425694
312002	7425294
311550	7461308

2.2 Survey Area Parameters

Job Number	-	1885
Survey Company	-	Fugro Airborne Surveys Pty Ltd
Date Flown	-	18th June 2007 – 21st July 2007
Client	-	NuPower Resources Limited
EM System	-	25 Hz TEMPEST
Navigation	-	Real-time differential GPS
Datum	-	GDA94 (Zone 53)
Area Name	-	Area 1-5 Alice Springs, Northern Territory
Nominal Terrain Clearance	-	120 m

Area	Traverse Line Spacing	Traverse Line Direction	Tie Line Spacing	Tie Line Direction	Line Kilometres
1	500 m	113 – 293	11000 m	023 – 203	2230.8
2	1000 m	113 – 293	N/A	N/A	1666.2
3	1000 m	090 – 270	N/A	N/A	310.6
4	1000 m	000 – 180	N/A	N/A	1296
5	1000 m	000 - 180	N/A	N/A	1144.6

Traverse Line Numbers	-	Area 1 - West	1001 – 1063
		Area 2 - North	2001 – 2034
		Area 3 - East	3001 – 3019
		Area 4 – South	4001 - 4053
		Area 5 – Central	5001 – 5046
Tie Line Numbers	-	Area 1 – West	1701 - 1707
Total Survey Line Kilometres	-	6648.2	

2.3 Flight Plans

The flight plans are given in Appendix 1.

2.4 Job Safety Plan

A Job Safety Plan was prepared and implemented in accordance with the Fugro Airborne Surveys Occupational Safety & Health Management System.

3. AIRCRAFT EQUIPMENT AND SPECIFICATIONS

3.1 Aircraft

Manufacturer	-	CASA
Model	-	C212-200 Turbo Prop
Registration	-	VH-TEM
Ownership	-	Fugro Airborne Surveys Pty Ltd

3.2 TEMPEST System Specifications

Specifications of the TEMPEST Airborne EM System (Lane et al., 2000) are:

- Base frequency - 25 Hz
- Transmitter area - 221 m^2
- Transmitter turns - 1
- Waveform - Square
- Duty cycle - 50%
- Transmitter pulse width - 10 ms
- Transmitter off-time - 10 ms
- Peak current - 280 A
- Peak moment - 61880 Am^2
- Average moment - 30940 Am^2
- Sample rate - 75 kHz on X and Z
- Sample interval - 13 microseconds
- Samples per half-cycle - 1500
- System bandwidth - 25 Hz to 37.5 kHz
- Flying height - 120 m (subject to safety considerations)
- EM sensor - Towed bird with 3 component dB/dt coils
- Tx-Rx horizontal separation - 120 m (nominal)
- Tx-Rx vertical separation - 35 m (nominal)
- Stacked data output interval - 200 ms (~12 m)
- Number of output windows - 15
- Window centre times - 13 µs to 16.2 ms
- Magnetometer - Stinger-mounted cesium vapour
- Magnetometer compensation - Fully digital
- Magnetometer output interval - 200 ms (~12 m)
- Magnetometer resolution - 0.001 nT
- Typical noise level - 0.2 nT
- GPS cycle rate - 1 second

3.2.1 EM Receiver and Logging Computer

The EM receiver computer is a Picodas PDAS-1000 data acquisition system. The EM receiver computer executes a proprietary program for system control, timing, data acquisition and recording. Control, triggering and timing is provided to the TEMPEST transmitter and DSP signal processing boards by the timing card, which ensures that all waveform generation and sampling is accomplished with high accuracy. The timing card is synchronised to GPS through the use of the PPS output from the system GPS card. Synchronisation is also provided to the magnetometer processor card for the purpose of accurate magnetic sampling with respect to the EM transmitter waveform.

The EM receiver computer displays information on the main screen during system calibrations and survey line acquisition to enable the airborne operator to assess the data quality and performance of the system.

3.2.2 TEMPEST Transmitter

The transmitted waveform is a square wave of alternating polarity, which is triggered directly from the EM receiver computer. The nominal transmitter base frequency was 25 Hz with a pulse width of 10ms (50 % duty cycle). Loop current waveform monitoring is provided by a current transformer located directly in the loop current path to allow for full logging of the waveform shape and amplitude, which is sampled by the EM receiver.

3.2.3 TEMPEST 3-Axis Towed Bird Assembly

The TEMPEST 3-axis towed bird assembly provides accurate low noise sampling of the X (horizontal in line), Y (horizontal transverse) and Z (vertical) components of the electromagnetic field. The receiver coils measure the time rate of change of the magnetic field (dB/dt). Signals from each axis are transferred to the aircraft through a tow cable specifically designed for its electrical and mechanical properties.

3.3 PDAS 1000 Survey Computer

The SURVEY computer is a PICODAS PDAS 1000 data acquisition system. The SURVEY computer executes a proprietary program for acquisition and recording of location, magnetic and ancillary data. Data are presented both numerically and graphically in real time on the VGA LCD display, which provides an on-line display capability. The operator may alter the sensitivity of the displays on-line to assist in quality control. Selected EM data are transferred from the EM receiver computer to the SURVEY computer for QC display.

3.3.1 Cesium Vapour Magnetometer Sensor

A cesium vapour magnetometer sensor is utilised on the aircraft and consists of the sensor head and cable, and the sensor electronics. The sensor head is housed at the end of a composite material tail stinger.

3.3.2 Magnetometer Processor Board

A Picodas magnetometer processor board is used for de-coupling and processing the Larmor frequency output of the magnetometer sensor. The processor board interfaces with the PDAS 1000 survey computer, which initiates data sampling and transfer for precise sample intervals and also with the EM receiver computer to ensure that the magnetic samples remain synchronised with the EM system.

3.3.3 Fluxgate Magnetometer

A tail stinger mounted Bartington MAG-03MC three-axis fluxgate magnetometer is used to provide information on the attitude of the aircraft. This information is used for compensation of the measured magnetic total field.

3.3.4 GPS Receiver

A Novatel GPScard 951R is utilised for airborne positioning and navigation. Satellite range data are recorded for generating post processed differential solutions.

3.3.5 Differential GPS Demodulator

The OMNISTAR differential GPS service provides real time differential corrections.

3.4 Navigation System

A Picodas PNAV 2001 Navigation Computer is used for real-time navigation. The PNAV computer loads a pre-programmed flight plan from disk which contains boundary co-ordinates, line start and end co-ordinates, local co-ordinate system parameters, line spacing, and cross track definitions. The WGS-84 latitude and longitude positional data received from the Novatel GPScard contained in the SURVEY computer is transformed to the local co-ordinate system for calculation of the cross track and distance to go values. This information, along with ground heading and ground speed, is displayed to the pilot numerically and graphically on a two line LCD display, and on an analog HSI indicator. It is also presented on a LCD screen in conjunction with a pictorial representation of the survey area, survey lines, and ongoing flight path.

The PNAV is interlocked to the SURVEY computer for auto selection and verification of the line to be flown. The GPS information passed to the PNAV 2001 navigation computer is corrected using the received real time differential data, enabling the aircraft to fly as close to the intended track as possible.

3.5 Altimeter System

3.5.1 Radar Altimeter

Model:	Sperry Stars RT-220 radio altimeter system
Sample interval:	0.2 second
Accuracy:	+/- 1.5 % of indicated altitude.

The Sperry radio altimeter is a high quality instrument whose output is factory calibrated. It is fitted with a test function which checks the calibration of a terrain clearance of 100 feet, and altitudes which are multiples of 100 feet. The aircraft radio altitude is recorded onto digital tape as well as displayed on the aircraft chart recorder. The recorded value is the average of the altimeters output during the previous second.

3.5.2 Barometric Altimeter

Output of a Digiquartz 215A-101pressure transducer is used for calculating the barometric altitude of the aircraft. The atmospheric pressure is taken from a gimbal-mounted probe projecting 0.5 metres from the wing tip of the aircraft and fed to the transducer mounted in the aircraft wingtip.

3.6 Video Tracking System

The video tape recorded by a PAL VHS colour video system is synchronised with the geophysical record by a digital fiducial display, which is recorded along with GPS latitude and longitude information and survey line number.

3.7 Data Recorded by the Airborne Acquisition Equipment

Raw EM data including fiducial, local time, X, Y, Z axis sensor response, current monitor and bird auxiliary sensor output are recorded on the EM receiver computer as "**G**" EM files.

The Survey computer records all other survey data including aeromagnetic and GPS data using as "**S**" Survey files, and "**R**" Rover files containing GPS raw range data for post processing.

4. GROUND DATA ACQUISITION EQUIPMENT AND SPECIFICATIONS

4.1 Magnetic Base Station

A CF1 magnetometer was used to measure the daily variations of the Earth's magnetic field. The base station was established in an area of low gradient, away from cultural influences. The base station was run continuously throughout the survey flying period with a sampling interval of 5 seconds at a sensitivity of 0.01 nT. The base station data were closely examined after each day's production flying to determine if any data had been acquired during periods of out-of-specification diurnal variation. The base station was located near the airport apron at Alice Springs.

4.2 GPS Base Station

A GPS base logging station was set up at Alice Springs Airport. The GPS antenna was positioned on the grassed area between the runway and the apron.

The GPS base system was comprised of a Novatel GPS PC card mounted in a portable IBM computer. The computer is connected to a mains UPS backup, with a reserve capacity of approximately 100 minutes, to ensure continuous data logging in the event of mains power interruptions.

The GPS base station position was calculated by logging data continuously at the base position over a period of approximately 30 hours. These data were then statistically averaged to obtain the position of the base station using GrafNav software.

The calculated GPS base position was (in WGS84):

Lat: 23° 48' 18.73415" S
Long: 133° 54' 18.47031" E
Height: 552.030 m. (WGS84 Ellipsoidal Height)

5. EM AND OTHER CALIBRATIONS AND MONITORING

At the beginning and end of each individual survey flight, the EM system is checked for background noise levels and performance. All of these checks are conducted at a nominal terrain clearance of 600 m (2000 ft) to eliminate ground response.

These checks include:-

5.1 Pre-Flight Barometer Calibration: Line C1511

A recording of the barometer output at a known elevation is carried out before take-off to assist with calibration and determination of drift during the flight. The barometer is used as a back-up to the GPS for aircraft altitude.

5.2 Pre-Flight Zero: Line C9001

This manoeuvre is performed once the aircraft is established en route to the survey area. Background EM levels are recorded and assessed by the airborne operator to determine if:-

a. the system noise level is acceptable,
b. the response had not varied significantly from previous flights, and
c. the sferic level is acceptable.

These data are recorded for approximately 90 seconds.

5.3 Pre-Flight Swoops: Line C9002

This manoeuvre is conducted immediately after the pre sortie zero. During this manoeuvre the relative position of the towed sensor is deliberately made to vary relative to the aircraft. The EM data are monitored by the airborne operator to confirm correct operation of the system during the manoeuvre.

5.4 Post-Flight Zero: Line C9003

This calibration is performed immediately following the completion of the survey sorties. Background EM levels are recorded to characterise any changes occurred in the system over the duration of the flight. These data are recorded for approximately 90 seconds.

5.5 Post-Flight Barometer Calibration: Line C1611

A recording of the barometer output is repeated following landing at the end of the flight to assist with calibration and determination of drift during the flight.

5.6 Additive EM Measurements: Lines C9004, C9005, and C9007

A recording of the background signal through the X, Y and Z receiver coil inputs is carried out before and/or after acquisition of data for survey lines on each flight. These measurements may be made with the transmitter on (C9004, C9005) or with the transmitter off (C9007). The signal from the receiver coils is removed from the signal pathway by disconnecting the power to the bird at the winch inside the aircraft.

5.7 Dynamic Magnetometer Compensation

To limit aircraft manoeuvre effects on the magnetic data that can be of the same spatial wavelength as the signals from geological sources, compensation calibration lines are flown in a low magnetic gradient area close to the survey. This involves flying a series of tests on the survey line heading and approximately 15 degrees either side to accommodate small heading variations whilst flying survey lines. The data for each heading consists of a series of aircraft manoeuvres, including pitches, rolls and yaws. This is done to artificially create the most extreme possible attitude the aircraft may encounter whilst on survey. Data from these lines are used to derive compensation coefficients for removing magnetic noise induced by the aircraft's attitude in the naturally occurring magnetic field.

Compensation data were acquired on the 19th of June 2007.

5.8 Parallax Checks

Due to the relative positions of the EM towed bird and the magnetometer instruments on the aircraft and to processing / recording time lags, raw readings from each vary in position. To correct for this and to align selected anomaly features on lines flown in opposite directions, magnetics, EM data and the altimeters are 'parallaxed' with respect to the position information. System parallax is checked occasionally or following any major changes in the aircraft system which are likely to affect the parallax values.

Variable	Parallax Value
Magnetics	0.6 s
GPS	0 s
Radar Altimeter	0.6 s
EM – X	0.2 s
EM – Z	1.4 s

5.9 Radar Altimeter Calibration

The radar altimeter is checked for accuracy and linearity every 12 months or when any change in a key system component requires this procedure to be carried out. This calibration allows the radar altimeter data to be compared and assessed with other height data (GPS and barometric) to confirm the accuracy of the radar altimeter over its operating range.

Absolute radar and barometric altimeter calibration was carried out over water at Mandurah, WA and was successful in calibrating the radar altimeter to information provided by the GPS and barometer instrument. Calibration factors were as expected. The calibration procedure also provides parallax information required for positional correction of the radar and GPS altimeters.

5.10 Heading Error Checks

Historically, heading error checks have been part of the aeromagnetic data acquisition procedure but they are no longer used. Fugro Airborne Surveys now calculates these effects using the aircraft magnetic compensation system and specially developed software. The precision to which these effects are now calculated and corrected for is far in excess of the manual methods used in the past.

6. DATA PROCESSING

6.1 Field Data Processing

6.1.1 Quality Control Specifications

6.1.1.1 Navigation Tolerance

The re-flight specifications applied for the duration of the survey were:

Electronic Navigation - absence of electronic navigation data (e.g. GPS base station fails).

Flight Path – flight path deviates from the flight plan by more than 50% of the nominal line spacing for more than 5 km or where lines cross.

Altitude - terrain clearance continuously exceeds the nominal terrain clearance by plus or minus 30 m over a distance of 5 km or more unless to do so would, in the sole opinion of the pilot, jeopardise the safety of the aircraft or the crew or the equipment or would be in contravention of the Civil Aviation Safety Authority regulation such as those pertaining to built up areas.

6.1.1.2 Magnetics Noise And Diurnal Tolerance

The re-flight specifications applied for the duration of the survey were:

Magnetic Diurnal - where the magnetometer base station data exceeds a 10 nT change in 10 minutes.

6.1.1.3 Electromagnetic Data

The quality control checks on the electromagnetic data were:

Noise - where RMS noise in the last channel of the EM data exceeds 0.1 fT over 3 km for B-field (assessed in a resistive region) or where FAS believes an important anomaly is rendered un-interpretable.

Sferics – where sferic activity renders a potential anomaly un-interpretable.

6.1.2 In-Field Data Processing

Following acquisition, multiple copies of the EM data are made onto DVDs or CDs. The EM, location, magnetic and ancillary data are then processed at the field base to the point that the quality of the data from each flight can be fully assessed. Copies of the raw and processed data are then transferred to Perth for final data processing. A more comprehensive statement of EM data processing is given in section 6.2.3.

6.2 Final Data Processing

6.2.1 Magnetics

Magnetic data were compensated for aircraft manoeuvre noise using coefficients derived from the appropriate compensation flight. Base station data is edited so that all significant spikes, level shifts and null data are eliminated.

A diurnal base value was then added.

Area	Base Value
All Areas	53325 nT

A lag was applied to synchronise the magnetic data with the navigation data.

The International Geomagnetic Reference Field (IGRF) 2000 model (updated for secular variation 2007.5) was removed from the levelled total field magnetics. An IGRF base value was then added to the data.

Area	Base Value
Area 1	52610 nT
Area 2	52553 nT
Area 3	52784 nT
Area 4	52967 nT
Area 5	52967 nT

Following this, a FAS proprietary microlevelling process was applied in order to more subtly level the data.

6.2.2 Derived Topography

Aircraft navigation whilst in survey mode is via real time differential GPS, obtained by combining broadcast differential corrections with on-board GPS measurements. Terrain clearance is measured with a radar altimeter.

The ground elevation, relative to the WGS84 spheroid used by GPS receiver units, is obtained by subtracting the terrain clearance from the aircraft altitude, noting the vertical separation between the GPS antenna and the radar altimeter, and applying suitable parallax corrections between the two measurements.

The digital elevation model derived from this survey can be expected to have an absolute accuracy of +/- several metres in areas of low to moderate topographic relief. Sources of error include uncertainty in the location of the GPS base station, variations in the radar altimeter characteristics over ground of varying surface texture, and the finite footprint of the radar altimeter.

Following this, a FAS proprietary microlevelling process was applied in order to more subtly level the data.

An N-Value is subtracted to correct the final data to the Australian Height Datum (AHD).

The accuracy of the elevation calculation is directly dependent on the accuracy of the two input parameters, radar altitude and GPS altitude. The radar altitude value may be erroneous in areas of heavy tree cover, where the altimeter reflects the distance to the tree canopy rather than the ground. The GPS altitude value is primarily dependent on the number of available satellites. Although post-processing of GPS data will yield X and Y accuracies in the order of 1-2 metres, the accuracy of the altitude value is usually much less, sometimes in the ±5 metre range. Further inaccuracies may be introduced during the interpolation and gridding process.

Because of the inherent inaccuracies of this method, no guarantee is made or implied that the information displayed is a true representation of the height above sea level. Although this product may be of some use as a general reference, THIS PRODUCT MUST NOT BE USED FOR NAVIGATION PURPOSES.

6.2.3 Electromagnetic Data Processing

Details of the pre-processing applied to TEMPEST data can be found in Lane et al. (2000).

6.2.3.1 Standard EM Processing

Calibration
High altitude calibration data are used to characterise the system response in the absence of any ground response.

Cleaning and Stacking
Routines to suppress sferic noise, powerline noise, VLF noise, coil motion noise (collectively termed “cleaning”) and to stack the data are applied to the survey line data. Output from the stacking filter is drawn at 0.2 second intervals. The stacked data are saved to file as an internal data management practice.

Deconvolution and Binning
The survey height stacked data are deconvolved using the high altitude reference waveform. The effect of currents in the transmitter loop and airframe (“primary”) are then removed, leaving a “pure” ground response. The deconvolved ground response data are then transformed to B-field response for a perfect 100% duty cycle square wave. Finally, the evenly spaced samples are binned into a number of windows.

Table of TEMPEST window information for 25Hz base frequency

Window #	Start sample	End sample	No of samples	start time (s)	End time (s)	centre time (s)	centre time (ms)
1	1	2	2	0.000007	0.000020	0.000013	0.013
2	3	4	2	0.000033	0.000047	0.000040	0.040
3	5	6	2	0.000060	0.000073	0.000067	0.067
4	7	10	4	0.000087	0.000127	0.000107	0.107
5	11	16	6	0.000140	0.000207	0.000173	0.173
6	17	26	10	0.000220	0.000340	0.000280	0.280
7	27	42	16	0.000353	0.000553	0.000453	0.453
8	43	66	24	0.000567	0.000873	0.000720	0.720
9	67	102	36	0.000887	0.001353	0.001120	1.120
10	103	158	56	0.001367	0.002100	0.001733	1.733
11	159	246	88	0.002113	0.003273	0.002693	2.693
12	247	384	138	0.003287	0.005113	0.004200	4.200
13	385	600	216	0.005127	0.007993	0.006560	6.560
14	601	930	330	0.008007	0.012393	0.010200	10.200
15	931	1500	570	0.012407	0.019993	0.016200	16.200

The data are reviewed after windowing. Any decisions involving re-flights due to AEM factors are made at this point.

Raw and Final EM Data
The “raw” or “uncorrected” EM amplitudes reflect, not only the variations in ground conductivity, but the variations in geometry of the various parts of the EM measurements (i.e. transmitter loop pitch, transmitter loop roll, transmitter loop terrain clearance, transmitter loop to receiver coil horizontal longitudinal separation, transmitter loop to receiver coil horizontal transverse separation, and transmitter loop to receiver coil vertical separation) during the survey. For example, the largest influence on the early time EM amplitude is the terrain clearance of the transmitter loop. The larger the terrain clearance, the smaller the amplitude. Later window times (larger window number) show diminished variations due to terrain clearance.

“Final” or “geometry-corrected” located data are produced for optimum presentation of the EM amplitude data in image format (e.g. window amplitude images, principal component analysis images derived from the window amplitudes (Green,1998b)). Between “raw” and “final” states, the ground response data undergo an approximate correction to produce data from a nominated standard geometry. A dipole-image method (Green, 1998a) is used to adjust the data to the response that would be expected at a standard terrain clearance (120m), standard transmitter loop pitch and roll (zero degrees), and a standard transmitter loop to receiver coil geometry (120m behind and 35 below the aircraft). These variables have been set to their respective standard values in the “final” located data (whereas the “raw” located data file contains the variable field data). Zero parallax is applied to transmitter loop pitch, roll, terrain clearance, X component EM and Z component EM data prior to geometry correction. Over extremely conductive ground (e.g. > 100 S conductance), the estimates for transmitter loop to receiver coil separation determined from the primary field coupling factors may be in error at the metre scale due to uncertainty in the estimation of the primary field. This will influence the accuracy of very early time window amplitude information in the “geometry-corrected” located data. Receiver coil pitch has a significant effect on early time Z component response and late time X component response (Green and Lin, 1996). Receiver coil roll impacts early time Z component response.

Levelling
Limited range micro-levelling may be applied to the final window amplitudes for presentation purposes, principally for multi-flight surveys or when isolated re-flight lines are present.

6.2.3.2 Factors and Corrections

Geometric Factor
The geometric factor gives the ratio of the strength of the primary field coupling between the transmitter loop and the receiver coil at each observation relative to the coupling observed at high altitude during acquisition of reference waveform data. Variations in this factor indicate a change in the attitude and/or relative separation of the transmitter loop and the receiver coil.

Transmitter-Receiver Geometry
Transmitter to receiver geometry values for each observation are derived from the high altitude reference waveforms and knowledge of the system characteristics. These data are available in the located data (see section 6.2.6.1 for “standardised” values)

GPS Antenna, Laser Altimeter and Transmitter Loop Offset Corrections
The transmitter loop was mounted 0.1m above the GPS antenna on the aircraft. The GPS antenna is 2.3m above the belly of the aircraft. The laser altimeter sensor is mounted in the belly of the aircraft. Therefore a total of 2.4m (0.1m + 2.3m) was added to the laser altimeter data to determine the transmitter loop height above the ground.

Transmitter Loop Pitch and Roll Correction
Measured vertical gyro aircraft pitch and roll attitude measurements are converted to transmitter loop pitch and roll by adding -0.9 degrees for pitch and -0.1 degrees for roll. Nose up is positive for pitch, and left wing up is positive for roll.

6.2.3.3 Primary Sources of EM Noise

A number of “monitor” values are calculated during processing to assist with interpretation. They generally represent quantities that have been removed as far as is practical from the data, but may still be present in trace amounts. These are more significant for interpretation of discrete conductors than for general mapping applications.

Sferic Monitor
Sferics are the electromagnetic signals associated with lightning activity. These signals travel large distances around the Earth. Background levels of sferics are recorded at all times from lightning activity in tropical areas of the world (eg tropical parts of Asia, South America and Africa). Additional higher amplitude signals are produced by "local" lightning activity (ie at distances of kilometres to hundreds of kilometres).

The sferic monitor is the sum of the absolute differences brought about by the sferic filter operations, summed over 0.2 second intervals, normalised by the receiver effective area. It is given in units of uV/sq.m/0.2s. Many sferics have a characteristic form that is well illustrated by figure 2 in Garner and Thiel (2000). The high frequency, initial part of a sferic event can be detected and filtered more easily than the later, low frequency portion. The sferic monitor indicates where at least the high frequency portion of a sferic has been successfully removed, but it is quite possible that lower frequency elements of the sferic event may have eluded detection, passing through to the window amplitude data. Thus, discrete anomalies coincident with sferic activity as indicated by the sferic monitor should be down-weighted relative to features clear of any sign of sferic activity.

Low Frequency Monitor

The Low Frequency Monitor (LFM) makes use of amplitudes at frequencies below the base frequency which are present in the streamed data to estimate the amplitude of coil motion (Earth magnetic field) noise at the base frequency in log10(pV/sqrt(Hz)/sq.m). The coil motion noise below the base frequency is rejected through the use of tapered stacking, but the coil motion noise at the base frequency itself is not easily removed. A sharp spike in the LFM can be an indicator of a coil motion event (eg the bird passing through extremely turbulent air). Note that the LFM will also respond to sferic events with an appreciable low frequency (sub-base frequency) component. This situation can be inferred when both the LFM and sferic monitors show a discrete kick.

Powerline Monitor

The powerline monitor gives the amplitude of the received signal at the powerline frequency (50 or 60 Hz) in log10(pV/sqrt(Hz)/sq.m). Careful selection of the base frequency (such that the powerline frequency is an even harmonic of the base frequency) and tapered stacking combine to strongly attenuate powerline signals. When passing directly over a powerline, the rapid lateral variations in the strength and direction of the magnetic fields associated with the powerline can result in imperfect cancellation of the powerline response during stacking. Some powerline-related interference can manifest itself in a form that is similar to the response of a discrete conductor. The exact form of the monitor profile over a powerline depends on the line direction, powerline direction, powerline current, and receiver component, but the monitor will show a general increase in amplitude approaching the powerline.

Grids (or images) of the powerline monitor reveal the location of the transmission lines. Note that the X component (horizontal receiver coil axis parallel with the flight line direction) does not register any response from powerlines parallel to the flight line direction since the magnetic fields associated with powerlines only vary in a direction perpendicular to the powerline. Note also that the Z component (vertical receiver coil axis) shows a narrow low directly over the powerline where the magnetic fields are purely horizontal.

Very Low Frequency Monitors

Wide area VLF communication signals in the 15 to 25 kHz frequency band are monitored by the TEMPEST system. In the Australian region, signals at 18.2 kHz, 19.8 kHz, 21.4 kHz and 22.2 kHz are monitored as the amplitude of the received signal at these frequencies in log10(pV/sqrt(Hz)/sq.m). The strongest signal comes from North West Cape (19.8 kHz). The signal at 18.2 kHz is often observed to pulse in a regular sequence. These strong narrow band signals have some impact on the high frequency response of the system, but they are strongly attenuated by selection of the base frequency and tapered stacking. The VLF transmissions are strongest in amplitude, in the horizontal direction at right angles to the direction to the VLF transmitter. This directional dependence enables the VLF monitors to be used to indicate the receiver coil attitude.

6.2.3.4 Other Sources of EM Noise

Man-made periodic discharges

If an image of the Z component sferic monitor shows the presence of spatially coherent events, then pulsed cultural interference would be strongly suspected. Since sferic signals are much stronger in the horizontal plane than in the vertical plane, few sferics of significant amplitude are recorded in Z component data. In contrast, evidence of cultural interference is generally swamped by true sferics in X component sferic monitor images.

Electric fences are the most common source of pulsed cultural interference. Periodic discharges (eg every second or so) into a large wire loop (fence) produce very large spikes in raw data. These are attenuated to a large degree by the sferic filter, but a residual artefact can still be present in the processed data.

Coil motion / Earth field noise
A change in coupling between the receiver coil and the ambient magnetic field will induce a voltage in the receiver coil. This noise is referred to as coil motion or Earth field noise. Receiver coils in the towed bird are suspended in a fashion that attempts to keep this noise below the noise floor at frequencies equal to and above the base frequency of the system. Severe turbulence, however, can result in 'coil knock events' that introduce noise into the processed data.

Grounded metal objects
Grounded extensive metal objects such as pipelines and rail lines can qualify as conductors and may produce a response that is visible in processed data. Grounded metal objects produce a response similar to shallow, highly conductive, steeply dipping conductors. These objects can sometimes be identified from good quality topographic maps, from aerial photographs, by viewing the tracking video, from their unusual spatial distribution (ie often a series of linear segments) and in some circumstances from their effect on the powerline monitor. A powerline running close to a long metal object will induce a 50 Hz response in the object.

6.2.4 Conductivity Depth Images (CDI)

CDI conductivity sections for TEMPEST data were calculated using EMFlow and then modified to reflect the finite depth of investigation using an in-house routine, *Sigtime*.

The *Sigtime* routine removes many of the spurious conductive features that appear at depth as a result of fitting long time constant exponential decays to very small amplitude features in the late times. For each observation, the time when the response falls below a signal threshold amplitude is determined. This time is transformed into a diffusion depth with reference to the conductivity values determined for that observation. Anomalous conductivity values below this depth are replaced by background values or set to undefined, reflecting the uncertainty in their origin. The settings and options applied are indicated in the appropriate header files for *Sigtime* output. This procedure is different to that which would be obtained by filtering conductivity values using either a constant time or constant depth across the entire line.

The "final" data for each area were input into version 5.10 of EMFlow to calculate Conductivity Depth Images (CDI). Conductivity values were calculated at each point then run through *Sigtime.* This processing was completed for the Z component data.

EMFlow was developed within the CRC-AMET through AMIRA research projects (Macnae et al, 1998, Macnae and Zonghou, 1998, Stolz and Macnae, 1998). The software has been commercialised by Encom Technology Pty Ltd. Examples of TEMPEST conductivity data can be seen in Lane et al. (2000), Lane et al. (1999), and Lane and Pracillio (2000).

Conductivity values were calculated to a depth of 500m below surface at each point, using a depth increment of 5m and a conductivity range of 40-4000mS/m.

6.2.5 System Specifications for Modelling TEMPEST Data

Differences between the specifications for the acquisition system, and those of the virtual system for which processed results are given, must be kept in mind when forward modelling, transforming or inverting TEMPEST data.

Acquisition is carried out with a 50% duty cycle square transmitter current waveform and dB/dt sensors.

During processing, TEMPEST EM data are transformed to the response that would be obtained with a B-field sensor for a 100% duty cycle square waveform at the base frequency, involving a 1A change in current (from -0.5A to +0.5A to -0.5A) in a 1sq.m transmitter. Data are given in units of femtotesla (fT = 10^{-15} Tesla). It is this configuration, rather than the actual acquisition configuration, which must be specified when modelling TEMPEST data.

Window timing information is given above (see section 6.2.3).

6.2.5.1 Standard Height and Geometry

The "final" EM data have been standardised through an approximate transformation to a standard transmitter loop terrain clearance, transmitter loop pitch and roll of zero degrees, and a fixed transmitter loop to receiver coil geometry (roughly equal to the average "raw" geometry values). Transmitter loop pitch, transmitter loop roll and transmitter loop terrain clearance values for each observation have been modified to reflect the standard values. Hence, the "final" (fixed) geometry values should be used if modelling with the final X- and Z-component amplitude data - the following table summarises the values used to correct the transmitter height/pitch/roll/geometry to.

Table of values used to standardise transmitter loop height, pitch, roll and geometry

Variable	Standardised value
Transmitter loop pitch	0 degrees
Transmitter loop roll	0 degrees
Transmitter loop terrain clearance	120 metres
Transmitter loop – to – receiver coil geometry	120 metres behind and 35 metres below the aircraft

6.2.5.2 Parallax

The located data files utilise the following parallax values :-

- magnetics = 0.6 fiducials (3 observations from the zero parallax position),
- radar altimeter = 0.6 fiducials (3 observations from the zero parallax position),
- EM X-component = 0.2 fiducials (1 observation from the zero parallax position),
- EM Z-component = 1.4 fiducials (7 observations from the zero parallax position),

These EM parallax values are optimised for aligning the EM response amplitudes for horizontal or broad steeply dipping conductors, which account for the majority of responses in regolith-dominated terrains such as this.

For optimum gridded display of the response for discrete vertical or narrow conductors, the following EM parallax values are appropriate :-

- EM X-component = 1.8 fiducials (9 observations from the zero parallax position, or 8 observations from the "horizontal" parallax position),
- EM Z-component = 0.6 fiducials (3 observations from the zero parallax position, or -4 observations from the "horizontal" parallax position).

(NB Positive parallax values are defined in this case as shifting the indicated quantity back along line to smaller fiducial values. Location information remains in the zero parallax state.)

6.2.6 Delivered Products

Appendix V contains a complete list of all data supplied digitally.

Digital located data in ASCII and Geosoft GDB format was produced, containing the raw and final, X and Z EM data as well as magnetics and digital elevation. The header file can be found in Appendix IV.

A list of gridded and map products can be found in Appendix V.

Acquisition and processing report in hardcopy and digital format.

7. REFERENCES

Garner, S.J., Thiel, D.V., 2000, Broadband (ULF-VLF) surface impedance measurements using MIMDAS: Exploration Geophysics, 31, 173-178.

Green, A., 1998. Altitude correction of time domain AEM data for image display and geological mapping, using the Apparent Dipole Depth (ADD) method. Expl. Geoph. 29, 87-91.

Green, A., 1998. The use of multivariate statistical techniques for the analysis and display of AEM data. Expl. Geoph. 29, 77-82.

Green, A., Lin, Z., 1996. Effect of uncertain or changing system geometry on airborne transient electromagnetic data: CSIRO Expl. and Mining Research News No. 6, August 1996, 9-11, CSIRO Division of Exploration and Mining.

Lane, R., 2000, Conductive unit parameters : summarising complex conductivity distributions: Paper accepted for presentation at the SEG Annual Meeting, August 2000.

Lane, R., Green, A., Golding, C., Owers, M., Pik, P., Plunkett, C., Sattel, D., Thorn, B., 2000, An example of 3D conductivity mapping using the TEMPEST airborne electromagnetic system: Exploration Geophysics, 31, 162-172.

Lane, R., Leeming, P., Owers, M., Triggs, D., 1999, Undercover assignment for TEMPEST: Preview, Issue 82, 17-21.

Lane, R., Pracilio, G., 2000: Visualisation of sub-surface conductivity derived from airborne EM, SAGEEP 2000, 101-111.

APPENDIX I – Flight Plan

```
JOB_Number  1885                                                                 *
CLIENT      NuPower Resources                                                    *
AREA_NAME   1                                                                    *
PLANNED_BY  gps2                                                                 *
|                                                                                *
SPHEROID    22  W.G.S_1984 6378137.0 298.257223563 0.9996                        *
DELTAXYZ    0.0 0.0 0.0 0.0 0.0 0.0 0.0                                          *
HEMISPHERE  SOUTH                                                                *
UTM_ORIGIN  53   135   135                                                       *
BOUNDARY    1   251747  7517912 -22.427029 +132.588153 -222537.3 +1323517.4 12 *
BOUNDARY    2   260650  7511111 -22.489687 +132.673567 -222922.9 +1324024.8 12 *
BOUNDARY    3   261813  7504568 -22.548911 +132.683881 -223256.1 +1324102.0 12 *
BOUNDARY    4   258234  7503136 -22.561327 +132.648884 -223340.8 +1323856.0 12 *
BOUNDARY    5   260298  7501129 -22.579735 +132.668633 -223447.0 +1324007.1 12 *
BOUNDARY    6   267456  7500723 -22.584395 +132.738148 -223503.8 +1324417.3 12 *
BOUNDARY    7   272770  7501270 -22.580181 +132.789884 -223448.7 +1324723.6 12 *
BOUNDARY    8   276009  7502063 -22.573452 +132.821483 -223424.4 +1324917.3 12 *
BOUNDARY    9   279842  7507569 -22.524243 +132.859508 -223127.3 +1325134.2 12 *
BOUNDARY   10   294227  7504274 -22.555795 +132.998877 -223320.9 +1325956.0 12 *
BOUNDARY   11   297150  7503196 -22.565874 +133.027146 -223357.1 +1330137.7 12 *
BOUNDARY   12   301385  7501568 -22.581078 +133.068115 -223451.9 +1330405.2 12 *
BOUNDARY   13   304933  7498518 -22.609023 +133.102237 -223632.5 +1330608.1 12 *
BOUNDARY   14   311917  7496138 -22.631306 +133.169867 -223752.7 +1331011.5 12 *
BOUNDARY   15   311917  7491894 -22.669621 +133.169359 -224010.6 +1331009.7 12 *
BOUNDARY   16   242650  7490926 -22.669242 +132.495438 -224009.3 +1322943.6 12 *
BOUNDARY   17   242326  7518087 -22.424053 +132.496723 -222526.6 +1322948.2 12 *
SQUARE_KMS  1015.507                                                             *
|                                                                                *
NAVTYPE     NOVATEL                                                              *
NAVMODE     U.T.M                                                                *
PLAN_TYPE   Normal                                                               *
LINE_TYPE   S.LINE    X.LINE    0         0                                      *
HEADING     113       203                                                        *
SPACING     500       11000     500       500                                    *
OVER_LINE   1         1                                                          *
OVERFLY     0         0                                                          *
MIN_LENGTH  8         8                                                          *
FIRST_LINE  10        10                                                         *
INCREMENT   1         1                                                          *
X_TRACK     100       100                                                        *
MASTER_PT   1   251747  7517912 -22.427029 +132.588153                           *
MASTER_NEW  0  Not implemented.                                                  *
KM_IN_AREA  2404      114                                                        *
KM+OVERFLY  2404      114                                                        *
```

```
JOB_Number  1885                                                                 *
CLIENT      NuPower Resources                                                    *
AREA_NAME   2                                                                    *
PLANNED_BY  gps2                                                                 *
|                                                                                *
SPHEROID    22  W.G.S_1984 6378137.0 298.257223563 0.9996                        *
DELTAXYZ    0.0 0.0 0.0 0.0 0.0 0.0 0.0                                          *
HEMISPHERE  SOUTH                                                                *
UTM_ORIGIN  53   135   135                                                       *
BOUNDARY    1   314959  7527302 -22.350244 +133.203095 -222100.9 +1331211.1 12 *
BOUNDARY    2   330285  7522055 -22.399209 +133.351312 -222357.2 +1332104.7 12 *
BOUNDARY    3   338804  7516764 -22.447809 +133.433513 -222652.1 +1332600.6 12 *
BOUNDARY    4   352253  7512996 -22.483058 +133.563828 -222859.0 +1333349.8 12 *
BOUNDARY    5   372155  7504208 -22.564037 +133.756535 -223350.5 +1334523.5 12 *
BOUNDARY    6   372998  7504302 -22.563251 +133.764744 -223347.7 +1334553.1 12 *
BOUNDARY    7   373350  7474331 -22.833966 +133.765740 -225002.3 +1334556.7 12 *
BOUNDARY    8   354453  7474021 -22.835233 +133.581589 -225006.8 +1333453.7 12 *
```

```
BOUNDARY     9   354315  7479532 -22.785447 +133.580767 -224707.6 +1333450.8 12 *
BOUNDARY    10   349238  7479661 -22.783839 +133.531326 -224701.8 +1333152.8 12 *
BOUNDARY    11   349159  7487087 -22.716769 +133.531271 -224300.4 +1333152.6 12 *
BOUNDARY    12   338705  7494022 -22.653177 +133.430230 -223911.4 +1332548.8 12 *
BOUNDARY    13   331404  7492109 -22.669735 +133.358992 -224011.0 +1332132.4 12 *
BOUNDARY    14   331334  7502617 -22.574844 +133.359430 -223429.4 +1332133.9 12 *
BOUNDARY    15   328231  7507004 -22.534913 +133.329741 -223205.7 +1331947.1 12 *
BOUNDARY    16   326006  7512733 -22.482959 +133.308738 -222858.7 +1331831.5 12 *
BOUNDARY    17   323723  7515213 -22.460330 +133.286835 -222737.2 +1331712.6 12 *
BOUNDARY    18   320953  7515214 -22.460033 +133.259921 -222736.1 +1331535.7 12 *
BOUNDARY    19   317760  7510909 -22.498564 +133.228405 -222954.8 +1331342.3 12 *
BOUNDARY    20   310671  7512924 -22.479597 +133.159756 -222846.5 +1330935.1 12 *
BOUNDARY    21   313335  7516500 -22.447606 +133.186064 -222651.4 +1331109.8 12 *
BOUNDARY    22   309483  7518692 -22.427388 +133.148910 -222538.6 +1330856.1 12 *
BOUNDARY    23   309267  7523379 -22.385039 +133.147373 -222306.1 +1330850.5 12 *
BOUNDARY    24   311374  7527593 -22.347226 +133.168329 -222050.0 +1331006.0 12 *
SQUARE_KMS  1542.250                                                            *
|                                                                               *
NAVTYPE     NOVATEL                                                             *
NAVMODE     U.T.M                                                               *
PLAN_TYPE   Normal                                                              *
LINE_TYPE   S.LINE    X.LINE    0         0                                     *
HEADING     113       203                                                       *
SPACING     1000      10000     1000      1000                                  *
OVER_LINE   1         1                                                         *
OVERFLY     0         0                                                         *
MIN_LENGTH  8         8                                                         *
FIRST_LINE  10        10                                                        *
INCREMENT   1         1                                                         *
X_TRACK     100       100                                                       *
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MASTER_NEW  0  Not implemented.                                                 *
KM_IN_AREA  1665      0                                                         *
KM+OVERFLY  1665      0                                                         *
```

```
JOB_Number  1885                                                                *
CLIENT      NuPower Resources                                                   *
AREA_NAME   3                                                                   *
PLANNED_BY  gps2                                                                *
|                                                                               *
SPHEROID    22  W.G.S_1984 6378137.0 298.257223563 0.9996                       *
DELTAXYZ    0.0 0.0 0.0 0.0 0.0 0.0 0.0                                         *
HEMISPHERE  SOUTH                                                               *
UTM_ORIGIN  53   135   135                                                      *
BOUNDARY    1   394393  7480839 -22.776642 +133.971224 -224635.9 +1335816.4 12 *
BOUNDARY    2   394246  7458853 -22.975208 +133.968299 -225830.7 +1335805.9 12 *
BOUNDARY    3   386983  7458147 -22.981112 +133.897402 -225852.0 +1335350.6 12 *
BOUNDARY    4   376720  7451946 -23.036384 +133.796792 -230211.0 +1334748.5 12 *
BOUNDARY    5   376899  7474301 -22.834497 +133.800318 -225004.2 +1334801.1 12 *
BOUNDARY    6   376899  7480565 -22.777923 +133.800813 -224640.5 +1334802.9 12 *
SQUARE_KMS  423.008                                                             *
|                                                                               *
NAVTYPE     NOVATEL                                                             *
NAVMODE     U.T.M                                                               *
PLAN_TYPE   Normal                                                              *
LINE_TYPE   S.LINE    X.LINE    0         0                                     *
HEADING     90        180                                                       *
SPACING     1000      16000     1000      1000                                  *
OVER_LINE   1         1                                                         *
OVERFLY     0         0                                                         *
MIN_LENGTH  8         8                                                         *
FIRST_LINE  10        10                                                        *
INCREMENT   1         1                                                         *
X_TRACK     100       100                                                       *
MASTER_PT   1   394393  7480839 -22.776642 +133.971224                          *
MASTER_NEW  0  Not implemented.                                                 *
KM_IN_AREA  310       0                                                         *
KM+OVERFLY  310       0                                                         *
```

```
JOB_Number  1885                                                                *
CLIENT      NuPower Resources                                                   *
AREA_NAME   4                                                                   *
PLANNED_BY  gps2                                                                *
|                                                                               *
SPHEROID    22  W.G.S_1984 6378137.0 298.257223563 0.9996                       *
DELTAXYZ    0.0 0.0 0.0 0.0 0.0 0.0 0.0                                         *
HEMISPHERE  SOUTH                                                               *
UTM_ORIGIN  53   135   135                                                      *
BOUNDARY    1   367017  7456114 -22.997998 +133.702472 -225952.8 +1334208.9 12 *
BOUNDARY    2   367091  7448647 -23.065439 +133.702541 -230355.6 +1334209.1 12 *
BOUNDARY    3   361868  7448715 -23.064394 +133.651573 -230351.8 +1333905.7 12 *
BOUNDARY    4   361982  7443315 -23.113174 +133.652204 -230647.4 +1333907.9 12 *
BOUNDARY    5   377392  7443346 -23.114108 +133.802663 -230650.8 +1334809.6 12 *
BOUNDARY    6   377534  7439502 -23.148830 +133.803740 -230855.8 +1334813.5 12 *
BOUNDARY    7   382564  7435783 -23.182783 +133.852575 -231058.0 +1335109.3 12 *
BOUNDARY    8   382435  7431992 -23.217017 +133.851025 -231301.3 +1335103.7 12 *
BOUNDARY    9   372453  7418947 -23.334078 +133.752386 -232002.7 +1334508.6 12 *
BOUNDARY   10   329223  7418444 -23.334682 +133.329595 -232004.9 +1331946.5 12 *
BOUNDARY   11   329001  7426263 -23.264064 +133.328310 -231550.6 +1331941.9 12 *
BOUNDARY   12   356833  7456207 -22.996309 +133.603134 -225946.7 +1333611.3 12 *
SQUARE_KMS  1265.604                                                            *
|                                                                               *
NAVTYPE     NOVATEL                                                             *
NAVMODE     U.T.M                                                               *
PLAN_TYPE   Normal                                                              *
LINE_TYPE   S.LINE    X.LINE    0         0                                     *
HEADING     0         90                                                        *
SPACING     1000      15000     1000      1000                                  *
OVER_LINE   1         1                                                         *
OVERFLY     0         0                                                         *
MIN_LENGTH  8         8                                                         *
FIRST_LINE  10        10                                                        *
INCREMENT   1         1                                                         *
X_TRACK     100       100                                                       *
MASTER_PT   1   367017  7456114 -22.997998 +133.702472                          *
MASTER_NEW  0  Not implemented.                                                 *
KM_IN_AREA  1294      0                                                         *
KM+OVERFLY  1294      0                                                         *
```

```
JOB_Number  1885                                                                *
CLIENT      NuPower Resources                                                   *
AREA_NAME   5                                                                   *
PLANNED_BY  MRA                                                                 *
|                                                                               *
SPHEROID    22  W.G.S_1984 6378137.0 298.257223563 0.9996                       *
DELTAXYZ    0.0 0.0 0.0 0.0 0.0 0.0 0.0                                         *
HEMISPHERE  SOUTH                                                               *
UTM_ORIGIN  53   135   135                                                      *
BOUNDARY    1   334710  7461579 -22.945754 +133.387915 -225644.7 +1332316.5 12 *
BOUNDARY    2   334730  7459734 -22.962416 +133.387913 -225744.7 +1332316.5 12 *
BOUNDARY    3   336439  7459753 -22.962413 +133.404579 -225744.7 +1332416.5 12 *
BOUNDARY    4   336480  7456064 -22.995724 +133.404587 -225944.6 +1332416.5 12 *
BOUNDARY    5   358046  7456424 -22.994453 +133.614981 -225940.0 +1333653.9 12 *
BOUNDARY    6   329483  7425694 -23.269247 +133.332958 -231609.3 +1331958.6 12 *
BOUNDARY    7   312002  7425294 -23.270951 +133.162071 -231615.4 +1330943.5 12 *
BOUNDARY    8   311550  7461308 -22.945746 +133.162088 -225644.7 +1330943.5 12 *
SQUARE_KMS  1103.658                                                            *
|                                                                               *
NAVTYPE     NOVATEL                                                             *
NAVMODE     U.T.M                                                               *
PLAN_TYPE   Normal                                                              *
LINE_TYPE   S.LINE    X.LINE    0         0                                     *
HEADING     0         90                                                        *
SPACING     1000      9050      1000      1000                                  *
OVER_LINE   1         1                                                         *
```

```
OVERFLY     0        0                                                    *
MIN_LENGTH  8        8                                                    *
FIRST_LINE  10       10                                                   *
INCREMENT   1        1                                                    *
X_TRACK     100      100                                                  *
MASTER_PT   1   334710  7461579 -22.945754 +133.387915                    *
MASTER_NEW  0  Not implemented.                                           *
KM_IN_AREA  1139     0                                                    *
KM+OVERFLY  1139     0                                                    *
```

APPENDIX II – Weekly Acquisition Reports

System: Tempest
Aircraft:
Hrs - Progressive M/R Hrs at the start of job

Total Job kms: 6648.200 Kms
roc. Reflight Kms: Kms
Kms Remain: 4837.800 Kms
% Complete: 27.23 %

6648.200 Kms - Total Job Kms including Proc. Reflights
4837.800 Kms - Kms remaining including Proc. Reflights

Job Number: 1885
Contract Number: 08 8952 8977
Job Name: Alice Springs
Area Names: Area 1 - 5
Accommodation: Diplomat Hotel
Flying Base: Alice Springs
Client: NuPower Resources Limited

Date	Flt	Pilot initials	On board Oper initials	Production excludes Scrubs & Reflights	Processing Reflights flown today	Fugro Scrub	Time Take Off	Time Land	Flt Hrs on M/R	Hours to Periodic Inspection	Job Hrs to Date	Prod. to Date	Proc. Reflight to Date	Scrubs to Date	Stdby Days	Lost Days	Activity	COMMENTS Weather, Data delivery, Safety Meetings Crew movements etc
Date 18-Jun																		
Julian Day 169	1																	EM DAS failed after takeoff
Monday																		unable to get working airborne
										0.0							Weather►	
Date 19-Jun	2																	EM DAS working
Julian Day 170																		Pdas mag failed
	3			122.500														All worked fine, 2 comp boxes
Tuesday																		and 7 lines in area 3
																		attempted area 2 - problem with flt plan
				122.500						0.0		122.500					Weather►	
Date 20-Jun	4			463.000		73.100												Low cloud and light rain in areas
Julian Day 171																		
																		Area 3 completed
Wednesday																		Scrubs area 1 due to bird
																		noise from turb, wind over hills
				463.000		73.100				0.0		585.500		73.100			Weather►	
Date 21-Jun																		Aircraft Maintenance
Julian Day 172																		
Thursday																		
										0.0		585.500		73.100			Weather►	
Date 22-Jun																		Aircraft Maintenance
Julian Day 173																		
Friday																		
										0.0		585.500		73.100			Weather►	
Date 23-Jun	5			598.800	73.100													Turbulance causing bird noise
Julian Day 174																		Probs with EM Das and Pdas losing sync
Saturday																		
				598.800	73.100					0.0		1184.300	73.100	73.100			Weather►	
Date 24-Jun	6			553.000		61.500												Initial problems with getting EM DAS to run
Julian Day 175																		lost 1:07 airborne flying in circles.
Sunday																		
				553.000		61.500				0.0		1737.300	73.100	134.600			Weather►	

System: Tempest
Aircraft: 0
0.0 Hrs - Progressive M/R Hrs at the start of job

Total Job kms: 6648.200 Kms
roc. Reflight Kms: 0.000 Kms
lan Kms Remain: 2149.800 Kms
% Complete: 67.66 %

6648.200 Kms - Total Job Kms including Proc. Reflights
2149.800 Kms - Kms remaining including Proc. Reflights

Job Number: 1885
Contract Number: 08 8952 8977
Job Name: Alice Springs
Area Names: Area 1 - 5
Accommodation: Diplomat Hotel
Flying Base: Alice Springs
Client: NuPower Resources Limited

Date	Flt	Pilot initials	On board Oper initials	Production excludes Scrubs & Reflights	Processing Reflights flown today	Fugro Scrub	Time Take Off	Time Land	Flt Hrs on M/R	Hours to Periodic Inspection	Job Hrs to Date	Prod. to Date	Proc. Reflight to Date	Scrubs to Date	Stdby Days	Lost Days	Activity	COMMENTS Weather, Data delivery, Safety Meetings Crew movements etc
Date 25-Jun	7																	Problem with EM Das failing
Julian Day 176																		Return to assess
Monday																		
										0.0	0.0	1737.300	73.100	134.600			Weather►	
Date 26-Jun																		EM Das inspection and repair
Julian Day 177																		
Tuesday																		
										0.0		1737.300	73.100	134.600			Weather►	
Date 27-Jun	8			412.500	61.500	194.100												EM Das apprears fixed
Julian Day 178																		very turbulant, bird noise high
Wednesday																		Problem with Z higher in cals but not X
				412.500	61.500	194.100				0.0		2149.800	134.600	328.700			Weather►	
Date 28-Jun	9			612.400	194.100													Initial problems with EM Das
Julian Day 179																		appears temp moisture related.
																		Some turbulence due to wind causing prob
Thursday																		with Z higher in cals.
				612.400	194.100					0.0		2762.200	328.700	328.700			Weather►	
Date 29-Jun	10			320.500														Conducted post survey flight tests
Julian Day 180																		to isolate Z problem
Friday																		
				320.500						0.0		3082.700	328.700	328.700			Weather►	
Date 30-Jun	11			670.000		135.900												Started area 4
Julian Day 181																		
Saturday																		
				670.000		135.900				0.0		3752.700	328.700	464.600			Weather►	
Date 1-Jul	12			281.100	135.900	90.000												Returned early due turbulence
Julian Day 182																		Aircraft TTIS 17434.2 hours
Sunday																		366kms to go area 4
																		6
				281.100	135.900	90.000				0.0		4033.800	464.600	554.600			Weather►	
			Totals This Week: ►	2296.500	391.500	420.000		Week Hours:►	0.0	▲: A/C Hrs to Next Service					0.0	0.0		

System:	Tempest		
Aircraft:	0	0.0 Hrs	- Progressive M/R Hrs at the start of job
Total Job kms:	6648.200 Kms		
Proc. Reflight Kms:	0.000 Kms	6648.200 Kms	- Total Job Kms including Proc. Reflights
Plan Kms Remain:	1450.800 Kms	1450.800 Kms	- Kms remaining including Proc. Reflights
% Complete:	78.18 %		

Job Number:	1885
Contract Number:	08 8952 8977
Job Name:	Alice Springs
Area Names:	Area 1 - 5
Accommodation:	Diplomat Hotel
Flying Base:	Alice Springs
Client:	NuPower Resources Limited

Date	Flt	Pilot initials	On board Oper initials	Production excludes Scrubs & Reflights	Processing Reflights flown today	Fugro Scrub	Time Take Off	Time Land	Flt Hrs on M/R	Hours to Periodic Inspection	Job Hrs to Date	Prod. to Date	Proc. Reflights to Date	Scrubs to Date	Stdby Days	Lost Days	Activity	COMMENTS Weather, Data delivery, Safety Meetings Crew movements etc
Date 2-Jul	13			343.000	90.000													Finished area 4.
Julian Day 183																		Started area 2
Monday																		Returned due turbulence
				343.000	90.000					0.0	0.0	4376.800	554.600	554.600			Weather►	
Date 3-Jul																		PDO
Julian Day 184																		
Tuesday																		
										0.0		4376.800	554.600	554.600			Weather►	
Date 4-Jul	14			199.000	67.000													
Julian Day 185																		
Wednesday																		
				199.000	67.000					0.0		4575.800	621.600	554.600			Weather►	
Date 5-Jul	15																	Problem with EM Das
Julian Day 186																		Could not boot system
Thursday																		Awaiting PDAS from Perth
										0.0		4575.800	621.600	554.600			Weather►	
Date 6-Jul																		PDAS did not arrive
Julian Day 187																		Air Express advise it is in Cairns
Friday																		
										0.0		4575.800	621.600	554.600			Weather►	
Date 7-Jul																		
Julian Day 188																		
Saturday																		
										0.0		4575.800	621.600	554.600			Weather►	
Date 8-Jul	16																	Aircraft TTIS 17444.8 hours
Julian Day 189																		Technician ran PDAS on ground for 2 hrs
Sunday																		and test flight was successful
																		Spare PDAS did not arrive
																		1309 kms to go area 2
										0.0		4575.800	621.600	554.600			Weather►	
			Totals This Week: ►	542.000	157.000	0.000		Week Hours:►	0.0	▲: A/C Hrs to Next Service					0.0	0.0		

System:	Tempest		
Aircraft:	0	0.0 Hrs	- Progressive M/R Hrs at the start of job
Total Job kms:	6646.200 Kms		
Proc. Reflight Kms:	0.000 Kms	6646.200 Kms	- Total Job Kms including Proc. Reflights
Plan Kms Remain:	-78.700 Kms	-78.700 Kms	- Kms remaining including Proc. Reflights
% Complete:	101.18 %		

Job Number:	1885
Contract Number:	7/9/2007
Job Name:	Alice Springs
Area Names:	Area 1 - 5
Accommodation:	Diplomat Hotel
Flying Base:	Alice Springs
Client:	NuPower Resources Limited

Date	Flt	Pilot initials	On board Oper initials	Production excludes Scrubs & Reflights	Processing Reflights flown today	Fugro Scrub	Time Take Off	Time Land	Flt Hrs on M/R	Hours to Periodic Inspection	Job Hrs to Date	Prod. to Date	Proc. Reflights to Date	Scrubs to Date	Stdby Days	Lost Days	Activity	COMMENTS Weather, Data delivery, Safety Meetings Crew movements etc
Date 9-Jul	17	GH																Early return due system errors
Julian Day 190																		Waiting for new PDAS
Monday																		
										0.0	0.0	4575.800	621.600	554.600			Weather►	
Date 10-Jul																		PDO
Julian Day 191																		
Tuesday																		
										0.0		4575.800	621.600	554.600			Weather►	
Date 11-Jul	18																	Bird "Robyn" flying abnormally
Julian Day 192																		Installed new bird "Gina"
Wednesday																		
										0.0		4575.800	621.600	554.600			Weather►	
Date 12-Jul	19			677.500		264.000												4 lines scrubbed due to noisy data
Julian Day 193																		New bird has lower noise coefficient.
Thursday																		
				677.500		264.000				0.0		5253.300	621.600	818.600			Weather►	
Date 13-Jul	20			93.200	264.000													System appears to working ok
Julian Day 194																		Strong 15 knot easterly causing turb.
Friday																		
				93.200	264.000					0.0		5346.500	885.600	818.600			Weather►	
Date 14-Jul	21			181.400														Early return due turbulence
Julian Day 195																		
Saturday																		
				181.400						0.0		5527.900	885.600	818.600			Weather►	
Date 15-Jul	22			311.400		45.400												Moderate turbulence early.
Julian Day 196																		Change in weather pattern expected.
																		Line 22 scrubbed due coil knocks
Sunday																		
				311.400		45.400				0.0		5839.300	885.600	864.000			Weather►	
			Totals This Week: ►	1263.500	264.000	309.400		Week Hours:►	0.0	▲: A/C Hrs to Next Service					0.0	0.0		

System:	Tempest		
Aircraft:	0	0.0 Hrs	- Progressive M/R Hrs at the start of job
Total Job kms:	6646.200 Kms		
Proc. Reflight Kms:	0.000 Kms	6646.200 Kms	- Total Job Kms including Proc. Reflights
Plan Kms Remain:	-1837.000 Kms	-1837.000 Kms	- Kms remaining including Proc. Reflights
% Complete:	127.64 %		

Job Number:	1885
Contract Number:	39272
Job Name:	Alice Springs
Area Names:	Area 1 - 5
Accommodation:	Diplomat Hotel
Flying Base:	Alice Springs
Client:	NuPower Resources Limited

Date	Flt	Pilot initials	On board Oper initials	Production excludes Scrubs & Reflights	Processing Reflights flown today	Fugro Scrub	Time Take Off	Time Land	Flt Hrs on M/R	Hours to Periodic Inspection	Job Hrs to Date	Prod. to Date	Proc. Reflights to Date	Scrubs to Date	Stdby Days	Lost Days	Activity	COMMENTS Weather, Data delivery, Safety Meetings Crew movements etc
Date 16-Jul																		PDO
Julian Day 197																		
Monday																		
										0.0	0.0	5839.300	885.600	864.000			Weather►	
Date 17-Jul																		No flight due flight planning proiblem.
Julian Day 198																		
Tuesday																		
										0.0	0.0	5839.300	885.600	864.000			Weather►	
Date 18-Jul	23/01			319.100		72.300												Finshed area 2 and started area 5
Julian Day 199																		
																		C. Hazelwood departs.
Wednesday																		
				319.100	0.000	72.300				**0.0**	0.0	6158.400	885.600	936.300			Weather►	
Date 19-Jul	2			227.800	72.300													Problem on 7 lines - locked up
Julian Day 200																		Had to refly them
																		Finished area 5
Thursday																		
				227.800	72.300					**0.0**	0.0	6386.200	957.900	936.300			Weather►	
Date 20-Jul	24			635.900														Started extension of area 4
Julian Day 201																		
Friday																		
				635.900						**0.0**	0.0	7022.100	957.900	936.300			Weather►	
Date 21-Jul	25			503.200														Finished area 4 extension
Julian Day 202																		
Saturday																		
				503.200						**0.0**	0.0	7525.300	957.900	936.300			Weather►	
Date 22-Jul																		
Julian Day 203																		
Sunday																		
				0.000						**0.0**	0.0	7525.300	957.900	936.300			Weather►	
			Totals This Week: ►	1686.000	72.300	72.300	Week Hours:►		**0.0**	▲: A/C Hrs to Next Service					**0.0**	**0.0**		

APPENDIX III – Flight Summary (Line Listing)

AREA 1 - WEST

```
COMM  Total number of lines :   88
COMM
COMM   Flt    Line   Start X   Start Y     End X     End Y       Kms
COMM
COMM     4   10630    239356   7492665    246839   7489573     8.10
COMM     4   10620    247439   7489877    239985   7492957     8.07
COMM     4   10610    240657   7493221    248084   7490136     8.04
COMM     4   10600    248675   7490454    241287   7493496     7.99
COMM     4   10590    241918   7493782    249356   7490700     8.05
COMM     4   10580    249947   7490995    242505   7494083     8.06
COMM     4   10570    242583   7494581    251135   7491047     9.25
COMM     4   10560    252397   7491062    242550   7495134    10.66
COMM     4   10550    242573   7495679    253672   7491075    12.02
COMM     4   10540    254933   7491103    242567   7496218    13.38
COMM     4   10530    242563   7496762    256242   7491094    14.81
COMM     4   10520    257460   7491129    242537   7497306    16.15
COMM     4   10510    242535   7497840    258751   7491129    17.55
COMM     4   10500    260015   7491149    242550   7498384    18.90
COMM     4   10490    242548   7498924    261243   7491182    20.23
COMM     4   10480    262535   7491187    242543   7499466    21.64
COMM     5   10320    282792   7491471    242411   7508192    43.71
COMM     5   10471    242551   7500012    263799   7491209    23.00
COMM     5   10310    242432   7508718    284022   7491481    45.02
COMM     5   10461    265042   7491218    242513   7500561    24.39
COMM     5   10451    242492   7501112    266349   7491231    25.82
COMM     5   10300    285262   7491520    260658   7501696    26.63
COMM     5   10440    267602   7491252    242512   7501651    27.16
COMM     5   10301    260660   7501694    242387   7509278    19.78
COMM     5   10430    242468   7502208    268864   7491282    28.57
COMM     5   10290    242416   7509807    286544   7491516    47.77
COMM     5   10420    270136   7491295    242500   7502738    29.91
COMM     5   10410    242354   7503327    271373   7491320    31.40
COMM     5   10400    272674   7491312    242471   7503835    32.70
COMM     5   10390    242444   7504376    273934   7491342    34.08
COMM     5   10380    275198   7491343    242451   7504917    35.45
COMM     5   10370    242458   7505462    276413   7491398    36.75
COMM     5   10360    277711   7491402    242446   7506009    38.17
COMM     5   10350    242418   7506548    278959   7491428    39.55
COMM     5   10340    280262   7491428    242444   7507092    40.93
COMM     5   10330    242449   7507627    281489   7491463    42.25
COMM     6   10280    287841   7491529    242397   7510338    49.18
COMM     6   10270    242418   7510891    289096   7491556    50.52
COMM     6   10260    290322   7491518    242408   7511435    51.89
COMM     6   10250    242382   7511981    291580   7491605    53.25
COMM     6   10240    292838   7491607    242397   7512511    54.60
COMM     6   10230    242361   7513083    261764   7505026    21.01
COMM     6   10231    271212   7501126    294121   7491633    24.80
COMM     6   10220    295367   7491646    272269   7501229    25.01
COMM     6   10221    261660   7505630    242360   7513623    20.89
COMM     6   10210    242368   7514156    261526   7506226    20.73
COMM     6   10211    273214   7501383    296683   7491659    25.40
COMM     6   10200    297899   7491698    273996   7501581    25.87
COMM     6   10201    261425   7506803    242337   7514709    20.66
COMM     8   10160    302982   7491757    276447   7502756    28.72
COMM     8   10190    242339   7515258    261321   7507400    20.54
COMM     8   10191    274837   7501789    299193   7491706    26.36
COMM     8   10161    260998   7509150    242343   7516876    20.19
COMM     9   10150    242307   7517423    260885   7509738    20.10
```

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COMM     9   10151    276738   7503160    304254   7491775    29.78
COMM     9   10180    300447   7491729    275678   7501995    26.81
COMM     9   10181    261201   7507947    242304   7515810    20.47
COMM     9   10170    242309   7516341    261105   7508559    20.34
COMM     9   10171    276153   7502319    301737   7491731    27.69
COMM     9   10140    305477   7491810    277056   7503584    30.76
COMM     9   10141    260823   7510291    242276   7517981    20.08
COMM     9   10130    243369   7518068    260704   7510900    18.76
COMM     9   10131    277368   7503994    306797   7491800    31.86
COMM     9   10120    309470   7491237    277625   7504420    34.47
COMM     9   10121    259629   7511883    244741   7518053    16.12
COMM     9   10111    246077   7518016    258092   7513057    13.00
COMM     9   10110    277939   7504839    309631   7491709    34.30
COMM     9   10100    310568   7491866    278209   7505283    35.03
COMM     9   10101    258445   7513448    247498   7517992    11.85
COMM     9   10091    248513   7518106    258539   7513952    10.85
COMM     9   10090    278514   7505680    311804   7491895    36.03
COMM     9   10080    311946   7492368    278826   7506087    35.85
COMM     9   10081    258744   7514413    250283   7517921     9.16
COMM     9   10071    251584   7517921    258950   7514858     7.98
COMM     9   10070    279078   7506518    311940   7492921    35.56
COMM     9   10060    311952   7493456    279376   7506946    35.26
COMM    10   10050    279636   7507367    311941   7493995    34.96
COMM    10   10040    311957   7494535    281275   7507243    33.21
COMM    10   10030    284226   7506567    311950   7495077    30.01
COMM    10   10020    311922   7495627    287124   7505911    26.85
COMM    10   10010    290054   7505226    311897   7496190    23.64
COMM    10   17070    311936   7497776    308802   7490400     8.01
COMM    10   17060    297366   7491613    301505   7501569    10.78
COMM    10   17050    291114   7505095    285418   7491475    14.76
COMM    10   17040    273433   7491213    280169   7507558    17.68
COMM    10   17030    266357   7502838    261470   7491125    12.69
COMM    10   17020    249463   7490896    258569   7512896    23.81
COMM    10   17010    248831   7518010    242476   7502762    16.52
COMM
COMM  Total Kilometres :      2230.61
```

AREA 2 - NORTH

```
COMM
COMM  Total number of lines :   34
COMM
COMM   Flt     Line   Start X   Start Y     End X     End Y       Kms
COMM
COMM     8   20010    315774   7527039    373013   7503314    61.96
COMM     8   20020    373080   7502217    311850   7527557    66.27
COMM     8   20340    359594   7473157    352215   7476207     7.98
COMM     8   20330    353441   7476798    360844   7473715     8.02
COMM     8   20320    362455   7474122    354353   7477492     8.77
COMM    14   20030    311000   7526834    373081   7501122    67.19
COMM    14   20040    373061   7500031    310507   7525949    67.71
COMM    14   20050    310071   7525063    373083   7498954    68.21
COMM    19   20060    373095   7497865    309631   7524153    68.69
COMM    19   20070    309267   7523248    373121   7496769    69.13
COMM    19   20080    373121   7495697    309276   7522137    69.10
COMM    19   20090    309347   7521025    373125   7494610    69.03
COMM    19   20100    373167   7493478    309383   7519924    69.05
COMM    19   20110    309487   7518804    373149   7492432    68.91
COMM    20   20120    373195   7491336    313067   7516234    65.08
COMM    20   20130    312485   7515397    373181   7490259    65.70
COMM    20   20140    373177   7489196    311894   7514558    66.32
COMM    20   20150    311264   7513736    373200   7488089    67.04
COMM    20   20160    373206   7486992    329597   7505060    47.20
COMM    20   20170    330681   7503529    373250   7485899    46.08
COMM    21   20180    373209   7484808    331351   7502181    45.32
```

```
COMM    21   20190    331324   7501105    373272   7483727    45.41
COMM    21   20200    373306   7482637    331325   7500015    45.44
COMM    21   20210    331344   7498915    373300   7481544    45.41
COMM    22   20230    331341   7496775    373281   7479394    45.40
COMM    22   20240    373340   7478293    331346   7495678    45.45
COMM    22   20250    331374   7494587    373357   7477193    45.44
COMM    22   20260    373328   7476126    331342   7493503    45.44
COMM    22   20270    331368   7492409    373350   7475037    45.43
COMM    22   20290    349193   7482874    369993   7474264    22.51
COMM    22   20281    372476   7474307    349188   7483957    25.21
COMM    22   20310    349188   7480705    364940   7474181    17.05
COMM    22   20300    367464   7474215    349171   7481790    19.80
COMM    23   20221    373308   7480458    331373   7497829    45.39
COMM
COMM  Total Kilometres :      1666.14
```

AREA 3 – EAST

```
COMM
COMM  Total number of lines :   19
COMM
COMM   Flt     Line   Start X   Start Y      End X     End Y       Kms
COMM
COMM     3   30010    376911   7474437    394344   7474438    17.43
COMM     3   30020    394396   7473441    376869   7473437    17.53
COMM     3   30030    376854   7472454    394364   7472439    17.51
COMM     3   30040    394356   7471425    376840   7471440    17.52
COMM     3   30050    376856   7470441    394349   7470456    17.49
COMM     3   30060    394367   7469433    376806   7469439    17.56
COMM     3   30070    376819   7468451    394326   7468434    17.51
COMM     4   30080    394357   7467435    376815   7467430    17.54
COMM     4   30090    376839   7466441    394340   7466438    17.50
COMM     4   30100    394330   7465479    376791   7465442    17.54
COMM     4   30110    376776   7464441    394305   7464448    17.53
COMM     4   30120    394327   7463432    376763   7463441    17.56
COMM     4   30130    376794   7462441    394284   7462440    17.49
COMM     4   30140    394306   7461442    376751   7461440    17.56
COMM     4   30150    376794   7460447    394277   7460438    17.48
COMM     4   30160    394290   7459485    376734   7459437    17.56
COMM     4   30170    376766   7458440    390009   7458446    13.24
COMM     4   30180    385799   7457435    376771   7457442     9.03
COMM     4   30190    376414   7456439    384482   7456439     8.07
COMM
COMM  Total Kilometres :       310.65
```

AREA 4 – SOUTH

```
COMM
COMM  Total number of lines :   53
COMM
COMM   Flt     Line   Start X   Start Y      End X     End Y       Kms
COMM
COMM    10   40011    329610   7426919    329603   7418417     8.50
COMM    10   40020    330599   7418433    330592   7428012     9.58
COMM    10   40030    331608   7429098    331607   7418485    10.61
COMM    10   40040    332583   7418457    332601   7430142    11.69
COMM    10   40050    333572   7431267    333612   7418473    12.79
COMM    10   40060    334596   7418514    334600   7432305    13.79
COMM    11   40410    369604   7443323    369603   7418863    24.46
COMM    11   40400    368598   7418894    368598   7443377    24.48
COMM    11   40530    381610   7437687    381601   7429674     8.01
COMM    11   40520    380596   7429427    380586   7437467     8.04
COMM    11   40510    379606   7438006    379603   7428237     9.77
COMM    11   40390    367588   7443365    367604   7418839    24.53
COMM    11   40500    378591   7426927    378597   7438733    11.81
```

COMM	11	40380	366592	7418886	366601	7456152	37.27
COMM	11	40480	376577	7424330	376594	7443341	19.01
COMM	11	40470	375590	7443362	375592	7423068	20.29
COMM	11	40370	365607	7456149	365595	7418836	37.31
COMM	11	40460	374626	7421766	374599	7443376	21.61
COMM	11	40360	364599	7418801	364602	7456172	37.37
COMM	11	40440	372597	7419125	372593	7443335	24.21
COMM	11	40350	363599	7456139	363599	7418792	37.35
COMM	11	40430	371595	7443341	371602	7418893	24.45
COMM	11	40340	362607	7418816	362606	7456144	37.33
COMM	11	40330	361590	7456155	361596	7418803	37.35
COMM	11	40320	360597	7418799	360599	7456184	37.38
COMM	11	40310	359597	7456187	359599	7418763	37.42
COMM	12	40490	377603	7439483	377609	7425652	13.83
COMM	12	40420	370609	7418884	370601	7443379	24.50
COMM	12	40450	373617	7443342	373604	7420407	22.94
COMM	12	40300	358610	7418781	358600	7456236	37.46
COMM	12	40290	357611	7456248	357600	7418786	37.46
COMM	12	40280	356588	7418716	356605	7455986	37.27
COMM	12	40270	355593	7454896	355610	7418730	36.17
COMM	12	40260	354595	7418694	354600	7453839	35.15
COMM	12	40250	353602	7452743	353600	7418690	34.05
COMM	12	40240	352609	7418705	352600	7451698	32.99
COMM	12	40220	350598	7418649	350597	7449502	30.85
COMM	13	40131	341607	7439839	341602	7418546	21.29
COMM	13	40230	351613	7450570	351600	7418662	31.91
COMM	13	40110	339607	7437685	339597	7418545	19.14
COMM	13	40200	348584	7418671	348596	7447338	28.67
COMM	13	40170	345567	7444166	345595	7418619	25.55
COMM	13	40210	349589	7448459	349601	7418638	29.82
COMM	13	40122	340596	7418583	340600	7438779	20.20
COMM	13	40180	346600	7418617	346597	7445189	26.57
COMM	13	40190	347625	7446259	347602	7418644	27.62
COMM	13	40160	344632	7418581	344598	7443047	24.47
COMM	13	40150	343630	7441967	343607	7418616	23.35
COMM	13	40140	342603	7418593	342598	7440908	22.32
COMM	14	40070	335601	7433388	335596	7418510	14.88
COMM	14	40080	336601	7418527	336598	7434481	15.95
COMM	14	40090	337559	7435542	337604	7418526	17.02
COMM	14	40100	338603	7418519	338594	7436636	18.12
COMM							
COMM	Total Kilometres :			1295.93			

AREA 5 - CENTRAL

Total number of lines : 46

Flt	Line	Start X	Start Y	End X	End Y	Kms
24	50460	356570	7451930	356588	7456576	4.65
24	50450	355598	7456594	355597	7451039	5.55
24	50440	354600	7450495	354594	7456569	6.07
24	50430	353594	7456563	353589	7449990	6.57
24	50420	352615	7449431	352594	7456527	7.10
24	50410	351608	7456557	351600	7448910	7.65
24	50400	350589	7448345	350600	7456463	8.12
24	50390	349588	7456517	349594	7447582	8.94
24	50380	348556	7446208	348603	7456395	10.19
24	50370	347590	7456475	347602	7445165	11.31
24	50360	346574	7444008	346595	7456415	12.41
24	50350	345599	7456431	345598	7442963	13.47
24	50340	344583	7441875	344596	7456327	14.45
24	50330	343609	7456333	343604	7440874	15.46
24	50320	342588	7439729	342593	7456289	16.56

24	50310	341596	7456293	341597	7438675	17.62
24	50300	340591	7437571	340594	7456232	18.66
24	50290	339604	7456251	339597	7436548	19.70
24	50280	338603	7435454	338600	7456195	20.74
24	50270	337583	7456243	337607	7434402	21.84
24	50260	336604	7433303	336594	7456212	22.91
24	50250	335599	7458665	335599	7432250	26.42
24	50240	334595	7431144	334592	7461641	30.50
24	50230	333602	7461700	333591	7430068	31.63
24	50220	332591	7428947	332599	7461660	32.71
24	50210	331591	7461666	331600	7427936	33.73
24	50200	330563	7426751	330598	7461621	34.87
24	50190	329601	7461612	329595	7425759	35.85
24	50180	328600	7425539	328599	7461613	36.07
24	50170	327594	7461582	327591	7425572	36.01
24	50160	326592	7425556	326595	7461559	36.00
24	50150	325593	7461606	325598	7425566	36.04
25	50101	320589	7425412	320595	7461469	36.06
25	50111	321571	7461498	321591	7425479	36.02
25	50010	311592	7461378	311598	7425304	36.07
25	50120	322579	7425430	322599	7461516	36.09
25	50020	312586	7425265	312595	7461348	36.08
25	50130	323600	7461542	323602	7425535	36.01
25	50030	313602	7461428	313597	7425290	36.14
25	50140	324596	7425505	324601	7461492	35.99
25	50040	314607	7425320	314591	7461366	36.05
25	50050	315601	7461406	315591	7425334	36.07
25	50060	316587	7425310	316593	7461386	36.08
25	50070	317585	7461469	317600	7425406	36.06
25	50080	318589	7425403	318601	7461431	36.03
25	50090	319585	7461482	319604	7425439	36.04

Total Kilometres : 1144.58

APPENDIX IV – Located Data Format

Header for final data file

AREA 1 - WEST

```
JOB NUMBER:                      1885
AREA NUMBER:                     1
SURVEY COMPANY:                  Fugro Airborne Surveys
CLIENT:                          NuPower Resources
SURVEY TYPE:                     25Hz TEMPEST
AREA NAME:                       Area 1 - West
STATE:                           N.T.
COUNTRY:                         Australia
SURVEY FLOWN:                    June, 2007
LOCATED DATA CREATED:            Wed Nov  7 15:50:43 2007

DATUM:                           GDA94
PROJECTION:                      MGA
ZONE:                            53

SURVEY SPECIFICATIONS

TRAVERSE LINE SPACING:           500 m
TRAVERSE LINE DIRECTION:         113-293 deg
TIE LINE SPACING:                11000 m
TIE LINE DIRECTION:              023-203 deg
NOMINAL TERRAIN CLEARANCE:       120 m
FINAL LINE KILOMETRES:           2230.8 km

LINE NUMBERING

TRAVERSE LINE NUMBERS:           1001 - 1063
TIE LINE NUMBERS:                1701 - 1707

AREA BOUNDARY (WGS84 UTM53)

Eastings  :  251747  260650  261813  258234  260298  267456  272770
             276009  279842  294227  297150  301385  304933  311917
             311917  242650  242326

Northings : 7517912 7511111 7504568 7503136 7501129 7500723 7501270
            7502063 7507569 7504274 7503196 7501568 7498518 7496138
            7491894 7490926 7518087

SURVEY EQUIPMENT

AIRCRAFT:                        VH-TEM Casa 212-200

MAGNETOMETER:                               Scintrex CS-2 CV
INSTALLATION:                               Stinger
RESOLUTION:                                 0.001 nT
RECORDING INTERVAL:                         1.0 s

ELECTROMAGNETIC SYSTEM:                     25Hz TEMPEST
INSTALLATION:                               Transmitter loop mounted on the
                                            Receiver coils in a towed bird
COIL ORIENTATION:                           X,Z
RECORDING INTERVAL:                         0.2 s
SYSTEM GEOMETRY:
RECEIVER DISTANCE BEHIND THE TRANSMITTER:   -120 m
RECEIVER DISTANCE BELOW THE TRANSMITTER:    -35 m
```

RADAR ALTIMETER: Sperry Stars AA220
RECORDING INTERVAL: 1.0 s

NAVIGATION: real-time differential GPS
RECORDING INTERVAL: 1.0 s

ACQUISITION SYSTEM: PDAS-1000

DATA PROCESSING

MAGNETIC DATA
DIURNAL CORRECTION APPLIED base value 53325 nT
PARALLAX CORRECTION APPLIED 0.6 s
IGRF CORRECTION APPLIED base value 52610 nT
IGRF MODEL 2005 EXTRAPOLATED TO 2007.5
DATA HAVE BEEN MICROLEVELLED

ELECTROMAGNETIC DATA
SYSTEM PARALLAX REMOVED, AS FOLLOWS
X-COMPONENT EM DATA 0.2 s
Z-COMPONENT EM DATA 1.4 s
DATA CORRECTED FOR TRANSMITTER HEIGHT, PITCH AND ROLL
DATA CORRECTED FOR TRANSMITTER-RECEIVER GEOMETRY VARIATIONS
DATA HAVE BEEN MICROLEVELLED
CONDUCTIVITY DEPTH INVERSION CALCULATED EMFlow V5.10
CONDUCTIVITIES CALCULATED USING corrected EM DATA

DIGITAL TERRAIN DATA
DTM CALCULATED [DTM = GPS ALTITUDE - (RADAR ALTITUDE + SENSOR SEPARATION)]
DATA CORRECTED TO AUSTRALIAN HEIGHT DATUM
DATA HAVE BEEN TIE LINE LEVELLED
DATA HAVE BEEN MICROLEVELLED

The accuracy of the elevation calculation is directly dependent on the accuracy of the two input parameters, radar altitude and GPS altitude. The radar altitude value may be erroneous in areas of heavy tree cover, where the altimeter reflects the distance to the tree canopy rather than the ground. The GPS altitude value is primarily dependent on the number of available satellites. Although post-processing of GPS data will yield X and Y accuracies in the order of 1-2 metres, the accuracy of the altitude value is usually much less, sometimes in the ±5 metre range. Further inaccuracies may be introduced during the interpolation and gridding process. Because of the inherent inaccuracies of this method, no guarantee is made or implied that the information displayed is a true representation of the height above sea level. Although this product may be of some use as a general reference,
THIS PRODUCT MUST NOT BE USED FOR NAVIGATION PURPOSES.

ELECTROMAGNETIC SYSTEM

TEMPEST IS A TIME-DOMAIN SQUARE-WAVE SYSTEM,
TRANSMITTING AT A BASE FREQUENCY OF 25Hz,
WITH 2 ORTHOGONAL-AXIS RECEIVER COILS IN A TOWED BIRD.
FINAL EM OUTPUT IS RECORDED 5 TIMES PER SECOND.
THE TIMES (IN MILLISECONDS) FOR THE 15 WINDOWS ARE:

WINDOW	START	END	CENTRE
1	0.007	0.020	0.013
2	0.033	0.047	0.040
3	0.060	0.073	0.067
4	0.087	0.127	0.107

5	0.140	0.207	0.173
6	0.220	0.340	0.280
7	0.353	0.553	0.453
8	0.567	0.873	0.720
9	0.887	1.353	1.120
10	1.367	2.100	1.733
11	2.113	3.273	2.693
12	3.287	5.113	4.200
13	5.127	7.993	6.560
14	8.007	12.393	10.200
15	12.407	19.993	16.200

PULSE WIDTH: 10 ms

TEMPEST EM data are transformed to the response that would be obtained with a B-field sensor for a 100% duty cycle square waveform at the base frequency, involving a 1A change in current (from -0.5A to +0.5A to -0.5A) in a 1sq.m transmitter. It is this configuration, rather than the actual acquisition configuration, which must be specified when modelling TEMPEST data.

LOCATED DATA FORMAT

Output field format : DOS - Flat ascii
Number of fields : 197

Field	Channel	Description	Units	Undefined	Format
1	LINE	Line		-9999999	i6
2	FLIGHT	Flight		-9999999	i4
3	FID	Fiducial	(s)	-9999999	f8.1
4	LAT_GDA94	Latitude GDA94	(deg)	-9999999	f13.6
5	LON_GDA94	Longitude GDA94	(deg)	-9999999	f13.6
6	X_MGA53	Easting MGA53	(m)	-9999999	f11.2
7	Y_MGA53	Northing MGA53	(m)	-9999999	f12.2
8	TxHeight	GPS height	(m)	-9999999	f8.2
9	TxRalt_raw	Raw Radar Altimeter	(m)	-9999999	f8.2
10	TxRalt_final	Final Radar Altimeter	(m)	-9999999	f8.2
11	DTM	DTM	(m)	-9999999	f8.2
12	MAG	Compensated TMI	(nT)	-9999999	f10.3
13	MAG_1VD	Levelled TMI 1VD	(nT/m)	-9999999	f12.5
14	Pitch_Raw	Raw Tx loop pitch	(deg)	-9999999	f10.5
15	Roll_Raw	Raw Tx loop roll	(deg)	-9999999	f10.5
16	HSep_Raw	Raw Tx-Rx horizontal separation	(m)	-9999999	f8.2
17	VSep_Raw	Raw Tx-Rx vertical separation	(m)	-9999999	f8.2
18	Pitch_Final	Final Tx loop pitch	(deg)	-9999999	f10.5
19	Roll_Final	Final Tx loop roll	(deg)	-9999999	f10.5
20	HSep_Final	Final Tx-Rx horizontal separation	(m)	-9999999	f8.2
21	VSep_Final	Final Tx-Rx vertical separation	(m)	-9999999	f8.2
22	EMX_Raw[1]	Raw EMX01 Window	(fT)	-9999999	f12.6
23	EMX_Raw[2]	Raw EMX02 Window	(fT)	-9999999	f12.6
24	EMX_Raw[3]	Raw EMX03 Window	(fT)	-9999999	f12.6
25	EMX_Raw[4]	Raw EMX04 Window	(fT)	-9999999	f12.6
26	EMX_Raw[5]	Raw EMX05 Window	(fT)	-9999999	f12.6
27	EMX_Raw[6]	Raw EMX06 Window	(fT)	-9999999	f12.6
28	EMX_Raw[7]	Raw EMX07 Window	(fT)	-9999999	f12.6
29	EMX_Raw[8]	Raw EMX08 Window	(fT)	-9999999	f12.6
30	EMX_Raw[9]	Raw EMX09 Window	(fT)	-9999999	f12.6
31	EMX_Raw[10]	Raw EMX10 Window	(fT)	-9999999	f12.6
32	EMX_Raw[11]	Raw EMX11 Window	(fT)	-9999999	f12.6
33	EMX_Raw[12]	Raw EMX12 Window	(fT)	-9999999	f12.6
34	EMX_Raw[13]	Raw EMX13 Window	(fT)	-9999999	f12.6
35	EMX_Raw[14]	Raw EMX14 Window	(fT)	-9999999	f12.6
36	EMX_Raw[15]	Raw EMX15 Window	(fT)	-9999999	f12.6
37	EMX_Final[1]	Final EMX01 Window	(fT)	-9999999	f12.6
38	EMX_Final[2]	Final EMX02 Window	(fT)	-9999999	f12.6

39	EMX_Final[3]	Final EMX03 Window			(fT)	-9999999	f12.6
40	EMX_Final[4]	Final EMX04 Window			(fT)	-9999999	f12.6
41	EMX_Final[5]	Final EMX05 Window			(fT)	-9999999	f12.6
42	EMX_Final[6]	Final EMX06 Window			(fT)	-9999999	f12.6
43	EMX_Final[7]	Final EMX07 Window			(fT)	-9999999	f12.6
44	EMX_Final[8]	Final EMX08 Window			(fT)	-9999999	f12.6
45	EMX_Final[9]	Final EMX09 Window			(fT)	-9999999	f12.6
46	EMX_Final[10]	Final EMX10 Window			(fT)	-9999999	f12.6
47	EMX_Final[11]	Final EMX11 Window			(fT)	-9999999	f12.6
48	EMX_Final[12]	Final EMX12 Window			(fT)	-9999999	f12.6
49	EMX_Final[13]	Final EMX13 Window			(fT)	-9999999	f12.6
50	EMX_Final[14]	Final EMX14 Window			(fT)	-9999999	f12.6
51	EMX_Final[15]	Final EMX15 Window			(fT)	-9999999	f12.6
52	X_Sferics	X_Sferics				-9999999	f10.3
53	X_Lowfreq	X_Lowfreq				-9999999	f10.3
54	X_Powerline	X_Powerline				-9999999	f10.3
55	X_VLF1	X_18.2kHz				-9999999	f10.3
56	X_VLF2	X_19.8kHz				-9999999	f10.3
57	X_VLF3	X_21.4kHz				-9999999	f10.3
58	X_VLF4	X_22.2kHz				-9999999	f10.3
59	X_Geofact	X_Geometric factor				-9999999	f10.3
60	EMZ_Raw[1]	Raw EMZ01 Window			(fT)	-9999999	f12.6
61	EMZ_Raw[2]	Raw EMZ02 Window			(fT)	-9999999	f12.6
62	EMZ_Raw[3]	Raw EMZ03 Window			(fT)	-9999999	f12.6
63	EMZ_Raw[4]	Raw EMZ04 Window			(fT)	-9999999	f12.6
64	EMZ_Raw[5]	Raw EMZ05 Window			(fT)	-9999999	f12.6
65	EMZ_Raw[6]	Raw EMZ06 Window			(fT)	-9999999	f12.6
66	EMZ_Raw[7]	Raw EMZ07 Window			(fT)	-9999999	f12.6
67	EMZ_Raw[8]	Raw EMZ08 Window			(fT)	-9999999	f12.6
68	EMZ_Raw[9]	Raw EMZ09 Window			(fT)	-9999999	f12.6
69	EMZ_Raw[10]	Raw EMZ10 Window			(fT)	-9999999	f12.6
70	EMZ_Raw[11]	Raw EMZ11 Window			(fT)	-9999999	f12.6
71	EMZ_Raw[12]	Raw EMZ12 Window			(fT)	-9999999	f12.6
72	EMZ_Raw[13]	Raw EMZ13 Window			(fT)	-9999999	f12.6
73	EMZ_Raw[14]	Raw EMZ14 Window			(fT)	-9999999	f12.6
74	EMZ_Raw[15]	Raw EMZ15 Window			(fT)	-9999999	f12.6
75	EMZ_Final[1]	Final EMZ01 Window			(fT)	-9999999	f12.6
76	EMZ_Final[2]	Final EMZ02 Window			(fT)	-9999999	f12.6
77	EMZ_Final[3]	Final EMZ03 Window			(fT)	-9999999	f12.6
78	EMZ_Final[4]	Final EMZ04 Window			(fT)	-9999999	f12.6
79	EMZ_Final[5]	Final EMZ05 Window			(fT)	-9999999	f12.6
80	EMZ_Final[6]	Final EMZ06 Window			(fT)	-9999999	f12.6
81	EMZ_Final[7]	Final EMZ07 Window			(fT)	-9999999	f12.6
82	EMZ_Final[8]	Final EMZ08 Window			(fT)	-9999999	f12.6
83	EMZ_Final[9]	Final EMZ09 Window			(fT)	-9999999	f12.6
84	EMZ_Final[10]	Final EMZ10 Window			(fT)	-9999999	f12.6
85	EMZ_Final[11]	Final EMZ11 Window			(fT)	-9999999	f12.6
86	EMZ_Final[12]	Final EMZ12 Window			(fT)	-9999999	f12.6
87	EMZ_Final[13]	Final EMZ13 Window			(fT)	-9999999	f12.6
88	EMZ_Final[14]	Final EMZ14 Window			(fT)	-9999999	f12.6
89	EMZ_Final[15]	Final EMZ15 Window			(fT)	-9999999	f12.6
90	Z_Sferics	Z_Sferics				-9999999	f10.3
91	Z_Lowfreq	Z_Lowfreq				-9999999	f10.3
92	Z_Powerline	Z_Powerline				-9999999	f10.3
93	Z_VLF1	Z_18.2kHz				-9999999	f10.3
94	Z_VLF2	Z_19.8kHz				-9999999	f10.3
95	Z_VLF3	Z_21.4kHz				-9999999	f10.3
96	Z_VLF4	Z_22.2kHz				-9999999	f10.3
97	Z_Geofact	Z_Geometric factor				-9999999	f10.3
98	CNDZ[1]	Conductivity_Z001	0-5	m	(mS/m)	-9999999	f10.3
99	CNDZ[2]	Conductivity_Z002	5-10	m	(mS/m)	-9999999	f10.3
100	CNDZ[3]	Conductivity_Z003	10-15	m	(mS/m)	-9999999	f10.3
101	CNDZ[4]	Conductivity_Z004	15-20	m	(mS/m)	-9999999	f10.3
102	CNDZ[5]	Conductivity_Z005	20-25	m	(mS/m)	-9999999	f10.3
103	CNDZ[6]	Conductivity_Z006	25-30	m	(mS/m)	-9999999	f10.3
104	CNDZ[7]	Conductivity_Z007	30-35	m	(mS/m)	-9999999	f10.3
105	CNDZ[8]	Conductivity_Z008	35-40	m	(mS/m)	-9999999	f10.3
106	CNDZ[9]	Conductivity_Z009	40-45	m	(mS/m)	-9999999	f10.3
107	CNDZ[10]	Conductivity_Z010	45-50	m	(mS/m)	-9999999	f10.3
108	CNDZ[11]	Conductivity_Z011	50-55	m	(mS/m)	-9999999	f10.3
109	CNDZ[12]	Conductivity_Z012	55-60	m	(mS/m)	-9999999	f10.3

110	CNDZ[13]	Conductivity_Z013	60-65	m	(mS/m)	-9999999	f10.3
111	CNDZ[14]	Conductivity_Z014	65-70	m	(mS/m)	-9999999	f10.3
112	CNDZ[15]	Conductivity_Z015	70-75	m	(mS/m)	-9999999	f10.3
113	CNDZ[16]	Conductivity_Z016	75-80	m	(mS/m)	-9999999	f10.3
114	CNDZ[17]	Conductivity_Z017	80-85	m	(mS/m)	-9999999	f10.3
115	CNDZ[18]	Conductivity_Z018	85-90	m	(mS/m)	-9999999	f10.3
116	CNDZ[19]	Conductivity_Z019	90-95	m	(mS/m)	-9999999	f10.3
117	CNDZ[20]	Conductivity_Z020	95-100	m	(mS/m)	-9999999	f10.3
118	CNDZ[21]	Conductivity_Z021	100-105	m	(mS/m)	-9999999	f10.3
119	CNDZ[22]	Conductivity_Z022	105-110	m	(mS/m)	-9999999	f10.3
120	CNDZ[23]	Conductivity_Z023	110-115	m	(mS/m)	-9999999	f10.3
121	CNDZ[24]	Conductivity_Z024	115-120	m	(mS/m)	-9999999	f10.3
122	CNDZ[25]	Conductivity_Z025	120-125	m	(mS/m)	-9999999	f10.3
123	CNDZ[26]	Conductivity_Z026	125-130	m	(mS/m)	-9999999	f10.3
124	CNDZ[27]	Conductivity_Z027	130-135	m	(mS/m)	-9999999	f10.3
125	CNDZ[28]	Conductivity_Z028	135-140	m	(mS/m)	-9999999	f10.3
126	CNDZ[29]	Conductivity_Z029	140-145	m	(mS/m)	-9999999	f10.3
127	CNDZ[30]	Conductivity_Z030	145-150	m	(mS/m)	-9999999	f10.3
128	CNDZ[31]	Conductivity_Z031	150-155	m	(mS/m)	-9999999	f10.3
129	CNDZ[32]	Conductivity_Z032	155-160	m	(mS/m)	-9999999	f10.3
130	CNDZ[33]	Conductivity_Z033	160-165	m	(mS/m)	-9999999	f10.3
131	CNDZ[34]	Conductivity_Z034	165-170	m	(mS/m)	-9999999	f10.3
132	CNDZ[35]	Conductivity_Z035	170-175	m	(mS/m)	-9999999	f10.3
133	CNDZ[36]	Conductivity_Z036	175-180	m	(mS/m)	-9999999	f10.3
134	CNDZ[37]	Conductivity_Z037	180-185	m	(mS/m)	-9999999	f10.3
135	CNDZ[38]	Conductivity_Z038	185-190	m	(mS/m)	-9999999	f10.3
136	CNDZ[39]	Conductivity_Z039	190-195	m	(mS/m)	-9999999	f10.3
137	CNDZ[40]	Conductivity_Z040	195-200	m	(mS/m)	-9999999	f10.3
138	CNDZ[41]	Conductivity_Z041	200-205	m	(mS/m)	-9999999	f10.3
139	CNDZ[42]	Conductivity_Z042	205-210	m	(mS/m)	-9999999	f10.3
140	CNDZ[43]	Conductivity_Z043	210-215	m	(mS/m)	-9999999	f10.3
141	CNDZ[44]	Conductivity_Z044	215-220	m	(mS/m)	-9999999	f10.3
142	CNDZ[45]	Conductivity_Z045	220-225	m	(mS/m)	-9999999	f10.3
143	CNDZ[46]	Conductivity_Z046	225-230	m	(mS/m)	-9999999	f10.3
144	CNDZ[47]	Conductivity_Z047	230-235	m	(mS/m)	-9999999	f10.3
145	CNDZ[48]	Conductivity_Z048	235-240	m	(mS/m)	-9999999	f10.3
146	CNDZ[49]	Conductivity_Z049	240-245	m	(mS/m)	-9999999	f10.3
147	CNDZ[50]	Conductivity_Z050	245-250	m	(mS/m)	-9999999	f10.3
148	CNDZ[51]	Conductivity_Z051	250-255	m	(mS/m)	-9999999	f10.3
149	CNDZ[52]	Conductivity_Z052	255-260	m	(mS/m)	-9999999	f10.3
150	CNDZ[53]	Conductivity_Z053	260-265	m	(mS/m)	-9999999	f10.3
151	CNDZ[54]	Conductivity_Z054	265-270	m	(mS/m)	-9999999	f10.3
152	CNDZ[55]	Conductivity_Z055	270-275	m	(mS/m)	-9999999	f10.3
153	CNDZ[56]	Conductivity_Z056	275-280	m	(mS/m)	-9999999	f10.3
154	CNDZ[57]	Conductivity_Z057	280-285	m	(mS/m)	-9999999	f10.3
155	CNDZ[58]	Conductivity_Z058	285-290	m	(mS/m)	-9999999	f10.3
156	CNDZ[59]	Conductivity_Z059	290-295	m	(mS/m)	-9999999	f10.3
157	CNDZ[60]	Conductivity_Z060	295-300	m	(mS/m)	-9999999	f10.3
158	CNDZ[61]	Conductivity_Z061	300-305	m	(mS/m)	-9999999	f10.3
159	CNDZ[62]	Conductivity_Z062	305-310	m	(mS/m)	-9999999	f10.3
160	CNDZ[63]	Conductivity_Z063	310-315	m	(mS/m)	-9999999	f10.3
161	CNDZ[64]	Conductivity_Z064	315-320	m	(mS/m)	-9999999	f10.3
162	CNDZ[65]	Conductivity_Z065	320-325	m	(mS/m)	-9999999	f10.3
163	CNDZ[66]	Conductivity_Z066	325-330	m	(mS/m)	-9999999	f10.3
164	CNDZ[67]	Conductivity_Z067	330-335	m	(mS/m)	-9999999	f10.3
165	CNDZ[68]	Conductivity_Z068	335-340	m	(mS/m)	-9999999	f10.3
166	CNDZ[69]	Conductivity_Z069	340-345	m	(mS/m)	-9999999	f10.3
167	CNDZ[70]	Conductivity_Z070	345-350	m	(mS/m)	-9999999	f10.3
168	CNDZ[71]	Conductivity_Z071	350-355	m	(mS/m)	-9999999	f10.3
169	CNDZ[72]	Conductivity_Z072	355-360	m	(mS/m)	-9999999	f10.3
170	CNDZ[73]	Conductivity_Z073	360-365	m	(mS/m)	-9999999	f10.3
171	CNDZ[74]	Conductivity_Z074	365-370	m	(mS/m)	-9999999	f10.3
172	CNDZ[75]	Conductivity_Z075	370-375	m	(mS/m)	-9999999	f10.3
173	CNDZ[76]	Conductivity_Z076	375-380	m	(mS/m)	-9999999	f10.3
174	CNDZ[77]	Conductivity_Z077	380-385	m	(mS/m)	-9999999	f10.3
175	CNDZ[78]	Conductivity_Z078	385-390	m	(mS/m)	-9999999	f10.3
176	CNDZ[79]	Conductivity_Z079	390-395	m	(mS/m)	-9999999	f10.3
177	CNDZ[80]	Conductivity_Z080	395-400	m	(mS/m)	-9999999	f10.3
178	CNDZ[81]	Conductivity_Z081	400-405	m	(mS/m)	-9999999	f10.3
179	CNDZ[82]	Conductivity_Z082	405-410	m	(mS/m)	-9999999	f10.3
180	CNDZ[83]	Conductivity_Z083	410-415	m	(mS/m)	-9999999	f10.3

181	CNDZ[84]	Conductivity_Z084	415-420	m	(mS/m)	-9999999	f10.3
182	CNDZ[85]	Conductivity_Z085	420-425	m	(mS/m)	-9999999	f10.3
183	CNDZ[86]	Conductivity_Z086	425-430	m	(mS/m)	-9999999	f10.3
184	CNDZ[87]	Conductivity_Z087	430-435	m	(mS/m)	-9999999	f10.3
185	CNDZ[88]	Conductivity_Z088	435-440	m	(mS/m)	-9999999	f10.3
186	CNDZ[89]	Conductivity_Z089	440-445	m	(mS/m)	-9999999	f10.3
187	CNDZ[90]	Conductivity_Z090	445-450	m	(mS/m)	-9999999	f10.3
188	CNDZ[91]	Conductivity_Z091	450-455	m	(mS/m)	-9999999	f10.3
189	CNDZ[92]	Conductivity_Z092	455-460	m	(mS/m)	-9999999	f10.3
190	CNDZ[93]	Conductivity_Z093	460-465	m	(mS/m)	-9999999	f10.3
191	CNDZ[94]	Conductivity_Z094	465-470	m	(mS/m)	-9999999	f10.3
192	CNDZ[95]	Conductivity_Z095	470-475	m	(mS/m)	-9999999	f10.3
193	CNDZ[96]	Conductivity_Z096	475-480	m	(mS/m)	-9999999	f10.3
194	CNDZ[97]	Conductivity_Z097	480-485	m	(mS/m)	-9999999	f10.3
195	CNDZ[98]	Conductivity_Z098	485-490	m	(mS/m)	-9999999	f10.3
196	CNDZ[99]	Conductivity_Z099	490-495	m	(mS/m)	-9999999	f10.3
197	CNDZ[100]	Conductivity_Z100	495-500	m	(mS/m)	-9999999	f10.3

AREA 2 – NORTH

```
JOB NUMBER:                     1885
AREA NUMBER:                    2
SURVEY COMPANY:                 Fugro Airborne Surveys
CLIENT:                         NuPower Resources
SURVEY TYPE:                    25Hz TEMPEST
AREA NAME:                      Area 2 - North
STATE:                          N.T.
COUNTRY:                        Australia
SURVEY FLOWN:                   June, 2007
LOCATED DATA CREATED:           Wed Nov  7 11:50:56 2007

DATUM:                          GDA94
PROJECTION:                     MGA
ZONE:                           53

SURVEY SPECIFICATIONS

TRAVERSE LINE SPACING:          1000 m
TRAVERSE LINE DIRECTION:        113-293 deg
NOMINAL TERRAIN CLEARANCE:      120 m
FINAL LINE KILOMETRES:          1666.2 km

LINE NUMBERING

TRAVERSE LINE NUMBERS:          2001 - 2034

AREA BOUNDARY (WGS84 UTM53)

Eastings  :  314959  330285  338804  352253  372155  372998  373350
             354453  354315  349238  349159  338705  331404  331334
             328231  326006  323723  320953  317760  310671  313335
             309483  309267  311374

Northings : 7527302 7522055 7516764 7512996 7504208 7504302 7474331
            7474021 7479532 7479661 7487087 7494022 7492109 7502617
            7507004 7512733 7515213 7515214 7510909 7512924 7516500
            7518692 7523379 7527593

SURVEY EQUIPMENT

AIRCRAFT:                       VH-TEM Casa 212-200

MAGNETOMETER:                              Scintrex CS-2 CV
INSTALLATION:                              Stinger
RESOLUTION:                                0.001 nT
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RECORDING INTERVAL:	1.0 s
ELECTROMAGNETIC SYSTEM:	25Hz TEMPEST
INSTALLATION:	Transmitter loop mounted on the Receiver coils in a towed bird
COIL ORIENTATION:	X,Z
RECORDING INTERVAL:	0.2 s
SYSTEM GEOMETRY:	
RECEIVER DISTANCE BEHIND THE TRANSMITTER:	-120 m
RECEIVER DISTANCE BELOW THE TRANSMITTER:	-35 m
RADAR ALTIMETER:	Sperry Stars AA220
RECORDING INTERVAL:	1.0 s
NAVIGATION:	real-time differential GPS
RECORDING INTERVAL:	1.0 s
ACQUISITION SYSTEM:	PDAS-1000

DATA PROCESSING

MAGNETIC DATA

DIURNAL CORRECTION APPLIED	base value 53325 nT
PARALLAX CORRECTION APPLIED	0.6 s
IGRF CORRECTION APPLIED	base value 52553 nT
IGRF MODEL 2005 EXTRAPOLATED TO	2007.5

DATA HAVE BEEN MICROLEVELLED

ELECTROMAGNETIC DATA

SYSTEM PARALLAX REMOVED, AS FOLLOWS

X-COMPONENT EM DATA	0.2 s
Z-COMPONENT EM DATA	1.4 s

DATA CORRECTED FOR TRANSMITTER HEIGHT, PITCH AND ROLL
DATA CORRECTED FOR TRANSMITTER-RECEIVER GEOMETRY VARIATIONS
DATA HAVE BEEN MICROLEVELLED
CONDUCTIVITY DEPTH INVERSION CALCULATED EMFlow V5.10
CONDUCTIVITIES CALCULATED USING corrected EM DATA

DIGITAL TERRAIN DATA
DTM CALCULATED [DTM = GPS ALTITUDE - (RADAR ALTITUDE + SENSOR SEPARATION)]
DATA CORRECTED TO AUSTRALIAN HEIGHT DATUM
DATA HAVE BEEN TIE LINE LEVELLED
DATA HAVE BEEN MICROLEVELLED

The accuracy of the elevation calculation is directly dependent on the accuracy of the two input parameters, radar altitude and GPS altitude. The radar altitude value may be erroneous in areas of heavy tree cover, where the altimeter reflects the distance to the tree canopy rather than the ground. The GPS altitude value is primarily dependent on the number of available satellites. Although post-processing of GPS data will yield X and Y accuracies in the order of 1-2 metres, the accuracy of the altitude value is usually much less, sometimes in the ±5 metre range. Further inaccuracies may be introduced during the interpolation and gridding process. Because of the inherent inaccuracies of this method, no guarantee is made or implied that the information displayed is a true representation of the height above sea level. Although this product may be of some use as a general reference,
THIS PRODUCT MUST NOT BE USED FOR NAVIGATION PURPOSES.

ELECTROMAGNETIC SYSTEM

TEMPEST IS A TIME-DOMAIN SQUARE-WAVE SYSTEM,

TRANSMITTING AT A BASE FREQUENCY OF 25Hz,
WITH 2 ORTHOGONAL-AXIS RECEIVER COILS IN A TOWED BIRD.
FINAL EM OUTPUT IS RECORDED 5 TIMES PER SECOND.
THE TIMES (IN MILLISECONDS) FOR THE 15 WINDOWS ARE:

WINDOW	START	END	CENTRE
1	0.007	0.020	0.013
2	0.033	0.047	0.040
3	0.060	0.073	0.067
4	0.087	0.127	0.107
5	0.140	0.207	0.173
6	0.220	0.340	0.280
7	0.353	0.553	0.453
8	0.567	0.873	0.720
9	0.887	1.353	1.120
10	1.367	2.100	1.733
11	2.113	3.273	2.693
12	3.287	5.113	4.200
13	5.127	7.993	6.560
14	8.007	12.393	10.200
15	12.407	19.993	16.200

PULSE WIDTH: 10 ms

TEMPEST EM data are transformed to the response that would be obtained with a B-field sensor for a 100% duty cycle square waveform at the base frequency, involving a 1A change in current (from -0.5A to +0.5A to -0.5A) in a 1sq.m transmitter. It is this configuration, rather than the actual acquisition configuration, which must be specified when modelling TEMPEST data.

LOCATED DATA FORMAT

Output field format : DOS - Flat ascii
Number of fields : 197

Field	Channel	Description	Units	Undefined	Format
1	LINE	Line		-9999999	i6
2	FLIGHT	Flight		-9999999	i4
3	FID	Fiducial	(s)	-9999999	f8.1
4	LAT_GDA94	Latitude GDA94	(deg)	-9999999	f13.6
5	LON_GDA94	Longitude GDA94	(deg)	-9999999	f13.6
6	X_MGA53	Easting MGA53	(m)	-9999999	f11.2
7	Y_MGA53	Northing MGA53	(m)	-9999999	f12.2
8	TxHeight	GPS height	(m)	-9999999	f8.2
9	TxRalt_raw	Raw Radar Altimeter	(m)	-9999999	f8.2
10	TxRalt_final	Final Radar Altimeter	(m)	-9999999	f8.2
11	DTM	DTM	(m)	-9999999	f8.2
12	MAG	Compensated TMI	(nT)	-9999999	f10.3
13	MAG_1VD	Levelled TMI 1VD	(nT/m)	-9999999	f12.5
14	Pitch_Raw	Raw Tx loop pitch	(deg)	-9999999	f10.5
15	Roll_Raw	Raw Tx loop roll	(deg)	-9999999	f10.5
16	HSep_Raw	Raw Tx-Rx horizontal separation	(m)	-9999999	f8.2
17	VSep_Raw	Raw Tx-Rx vertical separation	(m)	-9999999	f8.2
18	Pitch_Final	Final Tx loop pitch	(deg)	-9999999	f10.5
19	Roll_Final	Final Tx loop roll	(deg)	-9999999	f10.5
20	HSep_Final	Final Tx-Rx horizontal separation	(m)	-9999999	f8.2
21	VSep_Final	Final Tx-Rx vertical separation	(m)	-9999999	f8.2
22	EMX_Raw[1]	Raw EMX01 Window	(fT)	-9999999	f12.6
23	EMX_Raw[2]	Raw EMX02 Window	(fT)	-9999999	f12.6
24	EMX_Raw[3]	Raw EMX03 Window	(fT)	-9999999	f12.6
25	EMX_Raw[4]	Raw EMX04 Window	(fT)	-9999999	f12.6
26	EMX_Raw[5]	Raw EMX05 Window	(fT)	-9999999	f12.6
27	EMX_Raw[6]	Raw EMX06 Window	(fT)	-9999999	f12.6

28	EMX_Raw[7]	Raw EMX07 Window			(fT)	-9999999	f12.6
29	EMX_Raw[8]	Raw EMX08 Window			(fT)	-9999999	f12.6
30	EMX_Raw[9]	Raw EMX09 Window			(fT)	-9999999	f12.6
31	EMX_Raw[10]	Raw EMX10 Window			(fT)	-9999999	f12.6
32	EMX_Raw[11]	Raw EMX11 Window			(fT)	-9999999	f12.6
33	EMX_Raw[12]	Raw EMX12 Window			(fT)	-9999999	f12.6
34	EMX_Raw[13]	Raw EMX13 Window			(fT)	-9999999	f12.6
35	EMX_Raw[14]	Raw EMX14 Window			(fT)	-9999999	f12.6
36	EMX_Raw[15]	Raw EMX15 Window			(fT)	-9999999	f12.6
37	EMX_Final[1]	Final EMX01 Window			(fT)	-9999999	f12.6
38	EMX_Final[2]	Final EMX02 Window			(fT)	-9999999	f12.6
39	EMX_Final[3]	Final EMX03 Window			(fT)	-9999999	f12.6
40	EMX_Final[4]	Final EMX04 Window			(fT)	-9999999	f12.6
41	EMX_Final[5]	Final EMX05 Window			(fT)	-9999999	f12.6
42	EMX_Final[6]	Final EMX06 Window			(fT)	-9999999	f12.6
43	EMX_Final[7]	Final EMX07 Window			(fT)	-9999999	f12.6
44	EMX_Final[8]	Final EMX08 Window			(fT)	-9999999	f12.6
45	EMX_Final[9]	Final EMX09 Window			(fT)	-9999999	f12.6
46	EMX_Final[10]	Final EMX10 Window			(fT)	-9999999	f12.6
47	EMX_Final[11]	Final EMX11 Window			(fT)	-9999999	f12.6
48	EMX_Final[12]	Final EMX12 Window			(fT)	-9999999	f12.6
49	EMX_Final[13]	Final EMX13 Window			(fT)	-9999999	f12.6
50	EMX_Final[14]	Final EMX14 Window			(fT)	-9999999	f12.6
51	EMX_Final[15]	Final EMX15 Window			(fT)	-9999999	f12.6
52	X_Sferics	X_Sferics				-9999999	f10.3
53	X_Lowfreq	X_Lowfreq				-9999999	f10.3
54	X_Powerline	X_Powerline				-9999999	f10.3
55	X_VLF1	X_18.2kHz				-9999999	f10.3
56	X_VLF2	X_19.8kHz				-9999999	f10.3
57	X_VLF3	X_21.4kHz				-9999999	f10.3
58	X_VLF4	X_22.2kHz				-9999999	f10.3
59	X_Geofact	X_Geometric factor				-9999999	f10.3
60	EMZ_Raw[1]	Raw EMZ01 Window			(fT)	-9999999	f12.6
61	EMZ_Raw[2]	Raw EMZ02 Window			(fT)	-9999999	f12.6
62	EMZ_Raw[3]	Raw EMZ03 Window			(fT)	-9999999	f12.6
63	EMZ_Raw[4]	Raw EMZ04 Window			(fT)	-9999999	f12.6
64	EMZ_Raw[5]	Raw EMZ05 Window			(fT)	-9999999	f12.6
65	EMZ_Raw[6]	Raw EMZ06 Window			(fT)	-9999999	f12.6
66	EMZ_Raw[7]	Raw EMZ07 Window			(fT)	-9999999	f12.6
67	EMZ_Raw[8]	Raw EMZ08 Window			(fT)	-9999999	f12.6
68	EMZ_Raw[9]	Raw EMZ09 Window			(fT)	-9999999	f12.6
69	EMZ_Raw[10]	Raw EMZ10 Window			(fT)	-9999999	f12.6
70	EMZ_Raw[11]	Raw EMZ11 Window			(fT)	-9999999	f12.6
71	EMZ_Raw[12]	Raw EMZ12 Window			(fT)	-9999999	f12.6
72	EMZ_Raw[13]	Raw EMZ13 Window			(fT)	-9999999	f12.6
73	EMZ_Raw[14]	Raw EMZ14 Window			(fT)	-9999999	f12.6
74	EMZ_Raw[15]	Raw EMZ15 Window			(fT)	-9999999	f12.6
75	EMZ_Final[1]	Final EMZ01 Window			(fT)	-9999999	f12.6
76	EMZ_Final[2]	Final EMZ02 Window			(fT)	-9999999	f12.6
77	EMZ_Final[3]	Final EMZ03 Window			(fT)	-9999999	f12.6
78	EMZ_Final[4]	Final EMZ04 Window			(fT)	-9999999	f12.6
79	EMZ_Final[5]	Final EMZ05 Window			(fT)	-9999999	f12.6
80	EMZ_Final[6]	Final EMZ06 Window			(fT)	-9999999	f12.6
81	EMZ_Final[7]	Final EMZ07 Window			(fT)	-9999999	f12.6
82	EMZ_Final[8]	Final EMZ08 Window			(fT)	-9999999	f12.6
83	EMZ_Final[9]	Final EMZ09 Window			(fT)	-9999999	f12.6
84	EMZ_Final[10]	Final EMZ10 Window			(fT)	-9999999	f12.6
85	EMZ_Final[11]	Final EMZ11 Window			(fT)	-9999999	f12.6
86	EMZ_Final[12]	Final EMZ12 Window			(fT)	-9999999	f12.6
87	EMZ_Final[13]	Final EMZ13 Window			(fT)	-9999999	f12.6
88	EMZ_Final[14]	Final EMZ14 Window			(fT)	-9999999	f12.6
89	EMZ_Final[15]	Final EMZ15 Window			(fT)	-9999999	f12.6
90	Z_Sferics	Z_Sferics				-9999999	f10.3
91	Z_Lowfreq	Z_Lowfreq				-9999999	f10.3
92	Z_Powerline	Z_Powerline				-9999999	f10.3
93	Z_VLF1	Z_18.2kHz				-9999999	f10.3
94	Z_VLF2	Z_19.8kHz				-9999999	f10.3
95	Z_VLF3	Z_21.4kHz				-9999999	f10.3
96	Z_VLF4	Z_22.2kHz				-9999999	f10.3
97	Z_Geofact	Z_Geometric factor				-9999999	f10.3
98	CNDZ[1]	Conductivity_Z001	0-5	m	(mS/m)	-9999999	f10.3

99	CNDZ[2]	Conductivity_Z002	5-10	m	(mS/m)	-9999999	f10.3
100	CNDZ[3]	Conductivity_Z003	10-15	m	(mS/m)	-9999999	f10.3
101	CNDZ[4]	Conductivity_Z004	15-20	m	(mS/m)	-9999999	f10.3
102	CNDZ[5]	Conductivity_Z005	20-25	m	(mS/m)	-9999999	f10.3
103	CNDZ[6]	Conductivity_Z006	25-30	m	(mS/m)	-9999999	f10.3
104	CNDZ[7]	Conductivity_Z007	30-35	m	(mS/m)	-9999999	f10.3
105	CNDZ[8]	Conductivity_Z008	35-40	m	(mS/m)	-9999999	f10.3
106	CNDZ[9]	Conductivity_Z009	40-45	m	(mS/m)	-9999999	f10.3
107	CNDZ[10]	Conductivity_Z010	45-50	m	(mS/m)	-9999999	f10.3
108	CNDZ[11]	Conductivity_Z011	50-55	m	(mS/m)	-9999999	f10.3
109	CNDZ[12]	Conductivity_Z012	55-60	m	(mS/m)	-9999999	f10.3
110	CNDZ[13]	Conductivity_Z013	60-65	m	(mS/m)	-9999999	f10.3
111	CNDZ[14]	Conductivity_Z014	65-70	m	(mS/m)	-9999999	f10.3
112	CNDZ[15]	Conductivity_Z015	70-75	m	(mS/m)	-9999999	f10.3
113	CNDZ[16]	Conductivity_Z016	75-80	m	(mS/m)	-9999999	f10.3
114	CNDZ[17]	Conductivity_Z017	80-85	m	(mS/m)	-9999999	f10.3
115	CNDZ[18]	Conductivity_Z018	85-90	m	(mS/m)	-9999999	f10.3
116	CNDZ[19]	Conductivity_Z019	90-95	m	(mS/m)	-9999999	f10.3
117	CNDZ[20]	Conductivity_Z020	95-100	m	(mS/m)	-9999999	f10.3
118	CNDZ[21]	Conductivity_Z021	100-105	m	(mS/m)	-9999999	f10.3
119	CNDZ[22]	Conductivity_Z022	105-110	m	(mS/m)	-9999999	f10.3
120	CNDZ[23]	Conductivity_Z023	110-115	m	(mS/m)	-9999999	f10.3
121	CNDZ[24]	Conductivity_Z024	115-120	m	(mS/m)	-9999999	f10.3
122	CNDZ[25]	Conductivity_Z025	120-125	m	(mS/m)	-9999999	f10.3
123	CNDZ[26]	Conductivity_Z026	125-130	m	(mS/m)	-9999999	f10.3
124	CNDZ[27]	Conductivity_Z027	130-135	m	(mS/m)	-9999999	f10.3
125	CNDZ[28]	Conductivity_Z028	135-140	m	(mS/m)	-9999999	f10.3
126	CNDZ[29]	Conductivity_Z029	140-145	m	(mS/m)	-9999999	f10.3
127	CNDZ[30]	Conductivity_Z030	145-150	m	(mS/m)	-9999999	f10.3
128	CNDZ[31]	Conductivity_Z031	150-155	m	(mS/m)	-9999999	f10.3
129	CNDZ[32]	Conductivity_Z032	155-160	m	(mS/m)	-9999999	f10.3
130	CNDZ[33]	Conductivity_Z033	160-165	m	(mS/m)	-9999999	f10.3
131	CNDZ[34]	Conductivity_Z034	165-170	m	(mS/m)	-9999999	f10.3
132	CNDZ[35]	Conductivity_Z035	170-175	m	(mS/m)	-9999999	f10.3
133	CNDZ[36]	Conductivity_Z036	175-180	m	(mS/m)	-9999999	f10.3
134	CNDZ[37]	Conductivity_Z037	180-185	m	(mS/m)	-9999999	f10.3
135	CNDZ[38]	Conductivity_Z038	185-190	m	(mS/m)	-9999999	f10.3
136	CNDZ[39]	Conductivity_Z039	190-195	m	(mS/m)	-9999999	f10.3
137	CNDZ[40]	Conductivity_Z040	195-200	m	(mS/m)	-9999999	f10.3
138	CNDZ[41]	Conductivity_Z041	200-205	m	(mS/m)	-9999999	f10.3
139	CNDZ[42]	Conductivity_Z042	205-210	m	(mS/m)	-9999999	f10.3
140	CNDZ[43]	Conductivity_Z043	210-215	m	(mS/m)	-9999999	f10.3
141	CNDZ[44]	Conductivity_Z044	215-220	m	(mS/m)	-9999999	f10.3
142	CNDZ[45]	Conductivity_Z045	220-225	m	(mS/m)	-9999999	f10.3
143	CNDZ[46]	Conductivity_Z046	225-230	m	(mS/m)	-9999999	f10.3
144	CNDZ[47]	Conductivity_Z047	230-235	m	(mS/m)	-9999999	f10.3
145	CNDZ[48]	Conductivity_Z048	235-240	m	(mS/m)	-9999999	f10.3
146	CNDZ[49]	Conductivity_Z049	240-245	m	(mS/m)	-9999999	f10.3
147	CNDZ[50]	Conductivity_Z050	245-250	m	(mS/m)	-9999999	f10.3
148	CNDZ[51]	Conductivity_Z051	250-255	m	(mS/m)	-9999999	f10.3
149	CNDZ[52]	Conductivity_Z052	255-260	m	(mS/m)	-9999999	f10.3
150	CNDZ[53]	Conductivity_Z053	260-265	m	(mS/m)	-9999999	f10.3
151	CNDZ[54]	Conductivity_Z054	265-270	m	(mS/m)	-9999999	f10.3
152	CNDZ[55]	Conductivity_Z055	270-275	m	(mS/m)	-9999999	f10.3
153	CNDZ[56]	Conductivity_Z056	275-280	m	(mS/m)	-9999999	f10.3
154	CNDZ[57]	Conductivity_Z057	280-285	m	(mS/m)	-9999999	f10.3
155	CNDZ[58]	Conductivity_Z058	285-290	m	(mS/m)	-9999999	f10.3
156	CNDZ[59]	Conductivity_Z059	290-295	m	(mS/m)	-9999999	f10.3
157	CNDZ[60]	Conductivity_Z060	295-300	m	(mS/m)	-9999999	f10.3
158	CNDZ[61]	Conductivity_Z061	300-305	m	(mS/m)	-9999999	f10.3
159	CNDZ[62]	Conductivity_Z062	305-310	m	(mS/m)	-9999999	f10.3
160	CNDZ[63]	Conductivity_Z063	310-315	m	(mS/m)	-9999999	f10.3
161	CNDZ[64]	Conductivity_Z064	315-320	m	(mS/m)	-9999999	f10.3
162	CNDZ[65]	Conductivity_Z065	320-325	m	(mS/m)	-9999999	f10.3
163	CNDZ[66]	Conductivity_Z066	325-330	m	(mS/m)	-9999999	f10.3
164	CNDZ[67]	Conductivity_Z067	330-335	m	(mS/m)	-9999999	f10.3
165	CNDZ[68]	Conductivity_Z068	335-340	m	(mS/m)	-9999999	f10.3
166	CNDZ[69]	Conductivity_Z069	340-345	m	(mS/m)	-9999999	f10.3
167	CNDZ[70]	Conductivity_Z070	345-350	m	(mS/m)	-9999999	f10.3
168	CNDZ[71]	Conductivity_Z071	350-355	m	(mS/m)	-9999999	f10.3
169	CNDZ[72]	Conductivity_Z072	355-360	m	(mS/m)	-9999999	f10.3

170	CNDZ[73]	Conductivity_Z073	360-365	m	(mS/m)	-9999999	f10.3
171	CNDZ[74]	Conductivity_Z074	365-370	m	(mS/m)	-9999999	f10.3
172	CNDZ[75]	Conductivity_Z075	370-375	m	(mS/m)	-9999999	f10.3
173	CNDZ[76]	Conductivity_Z076	375-380	m	(mS/m)	-9999999	f10.3
174	CNDZ[77]	Conductivity_Z077	380-385	m	(mS/m)	-9999999	f10.3
175	CNDZ[78]	Conductivity_Z078	385-390	m	(mS/m)	-9999999	f10.3
176	CNDZ[79]	Conductivity_Z079	390-395	m	(mS/m)	-9999999	f10.3
177	CNDZ[80]	Conductivity_Z080	395-400	m	(mS/m)	-9999999	f10.3
178	CNDZ[81]	Conductivity_Z081	400-405	m	(mS/m)	-9999999	f10.3
179	CNDZ[82]	Conductivity_Z082	405-410	m	(mS/m)	-9999999	f10.3
180	CNDZ[83]	Conductivity_Z083	410-415	m	(mS/m)	-9999999	f10.3
181	CNDZ[84]	Conductivity_Z084	415-420	m	(mS/m)	-9999999	f10.3
182	CNDZ[85]	Conductivity_Z085	420-425	m	(mS/m)	-9999999	f10.3
183	CNDZ[86]	Conductivity_Z086	425-430	m	(mS/m)	-9999999	f10.3
184	CNDZ[87]	Conductivity_Z087	430-435	m	(mS/m)	-9999999	f10.3
185	CNDZ[88]	Conductivity_Z088	435-440	m	(mS/m)	-9999999	f10.3
186	CNDZ[89]	Conductivity_Z089	440-445	m	(mS/m)	-9999999	f10.3
187	CNDZ[90]	Conductivity_Z090	445-450	m	(mS/m)	-9999999	f10.3
188	CNDZ[91]	Conductivity_Z091	450-455	m	(mS/m)	-9999999	f10.3
189	CNDZ[92]	Conductivity_Z092	455-460	m	(mS/m)	-9999999	f10.3
190	CNDZ[93]	Conductivity_Z093	460-465	m	(mS/m)	-9999999	f10.3
191	CNDZ[94]	Conductivity_Z094	465-470	m	(mS/m)	-9999999	f10.3
192	CNDZ[95]	Conductivity_Z095	470-475	m	(mS/m)	-9999999	f10.3
193	CNDZ[96]	Conductivity_Z096	475-480	m	(mS/m)	-9999999	f10.3
194	CNDZ[97]	Conductivity_Z097	480-485	m	(mS/m)	-9999999	f10.3
195	CNDZ[98]	Conductivity_Z098	485-490	m	(mS/m)	-9999999	f10.3
196	CNDZ[99]	Conductivity_Z099	490-495	m	(mS/m)	-9999999	f10.3
197	CNDZ[100]	Conductivity_Z100	495-500	m	(mS/m)	-9999999	f10.3

AREA 3 - EAST

JOB NUMBER:	1885
AREA NUMBER:	3
SURVEY COMPANY:	Fugro Airborne Surveys
CLIENT:	NuPower Resources
SURVEY TYPE:	25Hz TEMPEST
AREA NAME:	Area 3 - East
STATE:	N.T.
COUNTRY:	Australia
SURVEY FLOWN:	June, 2007
LOCATED DATA CREATED:	Thu Nov 8 09:54:03 2007

DATUM:	GDA94
PROJECTION:	MGA
ZONE:	53

SURVEY SPECIFICATIONS

TRAVERSE LINE SPACING:	1000 m
TRAVERSE LINE DIRECTION:	090-270 deg
NOMINAL TERRAIN CLEARANCE:	120 m
FINAL LINE KILOMETRES:	310.6 km

LINE NUMBERING

TRAVERSE LINE NUMBERS: 3001 - 3019

AREA BOUNDARY (WGS84 UTM53)

Eastings : 394393 394246 386983 376720 376899 376899

Northings : 7480839 7458853 7458147 7451946 7474301 7480565

SURVEY EQUIPMENT

AIRCRAFT: VH-TEM Casa 212-200

MAGNETOMETER:	Scintrex CS-2 CV
INSTALLATION:	Stinger
RESOLUTION:	0.001 nT
RECORDING INTERVAL:	1.0 s
ELECTROMAGNETIC SYSTEM:	25Hz TEMPEST
INSTALLATION:	Transmitter loop mounted on the Receiver coils in a towed bird
COIL ORIENTATION:	X,Z
RECORDING INTERVAL:	0.2 s
SYSTEM GEOMETRY:	
RECEIVER DISTANCE BEHIND THE TRANSMITTER:	-120 m
RECEIVER DISTANCE BELOW THE TRANSMITTER:	-35 m
RADAR ALTIMETER:	Sperry Stars AA220
RECORDING INTERVAL:	1.0 s
NAVIGATION:	real-time differential GPS
RECORDING INTERVAL:	1.0 s
ACQUISITION SYSTEM:	PDAS-1000

DATA PROCESSING

MAGNETIC DATA

DIURNAL CORRECTION APPLIED	base value 53325 nT
PARALLAX CORRECTION APPLIED	0.6 s
IGRF CORRECTION APPLIED	base value 52784 nT
IGRF MODEL 2005 EXTRAPOLATED TO	2007.5
DATA HAVE BEEN MICROLEVELLED	

ELECTROMAGNETIC DATA

SYSTEM PARALLAX REMOVED, AS FOLLOWS	
X-COMPONENT EM DATA	0.2 s
Z-COMPONENT EM DATA	1.4 s
DATA CORRECTED FOR TRANSMITTER HEIGHT, PITCH AND ROLL	
DATA CORRECTED FOR TRANSMITTER-RECEIVER GEOMETRY VARIATIONS	
DATA HAVE BEEN MICROLEVELLED	
CONDUCTIVITY DEPTH INVERSION CALCULATED	EMFlow V5.10
CONDUCTIVITIES CALCULATED USING corrected EM DATA	

DIGITAL TERRAIN DATA
DTM CALCULATED [DTM = GPS ALTITUDE - (RADAR ALTITUDE + SENSOR SEPARATION)]
DATA CORRECTED TO AUSTRALIAN HEIGHT DATUM
DATA HAVE BEEN TIE LINE LEVELLED
DATA HAVE BEEN MICROLEVELLED

The accuracy of the elevation calculation is directly dependent on the accuracy of the two input parameters, radar altitude and GPS altitude. The radar altitude value may be erroneous in areas of heavy tree cover, where the altimeter reflects the distance to the tree canopy rather than the ground. The GPS altitude value is primarily dependent on the number of available satellites. Although post-processing of GPS data will yield X and Y accuracies in the order of 1-2 metres, the accuracy of the altitude value is usually much less, sometimes in the ±5 metre range. Further inaccuracies may be introduced during the interpolation and gridding process. Because of the inherent inaccuracies of this method, no guarantee is made or implied that the information displayed is a true representation of the height above sea level. Although this product may be of some use as a general reference,
THIS PRODUCT MUST NOT BE USED FOR NAVIGATION PURPOSES.

ELECTROMAGNETIC SYSTEM

TEMPEST IS A TIME-DOMAIN SQUARE-WAVE SYSTEM,
TRANSMITTING AT A BASE FREQUENCY OF 25Hz,
WITH 2 ORTHOGONAL-AXIS RECEIVER COILS IN A TOWED BIRD.
FINAL EM OUTPUT IS RECORDED 5 TIMES PER SECOND.
THE TIMES (IN MILLISECONDS) FOR THE 15 WINDOWS ARE:

WINDOW	START	END	CENTRE
1	0.007	0.020	0.013
2	0.033	0.047	0.040
3	0.060	0.073	0.067
4	0.087	0.127	0.107
5	0.140	0.207	0.173
6	0.220	0.340	0.280
7	0.353	0.553	0.453
8	0.567	0.873	0.720
9	0.887	1.353	1.120
10	1.367	2.100	1.733
11	2.113	3.273	2.693
12	3.287	5.113	4.200
13	5.127	7.993	6.560
14	8.007	12.393	10.200
15	12.407	19.993	16.200

PULSE WIDTH: 10 ms

TEMPEST EM data are transformed to the response that would be obtained with a B-field sensor for a 100% duty cycle square waveform at the base frequency, involving a 1A change in current (from -0.5A to +0.5A to -0.5A) in a 1sq.m transmitter. It is this configuration, rather than the actual acquisition configuration, which must be specified when modelling TEMPEST data.

LOCATED DATA FORMAT

Output field format : DOS - Flat ascii
Number of fields : 197

Field	Channel	Description	Units	Undefined	Format
1	LINE	Line		-9999999	i6
2	FLIGHT	Flight		-9999999	i4
3	FID	Fiducial	(s)	-9999999	f8.1
4	LAT_GDA94	Latitude GDA94	(deg)	-9999999	f13.6
5	LON_GDA94	Longitude GDA94	(deg)	-9999999	f13.6
6	X_MGA53	Easting MGA53	(m)	-9999999	f11.2
7	Y_MGA53	Northing MGA53	(m)	-9999999	f12.2
8	TxHeight	GPS height	(m)	-9999999	f8.2
9	TxRalt_raw	Raw Radar Altimeter	(m)	-9999999	f8.2
10	TxRalt_final	Final Radar Altimeter	(m)	-9999999	f8.2
11	DTM	DTM	(m)	-9999999	f8.2
12	MAG	Compensated TMI	(nT)	-9999999	f10.3
13	MAG_1VD	Levelled TMI 1VD	(nT/m)	-9999999	f12.5
14	Pitch_Raw	Raw Tx loop pitch	(deg)	-9999999	f10.5
15	Roll_Raw	Raw Tx loop roll	(deg)	-9999999	f10.5
16	HSep_Raw	Raw Tx-Rx horizontal separation	(m)	-9999999	f8.2
17	VSep_Raw	Raw Tx-Rx vertical separation	(m)	-9999999	f8.2
18	Pitch_Final	Final Tx loop pitch	(deg)	-9999999	f10.5
19	Roll_Final	Final Tx loop roll	(deg)	-9999999	f10.5
20	HSep_Final	Final Tx-Rx horizontal separation	(m)	-9999999	f8.2
21	VSep_Final	Final Tx-Rx vertical separation	(m)	-9999999	f8.2
22	EMX_Raw[1]	Raw EMX01 Window	(fT)	-9999999	f12.6

23	EMX_Raw[2]	Raw EMX02 Window	(fT)	-9999999	f12.6
24	EMX_Raw[3]	Raw EMX03 Window	(fT)	-9999999	f12.6
25	EMX_Raw[4]	Raw EMX04 Window	(fT)	-9999999	f12.6
26	EMX_Raw[5]	Raw EMX05 Window	(fT)	-9999999	f12.6
27	EMX_Raw[6]	Raw EMX06 Window	(fT)	-9999999	f12.6
28	EMX_Raw[7]	Raw EMX07 Window	(fT)	-9999999	f12.6
29	EMX_Raw[8]	Raw EMX08 Window	(fT)	-9999999	f12.6
30	EMX_Raw[9]	Raw EMX09 Window	(fT)	-9999999	f12.6
31	EMX_Raw[10]	Raw EMX10 Window	(fT)	-9999999	f12.6
32	EMX_Raw[11]	Raw EMX11 Window	(fT)	-9999999	f12.6
33	EMX_Raw[12]	Raw EMX12 Window	(fT)	-9999999	f12.6
34	EMX_Raw[13]	Raw EMX13 Window	(fT)	-9999999	f12.6
35	EMX_Raw[14]	Raw EMX14 Window	(fT)	-9999999	f12.6
36	EMX_Raw[15]	Raw EMX15 Window	(fT)	-9999999	f12.6
37	EMX_Final[1]	Final EMX01 Window	(fT)	-9999999	f12.6
38	EMX_Final[2]	Final EMX02 Window	(fT)	-9999999	f12.6
39	EMX_Final[3]	Final EMX03 Window	(fT)	-9999999	f12.6
40	EMX_Final[4]	Final EMX04 Window	(fT)	-9999999	f12.6
41	EMX_Final[5]	Final EMX05 Window	(fT)	-9999999	f12.6
42	EMX_Final[6]	Final EMX06 Window	(fT)	-9999999	f12.6
43	EMX_Final[7]	Final EMX07 Window	(fT)	-9999999	f12.6
44	EMX_Final[8]	Final EMX08 Window	(fT)	-9999999	f12.6
45	EMX_Final[9]	Final EMX09 Window	(fT)	-9999999	f12.6
46	EMX_Final[10]	Final EMX10 Window	(fT)	-9999999	f12.6
47	EMX_Final[11]	Final EMX11 Window	(fT)	-9999999	f12.6
48	EMX_Final[12]	Final EMX12 Window	(fT)	-9999999	f12.6
49	EMX_Final[13]	Final EMX13 Window	(fT)	-9999999	f12.6
50	EMX_Final[14]	Final EMX14 Window	(fT)	-9999999	f12.6
51	EMX_Final[15]	Final EMX15 Window	(fT)	-9999999	f12.6
52	X_Sferics	X_Sferics		-9999999	f10.3
53	X_Lowfreq	X_Lowfreq		-9999999	f10.3
54	X_Powerline	X_Powerline		-9999999	f10.3
55	X_VLF1	X_18.2kHz		-9999999	f10.3
56	X_VLF2	X_19.8kHz		-9999999	f10.3
57	X_VLF3	X_21.4kHz		-9999999	f10.3
58	X_VLF4	X_22.2kHz		-9999999	f10.3
59	X_Geofact	X_Geometric factor		-9999999	f10.3
60	EMZ_Raw[1]	Raw EMZ01 Window	(fT)	-9999999	f12.6
61	EMZ_Raw[2]	Raw EMZ02 Window	(fT)	-9999999	f12.6
62	EMZ_Raw[3]	Raw EMZ03 Window	(fT)	-9999999	f12.6
63	EMZ_Raw[4]	Raw EMZ04 Window	(fT)	-9999999	f12.6
64	EMZ_Raw[5]	Raw EMZ05 Window	(fT)	-9999999	f12.6
65	EMZ_Raw[6]	Raw EMZ06 Window	(fT)	-9999999	f12.6
66	EMZ_Raw[7]	Raw EMZ07 Window	(fT)	-9999999	f12.6
67	EMZ_Raw[8]	Raw EMZ08 Window	(fT)	-9999999	f12.6
68	EMZ_Raw[9]	Raw EMZ09 Window	(fT)	-9999999	f12.6
69	EMZ_Raw[10]	Raw EMZ10 Window	(fT)	-9999999	f12.6
70	EMZ_Raw[11]	Raw EMZ11 Window	(fT)	-9999999	f12.6
71	EMZ_Raw[12]	Raw EMZ12 Window	(fT)	-9999999	f12.6
72	EMZ_Raw[13]	Raw EMZ13 Window	(fT)	-9999999	f12.6
73	EMZ_Raw[14]	Raw EMZ14 Window	(fT)	-9999999	f12.6
74	EMZ_Raw[15]	Raw EMZ15 Window	(fT)	-9999999	f12.6
75	EMZ_Final[1]	Final EMZ01 Window	(fT)	-9999999	f12.6
76	EMZ_Final[2]	Final EMZ02 Window	(fT)	-9999999	f12.6
77	EMZ_Final[3]	Final EMZ03 Window	(fT)	-9999999	f12.6
78	EMZ_Final[4]	Final EMZ04 Window	(fT)	-9999999	f12.6
79	EMZ_Final[5]	Final EMZ05 Window	(fT)	-9999999	f12.6
80	EMZ_Final[6]	Final EMZ06 Window	(fT)	-9999999	f12.6
81	EMZ_Final[7]	Final EMZ07 Window	(fT)	-9999999	f12.6
82	EMZ_Final[8]	Final EMZ08 Window	(fT)	-9999999	f12.6
83	EMZ_Final[9]	Final EMZ09 Window	(fT)	-9999999	f12.6
84	EMZ_Final[10]	Final EMZ10 Window	(fT)	-9999999	f12.6
85	EMZ_Final[11]	Final EMZ11 Window	(fT)	-9999999	f12.6
86	EMZ_Final[12]	Final EMZ12 Window	(fT)	-9999999	f12.6
87	EMZ_Final[13]	Final EMZ13 Window	(fT)	-9999999	f12.6
88	EMZ_Final[14]	Final EMZ14 Window	(fT)	-9999999	f12.6
89	EMZ_Final[15]	Final EMZ15 Window	(fT)	-9999999	f12.6
90	Z_Sferics	Z_Sferics		-9999999	f10.3
91	Z_Lowfreq	Z_Lowfreq		-9999999	f10.3
92	Z_Powerline	Z_Powerline		-9999999	f10.3
93	Z_VLF1	Z_18.2kHz		-9999999	f10.3

94	Z_VLF2	Z_19.8kHz				-9999999	f10.3
95	Z_VLF3	Z_21.4kHz				-9999999	f10.3
96	Z_VLF4	Z_22.2kHz				-9999999	f10.3
97	Z_Geofact	Z_Geometric factor				-9999999	f10.3
98	CNDZ[1]	Conductivity_Z001	0-5	m	(mS/m)	-9999999	f10.3
99	CNDZ[2]	Conductivity_Z002	5-10	m	(mS/m)	-9999999	f10.3
100	CNDZ[3]	Conductivity_Z003	10-15	m	(mS/m)	-9999999	f10.3
101	CNDZ[4]	Conductivity_Z004	15-20	m	(mS/m)	-9999999	f10.3
102	CNDZ[5]	Conductivity_Z005	20-25	m	(mS/m)	-9999999	f10.3
103	CNDZ[6]	Conductivity_Z006	25-30	m	(mS/m)	-9999999	f10.3
104	CNDZ[7]	Conductivity_Z007	30-35	m	(mS/m)	-9999999	f10.3
105	CNDZ[8]	Conductivity_Z008	35-40	m	(mS/m)	-9999999	f10.3
106	CNDZ[9]	Conductivity_Z009	40-45	m	(mS/m)	-9999999	f10.3
107	CNDZ[10]	Conductivity_Z010	45-50	m	(mS/m)	-9999999	f10.3
108	CNDZ[11]	Conductivity_Z011	50-55	m	(mS/m)	-9999999	f10.3
109	CNDZ[12]	Conductivity_Z012	55-60	m	(mS/m)	-9999999	f10.3
110	CNDZ[13]	Conductivity_Z013	60-65	m	(mS/m)	-9999999	f10.3
111	CNDZ[14]	Conductivity_Z014	65-70	m	(mS/m)	-9999999	f10.3
112	CNDZ[15]	Conductivity_Z015	70-75	m	(mS/m)	-9999999	f10.3
113	CNDZ[16]	Conductivity_Z016	75-80	m	(mS/m)	-9999999	f10.3
114	CNDZ[17]	Conductivity_Z017	80-85	m	(mS/m)	-9999999	f10.3
115	CNDZ[18]	Conductivity_Z018	85-90	m	(mS/m)	-9999999	f10.3
116	CNDZ[19]	Conductivity_Z019	90-95	m	(mS/m)	-9999999	f10.3
117	CNDZ[20]	Conductivity_Z020	95-100	m	(mS/m)	-9999999	f10.3
118	CNDZ[21]	Conductivity_Z021	100-105	m	(mS/m)	-9999999	f10.3
119	CNDZ[22]	Conductivity_Z022	105-110	m	(mS/m)	-9999999	f10.3
120	CNDZ[23]	Conductivity_Z023	110-115	m	(mS/m)	-9999999	f10.3
121	CNDZ[24]	Conductivity_Z024	115-120	m	(mS/m)	-9999999	f10.3
122	CNDZ[25]	Conductivity_Z025	120-125	m	(mS/m)	-9999999	f10.3
123	CNDZ[26]	Conductivity_Z026	125-130	m	(mS/m)	-9999999	f10.3
124	CNDZ[27]	Conductivity_Z027	130-135	m	(mS/m)	-9999999	f10.3
125	CNDZ[28]	Conductivity_Z028	135-140	m	(mS/m)	-9999999	f10.3
126	CNDZ[29]	Conductivity_Z029	140-145	m	(mS/m)	-9999999	f10.3
127	CNDZ[30]	Conductivity_Z030	145-150	m	(mS/m)	-9999999	f10.3
128	CNDZ[31]	Conductivity_Z031	150-155	m	(mS/m)	-9999999	f10.3
129	CNDZ[32]	Conductivity_Z032	155-160	m	(mS/m)	-9999999	f10.3
130	CNDZ[33]	Conductivity_Z033	160-165	m	(mS/m)	-9999999	f10.3
131	CNDZ[34]	Conductivity_Z034	165-170	m	(mS/m)	-9999999	f10.3
132	CNDZ[35]	Conductivity_Z035	170-175	m	(mS/m)	-9999999	f10.3
133	CNDZ[36]	Conductivity_Z036	175-180	m	(mS/m)	-9999999	f10.3
134	CNDZ[37]	Conductivity_Z037	180-185	m	(mS/m)	-9999999	f10.3
135	CNDZ[38]	Conductivity_Z038	185-190	m	(mS/m)	-9999999	f10.3
136	CNDZ[39]	Conductivity_Z039	190-195	m	(mS/m)	-9999999	f10.3
137	CNDZ[40]	Conductivity_Z040	195-200	m	(mS/m)	-9999999	f10.3
138	CNDZ[41]	Conductivity_Z041	200-205	m	(mS/m)	-9999999	f10.3
139	CNDZ[42]	Conductivity_Z042	205-210	m	(mS/m)	-9999999	f10.3
140	CNDZ[43]	Conductivity_Z043	210-215	m	(mS/m)	-9999999	f10.3
141	CNDZ[44]	Conductivity_Z044	215-220	m	(mS/m)	-9999999	f10.3
142	CNDZ[45]	Conductivity_Z045	220-225	m	(mS/m)	-9999999	f10.3
143	CNDZ[46]	Conductivity_Z046	225-230	m	(mS/m)	-9999999	f10.3
144	CNDZ[47]	Conductivity_Z047	230-235	m	(mS/m)	-9999999	f10.3
145	CNDZ[48]	Conductivity_Z048	235-240	m	(mS/m)	-9999999	f10.3
146	CNDZ[49]	Conductivity_Z049	240-245	m	(mS/m)	-9999999	f10.3
147	CNDZ[50]	Conductivity_Z050	245-250	m	(mS/m)	-9999999	f10.3
148	CNDZ[51]	Conductivity_Z051	250-255	m	(mS/m)	-9999999	f10.3
149	CNDZ[52]	Conductivity_Z052	255-260	m	(mS/m)	-9999999	f10.3
150	CNDZ[53]	Conductivity_Z053	260-265	m	(mS/m)	-9999999	f10.3
151	CNDZ[54]	Conductivity_Z054	265-270	m	(mS/m)	-9999999	f10.3
152	CNDZ[55]	Conductivity_Z055	270-275	m	(mS/m)	-9999999	f10.3
153	CNDZ[56]	Conductivity_Z056	275-280	m	(mS/m)	-9999999	f10.3
154	CNDZ[57]	Conductivity_Z057	280-285	m	(mS/m)	-9999999	f10.3
155	CNDZ[58]	Conductivity_Z058	285-290	m	(mS/m)	-9999999	f10.3
156	CNDZ[59]	Conductivity_Z059	290-295	m	(mS/m)	-9999999	f10.3
157	CNDZ[60]	Conductivity_Z060	295-300	m	(mS/m)	-9999999	f10.3
158	CNDZ[61]	Conductivity_Z061	300-305	m	(mS/m)	-9999999	f10.3
159	CNDZ[62]	Conductivity_Z062	305-310	m	(mS/m)	-9999999	f10.3
160	CNDZ[63]	Conductivity_Z063	310-315	m	(mS/m)	-9999999	f10.3
161	CNDZ[64]	Conductivity_Z064	315-320	m	(mS/m)	-9999999	f10.3
162	CNDZ[65]	Conductivity_Z065	320-325	m	(mS/m)	-9999999	f10.3
163	CNDZ[66]	Conductivity_Z066	325-330	m	(mS/m)	-9999999	f10.3
164	CNDZ[67]	Conductivity_Z067	330-335	m	(mS/m)	-9999999	f10.3

165	CNDZ[68]	Conductivity_Z068	335-340	m	(mS/m)	-9999999	f10.3
166	CNDZ[69]	Conductivity_Z069	340-345	m	(mS/m)	-9999999	f10.3
167	CNDZ[70]	Conductivity_Z070	345-350	m	(mS/m)	-9999999	f10.3
168	CNDZ[71]	Conductivity_Z071	350-355	m	(mS/m)	-9999999	f10.3
169	CNDZ[72]	Conductivity_Z072	355-360	m	(mS/m)	-9999999	f10.3
170	CNDZ[73]	Conductivity_Z073	360-365	m	(mS/m)	-9999999	f10.3
171	CNDZ[74]	Conductivity_Z074	365-370	m	(mS/m)	-9999999	f10.3
172	CNDZ[75]	Conductivity_Z075	370-375	m	(mS/m)	-9999999	f10.3
173	CNDZ[76]	Conductivity_Z076	375-380	m	(mS/m)	-9999999	f10.3
174	CNDZ[77]	Conductivity_Z077	380-385	m	(mS/m)	-9999999	f10.3
175	CNDZ[78]	Conductivity_Z078	385-390	m	(mS/m)	-9999999	f10.3
176	CNDZ[79]	Conductivity_Z079	390-395	m	(mS/m)	-9999999	f10.3
177	CNDZ[80]	Conductivity_Z080	395-400	m	(mS/m)	-9999999	f10.3
178	CNDZ[81]	Conductivity_Z081	400-405	m	(mS/m)	-9999999	f10.3
179	CNDZ[82]	Conductivity_Z082	405-410	m	(mS/m)	-9999999	f10.3
180	CNDZ[83]	Conductivity_Z083	410-415	m	(mS/m)	-9999999	f10.3
181	CNDZ[84]	Conductivity_Z084	415-420	m	(mS/m)	-9999999	f10.3
182	CNDZ[85]	Conductivity_Z085	420-425	m	(mS/m)	-9999999	f10.3
183	CNDZ[86]	Conductivity_Z086	425-430	m	(mS/m)	-9999999	f10.3
184	CNDZ[87]	Conductivity_Z087	430-435	m	(mS/m)	-9999999	f10.3
185	CNDZ[88]	Conductivity_Z088	435-440	m	(mS/m)	-9999999	f10.3
186	CNDZ[89]	Conductivity_Z089	440-445	m	(mS/m)	-9999999	f10.3
187	CNDZ[90]	Conductivity_Z090	445-450	m	(mS/m)	-9999999	f10.3
188	CNDZ[91]	Conductivity_Z091	450-455	m	(mS/m)	-9999999	f10.3
189	CNDZ[92]	Conductivity_Z092	455-460	m	(mS/m)	-9999999	f10.3
190	CNDZ[93]	Conductivity_Z093	460-465	m	(mS/m)	-9999999	f10.3
191	CNDZ[94]	Conductivity_Z094	465-470	m	(mS/m)	-9999999	f10.3
192	CNDZ[95]	Conductivity_Z095	470-475	m	(mS/m)	-9999999	f10.3
193	CNDZ[96]	Conductivity_Z096	475-480	m	(mS/m)	-9999999	f10.3
194	CNDZ[97]	Conductivity_Z097	480-485	m	(mS/m)	-9999999	f10.3
195	CNDZ[98]	Conductivity_Z098	485-490	m	(mS/m)	-9999999	f10.3
196	CNDZ[99]	Conductivity_Z099	490-495	m	(mS/m)	-9999999	f10.3
197	CNDZ[100]	Conductivity_Z100	495-500	m	(mS/m)	-9999999	f10.3

AREA 4 - SOUTH

```
JOB NUMBER:                      1885
AREA NUMBER:                     4
SURVEY COMPANY:                  Fugro Airborne Surveys
CLIENT:                          NuPower Resources
SURVEY TYPE:                     25Hz TEMPEST
AREA NAME:                       Area 4 - South
STATE:                           N.T.
COUNTRY:                         Australia
SURVEY FLOWN:                    June, 2007
LOCATED DATA CREATED:            Thu Nov  8 14:42:55 2007

DATUM:                           GDA94
PROJECTION:                      MGA
ZONE:                            53

SURVEY SPECIFICATIONS

TRAVERSE LINE SPACING:           1000 m
TRAVERSE LINE DIRECTION:         000-180 deg
NOMINAL TERRAIN CLEARANCE:       120 m
FINAL LINE KILOMETRES:           1296 km

LINE NUMBERING

TRAVERSE LINE NUMBERS:           4001.1 - 4053

AREA BOUNDARY (WGS84 UTM53)

Eastings  :  367017  367091  361868  361982  377392  377534  382564
             382435  372453  329223  329001  356833
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Northings : 7456114 7448647 7448715 7443315 7443346 7439502 7435783
            7431992 7418947 7418444 7426263 7456207

SURVEY EQUIPMENT

AIRCRAFT:                       VH-TEM Casa 212-200

MAGNETOMETER:                              Scintrex CS-2 CV
INSTALLATION:                              Stinger
RESOLUTION:                                0.001 nT
RECORDING INTERVAL:                        1.0 s

ELECTROMAGNETIC SYSTEM:                    25Hz TEMPEST
INSTALLATION:                              Transmitter loop mounted on the
                                           Receiver coils in a towed bird
COIL ORIENTATION:                          X,Z
RECORDING INTERVAL:                        0.2 s
SYSTEM GEOMETRY:
RECEIVER DISTANCE BEHIND THE TRANSMITTER:  -120 m
RECEIVER DISTANCE BELOW THE TRANSMITTER:   -35 m

RADAR ALTIMETER:                           Sperry Stars AA220
RECORDING INTERVAL:                         1.0 s

NAVIGATION:                                real-time differential GPS
RECORDING INTERVAL:                        1.0 s

ACQUISITION SYSTEM:                        PDAS-1000

DATA PROCESSING

MAGNETIC DATA
DIURNAL CORRECTION APPLIED                 base value 53325 nT
PARALLAX CORRECTION APPLIED                0.6 s
IGRF CORRECTION APPLIED                    base value 52967 nT
IGRF MODEL 2005 EXTRAPOLATED TO            2007.5
DATA HAVE BEEN MICROLEVELLED

ELECTROMAGNETIC DATA
SYSTEM PARALLAX REMOVED, AS FOLLOWS
X-COMPONENT EM DATA                        0.2 s
Z-COMPONENT EM DATA                        1.4 s
DATA CORRECTED FOR TRANSMITTER HEIGHT, PITCH AND ROLL
DATA CORRECTED FOR TRANSMITTER-RECEIVER GEOMETRY VARIATIONS
DATA HAVE BEEN MICROLEVELLED
CONDUCTIVITY DEPTH INVERSION CALCULATED               EMFlow V5.10
CONDUCTIVITIES CALCULATED USING corrected EM DATA

DIGITAL TERRAIN DATA
DTM CALCULATED [DTM = GPS ALTITUDE - (RADAR ALTITUDE + SENSOR SEPARATION)]
DATA CORRECTED TO AUSTRALIAN HEIGHT DATUM
DATA HAVE BEEN TIE LINE LEVELLED
DATA HAVE BEEN MICROLEVELLED
----------------------------------------------------------------------
The accuracy of the elevation calculation is directly dependent on
the accuracy of the two input parameters, radar altitude and GPS
altitude.  The radar altitude value may be erroneous in areas of heavy
tree cover, where the altimeter reflects the distance to the tree
canopy rather than the ground.  The GPS altitude value is primarily
dependent on the number of available satellites. Although
post-processing of GPS data will yield X and Y accuracies in the
order of 1-2 metres, the accuracy of the altitude value is usually
much less, sometimes in the ±5 metre range.  Further inaccuracies
may be introduced during the interpolation and gridding process.
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Because of the inherent inaccuracies of this method, no guarantee is made or implied that the information displayed is a true representation of the height above sea level. Although this product may be of some use as a general reference,
THIS PRODUCT MUST NOT BE USED FOR NAVIGATION PURPOSES.

ELECTROMAGNETIC SYSTEM

TEMPEST IS A TIME-DOMAIN SQUARE-WAVE SYSTEM,
TRANSMITTING AT A BASE FREQUENCY OF 25Hz,
WITH 2 ORTHOGONAL-AXIS RECEIVER COILS IN A TOWED BIRD.
FINAL EM OUTPUT IS RECORDED 5 TIMES PER SECOND.
THE TIMES (IN MILLISECONDS) FOR THE 15 WINDOWS ARE:

WINDOW	START	END	CENTRE
1	0.007	0.020	0.013
2	0.033	0.047	0.040
3	0.060	0.073	0.067
4	0.087	0.127	0.107
5	0.140	0.207	0.173
6	0.220	0.340	0.280
7	0.353	0.553	0.453
8	0.567	0.873	0.720
9	0.887	1.353	1.120
10	1.367	2.100	1.733
11	2.113	3.273	2.693
12	3.287	5.113	4.200
13	5.127	7.993	6.560
14	8.007	12.393	10.200
15	12.407	19.993	16.200

PULSE WIDTH: 10 ms

TEMPEST EM data are transformed to the response that would be obtained with a B-field sensor for a 100% duty cycle square waveform at the base frequency, involving a 1A change in current (from -0.5A to +0.5A to -0.5A) in a 1sq.m transmitter. It is this configuration, rather than the actual acquisition configuration, which must be specified when modelling TEMPEST data.

LOCATED DATA FORMAT

Output field format : DOS - Flat ascii
Number of fields : 197

Field	Channel	Description	Units	Undefined	Format
1	LINE	Line		-9999999	i6
2	FLIGHT	Flight		-9999999	i4
3	FID	Fiducial	(s)	-9999999	f8.1
4	LAT_GDA94	Latitude GDA94	(deg)	-9999999	f13.6
5	LON_GDA94	Longitude GDA94	(deg)	-9999999	f13.6
6	X_MGA53	Easting MGA53	(m)	-9999999	f11.2
7	Y_MGA53	Northing MGA53	(m)	-9999999	f12.2
8	TxHeight	GPS height	(m)	-9999999	f8.2
9	TxRalt_raw	Raw Radar Altimeter	(m)	-9999999	f8.2
10	TxRalt_final	Final Radar Altimeter	(m)	-9999999	f8.2
11	DTM	DTM	(m)	-9999999	f8.2
12	MAG	Compensated TMI	(nT)	-9999999	f10.3
13	MAG_1VD	Levelled TMI 1VD	(nT/m)	-9999999	f12.5
14	Pitch_Raw	Raw Tx loop pitch	(deg)	-9999999	f10.5
15	Roll_Raw	Raw Tx loop roll	(deg)	-9999999	f10.5
16	HSep_Raw	Raw Tx-Rx horizontal separation	(m)	-9999999	f8.2

17	VSep_Raw	Raw Tx-Rx vertical separation	(m)	-9999999	f8.2
18	Pitch_Final	Final Tx loop pitch	(deg)	-9999999	f10.5
19	Roll_Final	Final Tx loop roll	(deg)	-9999999	f10.5
20	HSep_Final	Final Tx-Rx horizontal separation	(m)	-9999999	f8.2
21	VSep_Final	Final Tx-Rx vertical separation	(m)	-9999999	f8.2
22	EMX_Raw[1]	Raw EMX01 Window	(fT)	-9999999	f12.6
23	EMX_Raw[2]	Raw EMX02 Window	(fT)	-9999999	f12.6
24	EMX_Raw[3]	Raw EMX03 Window	(fT)	-9999999	f12.6
25	EMX_Raw[4]	Raw EMX04 Window	(fT)	-9999999	f12.6
26	EMX_Raw[5]	Raw EMX05 Window	(fT)	-9999999	f12.6
27	EMX_Raw[6]	Raw EMX06 Window	(fT)	-9999999	f12.6
28	EMX_Raw[7]	Raw EMX07 Window	(fT)	-9999999	f12.6
29	EMX_Raw[8]	Raw EMX08 Window	(fT)	-9999999	f12.6
30	EMX_Raw[9]	Raw EMX09 Window	(fT)	-9999999	f12.6
31	EMX_Raw[10]	Raw EMX10 Window	(fT)	-9999999	f12.6
32	EMX_Raw[11]	Raw EMX11 Window	(fT)	-9999999	f12.6
33	EMX_Raw[12]	Raw EMX12 Window	(fT)	-9999999	f12.6
34	EMX_Raw[13]	Raw EMX13 Window	(fT)	-9999999	f12.6
35	EMX_Raw[14]	Raw EMX14 Window	(fT)	-9999999	f12.6
36	EMX_Raw[15]	Raw EMX15 Window	(fT)	-9999999	f12.6
37	EMX_Final[1]	Final EMX01 Window	(fT)	-9999999	f12.6
38	EMX_Final[2]	Final EMX02 Window	(fT)	-9999999	f12.6
39	EMX_Final[3]	Final EMX03 Window	(fT)	-9999999	f12.6
40	EMX_Final[4]	Final EMX04 Window	(fT)	-9999999	f12.6
41	EMX_Final[5]	Final EMX05 Window	(fT)	-9999999	f12.6
42	EMX_Final[6]	Final EMX06 Window	(fT)	-9999999	f12.6
43	EMX_Final[7]	Final EMX07 Window	(fT)	-9999999	f12.6
44	EMX_Final[8]	Final EMX08 Window	(fT)	-9999999	f12.6
45	EMX_Final[9]	Final EMX09 Window	(fT)	-9999999	f12.6
46	EMX_Final[10]	Final EMX10 Window	(fT)	-9999999	f12.6
47	EMX_Final[11]	Final EMX11 Window	(fT)	-9999999	f12.6
48	EMX_Final[12]	Final EMX12 Window	(fT)	-9999999	f12.6
49	EMX_Final[13]	Final EMX13 Window	(fT)	-9999999	f12.6
50	EMX_Final[14]	Final EMX14 Window	(fT)	-9999999	f12.6
51	EMX_Final[15]	Final EMX15 Window	(fT)	-9999999	f12.6
52	X_Sferics	X_Sferics		-9999999	f10.3
53	X_Lowfreq	X_Lowfreq		-9999999	f10.3
54	X_Powerline	X_Powerline		-9999999	f10.3
55	X_VLF1	X_18.2kHz		-9999999	f10.3
56	X_VLF2	X_19.8kHz		-9999999	f10.3
57	X_VLF3	X_21.4kHz		-9999999	f10.3
58	X_VLF4	X_22.2kHz		-9999999	f10.3
59	X_Geofact	X_Geometric factor		-9999999	f10.3
60	EMZ_Raw[1]	Raw EMZ01 Window	(fT)	-9999999	f12.6
61	EMZ_Raw[2]	Raw EMZ02 Window	(fT)	-9999999	f12.6
62	EMZ_Raw[3]	Raw EMZ03 Window	(fT)	-9999999	f12.6
63	EMZ_Raw[4]	Raw EMZ04 Window	(fT)	-9999999	f12.6
64	EMZ_Raw[5]	Raw EMZ05 Window	(fT)	-9999999	f12.6
65	EMZ_Raw[6]	Raw EMZ06 Window	(fT)	-9999999	f12.6
66	EMZ_Raw[7]	Raw EMZ07 Window	(fT)	-9999999	f12.6
67	EMZ_Raw[8]	Raw EMZ08 Window	(fT)	-9999999	f12.6
68	EMZ_Raw[9]	Raw EMZ09 Window	(fT)	-9999999	f12.6
69	EMZ_Raw[10]	Raw EMZ10 Window	(fT)	-9999999	f12.6
70	EMZ_Raw[11]	Raw EMZ11 Window	(fT)	-9999999	f12.6
71	EMZ_Raw[12]	Raw EMZ12 Window	(fT)	-9999999	f12.6
72	EMZ_Raw[13]	Raw EMZ13 Window	(fT)	-9999999	f12.6
73	EMZ_Raw[14]	Raw EMZ14 Window	(fT)	-9999999	f12.6
74	EMZ_Raw[15]	Raw EMZ15 Window	(fT)	-9999999	f12.6
75	EMZ_Final[1]	Final EMZ01 Window	(fT)	-9999999	f12.6
76	EMZ_Final[2]	Final EMZ02 Window	(fT)	-9999999	f12.6
77	EMZ_Final[3]	Final EMZ03 Window	(fT)	-9999999	f12.6
78	EMZ_Final[4]	Final EMZ04 Window	(fT)	-9999999	f12.6
79	EMZ_Final[5]	Final EMZ05 Window	(fT)	-9999999	f12.6
80	EMZ_Final[6]	Final EMZ06 Window	(fT)	-9999999	f12.6
81	EMZ_Final[7]	Final EMZ07 Window	(fT)	-9999999	f12.6
82	EMZ_Final[8]	Final EMZ08 Window	(fT)	-9999999	f12.6
83	EMZ_Final[9]	Final EMZ09 Window	(fT)	-9999999	f12.6
84	EMZ_Final[10]	Final EMZ10 Window	(fT)	-9999999	f12.6
85	EMZ_Final[11]	Final EMZ11 Window	(fT)	-9999999	f12.6
86	EMZ_Final[12]	Final EMZ12 Window	(fT)	-9999999	f12.6
87	EMZ_Final[13]	Final EMZ13 Window	(fT)	-9999999	f12.6

88	EMZ_Final[14]	Final EMZ14 Window			(fT)	-9999999	f12.6
89	EMZ_Final[15]	Final EMZ15 Window			(fT)	-9999999	f12.6
90	Z_Sferics	Z_Sferics				-9999999	f10.3
91	Z_Lowfreq	Z_Lowfreq				-9999999	f10.3
92	Z_Powerline	Z_Powerline				-9999999	f10.3
93	Z_VLF1	Z_18.2kHz				-9999999	f10.3
94	Z_VLF2	Z_19.8kHz				-9999999	f10.3
95	Z_VLF3	Z_21.4kHz				-9999999	f10.3
96	Z_VLF4	Z_22.2kHz				-9999999	f10.3
97	Z_Geofact	Z_Geometric factor				-9999999	f10.3
98	CNDZ[1]	Conductivity_Z001	0-5	m	(mS/m)	-9999999	f10.3
99	CNDZ[2]	Conductivity_Z002	5-10	m	(mS/m)	-9999999	f10.3
100	CNDZ[3]	Conductivity_Z003	10-15	m	(mS/m)	-9999999	f10.3
101	CNDZ[4]	Conductivity_Z004	15-20	m	(mS/m)	-9999999	f10.3
102	CNDZ[5]	Conductivity_Z005	20-25	m	(mS/m)	-9999999	f10.3
103	CNDZ[6]	Conductivity_Z006	25-30	m	(mS/m)	-9999999	f10.3
104	CNDZ[7]	Conductivity_Z007	30-35	m	(mS/m)	-9999999	f10.3
105	CNDZ[8]	Conductivity_Z008	35-40	m	(mS/m)	-9999999	f10.3
106	CNDZ[9]	Conductivity_Z009	40-45	m	(mS/m)	-9999999	f10.3
107	CNDZ[10]	Conductivity_Z010	45-50	m	(mS/m)	-9999999	f10.3
108	CNDZ[11]	Conductivity_Z011	50-55	m	(mS/m)	-9999999	f10.3
109	CNDZ[12]	Conductivity_Z012	55-60	m	(mS/m)	-9999999	f10.3
110	CNDZ[13]	Conductivity_Z013	60-65	m	(mS/m)	-9999999	f10.3
111	CNDZ[14]	Conductivity_Z014	65-70	m	(mS/m)	-9999999	f10.3
112	CNDZ[15]	Conductivity_Z015	70-75	m	(mS/m)	-9999999	f10.3
113	CNDZ[16]	Conductivity_Z016	75-80	m	(mS/m)	-9999999	f10.3
114	CNDZ[17]	Conductivity_Z017	80-85	m	(mS/m)	-9999999	f10.3
115	CNDZ[18]	Conductivity_Z018	85-90	m	(mS/m)	-9999999	f10.3
116	CNDZ[19]	Conductivity_Z019	90-95	m	(mS/m)	-9999999	f10.3
117	CNDZ[20]	Conductivity_Z020	95-100	m	(mS/m)	-9999999	f10.3
118	CNDZ[21]	Conductivity_Z021	100-105	m	(mS/m)	-9999999	f10.3
119	CNDZ[22]	Conductivity_Z022	105-110	m	(mS/m)	-9999999	f10.3
120	CNDZ[23]	Conductivity_Z023	110-115	m	(mS/m)	-9999999	f10.3
121	CNDZ[24]	Conductivity_Z024	115-120	m	(mS/m)	-9999999	f10.3
122	CNDZ[25]	Conductivity_Z025	120-125	m	(mS/m)	-9999999	f10.3
123	CNDZ[26]	Conductivity_Z026	125-130	m	(mS/m)	-9999999	f10.3
124	CNDZ[27]	Conductivity_Z027	130-135	m	(mS/m)	-9999999	f10.3
125	CNDZ[28]	Conductivity_Z028	135-140	m	(mS/m)	-9999999	f10.3
126	CNDZ[29]	Conductivity_Z029	140-145	m	(mS/m)	-9999999	f10.3
127	CNDZ[30]	Conductivity_Z030	145-150	m	(mS/m)	-9999999	f10.3
128	CNDZ[31]	Conductivity_Z031	150-155	m	(mS/m)	-9999999	f10.3
129	CNDZ[32]	Conductivity_Z032	155-160	m	(mS/m)	-9999999	f10.3
130	CNDZ[33]	Conductivity_Z033	160-165	m	(mS/m)	-9999999	f10.3
131	CNDZ[34]	Conductivity_Z034	165-170	m	(mS/m)	-9999999	f10.3
132	CNDZ[35]	Conductivity_Z035	170-175	m	(mS/m)	-9999999	f10.3
133	CNDZ[36]	Conductivity_Z036	175-180	m	(mS/m)	-9999999	f10.3
134	CNDZ[37]	Conductivity_Z037	180-185	m	(mS/m)	-9999999	f10.3
135	CNDZ[38]	Conductivity_Z038	185-190	m	(mS/m)	-9999999	f10.3
136	CNDZ[39]	Conductivity_Z039	190-195	m	(mS/m)	-9999999	f10.3
137	CNDZ[40]	Conductivity_Z040	195-200	m	(mS/m)	-9999999	f10.3
138	CNDZ[41]	Conductivity_Z041	200-205	m	(mS/m)	-9999999	f10.3
139	CNDZ[42]	Conductivity_Z042	205-210	m	(mS/m)	-9999999	f10.3
140	CNDZ[43]	Conductivity_Z043	210-215	m	(mS/m)	-9999999	f10.3
141	CNDZ[44]	Conductivity_Z044	215-220	m	(mS/m)	-9999999	f10.3
142	CNDZ[45]	Conductivity_Z045	220-225	m	(mS/m)	-9999999	f10.3
143	CNDZ[46]	Conductivity_Z046	225-230	m	(mS/m)	-9999999	f10.3
144	CNDZ[47]	Conductivity_Z047	230-235	m	(mS/m)	-9999999	f10.3
145	CNDZ[48]	Conductivity_Z048	235-240	m	(mS/m)	-9999999	f10.3
146	CNDZ[49]	Conductivity_Z049	240-245	m	(mS/m)	-9999999	f10.3
147	CNDZ[50]	Conductivity_Z050	245-250	m	(mS/m)	-9999999	f10.3
148	CNDZ[51]	Conductivity_Z051	250-255	m	(mS/m)	-9999999	f10.3
149	CNDZ[52]	Conductivity_Z052	255-260	m	(mS/m)	-9999999	f10.3
150	CNDZ[53]	Conductivity_Z053	260-265	m	(mS/m)	-9999999	f10.3
151	CNDZ[54]	Conductivity_Z054	265-270	m	(mS/m)	-9999999	f10.3
152	CNDZ[55]	Conductivity_Z055	270-275	m	(mS/m)	-9999999	f10.3
153	CNDZ[56]	Conductivity_Z056	275-280	m	(mS/m)	-9999999	f10.3
154	CNDZ[57]	Conductivity_Z057	280-285	m	(mS/m)	-9999999	f10.3
155	CNDZ[58]	Conductivity_Z058	285-290	m	(mS/m)	-9999999	f10.3
156	CNDZ[59]	Conductivity_Z059	290-295	m	(mS/m)	-9999999	f10.3
157	CNDZ[60]	Conductivity_Z060	295-300	m	(mS/m)	-9999999	f10.3
158	CNDZ[61]	Conductivity_Z061	300-305	m	(mS/m)	-9999999	f10.3

159	CNDZ[62]	Conductivity_Z062	305-310	m	(mS/m)	-9999999	f10.3
160	CNDZ[63]	Conductivity_Z063	310-315	m	(mS/m)	-9999999	f10.3
161	CNDZ[64]	Conductivity_Z064	315-320	m	(mS/m)	-9999999	f10.3
162	CNDZ[65]	Conductivity_Z065	320-325	m	(mS/m)	-9999999	f10.3
163	CNDZ[66]	Conductivity_Z066	325-330	m	(mS/m)	-9999999	f10.3
164	CNDZ[67]	Conductivity_Z067	330-335	m	(mS/m)	-9999999	f10.3
165	CNDZ[68]	Conductivity_Z068	335-340	m	(mS/m)	-9999999	f10.3
166	CNDZ[69]	Conductivity_Z069	340-345	m	(mS/m)	-9999999	f10.3
167	CNDZ[70]	Conductivity_Z070	345-350	m	(mS/m)	-9999999	f10.3
168	CNDZ[71]	Conductivity_Z071	350-355	m	(mS/m)	-9999999	f10.3
169	CNDZ[72]	Conductivity_Z072	355-360	m	(mS/m)	-9999999	f10.3
170	CNDZ[73]	Conductivity_Z073	360-365	m	(mS/m)	-9999999	f10.3
171	CNDZ[74]	Conductivity_Z074	365-370	m	(mS/m)	-9999999	f10.3
172	CNDZ[75]	Conductivity_Z075	370-375	m	(mS/m)	-9999999	f10.3
173	CNDZ[76]	Conductivity_Z076	375-380	m	(mS/m)	-9999999	f10.3
174	CNDZ[77]	Conductivity_Z077	380-385	m	(mS/m)	-9999999	f10.3
175	CNDZ[78]	Conductivity_Z078	385-390	m	(mS/m)	-9999999	f10.3
176	CNDZ[79]	Conductivity_Z079	390-395	m	(mS/m)	-9999999	f10.3
177	CNDZ[80]	Conductivity_Z080	395-400	m	(mS/m)	-9999999	f10.3
178	CNDZ[81]	Conductivity_Z081	400-405	m	(mS/m)	-9999999	f10.3
179	CNDZ[82]	Conductivity_Z082	405-410	m	(mS/m)	-9999999	f10.3
180	CNDZ[83]	Conductivity_Z083	410-415	m	(mS/m)	-9999999	f10.3
181	CNDZ[84]	Conductivity_Z084	415-420	m	(mS/m)	-9999999	f10.3
182	CNDZ[85]	Conductivity_Z085	420-425	m	(mS/m)	-9999999	f10.3
183	CNDZ[86]	Conductivity_Z086	425-430	m	(mS/m)	-9999999	f10.3
184	CNDZ[87]	Conductivity_Z087	430-435	m	(mS/m)	-9999999	f10.3
185	CNDZ[88]	Conductivity_Z088	435-440	m	(mS/m)	-9999999	f10.3
186	CNDZ[89]	Conductivity_Z089	440-445	m	(mS/m)	-9999999	f10.3
187	CNDZ[90]	Conductivity_Z090	445-450	m	(mS/m)	-9999999	f10.3
188	CNDZ[91]	Conductivity_Z091	450-455	m	(mS/m)	-9999999	f10.3
189	CNDZ[92]	Conductivity_Z092	455-460	m	(mS/m)	-9999999	f10.3
190	CNDZ[93]	Conductivity_Z093	460-465	m	(mS/m)	-9999999	f10.3
191	CNDZ[94]	Conductivity_Z094	465-470	m	(mS/m)	-9999999	f10.3
192	CNDZ[95]	Conductivity_Z095	470-475	m	(mS/m)	-9999999	f10.3
193	CNDZ[96]	Conductivity_Z096	475-480	m	(mS/m)	-9999999	f10.3
194	CNDZ[97]	Conductivity_Z097	480-485	m	(mS/m)	-9999999	f10.3
195	CNDZ[98]	Conductivity_Z098	485-490	m	(mS/m)	-9999999	f10.3
196	CNDZ[99]	Conductivity_Z099	490-495	m	(mS/m)	-9999999	f10.3
197	CNDZ[100]	Conductivity_Z100	495-500	m	(mS/m)	-9999999	f10.3

AREA 5 - CENTRAL

```
JOB NUMBER:                     1885
AREA NUMBER:                    5
SURVEY COMPANY:                 Fugro Airborne Surveys
CLIENT:                         NuPower Resources
SURVEY TYPE:                    25Hz TEMPEST
AREA NAME:                      Area 5
STATE:                          N.T.
COUNTRY:                        Australia
SURVEY FLOWN:                   July, 2007
LOCATED DATA CREATED:           Thu Nov  8 16:34:18 2007

DATUM:                          GDA94
PROJECTION:                     MGA
ZONE:                           53

SURVEY SPECIFICATIONS

TRAVERSE LINE SPACING:          1000 m
TRAVERSE LINE DIRECTION:        000-180 deg
TIE LINE SPACING:               {TieSpc} m
TIE LINE DIRECTION:             {TieDir} deg
NOMINAL TERRAIN CLEARANCE:      120 m
FINAL LINE KILOMETRES:          1144.6 km

LINE NUMBERING
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TRAVERSE LINE NUMBERS:          5001 - 5046
TIE LINE NUMBERS:                -

AREA BOUNDARY (WGS84 UTM53)

Eastings  :  334710  334730  336439  336480  358046  329483  312002
             311550

Northings : 7461579 7459734 7459753 7456064 7456424 7425694 7425294
            7461308

SURVEY EQUIPMENT

AIRCRAFT:                       VH-TEM Casa 212-200

MAGNETOMETER:                              Scintrex CS-2 CV
INSTALLATION:                              Stinger
RESOLUTION:                                0.001 nT
RECORDING INTERVAL:                        1.0 s

ELECTROMAGNETIC SYSTEM:                    25Hz TEMPEST
INSTALLATION:                              Transmitter loop mounted on the
                                           Receiver coils in a towed bird
COIL ORIENTATION:                          X,Z
RECORDING INTERVAL:                        0.2 s
SYSTEM GEOMETRY:
RECEIVER DISTANCE BEHIND THE TRANSMITTER:  -120 m
RECEIVER DISTANCE BELOW THE TRANSMITTER:   -35 m

RADAR ALTIMETER:                           Sperry Stars AA220
RECORDING INTERVAL:                         1.0 s

NAVIGATION:                                real-time differential GPS
RECORDING INTERVAL:                        1.0 s

ACQUISITION SYSTEM:                        PDAS-1000

DATA PROCESSING

MAGNETIC DATA
DIURNAL CORRECTION APPLIED                 base value 53325 nT
PARALLAX CORRECTION APPLIED                0.6 s
IGRF CORRECTION APPLIED                    base value 52967 nT
IGRF MODEL 2005 EXTRAPOLATED TO            2007.5
DATA HAVE BEEN MICROLEVELLED

ELECTROMAGNETIC DATA
SYSTEM PARALLAX REMOVED, AS FOLLOWS
X-COMPONENT EM DATA                        0.2 s
Z-COMPONENT EM DATA                        1.4 s
DATA CORRECTED FOR TRANSMITTER HEIGHT, PITCH AND ROLL
DATA CORRECTED FOR TRANSMITTER-RECEIVER GEOMETRY VARIATIONS
DATA HAVE BEEN MICROLEVELLED
CONDUCTIVITY DEPTH INVERSION CALCULATED               EMFlow V5.10
CONDUCTIVITIES CALCULATED USING corrected EM DATA

DIGITAL TERRAIN DATA
DTM CALCULATED [DTM = GPS ALTITUDE - (RADAR ALTITUDE + SENSOR SEPARATION)]
DATA CORRECTED TO AUSTRALIAN HEIGHT DATUM
DATA HAVE BEEN TIE LINE LEVELLED
DATA HAVE BEEN MICROLEVELLED
----------------------------------------------------------------------
The accuracy of the elevation calculation is directly dependent on
the accuracy of the two input parameters, radar altitude and GPS
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altitude. The radar altitude value may be erroneous in areas of heavy tree cover, where the altimeter reflects the distance to the tree canopy rather than the ground. The GPS altitude value is primarily dependent on the number of available satellites. Although post-processing of GPS data will yield X and Y accuracies in the order of 1-2 metres, the accuracy of the altitude value is usually much less, sometimes in the ±5 metre range. Further inaccuracies may be introduced during the interpolation and gridding process. Because of the inherent inaccuracies of this method, no guarantee is made or implied that the information displayed is a true representation of the height above sea level. Although this product may be of some use as a general reference,
THIS PRODUCT MUST NOT BE USED FOR NAVIGATION PURPOSES.

ELECTROMAGNETIC SYSTEM

TEMPEST IS A TIME-DOMAIN SQUARE-WAVE SYSTEM,
TRANSMITTING AT A BASE FREQUENCY OF 25Hz,
WITH 2 ORTHOGONAL-AXIS RECEIVER COILS IN A TOWED BIRD.
FINAL EM OUTPUT IS RECORDED 5 TIMES PER SECOND.
THE TIMES (IN MILLISECONDS) FOR THE 15 WINDOWS ARE:

WINDOW	START	END	CENTRE
1	0.007	0.020	0.013
2	0.033	0.047	0.040
3	0.060	0.073	0.067
4	0.087	0.127	0.107
5	0.140	0.207	0.173
6	0.220	0.340	0.280
7	0.353	0.553	0.453
8	0.567	0.873	0.720
9	0.887	1.353	1.120
10	1.367	2.100	1.733
11	2.113	3.273	2.693
12	3.287	5.113	4.200
13	5.127	7.993	6.560
14	8.007	12.393	10.200
15	12.407	19.993	16.200

PULSE WIDTH: 10 ms

TEMPEST EM data are transformed to the response that would be obtained with a B-field sensor for a 100% duty cycle square waveform at the base frequency, involving a 1A change in current (from -0.5A to +0.5A to -0.5A) in a 1sq.m transmitter. It is this configuration, rather than the actual acquisition configuration, which must be specified when modelling TEMPEST data.

Output field format : DOS - Flat ascii
Number of fields : 197

Field	Columns	Type	Format	Channel	Description	
1	1 - 6	int	(i 6)	LINE	[Line	]
2	7 - 10	int	(i 4)	FLIGHT	[Flight	]
3	11 - 18	real	(f 8.1)	FID	[Fiducial	(s)]
4	19 - 31	real	(f13.6)	LAT_GDA94	[Latitude GDA94	(deg)]
5	32 - 44	real	(f13.6)	LON_GDA94	[Longitude GDA94	(deg)]
6	45 - 55	real	(f11.2)	X_MGA53	[Easting MGA53	(m)]
7	56 - 67	real	(f12.2)	Y_MGA53	[Northing MGA53	(m)]
8	68 - 75	real	(f 8.2)	TxHeight	[GPS height	(m)]
9	76 - 83	real	(f 8.2)	TxRalt_raw	[Raw Radar Altimeter	(m)]
10	84 - 91	real	(f 8.2)	TxRalt_final	[Final Radar Altimeter	(m)]

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11    92 -  99  real (f 8.2) DTM             [DTM                                    (m)]
12   100 - 109  real (f10.3) MAG             [Compensated TMI                       (nT)]
13   110 - 121  real (f12.5) MAG_1VD         [Levelled TMI 1VD                    (nT/m)]
14   122 - 131  real (f10.5) Pitch_Raw       [Raw Tx loop pitch                    (deg)]
15   132 - 141  real (f10.5) Roll_Raw        [Raw Tx loop roll                     (deg)]
16   142 - 149  real (f 8.2) HSep_Raw        [Raw Tx-Rx horizontal separation        (m)]
17   150 - 157  real (f 8.2) VSep_Raw        [Raw Tx-Rx vertical separation          (m)]
18   158 - 167  real (f10.5) Pitch_Final     [Final Tx loop pitch                  (deg)]
19   168 - 177  real (f10.5) Roll_Final      [Final Tx loop roll                   (deg)]
20   178 - 185  real (f 8.2) HSep_Final      [Final Tx-Rx horizontal separation      (m)]
21   186 - 193  real (f 8.2) VSep_Final      [Final Tx-Rx vertical separation        (m)]
22   194 - 205  real (f12.6) EMX_Raw[1]      [Raw EMX01 Window                      (fT)]
23   206 - 217  real (f12.6) EMX_Raw[2]      [Raw EMX02 Window                      (fT)]
24   218 - 229  real (f12.6) EMX_Raw[3]      [Raw EMX03 Window                      (fT)]
25   230 - 241  real (f12.6) EMX_Raw[4]      [Raw EMX04 Window                      (fT)]
26   242 - 253  real (f12.6) EMX_Raw[5]      [Raw EMX05 Window                      (fT)]
27   254 - 265  real (f12.6) EMX_Raw[6]      [Raw EMX06 Window                      (fT)]
28   266 - 277  real (f12.6) EMX_Raw[7]      [Raw EMX07 Window                      (fT)]
29   278 - 289  real (f12.6) EMX_Raw[8]      [Raw EMX08 Window                      (fT)]
30   290 - 301  real (f12.6) EMX_Raw[9]      [Raw EMX09 Window                      (fT)]
31   302 - 313  real (f12.6) EMX_Raw[10]     [Raw EMX10 Window                      (fT)]
32   314 - 325  real (f12.6) EMX_Raw[11]     [Raw EMX11 Window                      (fT)]
33   326 - 337  real (f12.6) EMX_Raw[12]     [Raw EMX12 Window                      (fT)]
34   338 - 349  real (f12.6) EMX_Raw[13]     [Raw EMX13 Window                      (fT)]
35   350 - 361  real (f12.6) EMX_Raw[14]     [Raw EMX14 Window                      (fT)]
36   362 - 373  real (f12.6) EMX_Raw[15]     [Raw EMX15 Window                      (fT)]
37   374 - 385  real (f12.6) EMX_Final[1]    [Final EMX01 Window                    (fT)]
38   386 - 397  real (f12.6) EMX_Final[2]    [Final EMX02 Window                    (fT)]
39   398 - 409  real (f12.6) EMX_Final[3]    [Final EMX03 Window                    (fT)]
40   410 - 421  real (f12.6) EMX_Final[4]    [Final EMX04 Window                    (fT)]
41   422 - 433  real (f12.6) EMX_Final[5]    [Final EMX05 Window                    (fT)]
42   434 - 445  real (f12.6) EMX_Final[6]    [Final EMX06 Window                    (fT)]
43   446 - 457  real (f12.6) EMX_Final[7]    [Final EMX07 Window                    (fT)]
44   458 - 469  real (f12.6) EMX_Final[8]    [Final EMX08 Window                    (fT)]
45   470 - 481  real (f12.6) EMX_Final[9]    [Final EMX09 Window                    (fT)]
46   482 - 493  real (f12.6) EMX_Final[10]   [Final EMX10 Window                    (fT)]
47   494 - 505  real (f12.6) EMX_Final[11]   [Final EMX11 Window                    (fT)]
48   506 - 517  real (f12.6) EMX_Final[12]   [Final EMX12 Window                    (fT)]
49   518 - 529  real (f12.6) EMX_Final[13]   [Final EMX13 Window                    (fT)]
50   530 - 541  real (f12.6) EMX_Final[14]   [Final EMX14 Window                    (fT)]
51   542 - 553  real (f12.6) EMX_Final[15]   [Final EMX15 Window                    (fT)]
52   554 - 563  real (f10.3) X_Sferics       [X_Sferics                                 ]
53   564 - 573  real (f10.3) X_Lowfreq       [X_Lowfreq                                 ]
54   574 - 583  real (f10.3) X_Powerline     [X_Powerline                               ]
55   584 - 593  real (f10.3) X_VLF1          [X_18.2kHz                                 ]
56   594 - 603  real (f10.3) X_VLF2          [X_19.8kHz                                 ]
57   604 - 613  real (f10.3) X_VLF3          [X_21.4kHz                                 ]
58   614 - 623  real (f10.3) X_VLF4          [X_22.2kHz                                 ]
59   624 - 633  real (f10.3) X_Geofact       [X_Geometric factor                        ]
60   634 - 645  real (f12.6) EMZ_Raw[1]      [Raw EMZ01 Window                      (fT)]
61   646 - 657  real (f12.6) EMZ_Raw[2]      [Raw EMZ02 Window                      (fT)]
62   658 - 669  real (f12.6) EMZ_Raw[3]      [Raw EMZ03 Window                      (fT)]
63   670 - 681  real (f12.6) EMZ_Raw[4]      [Raw EMZ04 Window                      (fT)]
64   682 - 693  real (f12.6) EMZ_Raw[5]      [Raw EMZ05 Window                      (fT)]
65   694 - 705  real (f12.6) EMZ_Raw[6]      [Raw EMZ06 Window                      (fT)]
66   706 - 717  real (f12.6) EMZ_Raw[7]      [Raw EMZ07 Window                      (fT)]
67   718 - 729  real (f12.6) EMZ_Raw[8]      [Raw EMZ08 Window                      (fT)]
68   730 - 741  real (f12.6) EMZ_Raw[9]      [Raw EMZ09 Window                      (fT)]
69   742 - 753  real (f12.6) EMZ_Raw[10]     [Raw EMZ10 Window                      (fT)]
70   754 - 765  real (f12.6) EMZ_Raw[11]     [Raw EMZ11 Window                      (fT)]
71   766 - 777  real (f12.6) EMZ_Raw[12]     [Raw EMZ12 Window                      (fT)]
72   778 - 789  real (f12.6) EMZ_Raw[13]     [Raw EMZ13 Window                      (fT)]
73   790 - 801  real (f12.6) EMZ_Raw[14]     [Raw EMZ14 Window                      (fT)]
74   802 - 813  real (f12.6) EMZ_Raw[15]     [Raw EMZ15 Window                      (fT)]
75   814 - 825  real (f12.6) EMZ_Final[1]    [Final EMZ01 Window                    (fT)]
76   826 - 837  real (f12.6) EMZ_Final[2]    [Final EMZ02 Window                    (fT)]
77   838 - 849  real (f12.6) EMZ_Final[3]    [Final EMZ03 Window                    (fT)]
78   850 - 861  real (f12.6) EMZ_Final[4]    [Final EMZ04 Window                    (fT)]
79   862 - 873  real (f12.6) EMZ_Final[5]    [Final EMZ05 Window                    (fT)]
80   874 - 885  real (f12.6) EMZ_Final[6]    [Final EMZ06 Window                    (fT)]
81   886 - 897  real (f12.6) EMZ_Final[7]    [Final EMZ07 Window                    (fT)]
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 82   898 - 909  real (f12.6) EMZ_Final[8]    [Final EMZ08 Window                 (fT)]
 83   910 - 921  real (f12.6) EMZ_Final[9]    [Final EMZ09 Window                 (fT)]
 84   922 - 933  real (f12.6) EMZ_Final[10]   [Final EMZ10 Window                 (fT)]
 85   934 - 945  real (f12.6) EMZ_Final[11]   [Final EMZ11 Window                 (fT)]
 86   946 - 957  real (f12.6) EMZ_Final[12]   [Final EMZ12 Window                 (fT)]
 87   958 - 969  real (f12.6) EMZ_Final[13]   [Final EMZ13 Window                 (fT)]
 88   970 - 981  real (f12.6) EMZ_Final[14]   [Final EMZ14 Window                 (fT)]
 89   982 - 993  real (f12.6) EMZ_Final[15]   [Final EMZ15 Window                 (fT)]
 90   994 -1003  real (f10.3) Z_Sferics       [Z_Sferics                              ]
 91  1004 -1013  real (f10.3) Z_Lowfreq       [Z_Lowfreq                              ]
 92  1014 -1023  real (f10.3) Z_Powerline     [Z_Powerline                            ]
 93  1024 -1033  real (f10.3) Z_VLF1          [Z_18.2kHz                              ]
 94  1034 -1043  real (f10.3) Z_VLF2          [Z_19.8kHz                              ]
 95  1044 -1053  real (f10.3) Z_VLF3          [Z_21.4kHz                              ]
 96  1054 -1063  real (f10.3) Z_VLF4          [Z_22.2kHz                              ]
 97  1064 -1073  real (f10.3) Z_Geofact       [Z_Geometric factor                     ]
 98  1074 -1083  real (f10.3) CNDZ[1]         [Conductivity_Z001     0-5    m  (mS/m)]
 99  1084 -1093  real (f10.3) CNDZ[2]         [Conductivity_Z002     5-10   m  (mS/m)]
100  1094 -1103  real (f10.3) CNDZ[3]         [Conductivity_Z003    10-15   m  (mS/m)]
101  1104 -1113  real (f10.3) CNDZ[4]         [Conductivity_Z004    15-20   m  (mS/m)]
102  1114 -1123  real (f10.3) CNDZ[5]         [Conductivity_Z005    20-25   m  (mS/m)]
103  1124 -1133  real (f10.3) CNDZ[6]         [Conductivity_Z006    25-30   m  (mS/m)]
104  1134 -1143  real (f10.3) CNDZ[7]         [Conductivity_Z007    30-35   m  (mS/m)]
105  1144 -1153  real (f10.3) CNDZ[8]         [Conductivity_Z008    35-40   m  (mS/m)]
106  1154 -1163  real (f10.3) CNDZ[9]         [Conductivity_Z009    40-45   m  (mS/m)]
107  1164 -1173  real (f10.3) CNDZ[10]        [Conductivity_Z010    45-50   m  (mS/m)]
108  1174 -1183  real (f10.3) CNDZ[11]        [Conductivity_Z011    50-55   m  (mS/m)]
109  1184 -1193  real (f10.3) CNDZ[12]        [Conductivity_Z012    55-60   m  (mS/m)]
110  1194 -1203  real (f10.3) CNDZ[13]        [Conductivity_Z013    60-65   m  (mS/m)]
111  1204 -1213  real (f10.3) CNDZ[14]        [Conductivity_Z014    65-70   m  (mS/m)]
112  1214 -1223  real (f10.3) CNDZ[15]        [Conductivity_Z015    70-75   m  (mS/m)]
113  1224 -1233  real (f10.3) CNDZ[16]        [Conductivity_Z016    75-80   m  (mS/m)]
114  1234 -1243  real (f10.3) CNDZ[17]        [Conductivity_Z017    80-85   m  (mS/m)]
115  1244 -1253  real (f10.3) CNDZ[18]        [Conductivity_Z018    85-90   m  (mS/m)]
116  1254 -1263  real (f10.3) CNDZ[19]        [Conductivity_Z019    90-95   m  (mS/m)]
117  1264 -1273  real (f10.3) CNDZ[20]        [Conductivity_Z020    95-100  m  (mS/m)]
118  1274 -1283  real (f10.3) CNDZ[21]        [Conductivity_Z021   100-105  m  (mS/m)]
119  1284 -1293  real (f10.3) CNDZ[22]        [Conductivity_Z022   105-110  m  (mS/m)]
120  1294 -1303  real (f10.3) CNDZ[23]        [Conductivity_Z023   110-115  m  (mS/m)]
121  1304 -1313  real (f10.3) CNDZ[24]        [Conductivity_Z024   115-120  m  (mS/m)]
122  1314 -1323  real (f10.3) CNDZ[25]        [Conductivity_Z025   120-125  m  (mS/m)]
123  1324 -1333  real (f10.3) CNDZ[26]        [Conductivity_Z026   125-130  m  (mS/m)]
124  1334 -1343  real (f10.3) CNDZ[27]        [Conductivity_Z027   130-135  m  (mS/m)]
125  1344 -1353  real (f10.3) CNDZ[28]        [Conductivity_Z028   135-140  m  (mS/m)]
126  1354 -1363  real (f10.3) CNDZ[29]        [Conductivity_Z029   140-145  m  (mS/m)]
127  1364 -1373  real (f10.3) CNDZ[30]        [Conductivity_Z030   145-150  m  (mS/m)]
128  1374 -1383  real (f10.3) CNDZ[31]        [Conductivity_Z031   150-155  m  (mS/m)]
129  1384 -1393  real (f10.3) CNDZ[32]        [Conductivity_Z032   155-160  m  (mS/m)]
130  1394 -1403  real (f10.3) CNDZ[33]        [Conductivity_Z033   160-165  m  (mS/m)]
131  1404 -1413  real (f10.3) CNDZ[34]        [Conductivity_Z034   165-170  m  (mS/m)]
132  1414 -1423  real (f10.3) CNDZ[35]        [Conductivity_Z035   170-175  m  (mS/m)]
133  1424 -1433  real (f10.3) CNDZ[36]        [Conductivity_Z036   175-180  m  (mS/m)]
134  1434 -1443  real (f10.3) CNDZ[37]        [Conductivity_Z037   180-185  m  (mS/m)]
135  1444 -1453  real (f10.3) CNDZ[38]        [Conductivity_Z038   185-190  m  (mS/m)]
136  1454 -1463  real (f10.3) CNDZ[39]        [Conductivity_Z039   190-195  m  (mS/m)]
137  1464 -1473  real (f10.3) CNDZ[40]        [Conductivity_Z040   195-200  m  (mS/m)]
138  1474 -1483  real (f10.3) CNDZ[41]        [Conductivity_Z041   200-205  m  (mS/m)]
139  1484 -1493  real (f10.3) CNDZ[42]        [Conductivity_Z042   205-210  m  (mS/m)]
140  1494 -1503  real (f10.3) CNDZ[43]        [Conductivity_Z043   210-215  m  (mS/m)]
141  1504 -1513  real (f10.3) CNDZ[44]        [Conductivity_Z044   215-220  m  (mS/m)]
142  1514 -1523  real (f10.3) CNDZ[45]        [Conductivity_Z045   220-225  m  (mS/m)]
143  1524 -1533  real (f10.3) CNDZ[46]        [Conductivity_Z046   225-230  m  (mS/m)]
144  1534 -1543  real (f10.3) CNDZ[47]        [Conductivity_Z047   230-235  m  (mS/m)]
145  1544 -1553  real (f10.3) CNDZ[48]        [Conductivity_Z048   235-240  m  (mS/m)]
146  1554 -1563  real (f10.3) CNDZ[49]        [Conductivity_Z049   240-245  m  (mS/m)]
147  1564 -1573  real (f10.3) CNDZ[50]        [Conductivity_Z050   245-250  m  (mS/m)]
148  1574 -1583  real (f10.3) CNDZ[51]        [Conductivity_Z051   250-255  m  (mS/m)]
149  1584 -1593  real (f10.3) CNDZ[52]        [Conductivity_Z052   255-260  m  (mS/m)]
150  1594 -1603  real (f10.3) CNDZ[53]        [Conductivity_Z053   260-265  m  (mS/m)]
151  1604 -1613  real (f10.3) CNDZ[54]        [Conductivity_Z054   265-270  m  (mS/m)]
152  1614 -1623  real (f10.3) CNDZ[55]        [Conductivity_Z055   270-275  m  (mS/m)]
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153  1624 -1633  real (f10.3) CNDZ[56]        [Conductivity_Z056    275-280  m  (mS/m)]
154  1634 -1643  real (f10.3) CNDZ[57]        [Conductivity_Z057    280-285  m  (mS/m)]
155  1644 -1653  real (f10.3) CNDZ[58]        [Conductivity_Z058    285-290  m  (mS/m)]
156  1654 -1663  real (f10.3) CNDZ[59]        [Conductivity_Z059    290-295  m  (mS/m)]
157  1664 -1673  real (f10.3) CNDZ[60]        [Conductivity_Z060    295-300  m  (mS/m)]
158  1674 -1683  real (f10.3) CNDZ[61]        [Conductivity_Z061    300-305  m  (mS/m)]
159  1684 -1693  real (f10.3) CNDZ[62]        [Conductivity_Z062    305-310  m  (mS/m)]
160  1694 -1703  real (f10.3) CNDZ[63]        [Conductivity_Z063    310-315  m  (mS/m)]
161  1704 -1713  real (f10.3) CNDZ[64]        [Conductivity_Z064    315-320  m  (mS/m)]
162  1714 -1723  real (f10.3) CNDZ[65]        [Conductivity_Z065    320-325  m  (mS/m)]
163  1724 -1733  real (f10.3) CNDZ[66]        [Conductivity_Z066    325-330  m  (mS/m)]
164  1734 -1743  real (f10.3) CNDZ[67]        [Conductivity_Z067    330-335  m  (mS/m)]
165  1744 -1753  real (f10.3) CNDZ[68]        [Conductivity_Z068    335-340  m  (mS/m)]
166  1754 -1763  real (f10.3) CNDZ[69]        [Conductivity_Z069    340-345  m  (mS/m)]
167  1764 -1773  real (f10.3) CNDZ[70]        [Conductivity_Z070    345-350  m  (mS/m)]
168  1774 -1783  real (f10.3) CNDZ[71]        [Conductivity_Z071    350-355  m  (mS/m)]
169  1784 -1793  real (f10.3) CNDZ[72]        [Conductivity_Z072    355-360  m  (mS/m)]
170  1794 -1803  real (f10.3) CNDZ[73]        [Conductivity_Z073    360-365  m  (mS/m)]
171  1804 -1813  real (f10.3) CNDZ[74]        [Conductivity_Z074    365-370  m  (mS/m)]
172  1814 -1823  real (f10.3) CNDZ[75]        [Conductivity_Z075    370-375  m  (mS/m)]
173  1824 -1833  real (f10.3) CNDZ[76]        [Conductivity_Z076    375-380  m  (mS/m)]
174  1834 -1843  real (f10.3) CNDZ[77]        [Conductivity_Z077    380-385  m  (mS/m)]
175  1844 -1853  real (f10.3) CNDZ[78]        [Conductivity_Z078    385-390  m  (mS/m)]
176  1854 -1863  real (f10.3) CNDZ[79]        [Conductivity_Z079    390-395  m  (mS/m)]
177  1864 -1873  real (f10.3) CNDZ[80]        [Conductivity_Z080    395-400  m  (mS/m)]
178  1874 -1883  real (f10.3) CNDZ[81]        [Conductivity_Z081    400-405  m  (mS/m)]
179  1884 -1893  real (f10.3) CNDZ[82]        [Conductivity_Z082    405-410  m  (mS/m)]
180  1894 -1903  real (f10.3) CNDZ[83]        [Conductivity_Z083    410-415  m  (mS/m)]
181  1904 -1913  real (f10.3) CNDZ[84]        [Conductivity_Z084    415-420  m  (mS/m)]
182  1914 -1923  real (f10.3) CNDZ[85]        [Conductivity_Z085    420-425  m  (mS/m)]
183  1924 -1933  real (f10.3) CNDZ[86]        [Conductivity_Z086    425-430  m  (mS/m)]
184  1934 -1943  real (f10.3) CNDZ[87]        [Conductivity_Z087    430-435  m  (mS/m)]
185  1944 -1953  real (f10.3) CNDZ[88]        [Conductivity_Z088    435-440  m  (mS/m)]
186  1954 -1963  real (f10.3) CNDZ[89]        [Conductivity_Z089    440-445  m  (mS/m)]
187  1964 -1973  real (f10.3) CNDZ[90]        [Conductivity_Z090    445-450  m  (mS/m)]
188  1974 -1983  real (f10.3) CNDZ[91]        [Conductivity_Z091    450-455  m  (mS/m)]
189  1984 -1993  real (f10.3) CNDZ[92]        [Conductivity_Z092    455-460  m  (mS/m)]
190  1994 -2003  real (f10.3) CNDZ[93]        [Conductivity_Z093    460-465  m  (mS/m)]
191  2004 -2013  real (f10.3) CNDZ[94]        [Conductivity_Z094    465-470  m  (mS/m)]
192  2014 -2023  real (f10.3) CNDZ[95]        [Conductivity_Z095    470-475  m  (mS/m)]
193  2024 -2033  real (f10.3) CNDZ[96]        [Conductivity_Z096    475-480  m  (mS/m)]
194  2034 -2043  real (f10.3) CNDZ[97]        [Conductivity_Z097    480-485  m  (mS/m)]
195  2044 -2053  real (f10.3) CNDZ[98]        [Conductivity_Z098    485-490  m  (mS/m)]
196  2054 -2063  real (f10.3) CNDZ[99]        [Conductivity_Z099    490-495  m  (mS/m)]
197  2064 -2073  real (f10.3) CNDZ[100]       [Conductivity_Z100    495-500  m  (mS/m)]
     2074 -2075 <newline>
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APPENDIX V – List of all Supplied Data and Products

Final Located Data

1885_1.hdr **-** header file describing the contents
1885_1.asc - flat ascii file containing located magnetic, EM and elevation data (see App IV).
1885_2.hdr **-** header file describing the contents
1885_2.asc - flat ascii file containing located magnetic, EM and elevation data (see App IV).
1885_3.hdr **-** header file describing the contents
1885_3.asc - flat ascii file containing located magnetic, EM and elevation data (see App IV).
1885_4.hdr **-** header file describing the contents
1885_4.asc - flat ascii file containing located magnetic, EM and elevation data (see App IV).
1885_5.hdr **-** header file describing the contents
1885_5.asc - flat ascii file containing located magnetic, EM and elevation data (see App IV).

Preliminary Gridded Products (delivered in ERMapper format GDA94 MGA53)

- Total Magnetic Intensity
- First Vertical Derivative TMI
- Digital Elevation Model
- 15 channels of X-component
- 15 channels of Z-component
- EM Time Constant for X-component
- EM Time Constant for Z-component

Final Gridded Products (delivered in ERMapper format GDA94 MGA53)

- Total Magnetic Intensity
- First Vertical Derivative TMI
- Digital Elevation Model
- 15 channels of X-component
- 15 channels of Z-component
- EM Time Constant for X-component
- EM Time Constant for Z-component

Final Digital Products

- Flight Path
- Total Magnetic Intensity
- Conductivity Depth Image Multiplots & Stacked sections Z-component

Final Acquisition and Processing Report

Delivered as hardcopy and digitally