Arnhem Land, NT

TEMPEST
Geophysical Survey

for

Cameco Australia Pty Ltd

Acquisition and Processing Report

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Authorised for release by : …………………………..

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Survey flown: May 2005

by

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FAS JOB# 1715

1 Introduction

This report summarises the acquisition and processing of data from the TEMPEST survey flown by Fugro Airborne Surveys (FAS) for the Arnhem Land projects during May of 2005, for Cameco Australia Pty Ltd.

Electromagnetic and elevation data were acquired over the areas shown below. Boundary coordinates are in WGS84.

Wellington Range (North) Survey Area 1

	Eastings	Northings
1	301062	8674983
2	292959	8672099
3	281674	8672014
4	281674	8674286
5	292385	8678132
6	292277	8687444
7	291783	8687707
8	290449	8688405
9	289479	8689152
10	285700	8699420
11	286903	8700463
12	287685	8701357
13	288171	8701940
14	288308	8702671
15	288361	8703732
16	288150	8704892
17	287843	8705660
18	287073	8706870
19	286439	8707611
20	285731	8708155
21	285108	8708622
22	284443	8708844
23	283525	8708793
24	281305	8708548
25	281377	8716298
26	275201	8729082
27	283810	8732207
28	300629	8701385

Tin Camp Creek (NE Myra) Survey Area 2

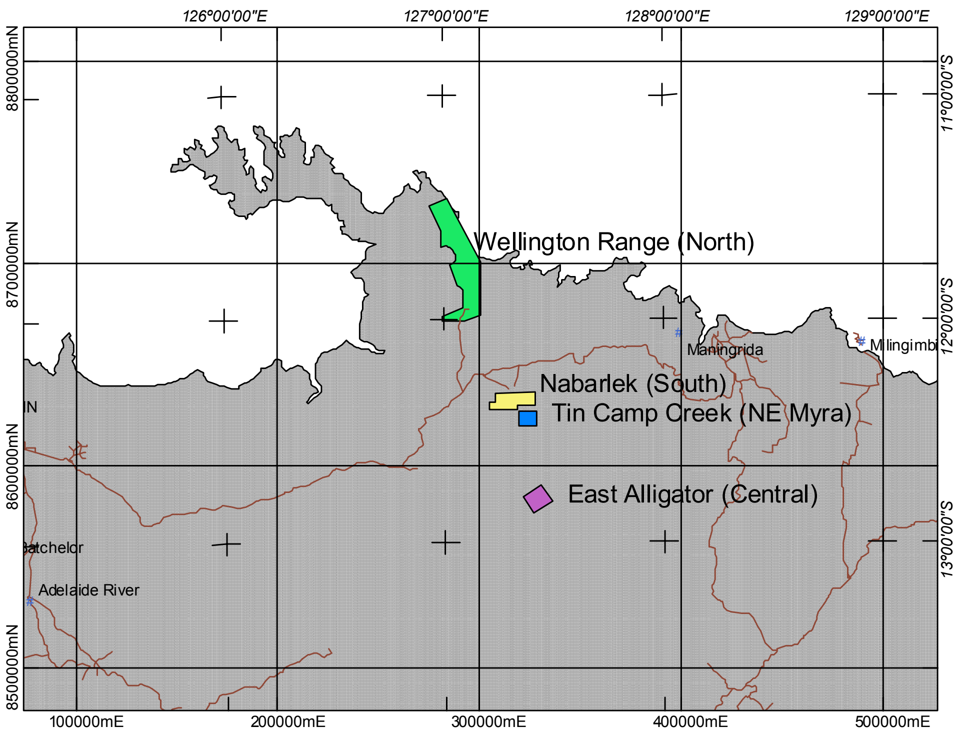
	Eastings	Northings
1	330926	8590679
2	336756	8582927
3	327554	8576892
4	322423	8584943

Nabarlek (South) Survey Area 3

	Eastings	Northings
1	328172	8636390
2	328211	8629918
3	319149	8629864
4	319160	8628020
5	305534	8627932
6	305510	8631467
7	308593	8631526
8	308417	8636246

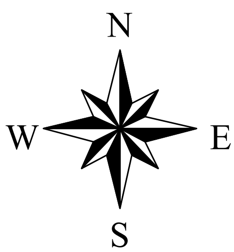
East Alligator (Central) Survey Area 4

	Eastings	Northings
1	328430	8627253
2	328396	8620167
3	322967	8619945
4	319987	8619989
5	319922	8627251



Client : Cameco Australia Pty Ltd
Survey Name : Arnhem Land
Survey Type : TEMPEST

Datum : WGS84
Projection : UTM
Zone : 53



2 Project Crew

The following personnel were employed for this project:

Field Operations

Processors	Denis Cowey / Matthew Owers
Airborne Operators & Techs	Shane Hulme
Crew Leader	Shane Hulme
Pilots	Tim Haldane / Simon Graham

Base Operations

Project Manager	Davin Allen
Processing Manager	Andrea Tovey
Data Processing	Matthew Owers

3 Summary of Survey Parameters

3.1 Survey Area Parameters

Fugro Job Number	1715
Survey Company	Fugro Airborne Surveys
Date Flown	6th May 2005 to 22nd May 2005
Client	Cameco Australia Pty Ltd
EM System	25Hz TEMPEST
Aircraft	CASA C212-200 Turbo Prop survey aircraft (VH-TEM)
Navigation	Real-time differential GPS
Datum	AGD66 (Zone 53)
Area 1 Line kilometres	1516 kilometres
Area 2 Line kilometres	294 kilometres
Area 3 Line kilometres	808 kilometres
Area 4 Line kilometres	315 kilometres
Total Line kilometres	2933 kilometres
Terrain Clearance	120 metres
Traverse Line Spacing	Areas 1 & 2: 400 metres; Areas 3 & 4: 200 metres.
Traverse Line Direction	Area 1: 066-246 degrees; Area 2: 057-237 degrees; Area 3: 090-270 degrees; Area 4: 000-180 degrees.

3.2 Flight Plans

The flight plans are given in Appendix I.

3.3 Job Safety Plan

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

4 Data Acquisition equipment and Specifications

The airborne data acquisition system utilised on this project consists of the following sub-systems:

4.1 Survey Aircraft

A CASA C212-200 Turbo Prop, registration VH-TEM, was used for this survey.

4.2 TEMPEST System Specifications

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

- Base frequency - 25Hz
- Transmitter area - 244m^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 - 68,320 Am^2
- Average moment - 34,160 Am^2
- Sample rate - 75 kHz
- Sample interval - 13.3 μs
- 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 - 13.3 μs to 16.2 ms
- GPS cycle rate - 1 second

4.2.1 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.

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.

4.2.2 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.

4.2.3 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.

4.3 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 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.

4.3.1 GPS Receiver

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

4.3.2 Differential GPS Demodulator

The OMNISTAR differential GPS service provides real time differential corrections.

4.4 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 interfaced 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.

4.5 Altimeter System

4.5.1 Radar Altimeter

Model:	Sperry Stars AA-200 radio altimeter system
Sample interval:	1.0 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.

4.5.2 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.

4.6 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.

4.7 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 GPS data using as “**S**” Survey files, and “**R**” Rover files containing GPS raw range data for post processing.

5 Ground Data Acquisition Equipment

5.1 GPS Base Station System

The GPS base station consists 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. For this survey, the antenna for the GPS base station was located on the corner of block 51-58 of the Aurora Resort at Jabiru.

The GPS base station was positioned by collecting 3 hours of data at the aircraft and this was used to post correct the base GPS position using GrafNav software.

The calculated GPS base position was (in WGS 84):
Lat: 12° 40′ 33.71681″ S
Long: 132° 28′ 43.41059″ E
Height: 70.213 m

6 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:-

6.1 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.

6.2 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.

6.3 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.

6.4 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.

6.5 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.

6.6 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.

6.7 Parallax Checks

Due to the relative positions of the EM towed bird 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, 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.

6.8 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 it's operating range.

Absolute radar and barometric altimeter calibration was carried out over water (27th January 2005, over 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.

6.9 Repeat Calibration Line

From previous surveys in the region, a low-level calibration line has been located in order to validate the repeatability of the EM system at the start of each day's acquisition. The line was flown in the same direction and at the nominal survey altitude, then processed right through to produce a CDI which was emailed to the client daily. The line coordinates are: 318000mE to 315000 at 8627400mN.

7 Data Processing

7.1 Field Data Processing

7.1.1 Quality Control Specifications

7.1.1.1 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).

Traverse Lines Separation - actual flight line path deviates more than 125% off course for a distance of 5 km or more, or if a flight line intersects an adjacent flight line. Where flight lines are more than 20 m off course over a continuous distance of 1500 m or more unless the deviation is required by civil aviation requirements.

Altitude - terrain clearance continuously exceeds the nominal terrain clearance by plus or minus 20 m over a distance of 2 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.

7.1.1.2 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.

7.1.2 In-Field Data Processing

Following acquisition, multiple copies of the EM data are made onto Exabyte tapes. The EM, location 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 7.2.2.

7.2 Final Data Processing

7.2.1 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. The aircraft's height above mean sea level was determined by differentially post-processing the synchronised DGPS data from the aircraft and GPS base station. Terrain clearance is measured with a laser 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 corrections for the separation between the two instruments (see section 7.2.2.2).

Derived surface topography, or digital elevation model (DEM), values with respect to mean sea level (referenced to the geoid) are obtained by correcting the spheroid values with geoid-spheroid separation values supplied by AUSLIG.

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.

7.2.2 Electromagnetic Data Processing

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

7.2.2.1 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 (120 m behind and 35 m 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
Noise levelling of late-time and limited range micro-levelling was applied to the final window amplitudes for presentation purposes, principally for multi-flight surveys or when isolated re-flight lines are present.

7.2.2.2 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 7.2.4.1 for “standardised” values)

GPS Antenna and Transmitter Loop 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.

7.2.2.3 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) will 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) will show 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.

7.2.2.4 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 artifact 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.

7.2.3 Conductivity Depth Images (CDI)

CDI conductivity sections for TEMPEST data are generally 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. 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 “raw” data for each area were input into EMFlow (version 5.10) to calculate Conductivity Depth Images (CDI). Conductivity values were calculated to a depth of 500m below surface at each point, using a depth increment of 5m, then run through *Sigtime* before being made into the CDI products (stacked CDI sections and CDI-multiplots). This processing was completed for both X and 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).

7.2.4 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 7.2.2.1).

7.2.4.1 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

7.2.4.2 Parallax

The located data files utilise the following parallax values :-

- 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.)

7.2.5 Other Products

Adaptive time constants
An "adaptive time constant" grid is calculated by fitting an exponential decay to the last few windows above a specified threshold. Thus, the calculation does not involve a fixed window range and 'adapts' to the nature of the decay at each observation. It summarises the latest time constants that are seen in the data (using a minimum of 2 windows and a maximum of 3 windows to define the time constant). The calculated time constants do not have any criteria applied to them as to how well the data fits an exponential decay model. This method of time constant calculation produces virtually continuous output, limited only by the requirement for at least 2 windows to be above a specified threshold. In resistive areas, this image highlights the long time constants associated with discrete conductors.

Time constant grids were produced for both X and Z component "final" EM data.

7.2.6 Delivered Products

Geosoft GDB databases plus flat ascii located data files were produced containing raw and final data for both the EM X- and Z-components. Digital elevation data were included. The header files can be found in Appendix III.

ER-Mapper grids of DTM, adaptive time constants for X and Z, and all final EM windows were also delivered.

See appendix IV for a complete listing of delivered digital products.

7.2.7 Comments on Data from this Survey

As with previous surveys in the area, it was deemed advantageous to use the “raw” EM data (see section 7.2.2.1 for explanation) rather than the “final” EM data. The reason is that in processing data from this region, the transmitter height/pitch/roll correction tends to *overcompensate* thereby producing results that correlate too well with topography. As can be seen in this survey’s CDIs, correlation with topography is next to negligible. Appendix VI displays the contents of the Emflow *descriptor* (.dsc) files. The tau range used was 0.002ms to 10ms, and the conductivities 0.1mS/m to 100mS/m; they were kept consistent for all areas. In addition, all four areas were processed with the same transmitter/receiver offset (see section 7.2.4.1).

Atmospheric activity was fairly quiet, especially compared to previous surveys; no doubt the time of year played a large part in that.

The Sigtime (see section 7.2.3) parameters were set differently for the X and Z-component data (due to their differing coupling strengths): the *depth factor* being 0.8 for the X-component EM data and 0.7 for the Z-component EM data.

One other minor change was made to the CDI-multiplots: where previously the profile (in the CDI panel of the plot) marked “Tx_altitude” was simply the DTM plus the drape height (to represent the idealised position of the transmitter *after* height/pitch/roll/geometry correction), the profile is now simply the actual flight path of the transmitter. The change was made in the belief that this was more intuitive and probably more use in cases where the CDI’s were *not* height/pitch/roll/geometry corrected.

Areas 1 and 2 (Wellington Range and East Alligator respectively) had a set of local “line-oriented” coordinates calculated since they were both flown at non-cardinal headings. If this is to be a regular occurrence, then Fugro recommend it be stipulated in future contracts.

8 References

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APPENDIX I - Flight Plans

AREA 1

```
JOB_Number   1715_1                                                              *
CLIENT       Cameco                                                              *
AREA_NAME    Wellington Range (North)                                            *
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   301062  8674983 -11.980148 +133.172935 -115848.5 +1331022.6 12 *
BOUNDARY     2   292959  8672099 -12.005720 +133.098359 -120020.6 +1330554.1 12 *
BOUNDARY     3   281674  8672014 -12.005764 +132.994750 -120020.8 +1325941.1 12 *
BOUNDARY     4   281674  8674286 -11.985231 +132.994902 -115906.8 +1325941.6 12 *
BOUNDARY     5   292385  8678132 -11.951156 +133.093472 -115704.2 +1330536.5 12 *
BOUNDARY     6   292277  8687444 -11.866983 +133.093069 -115201.1 +1330535.0 12 *
BOUNDARY     7   291783  8687707 -11.864575 +133.088555 -115152.5 +1330518.8 12 *
BOUNDARY     8   290449  8688405 -11.858184 +133.076355 -115129.5 +1330434.9 12 *
BOUNDARY     9   289479  8689152 -11.851371 +133.067508 -115104.9 +1330403.0 12 *
BOUNDARY    10   285700  8699420 -11.758329 +133.033487 -114530.0 +1330200.6 12 *
BOUNDARY    11   286903  8700463 -11.748978 +133.044590 -114456.3 +1330240.5 12 *
BOUNDARY    12   287685  8701357 -11.740947 +133.051825 -114427.4 +1330306.6 12 *
BOUNDARY    13   288171  8701940 -11.735708 +133.056314 -114408.5 +1330322.7 12 *
BOUNDARY    14   288308  8702671 -11.729109 +133.057621 -114344.8 +1330327.4 12 *
BOUNDARY    15   288361  8703732 -11.719523 +133.058173 -114310.3 +1330329.4 12 *
BOUNDARY    16   288150  8704892 -11.709025 +133.056310 -114232.5 +1330322.7 12 *
BOUNDARY    17   287843  8705660 -11.702065 +133.053545 -114207.4 +1330312.8 12 *
BOUNDARY    18   287073  8706870 -11.691080 +133.046557 -114127.9 +1330247.6 12 *
BOUNDARY    19   286439  8707611 -11.684343 +133.040788 -114103.6 +1330226.8 12 *
BOUNDARY    20   285731  8708155 -11.679382 +133.034336 -114045.8 +1330203.6 12 *
BOUNDARY    21   285108  8708622 -11.675122 +133.028653 -114030.4 +1330143.1 12 *
BOUNDARY    22   284443  8708844 -11.673074 +133.022563 -114023.1 +1330121.2 12 *
BOUNDARY    23   283525  8708793 -11.673477 +133.014142 -114024.5 +1330050.9 12 *
BOUNDARY    24   281305  8708548 -11.675549 +132.993774 -114032.0 +1325937.6 12 *
BOUNDARY    25   281377  8716298 -11.605509 +132.994932 -113619.8 +1325941.8 12 *
BOUNDARY    26   275201  8729082 -11.489571 +132.939164 -112922.5 +1325621.0 12 *
BOUNDARY    27   283810  8732207 -11.461874 +133.018252 -112742.7 +1330105.7 12 *
BOUNDARY    28   300629  8701385 -11.741479 +133.170555 -114429.3 +1331014.0 12 *
SQUARE_KMS   679.319                                                             *
|                                                                                *
NAVTYPE      NOVATEL                                                             *
NAVMODE      U.T.M                                                               *
PLAN_TYPE    Normal                                                              *
LINE_TYPE    S.LINE    X.LINE    0         0                                     *
HEADING      66        156                                                       *
SPACING      400       4000      400       400                                   *
OVER_LINE    1         1                                                         *
OVERFLY      0         0                                                         *
MIN_LENGTH   2         2                                                         *
FIRST_LINE   10        10                                                        *
INCREMENT    10        10                                                        *
X_TRACK      30        30                                                        *
MASTER_PT    1   301062  8674983 -11.980148 +133.172935                          *
MASTER_NEW   0  Not implemented.                                                 *
KM_IN_AREA   1313      106                                                       *
KM+OVERFLY   1313      106                                                       *
```

AREA 2

```
JOB_Number  1715_2                                                              *
CLIENT      Cameco                                                              *
AREA_NAME   East Alligator (Central)                                            *
PLANNED_BY  HopeMA                                                              *
|                                                                               *
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   330926  8590679 -12.743892 +133.442626 -124438.0 +1332633.5 12 *
BOUNDARY    2   336756  8582927 -12.814279 +133.495898 -124851.4 +1332945.2 12 *
BOUNDARY    3   327554  8576892 -12.868333 +133.410799 -125206.0 +1332438.9 12 *
BOUNDARY    4   322423  8584943 -12.795269 +133.363995 -124743.0 +1332150.4 12 *
SQUARE_KMS  102.199                                                             *
|                                                                               *
NAVTYPE     NOVATEL                                                             *
NAVMODE     U.T.M                                                               *
PLAN_TYPE   Normal                                                              *
LINE_TYPE   S.LINE    X.LINE    0         0                                     *
HEADING     57        147                                                       *
SPACING     400       4200      400       400                                   *
OVER_LINE   1         1                                                         *
OVERFLY     0         0                                                         *
MIN_LENGTH  2         2                                                         *
FIRST_LINE  10        10                                                        *
INCREMENT   10        10                                                        *
X_TRACK     100       100                                                       *
MASTER_PT   1   330926  8590679 -12.743892 +133.442626                          *
MASTER_NEW  0  Not implemented.                                                 *
KM_IN_AREA  245       29                                                        *
KM+OVERFLY  245       29                                                        *
```

AREA 3

```
JOB_Number  1715_3                                                              *
CLIENT      Cameco                                                              *
AREA_NAME   Nabarlek (South)                                                    *
PLANNED_BY  HopeMA                                                              *
|                                                                               *
SPHEROID    22  W.G.S_1984 6378137.0 298.257223563 0.9996                       *
DELTAXYZE   0.0 0.0 0.0 0.0 0.0 0.0 0.0                                         *
HEMISPHERE  SOUTH                                                               *
UTM_ORIGIN  53   135   135                                                      *
BOUNDARY    1   328172  8636390 -12.330534 +133.419789 -121949.9 +1332511.2 12 *
BOUNDARY    2   328211  8629918 -12.389041 +133.419793 -122320.5 +1332511.3 12 *
BOUNDARY    3   319149  8629864 -12.389032 +133.336457 -122320.5 +1332011.2 12 *
BOUNDARY    4   319160  8628020 -12.405701 +133.336452 -122420.5 +1332011.2 12 *
BOUNDARY    5   305534  8627932 -12.405699 +133.211147 -122420.5 +1331240.1 12 *
BOUNDARY    6   305510  8631467 -12.373746 +133.211140 -122225.5 +1331240.1 12 *
BOUNDARY    7   308593  8631526 -12.373397 +133.239488 -122224.2 +1331422.2 12 *
BOUNDARY    8   308417  8636246 -12.330723 +133.238163 -121950.6 +1331417.4 12 *
SQUARE_KMS  157.427                                                             *
|                                                                               *
NAVTYPE     NOVATEL                                                             *
NAVMODE     U.T.M                                                               *
PLAN_TYPE   Normal                                                              *
LINE_TYPE   S.LINE    X.LINE    0         0                                     *
HEADING     90        180                                                       *
SPACING     200       2000      200       200                                   *
OVER_LINE   1         1                                                         *
OVERFLY     0         0                                                         *
MIN_LENGTH  2         2                                                         *
FIRST_LINE  10        10                                                        *
INCREMENT   10        10                                                        *
X_TRACK     100       100                                                       *
MASTER_PT   1   328172  8636390 -12.330534 +133.419789                          *
MASTER_NEW  0  Not implemented.                                                 *
KM_IN_AREA  743       42                                                        *
KM+OVERFLY  743       42                                                        *
```

AREA 4

```
JOB_Number   1715_4                                                              *
CLIENT       Cameco                                                              *
AREA_NAME    Tin Camp Creek (NE Myra)                                            *
PLANNED_BY   HopeMA                                                              *
|                                                                                *
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   328430  8627253 -12.413144 +133.421666 -122447.3 +1332518.0 12 *
BOUNDARY     2   328396  8620167 -12.477197 +133.420962 -122837.9 +1332515.5 12 *
BOUNDARY     3   322967  8619945 -12.478907 +133.371012 -122844.1 +1332215.6 12 *
BOUNDARY     4   319987  8619989 -12.478342 +133.343601 -122842.0 +1332037.0 12 *
BOUNDARY     5   319922  8627251 -12.412695 +133.343415 -122445.7 +1332036.3 12 *
SQUARE_KMS   61.134                                                              *
|                                                                                *
NAVTYPE      NOVATEL                                                             *
NAVMODE      U.T.M                                                               *
PLAN_TYPE    Normal                                                              *
LINE_TYPE    S.LINE    X.LINE    0         0                                     *
HEADING      0         90                                                        *
SPACING      200       2000      200       200                                   *
OVER_LINE    1         1                                                         *
OVERFLY      0         0                                                         *
MIN_LENGTH   2         2                                                         *
FIRST_LINE   10        10                                                        *
INCREMENT    10        10                                                        *
X_TRACK      100       100                                                       *
MASTER_PT    1   328430  8627253 -12.413144 +133.421666                          *
MASTER_NEW   0  Not implemented.                                                 *
KM_IN_AREA   282       17                                                        *
KM+OVERFLY   282       17                                                        *
```

APPENDIX II – Weekly Operations Reports

Week Commencing:	**Monday 2-May-05**	Aircraft:	VH-TEM	Operators:	Shane Hulme	Pilots:	Tim Haldane / Simon Graham
Job Number:	1715	Base:	Jabiru	Data Proc:	Denis Cowey	Techs:	Shane Hulme
Total km:	2777	Country:	Australia	Crew Leader:	Shane Hulme	Client:	Cameco
		Area Name:		Accom:	Aurora Kakadu Resort	Contact #:	08 8979 0166 (office rm 55, SH 62, DC 57, LG 61, TH 60, SG 5

Date		Flight Number	Crew Plt(s)	Crew Op	Time T/O	Time Land	M/R Hrs	Oil L	Oil R	Fuel Added	This Flight Prod	This Flight Refly	To Date Prod	To Date Refly	Standby (0, 0.5, 1)	Comments
Monday	2-May-05															Weather:
Julian	122															Remarks:
Day					Hours Today		0.0				0.0	0.0				Safety Meeting:
Tuesday	3-May-05															
																Remarks:
Julian	123															
Day					Hours Today		0.0				0.0	0.0	0.0	0.0		Safety Meeting:
Wednesday	4-May-05															Weather:
																Remarks:
Julian	124															
Day					Hours Today		0.0				0.0	0.0	0.0	0.0		Safety Meeting:
Thursday	5-May-05															Weather:
																Remarks:
Julian	125															
Day	1				Hours Today		0.0				0.0	0.0	0.0	0.0		Safety Meeting:
Friday	6-May-05				6:30	9:18	2.8			1735	0.0					Weather: CAVOK
																Remarks:Ferry from Darwin to Jabiru. Recce of all areas flown and
Julian	126															compbox performed
Day	2				Hours Today		2.8				0.0	0.0	0.0	0.0		Safety Meeting: Safety meeting held and JSP/permit to work completed.
Saturday	7-May-05				6:57	8:58	2.0			744	0.0					Weather: Fine. High spherical activity.
																Remarks: 137.9kms scrubbed due to spherics
Julian	127															
Day	3				Hours Today		2.0				0.0	0.0	0.0	0.0		Safety Meeting:
Sunday	8-May-05										0.0					Weather: CAVOK
																Remarks: Mag base station failure called PDO today. Mag base station
Julian	128															ran ok later after disassembly, reset and restart.
Day	4				Hours Today		0.0				0.0	0.0	0.0	0.0		Safety Meeting:
Total Job Hours					Weekly Totals		4.8	0	0	2479	0.0	0.0			0.0	

Total Aircraft Hours	15986.9	Ltrs/Hr	515		Total Standby	0.0
Hours to Next Periodic	110.4	Running Avg	0.0	km/day	% Complete	0.0 %
Anticipated Hours Next week	25		0.0	km/hr	km Remaining	2777.0 km

Survey Equipment Problems: 856 Mag base failure. Reset ran OK during day. Spare arriving TNT tomorrow

Week Commencing: **Monday 9-May-05**
Job Number: 1715
Total km: 2777

Aircraft: VH-TEM
Base: Jabiru
Country: Australia
Area Name:

Operators: Shane Hulme
Data Proc: Denis Cowey
Crew Leader: Shane Hulme
Accom: Aurora Kakadu Resort

Pilots: Tim Haldane / Simon Graham
Techs: Shane Hulme
Client: Cameco
Contact #: 08 8979 0166 (office rm 55, SH 62, DC 57, LG 61, TH 60, SG 58)

Date		Flight	Crew		Time		M/R	Oil		Fuel	This Flight		To Date		Standby	Comments
		Number	Plt(s)	Op	T/O	Land	Hrs	L	R	Added	Prod	Refly	Prod	Refly	(0, 0.5, 1)	
Monday	9-May-05															Weather:
																Remarks:
Julian	129															
Day	5				Hours Today		0.0				0.0	0.0				Safety Meeting:
Tuesday	10-May-05	3			7:18	8:29	1.2									
																Remarks: Tx only developing 250A returned to base. Fault found in loop stinger
Julian	130															connection. 27.2 km scrubbed
Day	6				Hours Today		1.2				0.0	0.0	0.0	0.0		Safety Meeting:
Wednesday	11-May-05	4			6:48	9:48	3.0			1593	203.1	137.9				Weather:
																Remarks:
Julian	131															
Day	7				Hours Today		3.0				203.1	137.9	203.1	137.9		Safety Meeting:
Thursday	12-May-05	5			7:05	12:08	5.1			2063	558.5	27.2				Weather:
																Remarks: 77.1 km scrubbed
Julian	132															
Day	8				Hours Today		5.1				558.5	27.2	761.6	165.1		Safety Meeting:
Friday	13-May-05	6			7:09	11:39	4.5			1908	330.4	63.5				Weather:
																Remarks: 30km scrubbed
Julian	133															
Day	9				Hours Today		4.5				330.4	63.5	1092.0	228.6		Safety Meeting:
Saturday	14-May-05	7			6:36	11:32	4.9			2022	378.1					Weather:
																Remarks: 10.2 km scrubbed
Julian	134															
Day	10				Hours Today		4.9				378.1	0.0	1470.1	228.6		Safety Meeting:
Sunday	15-May-05	8			6:42	11:37	4.9			2239	358.2	40.2				Weather:
																Remarks: 29.1 km scrubbed
Julian	135															
Day	11				Hours Today		4.9				358.2	40.2	1828.3	268.8		Safety Meeting: Safety meeting held
Total Job Hours					Weekly Totals		23.6	0	0	9825	1828.3	268.8			0.0	

Total Aircraft Hours: 16010.5 Ltrs/Hr: 417 Total Standby: 0.0
Hours to Next Periodic: 86.8 Running Avg: 261.2 km/day % Complete: 65.8 %
Anticipated Hours Next week: 25 77.5 km/hr km Remaining: 948.7 km

Survey Equipment Problems: 856 Mag base failure. (operating on one mag base). Loop connection in stinger fault repaired

Week Commencing: **Monday 16-May-05**
Job Number: 1715
Total km: 2777

Aircraft: VH-TEM
Base: Jabiru
Country: Australia
Area Name:

Operators: Shane Hulme
Data Proc: Denis Cowey
Crew Leader: Shane Hulme
Accom: Aurora Kakadu Resort

Pilots: Tim Haldane / Simon Graham
Techs: Shane Hulme
Client: Cameco
Contact #: 08 8979 0166 (office rm 55, SH 62, DC 57, LG 61, TH 60, SG 58)

Date		Flight Number	Crew Plt(s)	Crew Op	Time T/O	Time Land	M/R Hrs	Oil L	Oil R	Fuel Added	This Flight Prod	This Flight Refly	To Date Prod	To Date Refly	Standby (0, 0.5, 1)	Comments
Monday	16-May-05	PDO														Weather:
																Remarks:
Julian	137															
Day	12				Hours Today		0.0				0.0	0.0	1828.3			Safety Meeting:
Tuesday	17-May-05	9			6:34	11:40	5.1			2200	486.7	43.3				
																Remarks: Tx only developing 250A returned to base. Fault found in loop stinger
Julian	138															connection. 27.2 km scrubbed
Day	13				Hours Today		5.1				486.7	43.3	2315.0	43.3		Safety Meeting:
Wednesday	18-May-05	10			6:40	10:07	3.5			1440	198.7	25.3				Weather:
																Remarks:
Julian	139															
Day	14				Hours Today		3.5				198.7	25.3	2513.7	68.6		Safety Meeting:
Thursday	19-May-05	11 & 01			6:35	10:31	3.9			1370	245.0					Weather:
																Remarks:
Julian	140															
Day	15				Hours Today		3.9				245.0	0.0	2758.7	68.6		Safety Meeting:
Friday	20-May-05	2			7:00	9:30	2.5			1719						Weather:
		Pilot Trg			10:30	11:35	1.1									Remarks:
Julian	141															
Day	16				Hours Today		3.6				0.0	0.0	2758.7	68.6		Safety Meeting:
Saturday	21-May-05	12 & 03			7:42	10:35	2.9			1278						Weather: Calm at takeoff quickly building to 15 to 20kts
																Remarks:
Julian	142															
Day	17				Hours Today		2.9				0.0	0.0	2758.7	68.6		Safety Meeting:
Sunday	22-May-05	13 & 04			6:41	9:03	2.4			1280						Weather: Calm at takeoff quickly building to 15 to 20kts
																Remarks:
Julian	143															
Day	18				Hours Today		2.4				0.0	0.0	2758.7	68.6		Safety Meeting: Safety meeting held
Total Job Hours				Weekly Totals			21.3	0	0	9287	930.4	68.6			0.0	
				Total Aircraft Hours			16031.8	Ltrs/Hr		436			Total Standby		0.0	
				Hours to Next Periodic			65.5	Running Avg			132.9 km/day		% Complete		99.3 %	
				Anticipated Hours Next week			25				43.6 km/hr		km Remaining		18.3 km	

Survey Equipment Problems: 856 Mag base failure. (operating on one mag base). Loop connection in stinger fault repaired

APPENDIX III – Data Formats (Post Processed Files)

Headers for final data files

WellingtonRange_final.hdr

```
COMM JOB NUMBER:                                                    1715
COMM AREA NUMBER:                                                      1
COMM SURVEY COMPMANY:                                Fugro Airborne Surveys
COMM CLIENT:                                       Cameco Australia Pty Ltd
COMM SURVEY TYPE:                                     25Hz TEMPEST Survey
COMM AREA NAME:                                    Wellington Range (North)
COMM STATE:                                              Northern Territory
COMM COUNTRY:                                                    Australia
COMM SURVEY FLOWN:                                                May 2005
COMM LOCATED DATA CREATED:                                    19 July 2005
COMM
COMM DATUM:                                                          AGD66
COMM PROJECTION:                                                       AMG
COMM ZONE:                                                              53
COMM
COMM SURVEY SPECIFICATIONS
COMM
COMM TRAVERSE LINE SPACING:                                          400 m
COMM TRAVERSE LINE DIRECTION:                                  066-246 deg
COMM TIE LINE SPACING:                                              4000 m
COMM TIE LINE DIRECTION:                                       156-336 deg
COMM NOMINAL TERRAIN CLEARANCE:                                      120 m
COMM FINAL LINE KILOMETRES:                                        1516 km
COMM
COMM LINE NUMBERING
COMM
COMM TRAVERSE LINE NUMBERS:                                  10010 - 11190
COMM TIE LINE NUMBERS:                                       17010 - 17020
COMM
COMM AREA BOUNDARY (WGS84, UTM53S)
COMM  EASTING NORTHING
COMM
COMM   301062  8674983
COMM   292959  8672099
COMM   281674  8672014
COMM   281674  8674286
COMM   292385  8678132
COMM   292277  8687444
COMM   291783  8687707
COMM   290449  8688405
COMM   289479  8689152
COMM   285700  8699420
COMM   286903  8700463
COMM   287685  8701357
COMM   288171  8701940
COMM   288308  8702671
COMM   288361  8703732
COMM   288150  8704892
COMM   287843  8705660
COMM   287073  8706870
COMM   286439  8707611
COMM   285731  8708155
COMM   285108  8708622
COMM   284443  8708844
COMM   283525  8708793
COMM   281305  8708548
COMM   281377  8716298
COMM   275201  8729082
COMM   283810  8732207
COMM   300629  8701385
COMM
COMM SURVEY EQUIPMENT
COMM
COMM AIRCRAFT:                               CASA C212 Turbo Prop, VH-TEM
COMM
COMM MAGNETOMETER:                            Scintrex CS-2 Cesium Vapour
COMM INSTALLATION:                                                Stinger
COMM RESOLUTION:                                                 0.001 nT
COMM RECORDING INTERVAL:                                          0.2 sec
COMM
COMM ELECTROMAGNETIC SYSTEM:                                  25Hz TEMPEST
```

```
COMM INSTALLATION:                Transmitter loop mounted on the aircraft
COMM                                        Receiver coils in a towed bird
COMM COIL ORIENTATION:                                                 X,Z
COMM RECORDING INTERVAL:                                           0.2 sec
COMM SYSTEM GEOMETRY:
COMM RECEIVER DISTANCE BEHIND THE TRANSMITTER:                       120 m
COMM RECEIVER DISTANCE BELOW THE TRANSMITTER:                         35 m
COMM
COMM RADAR ALTIMETER:                                         Sperry RT220
COMM RECORDING INTERVAL:                                           0.2 sec
COMM
COMM NAVIGATION:                              real-time differential GPS
COMM RECORDING INTERVAL:                                             1.0 s
COMM
COMM ACQUISITION SYSTEM:                                         Fugro DAS
COMM
COMM DATA PROCESSING
COMM
COMM MAGNETIC DATA
COMM DIURNAL CORRECTION APPLIED                      base value 46500 nT
COMM PARALLAX CORRECTION APPLIED                            0.6 seconds
COMM IGRF CORRECTION APPLIED                         base value 46250 nT
COMM IGRF MODEL 2000 EXTRAPOLATED TO                          June 2005
COMM
COMM
COMM ELECTROMAGNETIC DATA
COMM SYSTEM PARALLAX REMOVED, AS FOLLOWS
COMM X-COMPONENT EM DATA                                    0.2 seconds
COMM Z-COMPONENT EM DATA                                    1.4 seconds
COMM DATA CORRECTED FOR TRANSMITTER HEIGHT, PITCH AND ROLL
COMM DATA CORRECTED FOR TRANSMITTER-RECEIVER GEOMETRY VARIATIONS
COMM DATA HAVE BEEN MICROLEVELLED
COMM CONDUCTIVITY DEPTH INVERSION CALCULATED                EMFlow V5.10
COMM
COMM DIGITAL TERRAIN DATA
COMM PARALLAX CORRECTION APPLIED TO RADAR ALIMETER DATA       0.6 seconds
COMM PARALLAX CORRECTION APPLIED TO GPS ALIMETER DATA           0 seconds
COMM DTM CALCULATED [DTM = GPS ALTITUDE - RADAR ALTITUDE]
COMM DATA HAVE BEEN MICROLEVELLED
COMM -------------------------------------------------------------------
COMM The accuracy of the elevation calculation is directly dependent on
COMM the accuracy of the two input parameters, radar altitude and GPS
COMM altitude.  The radar altitude value may be erroneous in areas of heavy
COMM tree cover, where the altimeter reflects the distance to the tree
COMM canopy rather than the ground.  The GPS altitude value is primarily
COMM dependent on the number of available satellites. Although
COMM post-processing of GPS data will yield X and Y accuracies in the
COMM order of 1-2 metres, the accuracy of the altitude value is usually
COMM much less, sometimes in the ±5 metre range.  Further inaccuracies
COMM may be introduced during the interpolation and gridding process.
COMM Because of the inherent inaccuracies of this method, no guarantee is
COMM made or implied that the information displayed is a true
COMM representation of the height above sea level.  Although this product
COMM may be of some use as a general reference,
COMM THIS PRODUCT MUST NOT BE USED FOR NAVIGATION PURPOSES.
COMM -------------------------------------------------------------------
COMM
COMM ELECTROMAGNETIC SYSTEM
COMM
COMM TEMPEST IS A TIME-DOMAIN SQUARE-WAVE SYSTEM,
COMM TRANSMITTING AT A BASE FREQUENCY OF 25Hz,
COMM WITH 2 ORTHOGONAL-AXIS RECEIVER COILS IN A TOWED BIRD.
COMM FINAL EM OUTPUT IS RECORDED 5 TIMES PER SECOND.
COMM THE TIMES (IN MILLISECONDS) FOR THE 15 WINDOWS ARE:
COMM
COMM WINDOW      START       END      CENTRE
COMM    1        0.007      0.020      0.013
COMM    2        0.033      0.047      0.040
COMM    3        0.060      0.073      0.067
COMM    4        0.087      0.127      0.107
COMM    5        0.140      0.207      0.173
COMM    6        0.220      0.340      0.280
COMM    7        0.353      0.553      0.453
COMM    8        0.567      0.873      0.720
COMM    9        0.887      1.353      1.120
COMM   10        1.367      2.100      1.733
COMM   11        2.113      3.273      2.693
COMM   12        3.287      5.113      4.200
COMM   13        5.127      7.993      6.560
COMM   14        8.007     12.393     10.200
COMM   15       12.407     19.993     16.200
COMM
COMM PULSE WIDTH: 10 ms
COMM
COMM TEMPEST EM data are transformed to the response that would be
```

```
COMM obtained with a B-field sensor for a 100% duty cycle square
COMM waveform at the base frequency, involving a 1A change in
COMM current (from -0.5A to +0.5A to -0.5A) in a 1sq.m transmitter.
COMM It is this configuration, rather than the actual acquisition
COMM configuration, which must be specified when modelling TEMPEST data.
COMM
COMM
COMM LOCATED DATA FORMAT
COMM
COMM  Output field format : DOS  - Flat ascii
COMM  Number of fields    : 298
COMM
COMM Field  Channel         Description                        Units  Undefined Format
COMM -----  -------         -----------                        -----  --------- ------
COMM
COMM     1  LINE            Line                                       -9999999  i6
COMM     2  FLIGHT          Flight                                     -9999999  i4
COMM     3  FID             Fiducial                             (s)   -9999999  f8.1
COMM     4  LATITUDE        Latitude  AGD66                    (deg)   -9999999  f13.6
COMM     5  LONGITUDE       Longitude AGD66                    (deg)   -9999999  f13.6
COMM     6  EASTING         Easting   AGD66/AMG                  (m)   -9999999  f11.2
COMM     7  NORTHING        Northing  AGD66/AMG                  (m)   -9999999  f12.2
COMM     8  TxHeight        GPS height                           (m)   -9999999  f8.2
COMM     9  Baro            Barometric Altitude                  (m)   -9999999  f8.2
COMM    10  TxRalt_raw      Raw Radar Altimeter                  (m)   -9999999  f8.2
COMM    11  TxRalt_final    Final Radar Altimeter                (m)   -9999999  f8.2
COMM    12  DTM             DTM                                  (m)   -9999999  f8.2
COMM    13  Pitch_Raw       Raw Tx loop pitch                  (deg)   -9999999  f10.5
COMM    14  Roll_Raw        Raw Tx loop roll                   (deg)   -9999999  f10.5
COMM    15  HSep_Raw        Raw Tx-Rx horizontal separation      (m)   -9999999  f8.2
COMM    16  VSep_Raw        Raw Tx-Rx vertical separation        (m)   -9999999  f8.2
COMM    17  Pitch_Final     Final Tx loop pitch                (deg)   -9999999  f10.5
COMM    18  Roll_Final      Final Tx loop roll                 (deg)   -9999999  f10.5
COMM    19  HSep_Final      Final Tx-Rx horizontal separation    (m)   -9999999  f8.2
COMM    20  VSep_Final      Final Tx-Rx vertical separation      (m)   -9999999  f8.2
COMM    21  EMX_Raw[1]      Raw EMX01 Window                    (fT)   -9999999  f12.6
COMM    22  EMX_Raw[2]      Raw EMX02 Window                    (fT)   -9999999  f12.6
COMM    23  EMX_Raw[3]      Raw EMX03 Window                    (fT)   -9999999  f12.6
COMM    24  EMX_Raw[4]      Raw EMX04 Window                    (fT)   -9999999  f12.6
COMM    25  EMX_Raw[5]      Raw EMX05 Window                    (fT)   -9999999  f12.6
COMM    26  EMX_Raw[6]      Raw EMX06 Window                    (fT)   -9999999  f12.6
COMM    27  EMX_Raw[7]      Raw EMX07 Window                    (fT)   -9999999  f12.6
COMM    28  EMX_Raw[8]      Raw EMX08 Window                    (fT)   -9999999  f12.6
COMM    29  EMX_Raw[9]      Raw EMX09 Window                    (fT)   -9999999  f12.6
COMM    30  EMX_Raw[10]     Raw EMX10 Window                    (fT)   -9999999  f12.6
COMM    31  EMX_Raw[11]     Raw EMX11 Window                    (fT)   -9999999  f12.6
COMM    32  EMX_Raw[12]     Raw EMX12 Window                    (fT)   -9999999  f12.6
COMM    33  EMX_Raw[13]     Raw EMX13 Window                    (fT)   -9999999  f12.6
COMM    34  EMX_Raw[14]     Raw EMX14 Window                    (fT)   -9999999  f12.6
COMM    35  EMX_Raw[15]     Raw EMX15 Window                    (fT)   -9999999  f12.6
COMM    36  EMX_Final[1]    Final EMX01 Window                  (fT)   -9999999  f12.6
COMM    37  EMX_Final[2]    Final EMX02 Window                  (fT)   -9999999  f12.6
COMM    38  EMX_Final[3]    Final EMX03 Window                  (fT)   -9999999  f12.6
COMM    39  EMX_Final[4]    Final EMX04 Window                  (fT)   -9999999  f12.6
COMM    40  EMX_Final[5]    Final EMX05 Window                  (fT)   -9999999  f12.6
COMM    41  EMX_Final[6]    Final EMX06 Window                  (fT)   -9999999  f12.6
COMM    42  EMX_Final[7]    Final EMX07 Window                  (fT)   -9999999  f12.6
COMM    43  EMX_Final[8]    Final EMX08 Window                  (fT)   -9999999  f12.6
COMM    44  EMX_Final[9]    Final EMX09 Window                  (fT)   -9999999  f12.6
COMM    45  EMX_Final[10]   Final EMX10 Window                  (fT)   -9999999  f12.6
COMM    46  EMX_Final[11]   Final EMX11 Window                  (fT)   -9999999  f12.6
COMM    47  EMX_Final[12]   Final EMX12 Window                  (fT)   -9999999  f12.6
COMM    48  EMX_Final[13]   Final EMX13 Window                  (fT)   -9999999  f12.6
COMM    49  EMX_Final[14]   Final EMX14 Window                  (fT)   -9999999  f12.6
COMM    50  EMX_Final[15]   Final EMX15 Window                  (fT)   -9999999  f12.6
COMM    51  X_Sferics       X_Sferics                                  -9999999  f10.3
COMM    52  X_Lowfreq       X_Lowfreq                                  -9999999  f10.3
COMM    53  X_Powerline     X_Powerline                                -9999999  f10.3
COMM    54  X_kHz_182       X_kHz_18.2                                 -9999999  f10.3
COMM    55  X_kHz_198       X_kHz_19.8                                 -9999999  f10.3
COMM    56  X_kHz_205       X_kHz_20.5                                 -9999999  f10.3
COMM    57  X_kHz_222       X_kHz_22.2                                 -9999999  f10.3
COMM    58  X_Geofact       X_Geometric factor                         -9999999  f10.3
COMM    59  EMZ_Raw[1]      Raw EMZ01 Window                    (fT)   -9999999  f12.6
COMM    60  EMZ_Raw[2]      Raw EMZ02 Window                    (fT)   -9999999  f12.6
COMM    61  EMZ_Raw[3]      Raw EMZ03 Window                    (fT)   -9999999  f12.6
COMM    62  EMZ_Raw[4]      Raw EMZ04 Window                    (fT)   -9999999  f12.6
COMM    63  EMZ_Raw[5]      Raw EMZ05 Window                    (fT)   -9999999  f12.6
COMM    64  EMZ_Raw[6]      Raw EMZ06 Window                    (fT)   -9999999  f12.6
COMM    65  EMZ_Raw[7]      Raw EMZ07 Window                    (fT)   -9999999  f12.6
COMM    66  EMZ_Raw[8]      Raw EMZ08 Window                    (fT)   -9999999  f12.6
COMM    67  EMZ_Raw[9]      Raw EMZ09 Window                    (fT)   -9999999  f12.6
COMM    68  EMZ_Raw[10]     Raw EMZ10 Window                    (fT)   -9999999  f12.6
COMM    69  EMZ_Raw[11]     Raw EMZ11 Window                    (fT)   -9999999  f12.6
COMM    70  EMZ_Raw[12]     Raw EMZ12 Window                    (fT)   -9999999  f12.6
```

COMM	71	EMZ_Raw[13]	Raw EMZ13 Window		(fT)	-9999999	f12.6
COMM	72	EMZ_Raw[14]	Raw EMZ14 Window		(fT)	-9999999	f12.6
COMM	73	EMZ_Raw[15]	Raw EMZ15 Window		(fT)	-9999999	f12.6
COMM	74	EMZ_Final[1]	Final EMZ01 Window		(fT)	-9999999	f12.6
COMM	75	EMZ_Final[2]	Final EMZ02 Window		(fT)	-9999999	f12.6
COMM	76	EMZ_Final[3]	Final EMZ03 Window		(fT)	-9999999	f12.6
COMM	77	EMZ_Final[4]	Final EMZ04 Window		(fT)	-9999999	f12.6
COMM	78	EMZ_Final[5]	Final EMZ05 Window		(fT)	-9999999	f12.6
COMM	79	EMZ_Final[6]	Final EMZ06 Window		(fT)	-9999999	f12.6
COMM	80	EMZ_Final[7]	Final EMZ07 Window		(fT)	-9999999	f12.6
COMM	81	EMZ_Final[8]	Final EMZ08 Window		(fT)	-9999999	f12.6
COMM	82	EMZ_Final[9]	Final EMZ09 Window		(fT)	-9999999	f12.6
COMM	83	EMZ_Final[10]	Final EMZ10 Window		(fT)	-9999999	f12.6
COMM	84	EMZ_Final[11]	Final EMZ11 Window		(fT)	-9999999	f12.6
COMM	85	EMZ_Final[12]	Final EMZ12 Window		(fT)	-9999999	f12.6
COMM	86	EMZ_Final[13]	Final EMZ13 Window		(fT)	-9999999	f12.6
COMM	87	EMZ_Final[14]	Final EMZ14 Window		(fT)	-9999999	f12.6
COMM	88	EMZ_Final[15]	Final EMZ15 Window		(fT)	-9999999	f12.6
COMM	89	Z_Sferics	Z_Sferics			-9999999	f10.3
COMM	90	Z_Lowfreq	Z_Lowfreq			-9999999	f10.3
COMM	91	Z_Powerline	Z_Powerline			-9999999	f10.3
COMM	92	Z_kHz_182	Z_kHz_18.2			-9999999	f10.3
COMM	93	Z_kHz_198	Z_kHz_19.8			-9999999	f10.3
COMM	94	Z_kHz_205	Z_kHz_20.5			-9999999	f10.3
COMM	95	Z_kHz_222	Z_kHz_22.2			-9999999	f10.3
COMM	96	Z_Geofact	Z_Geometric factor			-9999999	f10.3
COMM	97	CNDX[1]	conductivity_X01	0-5 m	(mS/m)	-9999999	f10.3
COMM	98	CNDX[2]	conductivity_X02	5-10 m	(mS/m)	-9999999	f10.3
COMM	99	CNDX[3]	conductivity_X03	10-15 m	(mS/m)	-9999999	f10.3
COMM	100	CNDX[4]	conductivity_X04	15-20 m	(mS/m)	-9999999	f10.3
COMM	101	CNDX[5]	conductivity_X05	20-25 m	(mS/m)	-9999999	f10.3
COMM	102	CNDX[6]	conductivity_X06	25-30 m	(mS/m)	-9999999	f10.3
COMM	103	CNDX[7]	conductivity_X07	30-35 m	(mS/m)	-9999999	f10.3
COMM	104	CNDX[8]	conductivity_X08	35-40 m	(mS/m)	-9999999	f10.3
COMM	105	CNDX[9]	conductivity_X09	40-45 m	(mS/m)	-9999999	f10.3
COMM	106	CNDX[10]	conductivity_X10	45-50 m	(mS/m)	-9999999	f10.3
COMM	107	CNDX[11]	conductivity_X11	50-55 m	(mS/m)	-9999999	f10.3
COMM	108	CNDX[12]	conductivity_X12	55-60 m	(mS/m)	-9999999	f10.3
COMM	109	CNDX[13]	conductivity_X13	60-65 m	(mS/m)	-9999999	f10.3
COMM	110	CNDX[14]	conductivity_X14	65-70 m	(mS/m)	-9999999	f10.3
COMM	111	CNDX[15]	conductivity_X15	70-75 m	(mS/m)	-9999999	f10.3
COMM	112	CNDX[16]	conductivity_X16	75-80 m	(mS/m)	-9999999	f10.3
COMM	113	CNDX[17]	conductivity_X17	80-85 m	(mS/m)	-9999999	f10.3
COMM	114	CNDX[18]	conductivity_X18	85-90 m	(mS/m)	-9999999	f10.3
COMM	115	CNDX[19]	conductivity_X19	90-95 m	(mS/m)	-9999999	f10.3
COMM	116	CNDX[20]	conductivity_X20	95-100 m	(mS/m)	-9999999	f10.3
COMM	117	CNDX[21]	conductivity_X21	100-105 m	(mS/m)	-9999999	f10.3
COMM	118	CNDX[22]	conductivity_X22	105-110 m	(mS/m)	-9999999	f10.3
COMM	119	CNDX[23]	conductivity_X23	110-115 m	(mS/m)	-9999999	f10.3
COMM	120	CNDX[24]	conductivity_X24	115-120 m	(mS/m)	-9999999	f10.3
COMM	121	CNDX[25]	conductivity_X25	120-125 m	(mS/m)	-9999999	f10.3
COMM	122	CNDX[26]	conductivity_X26	125-130 m	(mS/m)	-9999999	f10.3
COMM	123	CNDX[27]	conductivity_X27	130-135 m	(mS/m)	-9999999	f10.3
COMM	124	CNDX[28]	conductivity_X28	135-140 m	(mS/m)	-9999999	f10.3
COMM	125	CNDX[29]	conductivity_X29	140-145 m	(mS/m)	-9999999	f10.3
COMM	126	CNDX[30]	conductivity_X30	145-150 m	(mS/m)	-9999999	f10.3
COMM	127	CNDX[31]	conductivity_X31	150-155 m	(mS/m)	-9999999	f10.3
COMM	128	CNDX[32]	conductivity_X32	155-160 m	(mS/m)	-9999999	f10.3
COMM	129	CNDX[33]	conductivity_X33	160-165 m	(mS/m)	-9999999	f10.3
COMM	130	CNDX[34]	conductivity_X34	165-170 m	(mS/m)	-9999999	f10.3
COMM	131	CNDX[35]	conductivity_X35	170-175 m	(mS/m)	-9999999	f10.3
COMM	132	CNDX[36]	conductivity_X36	175-180 m	(mS/m)	-9999999	f10.3
COMM	133	CNDX[37]	conductivity_X37	180-185 m	(mS/m)	-9999999	f10.3
COMM	134	CNDX[38]	conductivity_X38	185-190 m	(mS/m)	-9999999	f10.3
COMM	135	CNDX[39]	conductivity_X39	190-195 m	(mS/m)	-9999999	f10.3
COMM	136	CNDX[40]	conductivity_X40	195-200 m	(mS/m)	-9999999	f10.3
COMM	137	CNDX[41]	conductivity_X41	200-205 m	(mS/m)	-9999999	f10.3
COMM	138	CNDX[42]	conductivity_X42	205-210 m	(mS/m)	-9999999	f10.3
COMM	139	CNDX[43]	conductivity_X43	210-215 m	(mS/m)	-9999999	f10.3
COMM	140	CNDX[44]	conductivity_X44	215-220 m	(mS/m)	-9999999	f10.3
COMM	141	CNDX[45]	conductivity_X45	220-225 m	(mS/m)	-9999999	f10.3
COMM	142	CNDX[46]	conductivity_X46	225-230 m	(mS/m)	-9999999	f10.3
COMM	143	CNDX[47]	conductivity_X47	230-235 m	(mS/m)	-9999999	f10.3
COMM	144	CNDX[48]	conductivity_X48	235-240 m	(mS/m)	-9999999	f10.3
COMM	145	CNDX[49]	conductivity_X49	240-245 m	(mS/m)	-9999999	f10.3
COMM	146	CNDX[50]	conductivity_X50	245-250 m	(mS/m)	-9999999	f10.3
COMM	147	CNDX[51]	conductivity_X51	250-255 m	(mS/m)	-9999999	f10.3
COMM	148	CNDX[52]	conductivity_X52	255-260 m	(mS/m)	-9999999	f10.3
COMM	149	CNDX[53]	conductivity_X53	260-265 m	(mS/m)	-9999999	f10.3
COMM	150	CNDX[54]	conductivity_X54	265-270 m	(mS/m)	-9999999	f10.3
COMM	151	CNDX[55]	conductivity_X55	270-275 m	(mS/m)	-9999999	f10.3
COMM	152	CNDX[56]	conductivity_X56	275-280 m	(mS/m)	-9999999	f10.3
COMM	153	CNDX[57]	conductivity_X57	280-285 m	(mS/m)	-9999999	f10.3
COMM	154	CNDX[58]	conductivity_X58	285-290 m	(mS/m)	-9999999	f10.3
COMM	155	CNDX[59]	conductivity_X59	290-295 m	(mS/m)	-9999999	f10.3

COMM	156	CNDX[60]	conductivity_X60	295-300 m	(mS/m)	-9999999	f10.3
COMM	157	CNDX[61]	conductivity_X61	300-305 m	(mS/m)	-9999999	f10.3
COMM	158	CNDX[62]	conductivity_X62	305-310 m	(mS/m)	-9999999	f10.3
COMM	159	CNDX[63]	conductivity_X63	310-315 m	(mS/m)	-9999999	f10.3
COMM	160	CNDX[64]	conductivity_X64	315-320 m	(mS/m)	-9999999	f10.3
COMM	161	CNDX[65]	conductivity_X65	320-325 m	(mS/m)	-9999999	f10.3
COMM	162	CNDX[66]	conductivity_X66	325-330 m	(mS/m)	-9999999	f10.3
COMM	163	CNDX[67]	conductivity_X67	330-335 m	(mS/m)	-9999999	f10.3
COMM	164	CNDX[68]	conductivity_X68	335-340 m	(mS/m)	-9999999	f10.3
COMM	165	CNDX[69]	conductivity_X69	340-345 m	(mS/m)	-9999999	f10.3
COMM	166	CNDX[70]	conductivity_X70	345-350 m	(mS/m)	-9999999	f10.3
COMM	167	CNDX[71]	conductivity_X71	350-355 m	(mS/m)	-9999999	f10.3
COMM	168	CNDX[72]	conductivity_X72	355-360 m	(mS/m)	-9999999	f10.3
COMM	169	CNDX[73]	conductivity_X73	360-365 m	(mS/m)	-9999999	f10.3
COMM	170	CNDX[74]	conductivity_X74	365-370 m	(mS/m)	-9999999	f10.3
COMM	171	CNDX[75]	conductivity_X75	370-375 m	(mS/m)	-9999999	f10.3
COMM	172	CNDX[76]	conductivity_X76	375-380 m	(mS/m)	-9999999	f10.3
COMM	173	CNDX[77]	conductivity_X77	380-385 m	(mS/m)	-9999999	f10.3
COMM	174	CNDX[78]	conductivity_X78	385-390 m	(mS/m)	-9999999	f10.3
COMM	175	CNDX[79]	conductivity_X79	390-395 m	(mS/m)	-9999999	f10.3
COMM	176	CNDX[80]	conductivity_X80	395-400 m	(mS/m)	-9999999	f10.3
COMM	177	CNDX[81]	conductivity_X81	400-405 m	(mS/m)	-9999999	f10.3
COMM	178	CNDX[82]	conductivity_X82	405-410 m	(mS/m)	-9999999	f10.3
COMM	179	CNDX[83]	conductivity_X83	410-415 m	(mS/m)	-9999999	f10.3
COMM	180	CNDX[84]	conductivity_X84	415-420 m	(mS/m)	-9999999	f10.3
COMM	181	CNDX[85]	conductivity_X85	420-425 m	(mS/m)	-9999999	f10.3
COMM	182	CNDX[86]	conductivity_X86	425-430 m	(mS/m)	-9999999	f10.3
COMM	183	CNDX[87]	conductivity_X87	430-435 m	(mS/m)	-9999999	f10.3
COMM	184	CNDX[88]	conductivity_X88	435-440 m	(mS/m)	-9999999	f10.3
COMM	185	CNDX[89]	conductivity_X89	440-445 m	(mS/m)	-9999999	f10.3
COMM	186	CNDX[90]	conductivity_X90	445-450 m	(mS/m)	-9999999	f10.3
COMM	187	CNDX[91]	conductivity_X91	450-455 m	(mS/m)	-9999999	f10.3
COMM	188	CNDX[92]	conductivity_X92	455-460 m	(mS/m)	-9999999	f10.3
COMM	189	CNDX[93]	conductivity_X93	460-465 m	(mS/m)	-9999999	f10.3
COMM	190	CNDX[94]	conductivity_X94	465-470 m	(mS/m)	-9999999	f10.3
COMM	191	CNDX[95]	conductivity_X95	470-475 m	(mS/m)	-9999999	f10.3
COMM	192	CNDX[96]	conductivity_X96	475-480 m	(mS/m)	-9999999	f10.3
COMM	193	CNDX[97]	conductivity_X97	480-485 m	(mS/m)	-9999999	f10.3
COMM	194	CNDX[98]	conductivity_X98	485-490 m	(mS/m)	-9999999	f10.3
COMM	195	CNDX[99]	conductivity_X99	490-495 m	(mS/m)	-9999999	f10.3
COMM	196	CNDX[100]	conductivity_X100	495-500 m	(mS/m)	-9999999	f10.3
COMM	197	CNDZ[1]	conductivity_Z01	0-5 m	(mS/m)	-9999999	f10.3
COMM	198	CNDZ[2]	conductivity_Z02	5-10 m	(mS/m)	-9999999	f10.3
COMM	199	CNDZ[3]	conductivity_Z03	10-15 m	(mS/m)	-9999999	f10.3
COMM	200	CNDZ[4]	conductivity_Z04	15-20 m	(mS/m)	-9999999	f10.3
COMM	201	CNDZ[5]	conductivity_Z05	20-25 m	(mS/m)	-9999999	f10.3
COMM	202	CNDZ[6]	conductivity_Z06	25-30 m	(mS/m)	-9999999	f10.3
COMM	203	CNDZ[7]	conductivity_Z07	30-35 m	(mS/m)	-9999999	f10.3
COMM	204	CNDZ[8]	conductivity_Z08	35-40 m	(mS/m)	-9999999	f10.3
COMM	205	CNDZ[9]	conductivity_Z09	40-45 m	(mS/m)	-9999999	f10.3
COMM	206	CNDZ[10]	conductivity_Z10	45-50 m	(mS/m)	-9999999	f10.3
COMM	207	CNDZ[11]	conductivity_Z11	50-55 m	(mS/m)	-9999999	f10.3
COMM	208	CNDZ[12]	conductivity_Z12	55-60 m	(mS/m)	-9999999	f10.3
COMM	209	CNDZ[13]	conductivity_Z13	60-65 m	(mS/m)	-9999999	f10.3
COMM	210	CNDZ[14]	conductivity_Z14	65-70 m	(mS/m)	-9999999	f10.3
COMM	211	CNDZ[15]	conductivity_Z15	70-75 m	(mS/m)	-9999999	f10.3
COMM	212	CNDZ[16]	conductivity_Z16	75-80 m	(mS/m)	-9999999	f10.3
COMM	213	CNDZ[17]	conductivity_Z17	80-85 m	(mS/m)	-9999999	f10.3
COMM	214	CNDZ[18]	conductivity_Z18	85-90 m	(mS/m)	-9999999	f10.3
COMM	215	CNDZ[19]	conductivity_Z19	90-95 m	(mS/m)	-9999999	f10.3
COMM	216	CNDZ[20]	conductivity_Z20	95-100 m	(mS/m)	-9999999	f10.3
COMM	217	CNDZ[21]	conductivity_Z21	100-105 m	(mS/m)	-9999999	f10.3
COMM	218	CNDZ[22]	conductivity_Z22	105-110 m	(mS/m)	-9999999	f10.3
COMM	219	CNDZ[23]	conductivity_Z23	110-115 m	(mS/m)	-9999999	f10.3
COMM	220	CNDZ[24]	conductivity_Z24	115-120 m	(mS/m)	-9999999	f10.3
COMM	221	CNDZ[25]	conductivity_Z25	120-125 m	(mS/m)	-9999999	f10.3
COMM	222	CNDZ[26]	conductivity_Z26	125-130 m	(mS/m)	-9999999	f10.3
COMM	223	CNDZ[27]	conductivity_Z27	130-135 m	(mS/m)	-9999999	f10.3
COMM	224	CNDZ[28]	conductivity_Z28	135-140 m	(mS/m)	-9999999	f10.3
COMM	225	CNDZ[29]	conductivity_Z29	140-145 m	(mS/m)	-9999999	f10.3
COMM	226	CNDZ[30]	conductivity_Z30	145-150 m	(mS/m)	-9999999	f10.3
COMM	227	CNDZ[31]	conductivity_Z31	150-155 m	(mS/m)	-9999999	f10.3
COMM	228	CNDZ[32]	conductivity_Z32	155-160 m	(mS/m)	-9999999	f10.3
COMM	229	CNDZ[33]	conductivity_Z33	160-165 m	(mS/m)	-9999999	f10.3
COMM	230	CNDZ[34]	conductivity_Z34	165-170 m	(mS/m)	-9999999	f10.3
COMM	231	CNDZ[35]	conductivity_Z35	170-175 m	(mS/m)	-9999999	f10.3
COMM	232	CNDZ[36]	conductivity_Z36	175-180 m	(mS/m)	-9999999	f10.3
COMM	233	CNDZ[37]	conductivity_Z37	180-185 m	(mS/m)	-9999999	f10.3
COMM	234	CNDZ[38]	conductivity_Z38	185-190 m	(mS/m)	-9999999	f10.3
COMM	235	CNDZ[39]	conductivity_Z39	190-195 m	(mS/m)	-9999999	f10.3
COMM	236	CNDZ[40]	conductivity_Z40	195-200 m	(mS/m)	-9999999	f10.3
COMM	237	CNDZ[41]	conductivity_Z41	200-205 m	(mS/m)	-9999999	f10.3
COMM	238	CNDZ[42]	conductivity_Z42	205-210 m	(mS/m)	-9999999	f10.3
COMM	239	CNDZ[43]	conductivity_Z43	210-215 m	(mS/m)	-9999999	f10.3
COMM	240	CNDZ[44]	conductivity_Z44	215-220 m	(mS/m)	-9999999	f10.3

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COMM   241  CNDZ[45]        conductivity_Z45  220-225 m     (mS/m)     -9999999  f10.3
COMM   242  CNDZ[46]        conductivity_Z46  225-230 m     (mS/m)     -9999999  f10.3
COMM   243  CNDZ[47]        conductivity_Z47  230-235 m     (mS/m)     -9999999  f10.3
COMM   244  CNDZ[48]        conductivity_Z48  235-240 m     (mS/m)     -9999999  f10.3
COMM   245  CNDZ[49]        conductivity_Z49  240-245 m     (mS/m)     -9999999  f10.3
COMM   246  CNDZ[50]        conductivity_Z50  245-250 m     (mS/m)     -9999999  f10.3
COMM   247  CNDZ[51]        conductivity_Z51  250-255 m     (mS/m)     -9999999  f10.3
COMM   248  CNDZ[52]        conductivity_Z52  255-260 m     (mS/m)     -9999999  f10.3
COMM   249  CNDZ[53]        conductivity_Z53  260-265 m     (mS/m)     -9999999  f10.3
COMM   250  CNDZ[54]        conductivity_Z54  265-270 m     (mS/m)     -9999999  f10.3
COMM   251  CNDZ[55]        conductivity_Z55  270-275 m     (mS/m)     -9999999  f10.3
COMM   252  CNDZ[56]        conductivity_Z56  275-280 m     (mS/m)     -9999999  f10.3
COMM   253  CNDZ[57]        conductivity_Z57  280-285 m     (mS/m)     -9999999  f10.3
COMM   254  CNDZ[58]        conductivity_Z58  285-290 m     (mS/m)     -9999999  f10.3
COMM   255  CNDZ[59]        conductivity_Z59  290-295 m     (mS/m)     -9999999  f10.3
COMM   256  CNDZ[60]        conductivity_Z60  295-300 m     (mS/m)     -9999999  f10.3
COMM   257  CNDZ[61]        conductivity_Z61  300-305 m     (mS/m)     -9999999  f10.3
COMM   258  CNDZ[62]        conductivity_Z62  305-310 m     (mS/m)     -9999999  f10.3
COMM   259  CNDZ[63]        conductivity_Z63  310-315 m     (mS/m)     -9999999  f10.3
COMM   260  CNDZ[64]        conductivity_Z64  315-320 m     (mS/m)     -9999999  f10.3
COMM   261  CNDZ[65]        conductivity_Z65  320-325 m     (mS/m)     -9999999  f10.3
COMM   262  CNDZ[66]        conductivity_Z66  325-330 m     (mS/m)     -9999999  f10.3
COMM   263  CNDZ[67]        conductivity_Z67  330-335 m     (mS/m)     -9999999  f10.3
COMM   264  CNDZ[68]        conductivity_Z68  335-340 m     (mS/m)     -9999999  f10.3
COMM   265  CNDZ[69]        conductivity_Z69  340-345 m     (mS/m)     -9999999  f10.3
COMM   266  CNDZ[70]        conductivity_Z70  345-350 m     (mS/m)     -9999999  f10.3
COMM   267  CNDZ[71]        conductivity_Z71  350-355 m     (mS/m)     -9999999  f10.3
COMM   268  CNDZ[72]        conductivity_Z72  355-360 m     (mS/m)     -9999999  f10.3
COMM   269  CNDZ[73]        conductivity_Z73  360-365 m     (mS/m)     -9999999  f10.3
COMM   270  CNDZ[74]        conductivity_Z74  365-370 m     (mS/m)     -9999999  f10.3
COMM   271  CNDZ[75]        conductivity_Z75  370-375 m     (mS/m)     -9999999  f10.3
COMM   272  CNDZ[76]        conductivity_Z76  375-380 m     (mS/m)     -9999999  f10.3
COMM   273  CNDZ[77]        conductivity_Z77  380-385 m     (mS/m)     -9999999  f10.3
COMM   274  CNDZ[78]        conductivity_Z78  385-390 m     (mS/m)     -9999999  f10.3
COMM   275  CNDZ[79]        conductivity_Z79  390-395 m     (mS/m)     -9999999  f10.3
COMM   276  CNDZ[80]        conductivity_Z80  395-400 m     (mS/m)     -9999999  f10.3
COMM   277  CNDZ[81]        conductivity_Z81  400-405 m     (mS/m)     -9999999  f10.3
COMM   278  CNDZ[82]        conductivity_Z82  405-410 m     (mS/m)     -9999999  f10.3
COMM   279  CNDZ[83]        conductivity_Z83  410-415 m     (mS/m)     -9999999  f10.3
COMM   280  CNDZ[84]        conductivity_Z84  415-420 m     (mS/m)     -9999999  f10.3
COMM   281  CNDZ[85]        conductivity_Z85  420-425 m     (mS/m)     -9999999  f10.3
COMM   282  CNDZ[86]        conductivity_Z86  425-430 m     (mS/m)     -9999999  f10.3
COMM   283  CNDZ[87]        conductivity_Z87  430-435 m     (mS/m)     -9999999  f10.3
COMM   284  CNDZ[88]        conductivity_Z88  435-440 m     (mS/m)     -9999999  f10.3
COMM   285  CNDZ[89]        conductivity_Z89  440-445 m     (mS/m)     -9999999  f10.3
COMM   286  CNDZ[90]        conductivity_Z90  445-450 m     (mS/m)     -9999999  f10.3
COMM   287  CNDZ[91]        conductivity_Z91  450-455 m     (mS/m)     -9999999  f10.3
COMM   288  CNDZ[92]        conductivity_Z92  455-460 m     (mS/m)     -9999999  f10.3
COMM   289  CNDZ[93]        conductivity_Z93  460-465 m     (mS/m)     -9999999  f10.3
COMM   290  CNDZ[94]        conductivity_Z94  465-470 m     (mS/m)     -9999999  f10.3
COMM   291  CNDZ[95]        conductivity_Z95  470-475 m     (mS/m)     -9999999  f10.3
COMM   292  CNDZ[96]        conductivity_Z96  475-480 m     (mS/m)     -9999999  f10.3
COMM   293  CNDZ[97]        conductivity_Z97  480-485 m     (mS/m)     -9999999  f10.3
COMM   294  CNDZ[98]        conductivity_Z98  485-490 m     (mS/m)     -9999999  f10.3
COMM   295  CNDZ[99]        conductivity_Z99  490-495 m     (mS/m)     -9999999  f10.3
COMM   296  CNDZ[100]       conductivity_Z100 495-500 m     (mS/m)     -9999999  f10.3
COMM
COMM  Total number of lines :  121
COMM
COMM   Flt    Line   Start X   Start Y    End X     End Y      Kms
COMM
COMM    11   10010    284060   8732249   275023   8728159     9.92
COMM    11   10020    275145   8727777   284202   8731824     9.92
COMM    11   10030    284459   8731503   275339   8727423     9.99
COMM    11   10040    275502   8727060   284612   8731125     9.98
COMM    11   10050    284813   8730780   275725   8726714     9.96
COMM    11   10060    275870   8726346   285008   8730450    10.02
COMM    11   10070    285254   8730050   276050   8725961    10.07
COMM    11   10080    276180   8725619   285413   8729718    10.10
COMM    11   10090    285613   8729411   276439   8725287    10.06
COMM    11   10100    276578   8724904   285698   8728957     9.98
COMM    11   10110    285990   8728666   276822   8724582    10.04
COMM    11   10120    276877   8724164   286077   8728262    10.07
COMM    11   10130    286367   8727947   277094   8723827    10.15
COMM    11   10140    277230   8723458   286551   8727607    10.20
COMM    11   10150    286776   8727263   277447   8723121    10.21
COMM    10   10160    277606   8722734   286906   8726901    10.19
COMM    10   10170    287112   8726598   277814   8722398    10.20
COMM    10   10180    277929   8722004   287286   8726192    10.25
COMM    10   10190    287531   8725871   278125   8721663    10.30
COMM    10   10200    278288   8721277   287701   8725482    10.31
COMM    10   10210    287935   8725178   278502   8720959    10.33
COMM    10   10220    278625   8720566   288107   8724789    10.38
COMM    10   10230    288291   8724500   278838   8720235    10.37
COMM    10   10240    278998   8719862   288438   8724065    10.33
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COMM	10	10250	288638	8723765	279212	8719513	10.34
COMM	10	10260	279345	8719155	288812	8723371	10.36
COMM	10	10270	289015	8723189	279542	8718791	10.44
COMM	10	10280	279696	8718421	289211	8722665	10.42
COMM	10	10290	289248	8722333	279900	8718073	10.27
COMM	10	10300	280032	8717694	289641	8721973	10.52
COMM	10	10310	289815	8721618	280253	8717341	10.47
COMM	10	10320	280378	8716957	289946	8721334	10.52
COMM	10	10330	290250	8720908	280595	8716624	10.56
COMM	10	10340	280740	8716274	290321	8720562	10.50
COMM	10	10350	290634	8720233	280887	8715887	10.67
COMM	9	10360	280796	8715416	290744	8719855	10.89
COMM	9	10370	290985	8719500	280842	8714990	11.10
COMM	9	10380	280823	8714553	291130	8719160	11.29
COMM	9	10390	291367	8718795	280886	8714141	11.47
COMM	9	10400	280807	8713666	291499	8718434	11.71
COMM	9	10410	291778	8718122	280990	8713303	11.82
COMM	9	10420	280799	8712795	291898	8717735	12.15
COMM	9	10430	292152	8717397	281045	8712459	12.16
COMM	9	10440	280811	8711958	292145	8716967	12.39
COMM	9	10450	292561	8716709	280856	8711503	12.81
COMM	9	10460	280760	8711015	292722	8716323	13.09
COMM	10	10471	292855	8716094	280844	8710615	13.20
COMM	9	10480	280755	8710159	292983	8715606	13.39
COMM	9	10490	293301	8715319	280902	8709771	13.58
COMM	9	10500	280764	8709267	293435	8714922	13.88
COMM	9	10510	293680	8714598	280891	8708875	14.01
COMM	9	10520	280773	8708393	293734	8714176	14.19
COMM	10	10531	294029	8714024	281476	8708273	13.81
COMM	9	10540	282159	8708235	294192	8713494	13.13
COMM	9	10550	294465	8713173	284014	8708525	11.44
COMM	9	10560	284383	8708234	294592	8712786	11.18
COMM	9	10570	294838	8712486	284908	8708036	10.88
COMM	9	10580	285256	8707762	294826	8712010	10.47
COMM	9	10590	295196	8711750	285640	8707501	10.46
COMM	9	10600	285961	8707213	295378	8711392	10.30
COMM	9	10610	295628	8711017	286241	8706905	10.25
COMM	9	10620	286502	8706567	295671	8710681	10.05
COMM	9	10630	295998	8710345	286754	8706240	10.11
COMM	9	10640	286954	8705884	296051	8709952	9.97
COMM	9	10650	296429	8709555	287186	8705561	10.07
COMM	9	10660	287393	8705218	296561	8709288	10.03
COMM	9	10670	296762	8708888	287546	8704837	10.07
COMM	9	10680	287634	8704447	296963	8708549	10.19
COMM	9	10690	297160	8708156	287735	8704054	10.28
COMM	9	10700	287796	8703651	297273	8707867	10.37
COMM	9	10710	297478	8707568	287857	8703231	10.55
COMM	9	10720	287774	8702754	297629	8707146	10.79
COMM	9	10730	297839	8706904	287722	8702274	11.13
COMM	9	10740	287468	8701737	298016	8706416	11.54
COMM	9	10750	298281	8706126	287137	8701150	12.20
COMM	9	10760	286115	8700256	298470	8705788	13.54
COMM	9	10770	298691	8705471	285631	8699586	14.32
COMM	9	10780	285234	8698990	298763	8705017	14.81
COMM	8	10790	299175	8704580	285363	8698626	15.04
COMM	9	10801	285516	8698252	299141	8704315	14.91
COMM	8	10810	299444	8703980	285712	8697895	15.02
COMM	8	10820	285776	8697496	299440	8703581	14.96
COMM	8	10830	299805	8703326	285936	8697114	15.20
COMM	8	10840	286060	8696751	299937	8702904	15.18
COMM	8	10850	300200	8702596	286245	8696372	15.28
COMM	8	10860	286320	8695968	300356	8702232	15.37
COMM	8	10870	300643	8701899	286532	8695630	15.44
COMM	9	10881	286618	8695225	300767	8701544	15.50
COMM	8	10890	300902	8701144	286769	8694871	15.46
COMM	8	10900	286909	8694496	300757	8700657	15.16
COMM	9	10911	300918	8700257	287095	8694129	15.12
COMM	8	10920	287167	8693737	300911	8699843	15.04
COMM	8	10930	300960	8699428	287326	8693357	14.92
COMM	8	10940	287422	8692978	300773	8698909	14.61
COMM	8	10950	300967	8698570	287704	8692662	14.52
COMM	8	10960	287683	8692201	300916	8698106	14.49
COMM	8	10970	300963	8697692	287864	8691870	14.33
COMM	8	10980	288001	8691517	300965	8697244	14.17
COMM	8	10990	301015	8696697	288173	8691130	14.00
COMM	8	11000	288295	8690719	300990	8696371	13.90
COMM	8	11010	300973	8695937	288457	8690361	13.70
COMM	8	11020	288533	8689978	300967	8695488	13.60
COMM	8	11030	301007	8695074	288704	8689597	13.47
COMM	8	11040	288847	8689202	300925	8694611	13.23
COMM	7	11050	301027	8694208	288986	8688846	13.18
COMM	7	11060	289276	8688523	300804	8693673	12.63
COMM	7	11070	301061	8693355	289838	8688353	12.29
COMM	8	11081	289970	8687965	300975	8692854	12.04
COMM	7	11090	301089	8692479	290684	8687860	11.38

```
COMM     8   11101    290837   8687481    300983   8691989    11.10
COMM     7   11110    301080   8691630    291547   8687352    10.45
COMM     7   11120    292186   8687195    300977   8691129     9.63
COMM     7   11130    301073   8690732    291767   8686598    10.18
COMM     7   11140    291727   8686114    300891   8690188    10.03
COMM     7   11150    301087   8689838    291791   8685708    10.17
COMM     4   11160    291758   8685219    301066   8689424    10.21
COMM     4   11170    301098   8688971    291797   8684850    10.17
COMM     4   11180    291756   8684381    301117   8688546    10.25
COMM     4   11190    301150   8688132    291797   8683969    10.24
COMM    11   17010    277447   8730201    301172   8676927    58.32
COMM    11   17020    301136   8686862    281237   8731560    48.93
COMM
COMM  Total Kilometres :      1516.30
```

EastAlligator_final.hdr

```
COMM JOB NUMBER:                                                     1715
COMM AREA NUMBER:                                                       2
COMM SURVEY COMPMANY:                                Fugro Airborne Surveys
COMM CLIENT:                                       Cameco Australia Pty Ltd
COMM SURVEY TYPE:                                       25Hz TEMPEST Survey
COMM AREA NAME:                                    East Alligator (Central)
COMM STATE:                                              Northern Territory
COMM COUNTRY:                                                     Australia
COMM SURVEY FLOWN:                                                 May 2005
COMM LOCATED DATA CREATED:                                     14 July 2005
COMM
COMM DATUM:                                                           AGD66
COMM PROJECTION:                                                        AMG
COMM ZONE:                                                               53
COMM
COMM SURVEY SPECIFICATIONS
COMM
COMM TRAVERSE LINE SPACING:                                           400 m
COMM TRAVERSE LINE DIRECTION:                                   057-237 deg
COMM TIE LINE SPACING:                                               4200 m
COMM TIE LINE DIRECTION:                                        147-327 deg
COMM NOMINAL TERRAIN CLEARANCE:                                       120 m
COMM FINAL LINE KILOMETRES:                                          294 km
COMM
COMM LINE NUMBERING
COMM
COMM TRAVERSE LINE NUMBERS:                                   20010 - 20230
COMM TIE LINE NUMBERS:                                        27010 - 27030
COMM
COMM AREA BOUNDARY (WGS84, UTM53S)
COMM  EASTING NORTHING
COMM
COMM   330926  8590679
COMM   336756  8582927
COMM   327554  8576892
COMM   322423  8584943
COMM
COMM SURVEY EQUIPMENT
COMM
COMM AIRCRAFT:                                CASA C212 Turbo Prop, VH-TEM
COMM
COMM MAGNETOMETER:                              Scintrex CS-2 Cesium Vapour
COMM INSTALLATION:                                                  Stinger
COMM RESOLUTION:                                                   0.001 nT
COMM RECORDING INTERVAL:                                            0.2 sec
COMM
COMM ELECTROMAGNETIC SYSTEM:                                    25Hz TEMPEST
COMM INSTALLATION:                   Transmitter loop mounted on the aircraft
COMM                                           Receiver coils in a towed bird
COMM COIL ORIENTATION:                                                  X,Z
COMM RECORDING INTERVAL:                                            0.2 sec
COMM SYSTEM GEOMETRY:
COMM RECEIVER DISTANCE BEHIND THE TRANSMITTER:                        120 m
COMM RECEIVER DISTANCE BELOW THE TRANSMITTER:                          35 m
COMM
COMM RADAR ALTIMETER:                                          Sperry RT220
COMM RECORDING INTERVAL:                                            0.2 sec
COMM
COMM NAVIGATION:                                real-time differential GPS
COMM RECORDING INTERVAL:                                              1.0 s
COMM
COMM ACQUISITION SYSTEM:                                          Fugro DAS
COMM
COMM DATA PROCESSING
COMM
COMM MAGNETIC DATA
```

```
COMM DIURNAL CORRECTION APPLIED                         base value 46320 nT
COMM PARALLAX CORRECTION APPLIED                                0.6 seconds
COMM IGRF CORRECTION APPLIED                            base value 46051 nT
COMM IGRF MODEL 2000 EXTRAPOLATED TO                              June 2005
COMM
COMM
COMM ELECTROMAGNETIC DATA
COMM SYSTEM PARALLAX REMOVED, AS FOLLOWS
COMM X-COMPONENT EM DATA                                        0.2 seconds
COMM Z-COMPONENT EM DATA                                        1.4 seconds
COMM DATA CORRECTED FOR TRANSMITTER HEIGHT, PITCH AND ROLL
COMM DATA CORRECTED FOR TRANSMITTER-RECEIVER GEOMETRY VARIATIONS
COMM DATA HAVE BEEN MICROLEVELLED
COMM CONDUCTIVITY DEPTH INVERSION CALCULATED                   EMFlow V5.10
COMM
COMM DIGITAL TERRAIN DATA
COMM PARALLAX CORRECTION APPLIED TO RADAR ALIMETER DATA         0.6 seconds
COMM PARALLAX CORRECTION APPLIED TO GPS ALIMETER DATA             0 seconds
COMM DTM CALCULATED [DTM = GPS ALTITUDE - RADAR ALTITUDE]
COMM DATA HAVE BEEN MICROLEVELLED
COMM ----------------------------------------------------------------------
COMM The accuracy of the elevation calculation is directly dependent on
COMM the accuracy of the two input parameters, radar altitude and GPS
COMM altitude.  The radar altitude value may be erroneous in areas of heavy
COMM tree cover, where the altimeter reflects the distance to the tree
COMM canopy rather than the ground.  The GPS altitude value is primarily
COMM dependent on the number of available satellites. Although
COMM post-processing of GPS data will yield X and Y accuracies in the
COMM order of 1-2 metres, the accuracy of the altitude value is usually
COMM much less, sometimes in the ±5 metre range.  Further inaccuracies
COMM may be introduced during the interpolation and gridding process.
COMM Because of the inherent inaccuracies of this method, no guarantee is
COMM made or implied that the information displayed is a true
COMM representation of the height above sea level.  Although this product
COMM may be of some use as a general reference,
COMM THIS PRODUCT MUST NOT BE USED FOR NAVIGATION PURPOSES.
COMM ----------------------------------------------------------------------
COMM
COMM ELECTROMAGNETIC SYSTEM
COMM
COMM TEMPEST IS A TIME-DOMAIN SQUARE-WAVE SYSTEM,
COMM TRANSMITTING AT A BASE FREQUENCY OF 25Hz,
COMM WITH 2 ORTHOGONAL-AXIS RECEIVER COILS IN A TOWED BIRD.
COMM FINAL EM OUTPUT IS RECORDED 5 TIMES PER SECOND.
COMM THE TIMES (IN MILLISECONDS) FOR THE 15 WINDOWS ARE:
COMM
COMM WINDOW      START       END      CENTRE
COMM    1        0.007      0.020      0.013
COMM    2        0.033      0.047      0.040
COMM    3        0.060      0.073      0.067
COMM    4        0.087      0.127      0.107
COMM    5        0.140      0.207      0.173
COMM    6        0.220      0.340      0.280
COMM    7        0.353      0.553      0.453
COMM    8        0.567      0.873      0.720
COMM    9        0.887      1.353      1.120
COMM   10        1.367      2.100      1.733
COMM   11        2.113      3.273      2.693
COMM   12        3.287      5.113      4.200
COMM   13        5.127      7.993      6.560
COMM   14        8.007     12.393     10.200
COMM   15       12.407     19.993     16.200
COMM
COMM PULSE WIDTH: 10 ms
COMM
COMM TEMPEST EM data are transformed to the response that would be
COMM obtained with a B-field sensor for a 100% duty cycle square
COMM waveform at the base frequency, involving a 1A change in
COMM current (from -0.5A to +0.5A to -0.5A) in a 1sq.m transmitter.
COMM It is this configuration, rather than the actual acquisition
COMM configuration, which must be specified when modelling TEMPEST data.
COMM
COMM
COMM LOCATED DATA FORMAT
COMM
COMM  Output field format : DOS  - Flat ascii
COMM  Number of fields    : 298
COMM
COMM Field  Channel         Description                       Units  Undefined Format
COMM -----  -------         -----------                       -----  --------- ------
COMM
COMM     1  LINE            Line                                      -9999999  i6
COMM     2  FLIGHT          Flight                                    -9999999  i4
COMM     3  FID             Fiducial                            (s)   -9999999  f8.1
COMM     4  LATITUDE        Latitude  AGD66                   (deg)   -9999999  f13.6
```

COMM	5	LONGITUDE	Longitude AGD66	(deg)	-9999999	f13.6
COMM	6	EASTING	Easting AGD66/AMG	(m)	-9999999	f11.2
COMM	7	NORTHING	Northing AGD66/AMG	(m)	-9999999	f12.2
COMM	8	TxHeight	GPS height	(m)	-9999999	f8.2
COMM	9	Baro	Barometric Altitude	(m)	-9999999	f8.2
COMM	10	TxRalt_raw	Raw Radar Altimeter	(m)	-9999999	f8.2
COMM	11	TxRalt_final	Final Radar Altimeter	(m)	-9999999	f8.2
COMM	12	DTM	DTM	(m)	-9999999	f8.2
COMM	13	Pitch_Raw	Raw Tx loop pitch	(deg)	-9999999	f10.5
COMM	14	Roll_Raw	Raw Tx loop roll	(deg)	-9999999	f10.5
COMM	15	HSep_Raw	Raw Tx-Rx horizontal separation	(m)	-9999999	f8.2
COMM	16	VSep_Raw	Raw Tx-Rx vertical separation	(m)	-9999999	f8.2
COMM	17	Pitch_Final	Final Tx loop pitch	(deg)	-9999999	f10.5
COMM	18	Roll_Final	Final Tx loop roll	(deg)	-9999999	f10.5
COMM	19	HSep_Final	Final Tx-Rx horizontal separation	(m)	-9999999	f8.2
COMM	20	VSep_Final	Final Tx-Rx vertical separation	(m)	-9999999	f8.2
COMM	21	EMX_Raw[1]	Raw EMX01 Window	(fT)	-9999999	f12.6
COMM	22	EMX_Raw[2]	Raw EMX02 Window	(fT)	-9999999	f12.6
COMM	23	EMX_Raw[3]	Raw EMX03 Window	(fT)	-9999999	f12.6
COMM	24	EMX_Raw[4]	Raw EMX04 Window	(fT)	-9999999	f12.6
COMM	25	EMX_Raw[5]	Raw EMX05 Window	(fT)	-9999999	f12.6
COMM	26	EMX_Raw[6]	Raw EMX06 Window	(fT)	-9999999	f12.6
COMM	27	EMX_Raw[7]	Raw EMX07 Window	(fT)	-9999999	f12.6
COMM	28	EMX_Raw[8]	Raw EMX08 Window	(fT)	-9999999	f12.6
COMM	29	EMX_Raw[9]	Raw EMX09 Window	(fT)	-9999999	f12.6
COMM	30	EMX_Raw[10]	Raw EMX10 Window	(fT)	-9999999	f12.6
COMM	31	EMX_Raw[11]	Raw EMX11 Window	(fT)	-9999999	f12.6
COMM	32	EMX_Raw[12]	Raw EMX12 Window	(fT)	-9999999	f12.6
COMM	33	EMX_Raw[13]	Raw EMX13 Window	(fT)	-9999999	f12.6
COMM	34	EMX_Raw[14]	Raw EMX14 Window	(fT)	-9999999	f12.6
COMM	35	EMX_Raw[15]	Raw EMX15 Window	(fT)	-9999999	f12.6
COMM	36	EMX_Final[1]	Final EMX01 Window	(fT)	-9999999	f12.6
COMM	37	EMX_Final[2]	Final EMX02 Window	(fT)	-9999999	f12.6
COMM	38	EMX_Final[3]	Final EMX03 Window	(fT)	-9999999	f12.6
COMM	39	EMX_Final[4]	Final EMX04 Window	(fT)	-9999999	f12.6
COMM	40	EMX_Final[5]	Final EMX05 Window	(fT)	-9999999	f12.6
COMM	41	EMX_Final[6]	Final EMX06 Window	(fT)	-9999999	f12.6
COMM	42	EMX_Final[7]	Final EMX07 Window	(fT)	-9999999	f12.6
COMM	43	EMX_Final[8]	Final EMX08 Window	(fT)	-9999999	f12.6
COMM	44	EMX_Final[9]	Final EMX09 Window	(fT)	-9999999	f12.6
COMM	45	EMX_Final[10]	Final EMX10 Window	(fT)	-9999999	f12.6
COMM	46	EMX_Final[11]	Final EMX11 Window	(fT)	-9999999	f12.6
COMM	47	EMX_Final[12]	Final EMX12 Window	(fT)	-9999999	f12.6
COMM	48	EMX_Final[13]	Final EMX13 Window	(fT)	-9999999	f12.6
COMM	49	EMX_Final[14]	Final EMX14 Window	(fT)	-9999999	f12.6
COMM	50	EMX_Final[15]	Final EMX15 Window	(fT)	-9999999	f12.6
COMM	51	X_Sferics	X_Sferics		-9999999	f10.3
COMM	52	X_Lowfreq	X_Lowfreq		-9999999	f10.3
COMM	53	X_Powerline	X_Powerline		-9999999	f10.3
COMM	54	X_kHz_182	X_kHz_18.2		-9999999	f10.3
COMM	55	X_kHz_198	X_kHz_19.8		-9999999	f10.3
COMM	56	X_kHz_205	X_kHz_20.5		-9999999	f10.3
COMM	57	X_kHz_222	X_kHz_22.2		-9999999	f10.3
COMM	58	X_Geofact	X_Geometric factor		-9999999	f10.3
COMM	59	EMZ_Raw[1]	Raw EMZ01 Window	(fT)	-9999999	f12.6
COMM	60	EMZ_Raw[2]	Raw EMZ02 Window	(fT)	-9999999	f12.6
COMM	61	EMZ_Raw[3]	Raw EMZ03 Window	(fT)	-9999999	f12.6
COMM	62	EMZ_Raw[4]	Raw EMZ04 Window	(fT)	-9999999	f12.6
COMM	63	EMZ_Raw[5]	Raw EMZ05 Window	(fT)	-9999999	f12.6
COMM	64	EMZ_Raw[6]	Raw EMZ06 Window	(fT)	-9999999	f12.6
COMM	65	EMZ_Raw[7]	Raw EMZ07 Window	(fT)	-9999999	f12.6
COMM	66	EMZ_Raw[8]	Raw EMZ08 Window	(fT)	-9999999	f12.6
COMM	67	EMZ_Raw[9]	Raw EMZ09 Window	(fT)	-9999999	f12.6
COMM	68	EMZ_Raw[10]	Raw EMZ10 Window	(fT)	-9999999	f12.6
COMM	69	EMZ_Raw[11]	Raw EMZ11 Window	(fT)	-9999999	f12.6
COMM	70	EMZ_Raw[12]	Raw EMZ12 Window	(fT)	-9999999	f12.6
COMM	71	EMZ_Raw[13]	Raw EMZ13 Window	(fT)	-9999999	f12.6
COMM	72	EMZ_Raw[14]	Raw EMZ14 Window	(fT)	-9999999	f12.6
COMM	73	EMZ_Raw[15]	Raw EMZ15 Window	(fT)	-9999999	f12.6
COMM	74	EMZ_Final[1]	Final EMZ01 Window	(fT)	-9999999	f12.6
COMM	75	EMZ_Final[2]	Final EMZ02 Window	(fT)	-9999999	f12.6
COMM	76	EMZ_Final[3]	Final EMZ03 Window	(fT)	-9999999	f12.6
COMM	77	EMZ_Final[4]	Final EMZ04 Window	(fT)	-9999999	f12.6
COMM	78	EMZ_Final[5]	Final EMZ05 Window	(fT)	-9999999	f12.6
COMM	79	EMZ_Final[6]	Final EMZ06 Window	(fT)	-9999999	f12.6
COMM	80	EMZ_Final[7]	Final EMZ07 Window	(fT)	-9999999	f12.6
COMM	81	EMZ_Final[8]	Final EMZ08 Window	(fT)	-9999999	f12.6
COMM	82	EMZ_Final[9]	Final EMZ09 Window	(fT)	-9999999	f12.6
COMM	83	EMZ_Final[10]	Final EMZ10 Window	(fT)	-9999999	f12.6
COMM	84	EMZ_Final[11]	Final EMZ11 Window	(fT)	-9999999	f12.6
COMM	85	EMZ_Final[12]	Final EMZ12 Window	(fT)	-9999999	f12.6
COMM	86	EMZ_Final[13]	Final EMZ13 Window	(fT)	-9999999	f12.6
COMM	87	EMZ_Final[14]	Final EMZ14 Window	(fT)	-9999999	f12.6
COMM	88	EMZ_Final[15]	Final EMZ15 Window	(fT)	-9999999	f12.6
COMM	89	Z_Sferics	Z_Sferics		-9999999	f10.3

COMM	90	Z_Lowfreq	Z_Lowfreq			-9999999	f10.3
COMM	91	Z_Powerline	Z_Powerline			-9999999	f10.3
COMM	92	Z_kHz_182	Z_kHz_18.2			-9999999	f10.3
COMM	93	Z_kHz_198	Z_kHz_19.8			-9999999	f10.3
COMM	94	Z_kHz_205	Z_kHz_20.5			-9999999	f10.3
COMM	95	Z_kHz_222	Z_kHz_22.2			-9999999	f10.3
COMM	96	Z_Geofact	Z_Geometric factor			-9999999	f10.3
COMM	97	CNDX[1]	conductivity_X01	0-5 m	(mS/m)	-9999999	f10.3
COMM	98	CNDX[2]	conductivity_X02	5-10 m	(mS/m)	-9999999	f10.3
COMM	99	CNDX[3]	conductivity_X03	10-15 m	(mS/m)	-9999999	f10.3
COMM	100	CNDX[4]	conductivity_X04	15-20 m	(mS/m)	-9999999	f10.3
COMM	101	CNDX[5]	conductivity_X05	20-25 m	(mS/m)	-9999999	f10.3
COMM	102	CNDX[6]	conductivity_X06	25-30 m	(mS/m)	-9999999	f10.3
COMM	103	CNDX[7]	conductivity_X07	30-35 m	(mS/m)	-9999999	f10.3
COMM	104	CNDX[8]	conductivity_X08	35-40 m	(mS/m)	-9999999	f10.3
COMM	105	CNDX[9]	conductivity_X09	40-45 m	(mS/m)	-9999999	f10.3
COMM	106	CNDX[10]	conductivity_X10	45-50 m	(mS/m)	-9999999	f10.3
COMM	107	CNDX[11]	conductivity_X11	50-55 m	(mS/m)	-9999999	f10.3
COMM	108	CNDX[12]	conductivity_X12	55-60 m	(mS/m)	-9999999	f10.3
COMM	109	CNDX[13]	conductivity_X13	60-65 m	(mS/m)	-9999999	f10.3
COMM	110	CNDX[14]	conductivity_X14	65-70 m	(mS/m)	-9999999	f10.3
COMM	111	CNDX[15]	conductivity_X15	70-75 m	(mS/m)	-9999999	f10.3
COMM	112	CNDX[16]	conductivity_X16	75-80 m	(mS/m)	-9999999	f10.3
COMM	113	CNDX[17]	conductivity_X17	80-85 m	(mS/m)	-9999999	f10.3
COMM	114	CNDX[18]	conductivity_X18	85-90 m	(mS/m)	-9999999	f10.3
COMM	115	CNDX[19]	conductivity_X19	90-95 m	(mS/m)	-9999999	f10.3
COMM	116	CNDX[20]	conductivity_X20	95-100 m	(mS/m)	-9999999	f10.3
COMM	117	CNDX[21]	conductivity_X21	100-105 m	(mS/m)	-9999999	f10.3
COMM	118	CNDX[22]	conductivity_X22	105-110 m	(mS/m)	-9999999	f10.3
COMM	119	CNDX[23]	conductivity_X23	110-115 m	(mS/m)	-9999999	f10.3
COMM	120	CNDX[24]	conductivity_X24	115-120 m	(mS/m)	-9999999	f10.3
COMM	121	CNDX[25]	conductivity_X25	120-125 m	(mS/m)	-9999999	f10.3
COMM	122	CNDX[26]	conductivity_X26	125-130 m	(mS/m)	-9999999	f10.3
COMM	123	CNDX[27]	conductivity_X27	130-135 m	(mS/m)	-9999999	f10.3
COMM	124	CNDX[28]	conductivity_X28	135-140 m	(mS/m)	-9999999	f10.3
COMM	125	CNDX[29]	conductivity_X29	140-145 m	(mS/m)	-9999999	f10.3
COMM	126	CNDX[30]	conductivity_X30	145-150 m	(mS/m)	-9999999	f10.3
COMM	127	CNDX[31]	conductivity_X31	150-155 m	(mS/m)	-9999999	f10.3
COMM	128	CNDX[32]	conductivity_X32	155-160 m	(mS/m)	-9999999	f10.3
COMM	129	CNDX[33]	conductivity_X33	160-165 m	(mS/m)	-9999999	f10.3
COMM	130	CNDX[34]	conductivity_X34	165-170 m	(mS/m)	-9999999	f10.3
COMM	131	CNDX[35]	conductivity_X35	170-175 m	(mS/m)	-9999999	f10.3
COMM	132	CNDX[36]	conductivity_X36	175-180 m	(mS/m)	-9999999	f10.3
COMM	133	CNDX[37]	conductivity_X37	180-185 m	(mS/m)	-9999999	f10.3
COMM	134	CNDX[38]	conductivity_X38	185-190 m	(mS/m)	-9999999	f10.3
COMM	135	CNDX[39]	conductivity_X39	190-195 m	(mS/m)	-9999999	f10.3
COMM	136	CNDX[40]	conductivity_X40	195-200 m	(mS/m)	-9999999	f10.3
COMM	137	CNDX[41]	conductivity_X41	200-205 m	(mS/m)	-9999999	f10.3
COMM	138	CNDX[42]	conductivity_X42	205-210 m	(mS/m)	-9999999	f10.3
COMM	139	CNDX[43]	conductivity_X43	210-215 m	(mS/m)	-9999999	f10.3
COMM	140	CNDX[44]	conductivity_X44	215-220 m	(mS/m)	-9999999	f10.3
COMM	141	CNDX[45]	conductivity_X45	220-225 m	(mS/m)	-9999999	f10.3
COMM	142	CNDX[46]	conductivity_X46	225-230 m	(mS/m)	-9999999	f10.3
COMM	143	CNDX[47]	conductivity_X47	230-235 m	(mS/m)	-9999999	f10.3
COMM	144	CNDX[48]	conductivity_X48	235-240 m	(mS/m)	-9999999	f10.3
COMM	145	CNDX[49]	conductivity_X49	240-245 m	(mS/m)	-9999999	f10.3
COMM	146	CNDX[50]	conductivity_X50	245-250 m	(mS/m)	-9999999	f10.3
COMM	147	CNDX[51]	conductivity_X51	250-255 m	(mS/m)	-9999999	f10.3
COMM	148	CNDX[52]	conductivity_X52	255-260 m	(mS/m)	-9999999	f10.3
COMM	149	CNDX[53]	conductivity_X53	260-265 m	(mS/m)	-9999999	f10.3
COMM	150	CNDX[54]	conductivity_X54	265-270 m	(mS/m)	-9999999	f10.3
COMM	151	CNDX[55]	conductivity_X55	270-275 m	(mS/m)	-9999999	f10.3
COMM	152	CNDX[56]	conductivity_X56	275-280 m	(mS/m)	-9999999	f10.3
COMM	153	CNDX[57]	conductivity_X57	280-285 m	(mS/m)	-9999999	f10.3
COMM	154	CNDX[58]	conductivity_X58	285-290 m	(mS/m)	-9999999	f10.3
COMM	155	CNDX[59]	conductivity_X59	290-295 m	(mS/m)	-9999999	f10.3
COMM	156	CNDX[60]	conductivity_X60	295-300 m	(mS/m)	-9999999	f10.3
COMM	157	CNDX[61]	conductivity_X61	300-305 m	(mS/m)	-9999999	f10.3
COMM	158	CNDX[62]	conductivity_X62	305-310 m	(mS/m)	-9999999	f10.3
COMM	159	CNDX[63]	conductivity_X63	310-315 m	(mS/m)	-9999999	f10.3
COMM	160	CNDX[64]	conductivity_X64	315-320 m	(mS/m)	-9999999	f10.3
COMM	161	CNDX[65]	conductivity_X65	320-325 m	(mS/m)	-9999999	f10.3
COMM	162	CNDX[66]	conductivity_X66	325-330 m	(mS/m)	-9999999	f10.3
COMM	163	CNDX[67]	conductivity_X67	330-335 m	(mS/m)	-9999999	f10.3
COMM	164	CNDX[68]	conductivity_X68	335-340 m	(mS/m)	-9999999	f10.3
COMM	165	CNDX[69]	conductivity_X69	340-345 m	(mS/m)	-9999999	f10.3
COMM	166	CNDX[70]	conductivity_X70	345-350 m	(mS/m)	-9999999	f10.3
COMM	167	CNDX[71]	conductivity_X71	350-355 m	(mS/m)	-9999999	f10.3
COMM	168	CNDX[72]	conductivity_X72	355-360 m	(mS/m)	-9999999	f10.3
COMM	169	CNDX[73]	conductivity_X73	360-365 m	(mS/m)	-9999999	f10.3
COMM	170	CNDX[74]	conductivity_X74	365-370 m	(mS/m)	-9999999	f10.3
COMM	171	CNDX[75]	conductivity_X75	370-375 m	(mS/m)	-9999999	f10.3
COMM	172	CNDX[76]	conductivity_X76	375-380 m	(mS/m)	-9999999	f10.3
COMM	173	CNDX[77]	conductivity_X77	380-385 m	(mS/m)	-9999999	f10.3
COMM	174	CNDX[78]	conductivity_X78	385-390 m	(mS/m)	-9999999	f10.3

COMM	175	CNDX[79]	conductivity_X79	390-395 m	(mS/m)	-9999999	f10.3
COMM	176	CNDX[80]	conductivity_X80	395-400 m	(mS/m)	-9999999	f10.3
COMM	177	CNDX[81]	conductivity_X81	400-405 m	(mS/m)	-9999999	f10.3
COMM	178	CNDX[82]	conductivity_X82	405-410 m	(mS/m)	-9999999	f10.3
COMM	179	CNDX[83]	conductivity_X83	410-415 m	(mS/m)	-9999999	f10.3
COMM	180	CNDX[84]	conductivity_X84	415-420 m	(mS/m)	-9999999	f10.3
COMM	181	CNDX[85]	conductivity_X85	420-425 m	(mS/m)	-9999999	f10.3
COMM	182	CNDX[86]	conductivity_X86	425-430 m	(mS/m)	-9999999	f10.3
COMM	183	CNDX[87]	conductivity_X87	430-435 m	(mS/m)	-9999999	f10.3
COMM	184	CNDX[88]	conductivity_X88	435-440 m	(mS/m)	-9999999	f10.3
COMM	185	CNDX[89]	conductivity_X89	440-445 m	(mS/m)	-9999999	f10.3
COMM	186	CNDX[90]	conductivity_X90	445-450 m	(mS/m)	-9999999	f10.3
COMM	187	CNDX[91]	conductivity_X91	450-455 m	(mS/m)	-9999999	f10.3
COMM	188	CNDX[92]	conductivity_X92	455-460 m	(mS/m)	-9999999	f10.3
COMM	189	CNDX[93]	conductivity_X93	460-465 m	(mS/m)	-9999999	f10.3
COMM	190	CNDX[94]	conductivity_X94	465-470 m	(mS/m)	-9999999	f10.3
COMM	191	CNDX[95]	conductivity_X95	470-475 m	(mS/m)	-9999999	f10.3
COMM	192	CNDX[96]	conductivity_X96	475-480 m	(mS/m)	-9999999	f10.3
COMM	193	CNDX[97]	conductivity_X97	480-485 m	(mS/m)	-9999999	f10.3
COMM	194	CNDX[98]	conductivity_X98	485-490 m	(mS/m)	-9999999	f10.3
COMM	195	CNDX[99]	conductivity_X99	490-495 m	(mS/m)	-9999999	f10.3
COMM	196	CNDX[100]	conductivity_X100	495-500 m	(mS/m)	-9999999	f10.3
COMM	197	CNDZ[1]	conductivity_Z01	0-5 m	(mS/m)	-9999999	f10.3
COMM	198	CNDZ[2]	conductivity_Z02	5-10 m	(mS/m)	-9999999	f10.3
COMM	199	CNDZ[3]	conductivity_Z03	10-15 m	(mS/m)	-9999999	f10.3
COMM	200	CNDZ[4]	conductivity_Z04	15-20 m	(mS/m)	-9999999	f10.3
COMM	201	CNDZ[5]	conductivity_Z05	20-25 m	(mS/m)	-9999999	f10.3
COMM	202	CNDZ[6]	conductivity_Z06	25-30 m	(mS/m)	-9999999	f10.3
COMM	203	CNDZ[7]	conductivity_Z07	30-35 m	(mS/m)	-9999999	f10.3
COMM	204	CNDZ[8]	conductivity_Z08	35-40 m	(mS/m)	-9999999	f10.3
COMM	205	CNDZ[9]	conductivity_Z09	40-45 m	(mS/m)	-9999999	f10.3
COMM	206	CNDZ[10]	conductivity_Z10	45-50 m	(mS/m)	-9999999	f10.3
COMM	207	CNDZ[11]	conductivity_Z11	50-55 m	(mS/m)	-9999999	f10.3
COMM	208	CNDZ[12]	conductivity_Z12	55-60 m	(mS/m)	-9999999	f10.3
COMM	209	CNDZ[13]	conductivity_Z13	60-65 m	(mS/m)	-9999999	f10.3
COMM	210	CNDZ[14]	conductivity_Z14	65-70 m	(mS/m)	-9999999	f10.3
COMM	211	CNDZ[15]	conductivity_Z15	70-75 m	(mS/m)	-9999999	f10.3
COMM	212	CNDZ[16]	conductivity_Z16	75-80 m	(mS/m)	-9999999	f10.3
COMM	213	CNDZ[17]	conductivity_Z17	80-85 m	(mS/m)	-9999999	f10.3
COMM	214	CNDZ[18]	conductivity_Z18	85-90 m	(mS/m)	-9999999	f10.3
COMM	215	CNDZ[19]	conductivity_Z19	90-95 m	(mS/m)	-9999999	f10.3
COMM	216	CNDZ[20]	conductivity_Z20	95-100 m	(mS/m)	-9999999	f10.3
COMM	217	CNDZ[21]	conductivity_Z21	100-105 m	(mS/m)	-9999999	f10.3
COMM	218	CNDZ[22]	conductivity_Z22	105-110 m	(mS/m)	-9999999	f10.3
COMM	219	CNDZ[23]	conductivity_Z23	110-115 m	(mS/m)	-9999999	f10.3
COMM	220	CNDZ[24]	conductivity_Z24	115-120 m	(mS/m)	-9999999	f10.3
COMM	221	CNDZ[25]	conductivity_Z25	120-125 m	(mS/m)	-9999999	f10.3
COMM	222	CNDZ[26]	conductivity_Z26	125-130 m	(mS/m)	-9999999	f10.3
COMM	223	CNDZ[27]	conductivity_Z27	130-135 m	(mS/m)	-9999999	f10.3
COMM	224	CNDZ[28]	conductivity_Z28	135-140 m	(mS/m)	-9999999	f10.3
COMM	225	CNDZ[29]	conductivity_Z29	140-145 m	(mS/m)	-9999999	f10.3
COMM	226	CNDZ[30]	conductivity_Z30	145-150 m	(mS/m)	-9999999	f10.3
COMM	227	CNDZ[31]	conductivity_Z31	150-155 m	(mS/m)	-9999999	f10.3
COMM	228	CNDZ[32]	conductivity_Z32	155-160 m	(mS/m)	-9999999	f10.3
COMM	229	CNDZ[33]	conductivity_Z33	160-165 m	(mS/m)	-9999999	f10.3
COMM	230	CNDZ[34]	conductivity_Z34	165-170 m	(mS/m)	-9999999	f10.3
COMM	231	CNDZ[35]	conductivity_Z35	170-175 m	(mS/m)	-9999999	f10.3
COMM	232	CNDZ[36]	conductivity_Z36	175-180 m	(mS/m)	-9999999	f10.3
COMM	233	CNDZ[37]	conductivity_Z37	180-185 m	(mS/m)	-9999999	f10.3
COMM	234	CNDZ[38]	conductivity_Z38	185-190 m	(mS/m)	-9999999	f10.3
COMM	235	CNDZ[39]	conductivity_Z39	190-195 m	(mS/m)	-9999999	f10.3
COMM	236	CNDZ[40]	conductivity_Z40	195-200 m	(mS/m)	-9999999	f10.3
COMM	237	CNDZ[41]	conductivity_Z41	200-205 m	(mS/m)	-9999999	f10.3
COMM	238	CNDZ[42]	conductivity_Z42	205-210 m	(mS/m)	-9999999	f10.3
COMM	239	CNDZ[43]	conductivity_Z43	210-215 m	(mS/m)	-9999999	f10.3
COMM	240	CNDZ[44]	conductivity_Z44	215-220 m	(mS/m)	-9999999	f10.3
COMM	241	CNDZ[45]	conductivity_Z45	220-225 m	(mS/m)	-9999999	f10.3
COMM	242	CNDZ[46]	conductivity_Z46	225-230 m	(mS/m)	-9999999	f10.3
COMM	243	CNDZ[47]	conductivity_Z47	230-235 m	(mS/m)	-9999999	f10.3
COMM	244	CNDZ[48]	conductivity_Z48	235-240 m	(mS/m)	-9999999	f10.3
COMM	245	CNDZ[49]	conductivity_Z49	240-245 m	(mS/m)	-9999999	f10.3
COMM	246	CNDZ[50]	conductivity_Z50	245-250 m	(mS/m)	-9999999	f10.3
COMM	247	CNDZ[51]	conductivity_Z51	250-255 m	(mS/m)	-9999999	f10.3
COMM	248	CNDZ[52]	conductivity_Z52	255-260 m	(mS/m)	-9999999	f10.3
COMM	249	CNDZ[53]	conductivity_Z53	260-265 m	(mS/m)	-9999999	f10.3
COMM	250	CNDZ[54]	conductivity_Z54	265-270 m	(mS/m)	-9999999	f10.3
COMM	251	CNDZ[55]	conductivity_Z55	270-275 m	(mS/m)	-9999999	f10.3
COMM	252	CNDZ[56]	conductivity_Z56	275-280 m	(mS/m)	-9999999	f10.3
COMM	253	CNDZ[57]	conductivity_Z57	280-285 m	(mS/m)	-9999999	f10.3
COMM	254	CNDZ[58]	conductivity_Z58	285-290 m	(mS/m)	-9999999	f10.3
COMM	255	CNDZ[59]	conductivity_Z59	290-295 m	(mS/m)	-9999999	f10.3
COMM	256	CNDZ[60]	conductivity_Z60	295-300 m	(mS/m)	-9999999	f10.3
COMM	257	CNDZ[61]	conductivity_Z61	300-305 m	(mS/m)	-9999999	f10.3
COMM	258	CNDZ[62]	conductivity_Z62	305-310 m	(mS/m)	-9999999	f10.3
COMM	259	CNDZ[63]	conductivity_Z63	310-315 m	(mS/m)	-9999999	f10.3

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COMM   260  CNDZ[64]        conductivity_Z64  315-320 m    (mS/m)     -9999999  f10.3
COMM   261  CNDZ[65]        conductivity_Z65  320-325 m    (mS/m)     -9999999  f10.3
COMM   262  CNDZ[66]        conductivity_Z66  325-330 m    (mS/m)     -9999999  f10.3
COMM   263  CNDZ[67]        conductivity_Z67  330-335 m    (mS/m)     -9999999  f10.3
COMM   264  CNDZ[68]        conductivity_Z68  335-340 m    (mS/m)     -9999999  f10.3
COMM   265  CNDZ[69]        conductivity_Z69  340-345 m    (mS/m)     -9999999  f10.3
COMM   266  CNDZ[70]        conductivity_Z70  345-350 m    (mS/m)     -9999999  f10.3
COMM   267  CNDZ[71]        conductivity_Z71  350-355 m    (mS/m)     -9999999  f10.3
COMM   268  CNDZ[72]        conductivity_Z72  355-360 m    (mS/m)     -9999999  f10.3
COMM   269  CNDZ[73]        conductivity_Z73  360-365 m    (mS/m)     -9999999  f10.3
COMM   270  CNDZ[74]        conductivity_Z74  365-370 m    (mS/m)     -9999999  f10.3
COMM   271  CNDZ[75]        conductivity_Z75  370-375 m    (mS/m)     -9999999  f10.3
COMM   272  CNDZ[76]        conductivity_Z76  375-380 m    (mS/m)     -9999999  f10.3
COMM   273  CNDZ[77]        conductivity_Z77  380-385 m    (mS/m)     -9999999  f10.3
COMM   274  CNDZ[78]        conductivity_Z78  385-390 m    (mS/m)     -9999999  f10.3
COMM   275  CNDZ[79]        conductivity_Z79  390-395 m    (mS/m)     -9999999  f10.3
COMM   276  CNDZ[80]        conductivity_Z80  395-400 m    (mS/m)     -9999999  f10.3
COMM   277  CNDZ[81]        conductivity_Z81  400-405 m    (mS/m)     -9999999  f10.3
COMM   278  CNDZ[82]        conductivity_Z82  405-410 m    (mS/m)     -9999999  f10.3
COMM   279  CNDZ[83]        conductivity_Z83  410-415 m    (mS/m)     -9999999  f10.3
COMM   280  CNDZ[84]        conductivity_Z84  415-420 m    (mS/m)     -9999999  f10.3
COMM   281  CNDZ[85]        conductivity_Z85  420-425 m    (mS/m)     -9999999  f10.3
COMM   282  CNDZ[86]        conductivity_Z86  425-430 m    (mS/m)     -9999999  f10.3
COMM   283  CNDZ[87]        conductivity_Z87  430-435 m    (mS/m)     -9999999  f10.3
COMM   284  CNDZ[88]        conductivity_Z88  435-440 m    (mS/m)     -9999999  f10.3
COMM   285  CNDZ[89]        conductivity_Z89  440-445 m    (mS/m)     -9999999  f10.3
COMM   286  CNDZ[90]        conductivity_Z90  445-450 m    (mS/m)     -9999999  f10.3
COMM   287  CNDZ[91]        conductivity_Z91  450-455 m    (mS/m)     -9999999  f10.3
COMM   288  CNDZ[92]        conductivity_Z92  455-460 m    (mS/m)     -9999999  f10.3
COMM   289  CNDZ[93]        conductivity_Z93  460-465 m    (mS/m)     -9999999  f10.3
COMM   290  CNDZ[94]        conductivity_Z94  465-470 m    (mS/m)     -9999999  f10.3
COMM   291  CNDZ[95]        conductivity_Z95  470-475 m    (mS/m)     -9999999  f10.3
COMM   292  CNDZ[96]        conductivity_Z96  475-480 m    (mS/m)     -9999999  f10.3
COMM   293  CNDZ[97]        conductivity_Z97  480-485 m    (mS/m)     -9999999  f10.3
COMM   294  CNDZ[98]        conductivity_Z98  485-490 m    (mS/m)     -9999999  f10.3
COMM   295  CNDZ[99]        conductivity_Z99  490-495 m    (mS/m)     -9999999  f10.3
COMM   296  CNDZ[100]       conductivity_Z100 495-500 m    (mS/m)     -9999999  f10.3
COMM
COMM  Total number of lines :   26
COMM
COMM   Flt    Line   Start X   Start Y     End X     End Y       Kms
COMM
COMM     7   20010    331415   8590365    322109   8584308     11.10
COMM     7   20020    322313   8583977    331497   8589933     10.95
COMM     7   20030    331903   8589745    322551   8583635     11.17
COMM     7   20040    322739   8583269    332069   8589343     11.13
COMM     7   20050    332388   8589088    323026   8582957     11.19
COMM     7   20060    323157   8582611    332541   8588714     11.19
COMM     7   20070    332864   8588417    323441   8582293     11.24
COMM     7   20080    323617   8581970    333092   8588099     11.28
COMM     7   20090    333374   8587801    323931   8581676     11.26
COMM     7   20100    324004   8581256    333574   8587448     11.40
COMM     7   20110    333784   8587251    324389   8581019     11.27
COMM     7   20120    324463   8580584    333834   8586676     11.18
COMM     7   20130    334347   8586535    324789   8580325     11.40
COMM     7   20140    324926   8579895    334557   8586166     11.49
COMM     7   20150    334798   8585910    325182   8579643     11.48
COMM     7   20160    325305   8579223    334997   8585526     11.56
COMM     7   20170    335281   8585251    325663   8579016     11.46
COMM     7   20180    325734   8578572    335449   8584875     11.58
COMM     7   20190    335757   8584622    325999   8578249     11.65
COMM     7   20200    326158   8577910    336003   8584237     11.70
COMM     7   20210    336187   8583952    326497   8577614     11.58
COMM     7   20220    326625   8577177    336407   8583556     11.68
COMM     7   20230    336714   8583365    326893   8576917     11.75
COMM     7   27010    328474   8576944    322835   8585641     10.37
COMM     7   27020    326292   8588015    331928   8579336     10.35
COMM     7   27030    335478   8581501    329808   8590330     10.49
COMM
COMM  Total Kilometres :        292.91
```

Nabarlek_final.hdr

```
COMM JOB NUMBER:                                                            1715
COMM AREA NUMBER:                                                              3
COMM SURVEY COMPMANY:                                     Fugro Airborne Surveys
COMM CLIENT:                                            Cameco Australia Pty Ltd
COMM SURVEY TYPE:                                            25Hz TEMPEST Survey
COMM AREA NAME:                                                 Nabarlek (South)
COMM STATE:                                                   Northern Territory
COMM COUNTRY:                                                          Australia
COMM SURVEY FLOWN:                                                      May 2005
COMM LOCATED DATA CREATED:                                          12 July 2005
```

```
COMM
COMM DATUM:                                                         AGD66
COMM PROJECTION:                                                      AMG
COMM ZONE:                                                             53
COMM
COMM SURVEY SPECIFICATIONS
COMM
COMM TRAVERSE LINE SPACING:                                         200 m
COMM TRAVERSE LINE DIRECTION:                                 090-270 deg
COMM TIE LINE SPACING:                                             2000 m
COMM TIE LINE DIRECTION:                                      000-180 deg
COMM NOMINAL TERRAIN CLEARANCE:                                     120 m
COMM FINAL LINE KILOMETRES:                                        808 km
COMM
COMM LINE NUMBERING
COMM
COMM TRAVERSE LINE NUMBERS:                                 30010 - 30390
COMM TIE LINE NUMBERS:                                      37010 - 37060
COMM
COMM AREA BOUNDARY (WGS84, UTM53S)
COMM  EASTING NORTHING
COMM
COMM   328172  8636390
COMM   328211  8629918
COMM   319149  8629864
COMM   319160  8628020
COMM   305534  8627932
COMM   305510  8631467
COMM   308593  8631526
COMM   308417  8636246
COMM
COMM SURVEY EQUIPMENT
COMM
COMM AIRCRAFT:                             CASA C212 Turbo Prop, VH-TEM
COMM
COMM MAGNETOMETER:                          Scintrex CS-2 Cesium Vapour
COMM INSTALLATION:                                              Stinger
COMM RESOLUTION:                                               0.001 nT
COMM RECORDING INTERVAL:                                        0.2 sec
COMM
COMM ELECTROMAGNETIC SYSTEM:                               25Hz TEMPEST
COMM INSTALLATION:               Transmitter loop mounted on the aircraft
COMM                                       Receiver coils in a towed bird
COMM COIL ORIENTATION:                                              X,Z
COMM RECORDING INTERVAL:                                        0.2 sec
COMM SYSTEM GEOMETRY:
COMM RECEIVER DISTANCE BEHIND THE TRANSMITTER:                    120 m
COMM RECEIVER DISTANCE BELOW THE TRANSMITTER:                      35 m
COMM
COMM RADAR ALTIMETER:                                      Sperry RT220
COMM RECORDING INTERVAL:                                        0.2 sec
COMM
COMM NAVIGATION:                             real-time differential GPS
COMM RECORDING INTERVAL:                                          1.0 s
COMM
COMM ACQUISITION SYSTEM:                                      Fugro DAS
COMM
COMM DATA PROCESSING
COMM
COMM MAGNETIC DATA
COMM DIURNAL CORRECTION APPLIED                   base value 46320 nT
COMM PARALLAX CORRECTION APPLIED                          0.6 seconds
COMM IGRF CORRECTION APPLIED                      base value 46051 nT
COMM IGRF MODEL 2000 EXTRAPOLATED TO                        June 2005
COMM
COMM
COMM ELECTROMAGNETIC DATA
COMM SYSTEM PARALLAX REMOVED, AS FOLLOWS
COMM X-COMPONENT EM DATA                                  0.2 seconds
COMM Z-COMPONENT EM DATA                                  1.4 seconds
COMM DATA CORRECTED FOR TRANSMITTER HEIGHT, PITCH AND ROLL
COMM DATA CORRECTED FOR TRANSMITTER-RECEIVER GEOMETRY VARIATIONS
COMM DATA HAVE BEEN MICROLEVELLED
COMM CONDUCTIVITY DEPTH INVERSION CALCULATED              EMFlow V5.10
COMM
COMM DIGITAL TERRAIN DATA
COMM PARALLAX CORRECTION APPLIED TO RADAR ALIMETER DATA   0.6 seconds
COMM PARALLAX CORRECTION APPLIED TO GPS ALIMETER DATA       0 seconds
COMM DTM CALCULATED [DTM = GPS ALTITUDE - RADAR ALTITUDE]
COMM DATA HAVE BEEN MICROLEVELLED
COMM -----------------------------------------------------------------
COMM The accuracy of the elevation calculation is directly dependent on
COMM the accuracy of the two input parameters, radar altitude and GPS
COMM altitude.  The radar altitude value may be erroneous in areas of heavy
COMM tree cover, where the altimeter reflects the distance to the tree
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COMM canopy rather than the ground.  The GPS altitude value is primarily
COMM dependent on the number of available satellites. Although
COMM post-processing of GPS data will yield X and Y accuracies in the
COMM order of 1-2 metres, the accuracy of the altitude value is usually
COMM much less, sometimes in the ±5 metre range.  Further inaccuracies
COMM may be introduced during the interpolation and gridding process.
COMM Because of the inherent inaccuracies of this method, no guarantee is
COMM made or implied that the information displayed is a true
COMM representation of the height above sea level.  Although this product
COMM may be of some use as a general reference,
COMM THIS PRODUCT MUST NOT BE USED FOR NAVIGATION PURPOSES.
COMM ---------------------------------------------------------------------
COMM
COMM ELECTROMAGNETIC SYSTEM
COMM
COMM TEMPEST IS A TIME-DOMAIN SQUARE-WAVE SYSTEM,
COMM TRANSMITTING AT A BASE FREQUENCY OF 25Hz,
COMM WITH 2 ORTHOGONAL-AXIS RECEIVER COILS IN A TOWED BIRD.
COMM FINAL EM OUTPUT IS RECORDED 5 TIMES PER SECOND.
COMM THE TIMES (IN MILLISECONDS) FOR THE 15 WINDOWS ARE:
COMM
COMM WINDOW      START       END      CENTRE
COMM    1        0.007      0.020      0.013
COMM    2        0.033      0.047      0.040
COMM    3        0.060      0.073      0.067
COMM    4        0.087      0.127      0.107
COMM    5        0.140      0.207      0.173
COMM    6        0.220      0.340      0.280
COMM    7        0.353      0.553      0.453
COMM    8        0.567      0.873      0.720
COMM    9        0.887      1.353      1.120
COMM   10        1.367      2.100      1.733
COMM   11        2.113      3.273      2.693
COMM   12        3.287      5.113      4.200
COMM   13        5.127      7.993      6.560
COMM   14        8.007     12.393     10.200
COMM   15       12.407     19.993     16.200
COMM
COMM PULSE WIDTH: 10 ms
COMM
COMM TEMPEST EM data are transformed to the response that would be
COMM obtained with a B-field sensor for a 100% duty cycle square
COMM waveform at the base frequency, involving a 1A change in
COMM current (from -0.5A to +0.5A to -0.5A) in a 1sq.m transmitter.
COMM It is this configuration, rather than the actual acquisition
COMM configuration, which must be specified when modelling TEMPEST data.
COMM
COMM
COMM LOCATED DATA FORMAT
COMM
COMM  Output field format : DOS  - Flat ascii
COMM  Number of fields    : 298
COMM
COMM Field  Channel         Description                       Units  Undefined Format
COMM -----  -------         -----------                       -----  --------- ------
COMM
COMM     1  LINE            Line                                      -9999999  i6
COMM     2  FLIGHT          Flight                                    -9999999  i4
COMM     3  FID             Fiducial                            (s)   -9999999  f8.1
COMM     4  LATITUDE        Latitude  AGD66                    (deg)  -9999999  f13.6
COMM     5  LONGITUDE       Longitude AGD66                    (deg)  -9999999  f13.6
COMM     6  EASTING         Easting   AGD66/AMG                  (m)  -9999999  f11.2
COMM     7  NORTHING        Northing  AGD66/AMG                  (m)  -9999999  f12.2
COMM     8  TxHeight        GPS height                           (m)  -9999999  f8.2
COMM     9  Baro            Barometric Altitude                  (m)  -9999999  f8.2
COMM    10  TxRalt_raw      Raw Radar Altimeter                  (m)  -9999999  f8.2
COMM    11  TxRalt_final    Final Radar Altimeter                (m)  -9999999  f8.2
COMM    12  DTM             DTM                                  (m)  -9999999  f8.2
COMM    13  Pitch_Raw       Raw Tx loop pitch                  (deg)  -9999999  f10.5
COMM    14  Roll_Raw        Raw Tx loop roll                   (deg)  -9999999  f10.5
COMM    15  HSep_Raw        Raw Tx-Rx horizontal separation      (m)  -9999999  f8.2
COMM    16  VSep_Raw        Raw Tx-Rx vertical separation        (m)  -9999999  f8.2
COMM    17  Pitch_Final     Final Tx loop pitch                (deg)  -9999999  f10.5
COMM    18  Roll_Final      Final Tx loop roll                 (deg)  -9999999  f10.5
COMM    19  HSep_Final      Final Tx-Rx horizontal separation    (m)  -9999999  f8.2
COMM    20  VSep_Final      Final Tx-Rx vertical separation      (m)  -9999999  f8.2
COMM    21  EMX_Raw[1]      Raw EMX01 Window                    (fT)  -9999999  f12.6
COMM    22  EMX_Raw[2]      Raw EMX02 Window                    (fT)  -9999999  f12.6
COMM    23  EMX_Raw[3]      Raw EMX03 Window                    (fT)  -9999999  f12.6
COMM    24  EMX_Raw[4]      Raw EMX04 Window                    (fT)  -9999999  f12.6
COMM    25  EMX_Raw[5]      Raw EMX05 Window                    (fT)  -9999999  f12.6
COMM    26  EMX_Raw[6]      Raw EMX06 Window                    (fT)  -9999999  f12.6
COMM    27  EMX_Raw[7]      Raw EMX07 Window                    (fT)  -9999999  f12.6
COMM    28  EMX_Raw[8]      Raw EMX08 Window                    (fT)  -9999999  f12.6
COMM    29  EMX_Raw[9]      Raw EMX09 Window                    (fT)  -9999999  f12.6
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COMM	30	EMX_Raw[10]	Raw EMX10 Window		(fT)	-9999999	f12.6
COMM	31	EMX_Raw[11]	Raw EMX11 Window		(fT)	-9999999	f12.6
COMM	32	EMX_Raw[12]	Raw EMX12 Window		(fT)	-9999999	f12.6
COMM	33	EMX_Raw[13]	Raw EMX13 Window		(fT)	-9999999	f12.6
COMM	34	EMX_Raw[14]	Raw EMX14 Window		(fT)	-9999999	f12.6
COMM	35	EMX_Raw[15]	Raw EMX15 Window		(fT)	-9999999	f12.6
COMM	36	EMX_Final[1]	Final EMX01 Window		(fT)	-9999999	f12.6
COMM	37	EMX_Final[2]	Final EMX02 Window		(fT)	-9999999	f12.6
COMM	38	EMX_Final[3]	Final EMX03 Window		(fT)	-9999999	f12.6
COMM	39	EMX_Final[4]	Final EMX04 Window		(fT)	-9999999	f12.6
COMM	40	EMX_Final[5]	Final EMX05 Window		(fT)	-9999999	f12.6
COMM	41	EMX_Final[6]	Final EMX06 Window		(fT)	-9999999	f12.6
COMM	42	EMX_Final[7]	Final EMX07 Window		(fT)	-9999999	f12.6
COMM	43	EMX_Final[8]	Final EMX08 Window		(fT)	-9999999	f12.6
COMM	44	EMX_Final[9]	Final EMX09 Window		(fT)	-9999999	f12.6
COMM	45	EMX_Final[10]	Final EMX10 Window		(fT)	-9999999	f12.6
COMM	46	EMX_Final[11]	Final EMX11 Window		(fT)	-9999999	f12.6
COMM	47	EMX_Final[12]	Final EMX12 Window		(fT)	-9999999	f12.6
COMM	48	EMX_Final[13]	Final EMX13 Window		(fT)	-9999999	f12.6
COMM	49	EMX_Final[14]	Final EMX14 Window		(fT)	-9999999	f12.6
COMM	50	EMX_Final[15]	Final EMX15 Window		(fT)	-9999999	f12.6
COMM	51	X_Sferics	X_Sferics			-9999999	f10.3
COMM	52	X_Lowfreq	X_Lowfreq			-9999999	f10.3
COMM	53	X_Powerline	X_Powerline			-9999999	f10.3
COMM	54	X_kHz_182	X_kHz_18.2			-9999999	f10.3
COMM	55	X_kHz_198	X_kHz_19.8			-9999999	f10.3
COMM	56	X_kHz_205	X_kHz_20.5			-9999999	f10.3
COMM	57	X_kHz_222	X_kHz_22.2			-9999999	f10.3
COMM	58	X_Geofact	X_Geometric factor			-9999999	f10.3
COMM	59	EMZ_Raw[1]	Raw EMZ01 Window		(fT)	-9999999	f12.6
COMM	60	EMZ_Raw[2]	Raw EMZ02 Window		(fT)	-9999999	f12.6
COMM	61	EMZ_Raw[3]	Raw EMZ03 Window		(fT)	-9999999	f12.6
COMM	62	EMZ_Raw[4]	Raw EMZ04 Window		(fT)	-9999999	f12.6
COMM	63	EMZ_Raw[5]	Raw EMZ05 Window		(fT)	-9999999	f12.6
COMM	64	EMZ_Raw[6]	Raw EMZ06 Window		(fT)	-9999999	f12.6
COMM	65	EMZ_Raw[7]	Raw EMZ07 Window		(fT)	-9999999	f12.6
COMM	66	EMZ_Raw[8]	Raw EMZ08 Window		(fT)	-9999999	f12.6
COMM	67	EMZ_Raw[9]	Raw EMZ09 Window		(fT)	-9999999	f12.6
COMM	68	EMZ_Raw[10]	Raw EMZ10 Window		(fT)	-9999999	f12.6
COMM	69	EMZ_Raw[11]	Raw EMZ11 Window		(fT)	-9999999	f12.6
COMM	70	EMZ_Raw[12]	Raw EMZ12 Window		(fT)	-9999999	f12.6
COMM	71	EMZ_Raw[13]	Raw EMZ13 Window		(fT)	-9999999	f12.6
COMM	72	EMZ_Raw[14]	Raw EMZ14 Window		(fT)	-9999999	f12.6
COMM	73	EMZ_Raw[15]	Raw EMZ15 Window		(fT)	-9999999	f12.6
COMM	74	EMZ_Final[1]	Final EMZ01 Window		(fT)	-9999999	f12.6
COMM	75	EMZ_Final[2]	Final EMZ02 Window		(fT)	-9999999	f12.6
COMM	76	EMZ_Final[3]	Final EMZ03 Window		(fT)	-9999999	f12.6
COMM	77	EMZ_Final[4]	Final EMZ04 Window		(fT)	-9999999	f12.6
COMM	78	EMZ_Final[5]	Final EMZ05 Window		(fT)	-9999999	f12.6
COMM	79	EMZ_Final[6]	Final EMZ06 Window		(fT)	-9999999	f12.6
COMM	80	EMZ_Final[7]	Final EMZ07 Window		(fT)	-9999999	f12.6
COMM	81	EMZ_Final[8]	Final EMZ08 Window		(fT)	-9999999	f12.6
COMM	82	EMZ_Final[9]	Final EMZ09 Window		(fT)	-9999999	f12.6
COMM	83	EMZ_Final[10]	Final EMZ10 Window		(fT)	-9999999	f12.6
COMM	84	EMZ_Final[11]	Final EMZ11 Window		(fT)	-9999999	f12.6
COMM	85	EMZ_Final[12]	Final EMZ12 Window		(fT)	-9999999	f12.6
COMM	86	EMZ_Final[13]	Final EMZ13 Window		(fT)	-9999999	f12.6
COMM	87	EMZ_Final[14]	Final EMZ14 Window		(fT)	-9999999	f12.6
COMM	88	EMZ_Final[15]	Final EMZ15 Window		(fT)	-9999999	f12.6
COMM	89	Z_Sferics	Z_Sferics			-9999999	f10.3
COMM	90	Z_Lowfreq	Z_Lowfreq			-9999999	f10.3
COMM	91	Z_Powerline	Z_Powerline			-9999999	f10.3
COMM	92	Z_kHz_182	Z_kHz_18.2			-9999999	f10.3
COMM	93	Z_kHz_198	Z_kHz_19.8			-9999999	f10.3
COMM	94	Z_kHz_205	Z_kHz_20.5			-9999999	f10.3
COMM	95	Z_kHz_222	Z_kHz_22.2			-9999999	f10.3
COMM	96	Z_Geofact	Z_Geometric factor			-9999999	f10.3
COMM	97	CNDX[1]	conductivity_X01	0-5 m	(mS/m)	-9999999	f10.3
COMM	98	CNDX[2]	conductivity_X02	5-10 m	(mS/m)	-9999999	f10.3
COMM	99	CNDX[3]	conductivity_X03	10-15 m	(mS/m)	-9999999	f10.3
COMM	100	CNDX[4]	conductivity_X04	15-20 m	(mS/m)	-9999999	f10.3
COMM	101	CNDX[5]	conductivity_X05	20-25 m	(mS/m)	-9999999	f10.3
COMM	102	CNDX[6]	conductivity_X06	25-30 m	(mS/m)	-9999999	f10.3
COMM	103	CNDX[7]	conductivity_X07	30-35 m	(mS/m)	-9999999	f10.3
COMM	104	CNDX[8]	conductivity_X08	35-40 m	(mS/m)	-9999999	f10.3
COMM	105	CNDX[9]	conductivity_X09	40-45 m	(mS/m)	-9999999	f10.3
COMM	106	CNDX[10]	conductivity_X10	45-50 m	(mS/m)	-9999999	f10.3
COMM	107	CNDX[11]	conductivity_X11	50-55 m	(mS/m)	-9999999	f10.3
COMM	108	CNDX[12]	conductivity_X12	55-60 m	(mS/m)	-9999999	f10.3
COMM	109	CNDX[13]	conductivity_X13	60-65 m	(mS/m)	-9999999	f10.3
COMM	110	CNDX[14]	conductivity_X14	65-70 m	(mS/m)	-9999999	f10.3
COMM	111	CNDX[15]	conductivity_X15	70-75 m	(mS/m)	-9999999	f10.3
COMM	112	CNDX[16]	conductivity_X16	75-80 m	(mS/m)	-9999999	f10.3
COMM	113	CNDX[17]	conductivity_X17	80-85 m	(mS/m)	-9999999	f10.3
COMM	114	CNDX[18]	conductivity_X18	85-90 m	(mS/m)	-9999999	f10.3

COMM	115	CNDX[19]	conductivity_X19	90-95 m	(mS/m)	-9999999	f10.3
COMM	116	CNDX[20]	conductivity_X20	95-100 m	(mS/m)	-9999999	f10.3
COMM	117	CNDX[21]	conductivity_X21	100-105 m	(mS/m)	-9999999	f10.3
COMM	118	CNDX[22]	conductivity_X22	105-110 m	(mS/m)	-9999999	f10.3
COMM	119	CNDX[23]	conductivity_X23	110-115 m	(mS/m)	-9999999	f10.3
COMM	120	CNDX[24]	conductivity_X24	115-120 m	(mS/m)	-9999999	f10.3
COMM	121	CNDX[25]	conductivity_X25	120-125 m	(mS/m)	-9999999	f10.3
COMM	122	CNDX[26]	conductivity_X26	125-130 m	(mS/m)	-9999999	f10.3
COMM	123	CNDX[27]	conductivity_X27	130-135 m	(mS/m)	-9999999	f10.3
COMM	124	CNDX[28]	conductivity_X28	135-140 m	(mS/m)	-9999999	f10.3
COMM	125	CNDX[29]	conductivity_X29	140-145 m	(mS/m)	-9999999	f10.3
COMM	126	CNDX[30]	conductivity_X30	145-150 m	(mS/m)	-9999999	f10.3
COMM	127	CNDX[31]	conductivity_X31	150-155 m	(mS/m)	-9999999	f10.3
COMM	128	CNDX[32]	conductivity_X32	155-160 m	(mS/m)	-9999999	f10.3
COMM	129	CNDX[33]	conductivity_X33	160-165 m	(mS/m)	-9999999	f10.3
COMM	130	CNDX[34]	conductivity_X34	165-170 m	(mS/m)	-9999999	f10.3
COMM	131	CNDX[35]	conductivity_X35	170-175 m	(mS/m)	-9999999	f10.3
COMM	132	CNDX[36]	conductivity_X36	175-180 m	(mS/m)	-9999999	f10.3
COMM	133	CNDX[37]	conductivity_X37	180-185 m	(mS/m)	-9999999	f10.3
COMM	134	CNDX[38]	conductivity_X38	185-190 m	(mS/m)	-9999999	f10.3
COMM	135	CNDX[39]	conductivity_X39	190-195 m	(mS/m)	-9999999	f10.3
COMM	136	CNDX[40]	conductivity_X40	195-200 m	(mS/m)	-9999999	f10.3
COMM	137	CNDX[41]	conductivity_X41	200-205 m	(mS/m)	-9999999	f10.3
COMM	138	CNDX[42]	conductivity_X42	205-210 m	(mS/m)	-9999999	f10.3
COMM	139	CNDX[43]	conductivity_X43	210-215 m	(mS/m)	-9999999	f10.3
COMM	140	CNDX[44]	conductivity_X44	215-220 m	(mS/m)	-9999999	f10.3
COMM	141	CNDX[45]	conductivity_X45	220-225 m	(mS/m)	-9999999	f10.3
COMM	142	CNDX[46]	conductivity_X46	225-230 m	(mS/m)	-9999999	f10.3
COMM	143	CNDX[47]	conductivity_X47	230-235 m	(mS/m)	-9999999	f10.3
COMM	144	CNDX[48]	conductivity_X48	235-240 m	(mS/m)	-9999999	f10.3
COMM	145	CNDX[49]	conductivity_X49	240-245 m	(mS/m)	-9999999	f10.3
COMM	146	CNDX[50]	conductivity_X50	245-250 m	(mS/m)	-9999999	f10.3
COMM	147	CNDX[51]	conductivity_X51	250-255 m	(mS/m)	-9999999	f10.3
COMM	148	CNDX[52]	conductivity_X52	255-260 m	(mS/m)	-9999999	f10.3
COMM	149	CNDX[53]	conductivity_X53	260-265 m	(mS/m)	-9999999	f10.3
COMM	150	CNDX[54]	conductivity_X54	265-270 m	(mS/m)	-9999999	f10.3
COMM	151	CNDX[55]	conductivity_X55	270-275 m	(mS/m)	-9999999	f10.3
COMM	152	CNDX[56]	conductivity_X56	275-280 m	(mS/m)	-9999999	f10.3
COMM	153	CNDX[57]	conductivity_X57	280-285 m	(mS/m)	-9999999	f10.3
COMM	154	CNDX[58]	conductivity_X58	285-290 m	(mS/m)	-9999999	f10.3
COMM	155	CNDX[59]	conductivity_X59	290-295 m	(mS/m)	-9999999	f10.3
COMM	156	CNDX[60]	conductivity_X60	295-300 m	(mS/m)	-9999999	f10.3
COMM	157	CNDX[61]	conductivity_X61	300-305 m	(mS/m)	-9999999	f10.3
COMM	158	CNDX[62]	conductivity_X62	305-310 m	(mS/m)	-9999999	f10.3
COMM	159	CNDX[63]	conductivity_X63	310-315 m	(mS/m)	-9999999	f10.3
COMM	160	CNDX[64]	conductivity_X64	315-320 m	(mS/m)	-9999999	f10.3
COMM	161	CNDX[65]	conductivity_X65	320-325 m	(mS/m)	-9999999	f10.3
COMM	162	CNDX[66]	conductivity_X66	325-330 m	(mS/m)	-9999999	f10.3
COMM	163	CNDX[67]	conductivity_X67	330-335 m	(mS/m)	-9999999	f10.3
COMM	164	CNDX[68]	conductivity_X68	335-340 m	(mS/m)	-9999999	f10.3
COMM	165	CNDX[69]	conductivity_X69	340-345 m	(mS/m)	-9999999	f10.3
COMM	166	CNDX[70]	conductivity_X70	345-350 m	(mS/m)	-9999999	f10.3
COMM	167	CNDX[71]	conductivity_X71	350-355 m	(mS/m)	-9999999	f10.3
COMM	168	CNDX[72]	conductivity_X72	355-360 m	(mS/m)	-9999999	f10.3
COMM	169	CNDX[73]	conductivity_X73	360-365 m	(mS/m)	-9999999	f10.3
COMM	170	CNDX[74]	conductivity_X74	365-370 m	(mS/m)	-9999999	f10.3
COMM	171	CNDX[75]	conductivity_X75	370-375 m	(mS/m)	-9999999	f10.3
COMM	172	CNDX[76]	conductivity_X76	375-380 m	(mS/m)	-9999999	f10.3
COMM	173	CNDX[77]	conductivity_X77	380-385 m	(mS/m)	-9999999	f10.3
COMM	174	CNDX[78]	conductivity_X78	385-390 m	(mS/m)	-9999999	f10.3
COMM	175	CNDX[79]	conductivity_X79	390-395 m	(mS/m)	-9999999	f10.3
COMM	176	CNDX[80]	conductivity_X80	395-400 m	(mS/m)	-9999999	f10.3
COMM	177	CNDX[81]	conductivity_X81	400-405 m	(mS/m)	-9999999	f10.3
COMM	178	CNDX[82]	conductivity_X82	405-410 m	(mS/m)	-9999999	f10.3
COMM	179	CNDX[83]	conductivity_X83	410-415 m	(mS/m)	-9999999	f10.3
COMM	180	CNDX[84]	conductivity_X84	415-420 m	(mS/m)	-9999999	f10.3
COMM	181	CNDX[85]	conductivity_X85	420-425 m	(mS/m)	-9999999	f10.3
COMM	182	CNDX[86]	conductivity_X86	425-430 m	(mS/m)	-9999999	f10.3
COMM	183	CNDX[87]	conductivity_X87	430-435 m	(mS/m)	-9999999	f10.3
COMM	184	CNDX[88]	conductivity_X88	435-440 m	(mS/m)	-9999999	f10.3
COMM	185	CNDX[89]	conductivity_X89	440-445 m	(mS/m)	-9999999	f10.3
COMM	186	CNDX[90]	conductivity_X90	445-450 m	(mS/m)	-9999999	f10.3
COMM	187	CNDX[91]	conductivity_X91	450-455 m	(mS/m)	-9999999	f10.3
COMM	188	CNDX[92]	conductivity_X92	455-460 m	(mS/m)	-9999999	f10.3
COMM	189	CNDX[93]	conductivity_X93	460-465 m	(mS/m)	-9999999	f10.3
COMM	190	CNDX[94]	conductivity_X94	465-470 m	(mS/m)	-9999999	f10.3
COMM	191	CNDX[95]	conductivity_X95	470-475 m	(mS/m)	-9999999	f10.3
COMM	192	CNDX[96]	conductivity_X96	475-480 m	(mS/m)	-9999999	f10.3
COMM	193	CNDX[97]	conductivity_X97	480-485 m	(mS/m)	-9999999	f10.3
COMM	194	CNDX[98]	conductivity_X98	485-490 m	(mS/m)	-9999999	f10.3
COMM	195	CNDX[99]	conductivity_X99	490-495 m	(mS/m)	-9999999	f10.3
COMM	196	CNDX[100]	conductivity_X100	495-500 m	(mS/m)	-9999999	f10.3
COMM	197	CNDZ[1]	conductivity_Z01	0-5 m	(mS/m)	-9999999	f10.3
COMM	198	CNDZ[2]	conductivity_Z02	5-10 m	(mS/m)	-9999999	f10.3
COMM	199	CNDZ[3]	conductivity_Z03	10-15 m	(mS/m)	-9999999	f10.3

COMM	200	CNDZ[4]	conductivity_Z04	15-20 m	(mS/m)	-9999999	f10.3
COMM	201	CNDZ[5]	conductivity_Z05	20-25 m	(mS/m)	-9999999	f10.3
COMM	202	CNDZ[6]	conductivity_Z06	25-30 m	(mS/m)	-9999999	f10.3
COMM	203	CNDZ[7]	conductivity_Z07	30-35 m	(mS/m)	-9999999	f10.3
COMM	204	CNDZ[8]	conductivity_Z08	35-40 m	(mS/m)	-9999999	f10.3
COMM	205	CNDZ[9]	conductivity_Z09	40-45 m	(mS/m)	-9999999	f10.3
COMM	206	CNDZ[10]	conductivity_Z10	45-50 m	(mS/m)	-9999999	f10.3
COMM	207	CNDZ[11]	conductivity_Z11	50-55 m	(mS/m)	-9999999	f10.3
COMM	208	CNDZ[12]	conductivity_Z12	55-60 m	(mS/m)	-9999999	f10.3
COMM	209	CNDZ[13]	conductivity_Z13	60-65 m	(mS/m)	-9999999	f10.3
COMM	210	CNDZ[14]	conductivity_Z14	65-70 m	(mS/m)	-9999999	f10.3
COMM	211	CNDZ[15]	conductivity_Z15	70-75 m	(mS/m)	-9999999	f10.3
COMM	212	CNDZ[16]	conductivity_Z16	75-80 m	(mS/m)	-9999999	f10.3
COMM	213	CNDZ[17]	conductivity_Z17	80-85 m	(mS/m)	-9999999	f10.3
COMM	214	CNDZ[18]	conductivity_Z18	85-90 m	(mS/m)	-9999999	f10.3
COMM	215	CNDZ[19]	conductivity_Z19	90-95 m	(mS/m)	-9999999	f10.3
COMM	216	CNDZ[20]	conductivity_Z20	95-100 m	(mS/m)	-9999999	f10.3
COMM	217	CNDZ[21]	conductivity_Z21	100-105 m	(mS/m)	-9999999	f10.3
COMM	218	CNDZ[22]	conductivity_Z22	105-110 m	(mS/m)	-9999999	f10.3
COMM	219	CNDZ[23]	conductivity_Z23	110-115 m	(mS/m)	-9999999	f10.3
COMM	220	CNDZ[24]	conductivity_Z24	115-120 m	(mS/m)	-9999999	f10.3
COMM	221	CNDZ[25]	conductivity_Z25	120-125 m	(mS/m)	-9999999	f10.3
COMM	222	CNDZ[26]	conductivity_Z26	125-130 m	(mS/m)	-9999999	f10.3
COMM	223	CNDZ[27]	conductivity_Z27	130-135 m	(mS/m)	-9999999	f10.3
COMM	224	CNDZ[28]	conductivity_Z28	135-140 m	(mS/m)	-9999999	f10.3
COMM	225	CNDZ[29]	conductivity_Z29	140-145 m	(mS/m)	-9999999	f10.3
COMM	226	CNDZ[30]	conductivity_Z30	145-150 m	(mS/m)	-9999999	f10.3
COMM	227	CNDZ[31]	conductivity_Z31	150-155 m	(mS/m)	-9999999	f10.3
COMM	228	CNDZ[32]	conductivity_Z32	155-160 m	(mS/m)	-9999999	f10.3
COMM	229	CNDZ[33]	conductivity_Z33	160-165 m	(mS/m)	-9999999	f10.3
COMM	230	CNDZ[34]	conductivity_Z34	165-170 m	(mS/m)	-9999999	f10.3
COMM	231	CNDZ[35]	conductivity_Z35	170-175 m	(mS/m)	-9999999	f10.3
COMM	232	CNDZ[36]	conductivity_Z36	175-180 m	(mS/m)	-9999999	f10.3
COMM	233	CNDZ[37]	conductivity_Z37	180-185 m	(mS/m)	-9999999	f10.3
COMM	234	CNDZ[38]	conductivity_Z38	185-190 m	(mS/m)	-9999999	f10.3
COMM	235	CNDZ[39]	conductivity_Z39	190-195 m	(mS/m)	-9999999	f10.3
COMM	236	CNDZ[40]	conductivity_Z40	195-200 m	(mS/m)	-9999999	f10.3
COMM	237	CNDZ[41]	conductivity_Z41	200-205 m	(mS/m)	-9999999	f10.3
COMM	238	CNDZ[42]	conductivity_Z42	205-210 m	(mS/m)	-9999999	f10.3
COMM	239	CNDZ[43]	conductivity_Z43	210-215 m	(mS/m)	-9999999	f10.3
COMM	240	CNDZ[44]	conductivity_Z44	215-220 m	(mS/m)	-9999999	f10.3
COMM	241	CNDZ[45]	conductivity_Z45	220-225 m	(mS/m)	-9999999	f10.3
COMM	242	CNDZ[46]	conductivity_Z46	225-230 m	(mS/m)	-9999999	f10.3
COMM	243	CNDZ[47]	conductivity_Z47	230-235 m	(mS/m)	-9999999	f10.3
COMM	244	CNDZ[48]	conductivity_Z48	235-240 m	(mS/m)	-9999999	f10.3
COMM	245	CNDZ[49]	conductivity_Z49	240-245 m	(mS/m)	-9999999	f10.3
COMM	246	CNDZ[50]	conductivity_Z50	245-250 m	(mS/m)	-9999999	f10.3
COMM	247	CNDZ[51]	conductivity_Z51	250-255 m	(mS/m)	-9999999	f10.3
COMM	248	CNDZ[52]	conductivity_Z52	255-260 m	(mS/m)	-9999999	f10.3
COMM	249	CNDZ[53]	conductivity_Z53	260-265 m	(mS/m)	-9999999	f10.3
COMM	250	CNDZ[54]	conductivity_Z54	265-270 m	(mS/m)	-9999999	f10.3
COMM	251	CNDZ[55]	conductivity_Z55	270-275 m	(mS/m)	-9999999	f10.3
COMM	252	CNDZ[56]	conductivity_Z56	275-280 m	(mS/m)	-9999999	f10.3
COMM	253	CNDZ[57]	conductivity_Z57	280-285 m	(mS/m)	-9999999	f10.3
COMM	254	CNDZ[58]	conductivity_Z58	285-290 m	(mS/m)	-9999999	f10.3
COMM	255	CNDZ[59]	conductivity_Z59	290-295 m	(mS/m)	-9999999	f10.3
COMM	256	CNDZ[60]	conductivity_Z60	295-300 m	(mS/m)	-9999999	f10.3
COMM	257	CNDZ[61]	conductivity_Z61	300-305 m	(mS/m)	-9999999	f10.3
COMM	258	CNDZ[62]	conductivity_Z62	305-310 m	(mS/m)	-9999999	f10.3
COMM	259	CNDZ[63]	conductivity_Z63	310-315 m	(mS/m)	-9999999	f10.3
COMM	260	CNDZ[64]	conductivity_Z64	315-320 m	(mS/m)	-9999999	f10.3
COMM	261	CNDZ[65]	conductivity_Z65	320-325 m	(mS/m)	-9999999	f10.3
COMM	262	CNDZ[66]	conductivity_Z66	325-330 m	(mS/m)	-9999999	f10.3
COMM	263	CNDZ[67]	conductivity_Z67	330-335 m	(mS/m)	-9999999	f10.3
COMM	264	CNDZ[68]	conductivity_Z68	335-340 m	(mS/m)	-9999999	f10.3
COMM	265	CNDZ[69]	conductivity_Z69	340-345 m	(mS/m)	-9999999	f10.3
COMM	266	CNDZ[70]	conductivity_Z70	345-350 m	(mS/m)	-9999999	f10.3
COMM	267	CNDZ[71]	conductivity_Z71	350-355 m	(mS/m)	-9999999	f10.3
COMM	268	CNDZ[72]	conductivity_Z72	355-360 m	(mS/m)	-9999999	f10.3
COMM	269	CNDZ[73]	conductivity_Z73	360-365 m	(mS/m)	-9999999	f10.3
COMM	270	CNDZ[74]	conductivity_Z74	365-370 m	(mS/m)	-9999999	f10.3
COMM	271	CNDZ[75]	conductivity_Z75	370-375 m	(mS/m)	-9999999	f10.3
COMM	272	CNDZ[76]	conductivity_Z76	375-380 m	(mS/m)	-9999999	f10.3
COMM	273	CNDZ[77]	conductivity_Z77	380-385 m	(mS/m)	-9999999	f10.3
COMM	274	CNDZ[78]	conductivity_Z78	385-390 m	(mS/m)	-9999999	f10.3
COMM	275	CNDZ[79]	conductivity_Z79	390-395 m	(mS/m)	-9999999	f10.3
COMM	276	CNDZ[80]	conductivity_Z80	395-400 m	(mS/m)	-9999999	f10.3
COMM	277	CNDZ[81]	conductivity_Z81	400-405 m	(mS/m)	-9999999	f10.3
COMM	278	CNDZ[82]	conductivity_Z82	405-410 m	(mS/m)	-9999999	f10.3
COMM	279	CNDZ[83]	conductivity_Z83	410-415 m	(mS/m)	-9999999	f10.3
COMM	280	CNDZ[84]	conductivity_Z84	415-420 m	(mS/m)	-9999999	f10.3
COMM	281	CNDZ[85]	conductivity_Z85	420-425 m	(mS/m)	-9999999	f10.3
COMM	282	CNDZ[86]	conductivity_Z86	425-430 m	(mS/m)	-9999999	f10.3
COMM	283	CNDZ[87]	conductivity_Z87	430-435 m	(mS/m)	-9999999	f10.3
COMM	284	CNDZ[88]	conductivity_Z88	435-440 m	(mS/m)	-9999999	f10.3

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COMM   285  CNDZ[89]        conductivity_Z89  440-445 m    (mS/m)     -9999999  f10.3
COMM   286  CNDZ[90]        conductivity_Z90  445-450 m    (mS/m)     -9999999  f10.3
COMM   287  CNDZ[91]        conductivity_Z91  450-455 m    (mS/m)     -9999999  f10.3
COMM   288  CNDZ[92]        conductivity_Z92  455-460 m    (mS/m)     -9999999  f10.3
COMM   289  CNDZ[93]        conductivity_Z93  460-465 m    (mS/m)     -9999999  f10.3
COMM   290  CNDZ[94]        conductivity_Z94  465-470 m    (mS/m)     -9999999  f10.3
COMM   291  CNDZ[95]        conductivity_Z95  470-475 m    (mS/m)     -9999999  f10.3
COMM   292  CNDZ[96]        conductivity_Z96  475-480 m    (mS/m)     -9999999  f10.3
COMM   293  CNDZ[97]        conductivity_Z97  480-485 m    (mS/m)     -9999999  f10.3
COMM   294  CNDZ[98]        conductivity_Z98  485-490 m    (mS/m)     -9999999  f10.3
COMM   295  CNDZ[99]        conductivity_Z99  490-495 m    (mS/m)     -9999999  f10.3
COMM   296  CNDZ[100]       conductivity_Z100 495-500 m    (mS/m)     -9999999  f10.3
COMM
COMM  Total number of lines :   45
COMM
COMM   Flt    Line   Start X   Start Y     End X     End Y       Kms
COMM
COMM     4   30011    328237   8635828    308132   8635743     20.11
COMM     4   30021    308101   8635554    328254   8635559     20.15
COMM     4   30031    328279   8635368    308157   8635366     20.12
COMM     4   30041    308109   8635157    328203   8635156     20.09
COMM     4   30051    328280   8634937    308150   8634964     20.13
COMM     4   30061    308137   8634763    328203   8634738     20.07
COMM     4   30071    328286   8634555    308195   8634559     20.09
COMM     4   30080    308157   8634355    328254   8634366     20.10
COMM     5   30090    328280   8634149    308169   8634140     20.11
COMM     5   30100    308178   8633971    328253   8633967     20.08
COMM     5   30110    328310   8633751    308210   8633754     20.10
COMM     5   30120    308163   8633563    328253   8633552     20.09
COMM     5   30130    328308   8633370    308189   8633359     20.12
COMM     5   30140    308183   8633155    328247   8633160     20.06
COMM     5   30150    328248   8632941    308250   8632954     20.00
COMM     5   30160    308189   8632768    328262   8632764     20.07
COMM     5   30170    328309   8632534    308244   8632552     20.07
COMM     5   30180    308212   8632351    328241   8632351     20.03
COMM     5   30190    328254   8632171    308236   8632154     20.02
COMM     5   30200    308238   8631954    328273   8631948     20.03
COMM     5   30210    328307   8631728    308290   8631764     20.02
COMM     5   30220    308258   8631560    328224   8631553     19.97
COMM     5   30230    328264   8631413    305189   8631352     23.08
COMM     5   30240    305177   8631157    328253   8631153     23.08
COMM     5   30250    328261   8630956    305181   8630967     23.08
COMM     5   30260    305161   8630751    328234   8630768     23.07
COMM     5   30270    328261   8630599    305241   8630554     23.02
COMM     5   30280    305174   8630373    328262   8630346     23.09
COMM     5   30290    328274   8630190    305177   8630163     23.10
COMM     5   30300    305200   8629925    328271   8629970     23.07
COMM     6   30311    328329   8629777    305209   8629750     23.12
COMM     5   30321    305200   8629553    319468   8629545     14.27
COMM     6   30331    319244   8629353    305205   8629352     14.04
COMM     5   30340    305161   8629161    319174   8629156     14.01
COMM     6   30351    319241   8628932    305198   8628947     14.04
COMM     5   30360    305177   8628753    319220   8628762     14.04
COMM     5   30370    319227   8628508    305212   8628554     14.02
COMM     6   30381    305204   8628361    319213   8628361     14.01
COMM     5   30391    319243   8628208    305232   8628177     14.01
COMM     4   37010    311746   8627620    311741   8636299      8.68
COMM     6   37020    315701   8636360    315725   8627632      8.73
COMM     6   37030    319735   8629512    319728   8636364      6.85
COMM     6   37040    323709   8636425    323753   8629570      6.86
COMM     6   37050    325712   8629494    325733   8636401      6.91
COMM     6   37060    327720   8636416    327742   8629552      6.86
COMM
COMM  Total Kilometres :       806.64
```

TinCampCk_final.hdr

```
COMM JOB NUMBER:                                                           1715
COMM AREA NUMBER:                                                             4
COMM SURVEY COMPMANY:                                    Fugro Airborne Surveys
COMM CLIENT:                                           Cameco Australia Pty Ltd
COMM SURVEY TYPE:                                           25Hz TEMPEST Survey
COMM AREA NAME:                                        Tin Camp Creek (NE Myra)
COMM STATE:                                                  Northern Territory
COMM COUNTRY:                                                         Australia
COMM SURVEY FLOWN:                                                     May 2005
COMM LOCATED DATA CREATED:                                         13 July 2005
COMM
COMM DATUM:                                                               AGD66
COMM PROJECTION:                                                            AMG
COMM ZONE:                                                                   53
COMM
COMM SURVEY SPECIFICATIONS
```

```
COMM
COMM TRAVERSE LINE SPACING:                                          200 m
COMM TRAVERSE LINE DIRECTION:                                  000-180 deg
COMM TIE LINE SPACING:                                              2000 m
COMM TIE LINE DIRECTION:                                       090-270 deg
COMM NOMINAL TERRAIN CLEARANCE:                                      120 m
COMM FINAL LINE KILOMETRES:                                         315 km
COMM
COMM LINE NUMBERING
COMM
COMM TRAVERSE LINE NUMBERS:                                  40010 - 40390
COMM TIE LINE NUMBERS:                                       47010 - 47020
COMM
COMM AREA BOUNDARY (WGS84, UTM53S)
COMM  EASTING NORTHING
COMM
COMM   328430  8627253
COMM   328396  8620167
COMM   322967  8619945
COMM   319987  8619989
COMM   319922  8627251
COMM
COMM SURVEY EQUIPMENT
COMM
COMM AIRCRAFT:                              CASA C212 Turbo Prop, VH-TEM
COMM
COMM MAGNETOMETER:                           Scintrex CS-2 Cesium Vapour
COMM INSTALLATION:                                               Stinger
COMM RESOLUTION:                                                0.001 nT
COMM RECORDING INTERVAL:                                         0.2 sec
COMM
COMM ELECTROMAGNETIC SYSTEM:                                25Hz TEMPEST
COMM INSTALLATION:                  Transmitter loop mounted on the aircraft
COMM                                          Receiver coils in a towed bird
COMM COIL ORIENTATION:                                               X,Z
COMM RECORDING INTERVAL:                                         0.2 sec
COMM SYSTEM GEOMETRY:
COMM RECEIVER DISTANCE BEHIND THE TRANSMITTER:                     120 m
COMM RECEIVER DISTANCE BELOW THE TRANSMITTER:                       35 m
COMM
COMM RADAR ALTIMETER:                                       Sperry RT220
COMM RECORDING INTERVAL:                                         0.2 sec
COMM
COMM NAVIGATION:                               real-time differential GPS
COMM RECORDING INTERVAL:                                           1.0 s
COMM
COMM ACQUISITION SYSTEM:                                       Fugro DAS
COMM
COMM DATA PROCESSING
COMM
COMM MAGNETIC DATA
COMM DIURNAL CORRECTION APPLIED                     base value 46320 nT
COMM PARALLAX CORRECTION APPLIED                           0.6 seconds
COMM IGRF CORRECTION APPLIED                        base value 46051 nT
COMM IGRF MODEL 2000 EXTRAPOLATED TO                          June 2005
COMM
COMM
COMM ELECTROMAGNETIC DATA
COMM SYSTEM PARALLAX REMOVED, AS FOLLOWS
COMM X-COMPONENT EM DATA                                   0.2 seconds
COMM Z-COMPONENT EM DATA                                   1.4 seconds
COMM DATA CORRECTED FOR TRANSMITTER HEIGHT, PITCH AND ROLL
COMM DATA CORRECTED FOR TRANSMITTER-RECEIVER GEOMETRY VARIATIONS
COMM DATA HAVE BEEN MICROLEVELLED
COMM CONDUCTIVITY DEPTH INVERSION CALCULATED               EMFlow V5.10
COMM
COMM DIGITAL TERRAIN DATA
COMM PARALLAX CORRECTION APPLIED TO RADAR ALIMETER DATA    0.6 seconds
COMM PARALLAX CORRECTION APPLIED TO GPS ALIMETER DATA        0 seconds
COMM DTM CALCULATED [DTM = GPS ALTITUDE - RADAR ALTITUDE]
COMM DATA HAVE BEEN MICROLEVELLED
COMM ---------------------------------------------------------------------
COMM The accuracy of the elevation calculation is directly dependent on
COMM the accuracy of the two input parameters, radar altitude and GPS
COMM altitude.  The radar altitude value may be erroneous in areas of heavy
COMM tree cover, where the altimeter reflects the distance to the tree
COMM canopy rather than the ground.  The GPS altitude value is primarily
COMM dependent on the number of available satellites. Although
COMM post-processing of GPS data will yield X and Y accuracies in the
COMM order of 1-2 metres, the accuracy of the altitude value is usually
COMM much less, sometimes in the ±5 metre range.  Further inaccuracies
COMM may be introduced during the interpolation and gridding process.
COMM Because of the inherent inaccuracies of this method, no guarantee is
COMM made or implied that the information displayed is a true
COMM representation of the height above sea level.  Although this product
```

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COMM may be of some use as a general reference,
COMM THIS PRODUCT MUST NOT BE USED FOR NAVIGATION PURPOSES.
COMM ----------------------------------------------------------------------
COMM
COMM ELECTROMAGNETIC SYSTEM
COMM
COMM TEMPEST IS A TIME-DOMAIN SQUARE-WAVE SYSTEM,
COMM TRANSMITTING AT A BASE FREQUENCY OF 25Hz,
COMM WITH 2 ORTHOGONAL-AXIS RECEIVER COILS IN A TOWED BIRD.
COMM FINAL EM OUTPUT IS RECORDED 5 TIMES PER SECOND.
COMM THE TIMES (IN MILLISECONDS) FOR THE 15 WINDOWS ARE:
COMM
COMM WINDOW      START       END      CENTRE
COMM    1        0.007      0.020      0.013
COMM    2        0.033      0.047      0.040
COMM    3        0.060      0.073      0.067
COMM    4        0.087      0.127      0.107
COMM    5        0.140      0.207      0.173
COMM    6        0.220      0.340      0.280
COMM    7        0.353      0.553      0.453
COMM    8        0.567      0.873      0.720
COMM    9        0.887      1.353      1.120
COMM   10        1.367      2.100      1.733
COMM   11        2.113      3.273      2.693
COMM   12        3.287      5.113      4.200
COMM   13        5.127      7.993      6.560
COMM   14        8.007     12.393     10.200
COMM   15       12.407     19.993     16.200
COMM
COMM PULSE WIDTH: 10 ms
COMM
COMM TEMPEST EM data are transformed to the response that would be
COMM obtained with a B-field sensor for a 100% duty cycle square
COMM waveform at the base frequency, involving a 1A change in
COMM current (from -0.5A to +0.5A to -0.5A) in a 1sq.m transmitter.
COMM It is this configuration, rather than the actual acquisition
COMM configuration, which must be specified when modelling TEMPEST data.
COMM
COMM
COMM LOCATED DATA FORMAT
COMM
COMM  Output field format : DOS  - Flat ascii
COMM  Number of fields    : 298
COMM
COMM Field  Channel         Description                        Units  Undefined Format
COMM -----  -------         -----------                        -----  --------- ------
COMM
COMM     1  LINE            Line                                       -9999999  i6
COMM     2  FLIGHT          Flight                                     -9999999  i4
COMM     3  FID             Fiducial                             (s)   -9999999  f8.1
COMM     4  LATITUDE        Latitude  AGD66                    (deg)   -9999999  f13.6
COMM     5  LONGITUDE       Longitude AGD66                    (deg)   -9999999  f13.6
COMM     6  EASTING         Easting   AGD66/AMG                  (m)   -9999999  f11.2
COMM     7  NORTHING        Northing  AGD66/AMG                  (m)   -9999999  f12.2
COMM     8  TxHeight        GPS height                           (m)   -9999999  f8.2
COMM     9  Baro            Barometric Altitude                  (m)   -9999999  f8.2
COMM    10  TxRalt_raw      Raw Radar Altimeter                  (m)   -9999999  f8.2
COMM    11  TxRalt_final    Final Radar Altimeter                (m)   -9999999  f8.2
COMM    12  DTM             DTM                                  (m)   -9999999  f8.2
COMM    13  Pitch_Raw       Raw Tx loop pitch                  (deg)   -9999999  f10.5
COMM    14  Roll_Raw        Raw Tx loop roll                   (deg)   -9999999  f10.5
COMM    15  HSep_Raw        Raw Tx-Rx horizontal separation      (m)   -9999999  f8.2
COMM    16  VSep_Raw        Raw Tx-Rx vertical separation        (m)   -9999999  f8.2
COMM    17  Pitch_Final     Final Tx loop pitch                (deg)   -9999999  f10.5
COMM    18  Roll_Final      Final Tx loop roll                 (deg)   -9999999  f10.5
COMM    19  HSep_Final      Final Tx-Rx horizontal separation    (m)   -9999999  f8.2
COMM    20  VSep_Final      Final Tx-Rx vertical separation      (m)   -9999999  f8.2
COMM    21  EMX_Raw[1]      Raw EMX01 Window                    (fT)   -9999999  f12.6
COMM    22  EMX_Raw[2]      Raw EMX02 Window                    (fT)   -9999999  f12.6
COMM    23  EMX_Raw[3]      Raw EMX03 Window                    (fT)   -9999999  f12.6
COMM    24  EMX_Raw[4]      Raw EMX04 Window                    (fT)   -9999999  f12.6
COMM    25  EMX_Raw[5]      Raw EMX05 Window                    (fT)   -9999999  f12.6
COMM    26  EMX_Raw[6]      Raw EMX06 Window                    (fT)   -9999999  f12.6
COMM    27  EMX_Raw[7]      Raw EMX07 Window                    (fT)   -9999999  f12.6
COMM    28  EMX_Raw[8]      Raw EMX08 Window                    (fT)   -9999999  f12.6
COMM    29  EMX_Raw[9]      Raw EMX09 Window                    (fT)   -9999999  f12.6
COMM    30  EMX_Raw[10]     Raw EMX10 Window                    (fT)   -9999999  f12.6
COMM    31  EMX_Raw[11]     Raw EMX11 Window                    (fT)   -9999999  f12.6
COMM    32  EMX_Raw[12]     Raw EMX12 Window                    (fT)   -9999999  f12.6
COMM    33  EMX_Raw[13]     Raw EMX13 Window                    (fT)   -9999999  f12.6
COMM    34  EMX_Raw[14]     Raw EMX14 Window                    (fT)   -9999999  f12.6
COMM    35  EMX_Raw[15]     Raw EMX15 Window                    (fT)   -9999999  f12.6
COMM    36  EMX_Final[1]    Final EMX01 Window                  (fT)   -9999999  f12.6
COMM    37  EMX_Final[2]    Final EMX02 Window                  (fT)   -9999999  f12.6
COMM    38  EMX_Final[3]    Final EMX03 Window                  (fT)   -9999999  f12.6
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COMM	39	EMX_Final[4]	Final EMX04 Window		(fT)	-9999999	f12.6
COMM	40	EMX_Final[5]	Final EMX05 Window		(fT)	-9999999	f12.6
COMM	41	EMX_Final[6]	Final EMX06 Window		(fT)	-9999999	f12.6
COMM	42	EMX_Final[7]	Final EMX07 Window		(fT)	-9999999	f12.6
COMM	43	EMX_Final[8]	Final EMX08 Window		(fT)	-9999999	f12.6
COMM	44	EMX_Final[9]	Final EMX09 Window		(fT)	-9999999	f12.6
COMM	45	EMX_Final[10]	Final EMX10 Window		(fT)	-9999999	f12.6
COMM	46	EMX_Final[11]	Final EMX11 Window		(fT)	-9999999	f12.6
COMM	47	EMX_Final[12]	Final EMX12 Window		(fT)	-9999999	f12.6
COMM	48	EMX_Final[13]	Final EMX13 Window		(fT)	-9999999	f12.6
COMM	49	EMX_Final[14]	Final EMX14 Window		(fT)	-9999999	f12.6
COMM	50	EMX_Final[15]	Final EMX15 Window		(fT)	-9999999	f12.6
COMM	51	X_Sferics	X_Sferics			-9999999	f10.3
COMM	52	X_Lowfreq	X_Lowfreq			-9999999	f10.3
COMM	53	X_Powerline	X_Powerline			-9999999	f10.3
COMM	54	X_kHz_182	X_kHz_18.2			-9999999	f10.3
COMM	55	X_kHz_198	X_kHz_19.8			-9999999	f10.3
COMM	56	X_kHz_205	X_kHz_20.5			-9999999	f10.3
COMM	57	X_kHz_222	X_kHz_22.2			-9999999	f10.3
COMM	58	X_Geofact	X_Geometric factor			-9999999	f10.3
COMM	59	EMZ_Raw[1]	Raw EMZ01 Window		(fT)	-9999999	f12.6
COMM	60	EMZ_Raw[2]	Raw EMZ02 Window		(fT)	-9999999	f12.6
COMM	61	EMZ_Raw[3]	Raw EMZ03 Window		(fT)	-9999999	f12.6
COMM	62	EMZ_Raw[4]	Raw EMZ04 Window		(fT)	-9999999	f12.6
COMM	63	EMZ_Raw[5]	Raw EMZ05 Window		(fT)	-9999999	f12.6
COMM	64	EMZ_Raw[6]	Raw EMZ06 Window		(fT)	-9999999	f12.6
COMM	65	EMZ_Raw[7]	Raw EMZ07 Window		(fT)	-9999999	f12.6
COMM	66	EMZ_Raw[8]	Raw EMZ08 Window		(fT)	-9999999	f12.6
COMM	67	EMZ_Raw[9]	Raw EMZ09 Window		(fT)	-9999999	f12.6
COMM	68	EMZ_Raw[10]	Raw EMZ10 Window		(fT)	-9999999	f12.6
COMM	69	EMZ_Raw[11]	Raw EMZ11 Window		(fT)	-9999999	f12.6
COMM	70	EMZ_Raw[12]	Raw EMZ12 Window		(fT)	-9999999	f12.6
COMM	71	EMZ_Raw[13]	Raw EMZ13 Window		(fT)	-9999999	f12.6
COMM	72	EMZ_Raw[14]	Raw EMZ14 Window		(fT)	-9999999	f12.6
COMM	73	EMZ_Raw[15]	Raw EMZ15 Window		(fT)	-9999999	f12.6
COMM	74	EMZ_Final[1]	Final EMZ01 Window		(fT)	-9999999	f12.6
COMM	75	EMZ_Final[2]	Final EMZ02 Window		(fT)	-9999999	f12.6
COMM	76	EMZ_Final[3]	Final EMZ03 Window		(fT)	-9999999	f12.6
COMM	77	EMZ_Final[4]	Final EMZ04 Window		(fT)	-9999999	f12.6
COMM	78	EMZ_Final[5]	Final EMZ05 Window		(fT)	-9999999	f12.6
COMM	79	EMZ_Final[6]	Final EMZ06 Window		(fT)	-9999999	f12.6
COMM	80	EMZ_Final[7]	Final EMZ07 Window		(fT)	-9999999	f12.6
COMM	81	EMZ_Final[8]	Final EMZ08 Window		(fT)	-9999999	f12.6
COMM	82	EMZ_Final[9]	Final EMZ09 Window		(fT)	-9999999	f12.6
COMM	83	EMZ_Final[10]	Final EMZ10 Window		(fT)	-9999999	f12.6
COMM	84	EMZ_Final[11]	Final EMZ11 Window		(fT)	-9999999	f12.6
COMM	85	EMZ_Final[12]	Final EMZ12 Window		(fT)	-9999999	f12.6
COMM	86	EMZ_Final[13]	Final EMZ13 Window		(fT)	-9999999	f12.6
COMM	87	EMZ_Final[14]	Final EMZ14 Window		(fT)	-9999999	f12.6
COMM	88	EMZ_Final[15]	Final EMZ15 Window		(fT)	-9999999	f12.6
COMM	89	Z_Sferics	Z_Sferics			-9999999	f10.3
COMM	90	Z_Lowfreq	Z_Lowfreq			-9999999	f10.3
COMM	91	Z_Powerline	Z_Powerline			-9999999	f10.3
COMM	92	Z_kHz_182	Z_kHz_18.2			-9999999	f10.3
COMM	93	Z_kHz_198	Z_kHz_19.8			-9999999	f10.3
COMM	94	Z_kHz_205	Z_kHz_20.5			-9999999	f10.3
COMM	95	Z_kHz_222	Z_kHz_22.2			-9999999	f10.3
COMM	96	Z_Geofact	Z_Geometric factor			-9999999	f10.3
COMM	97	CNDX[1]	conductivity_X01	0-5 m	(mS/m)	-9999999	f10.3
COMM	98	CNDX[2]	conductivity_X02	5-10 m	(mS/m)	-9999999	f10.3
COMM	99	CNDX[3]	conductivity_X03	10-15 m	(mS/m)	-9999999	f10.3
COMM	100	CNDX[4]	conductivity_X04	15-20 m	(mS/m)	-9999999	f10.3
COMM	101	CNDX[5]	conductivity_X05	20-25 m	(mS/m)	-9999999	f10.3
COMM	102	CNDX[6]	conductivity_X06	25-30 m	(mS/m)	-9999999	f10.3
COMM	103	CNDX[7]	conductivity_X07	30-35 m	(mS/m)	-9999999	f10.3
COMM	104	CNDX[8]	conductivity_X08	35-40 m	(mS/m)	-9999999	f10.3
COMM	105	CNDX[9]	conductivity_X09	40-45 m	(mS/m)	-9999999	f10.3
COMM	106	CNDX[10]	conductivity_X10	45-50 m	(mS/m)	-9999999	f10.3
COMM	107	CNDX[11]	conductivity_X11	50-55 m	(mS/m)	-9999999	f10.3
COMM	108	CNDX[12]	conductivity_X12	55-60 m	(mS/m)	-9999999	f10.3
COMM	109	CNDX[13]	conductivity_X13	60-65 m	(mS/m)	-9999999	f10.3
COMM	110	CNDX[14]	conductivity_X14	65-70 m	(mS/m)	-9999999	f10.3
COMM	111	CNDX[15]	conductivity_X15	70-75 m	(mS/m)	-9999999	f10.3
COMM	112	CNDX[16]	conductivity_X16	75-80 m	(mS/m)	-9999999	f10.3
COMM	113	CNDX[17]	conductivity_X17	80-85 m	(mS/m)	-9999999	f10.3
COMM	114	CNDX[18]	conductivity_X18	85-90 m	(mS/m)	-9999999	f10.3
COMM	115	CNDX[19]	conductivity_X19	90-95 m	(mS/m)	-9999999	f10.3
COMM	116	CNDX[20]	conductivity_X20	95-100 m	(mS/m)	-9999999	f10.3
COMM	117	CNDX[21]	conductivity_X21	100-105 m	(mS/m)	-9999999	f10.3
COMM	118	CNDX[22]	conductivity_X22	105-110 m	(mS/m)	-9999999	f10.3
COMM	119	CNDX[23]	conductivity_X23	110-115 m	(mS/m)	-9999999	f10.3
COMM	120	CNDX[24]	conductivity_X24	115-120 m	(mS/m)	-9999999	f10.3
COMM	121	CNDX[25]	conductivity_X25	120-125 m	(mS/m)	-9999999	f10.3
COMM	122	CNDX[26]	conductivity_X26	125-130 m	(mS/m)	-9999999	f10.3
COMM	123	CNDX[27]	conductivity_X27	130-135 m	(mS/m)	-9999999	f10.3

COMM	124	CNDX[28]	conductivity_X28	135-140 m	(mS/m)	-9999999	f10.3
COMM	125	CNDX[29]	conductivity_X29	140-145 m	(mS/m)	-9999999	f10.3
COMM	126	CNDX[30]	conductivity_X30	145-150 m	(mS/m)	-9999999	f10.3
COMM	127	CNDX[31]	conductivity_X31	150-155 m	(mS/m)	-9999999	f10.3
COMM	128	CNDX[32]	conductivity_X32	155-160 m	(mS/m)	-9999999	f10.3
COMM	129	CNDX[33]	conductivity_X33	160-165 m	(mS/m)	-9999999	f10.3
COMM	130	CNDX[34]	conductivity_X34	165-170 m	(mS/m)	-9999999	f10.3
COMM	131	CNDX[35]	conductivity_X35	170-175 m	(mS/m)	-9999999	f10.3
COMM	132	CNDX[36]	conductivity_X36	175-180 m	(mS/m)	-9999999	f10.3
COMM	133	CNDX[37]	conductivity_X37	180-185 m	(mS/m)	-9999999	f10.3
COMM	134	CNDX[38]	conductivity_X38	185-190 m	(mS/m)	-9999999	f10.3
COMM	135	CNDX[39]	conductivity_X39	190-195 m	(mS/m)	-9999999	f10.3
COMM	136	CNDX[40]	conductivity_X40	195-200 m	(mS/m)	-9999999	f10.3
COMM	137	CNDX[41]	conductivity_X41	200-205 m	(mS/m)	-9999999	f10.3
COMM	138	CNDX[42]	conductivity_X42	205-210 m	(mS/m)	-9999999	f10.3
COMM	139	CNDX[43]	conductivity_X43	210-215 m	(mS/m)	-9999999	f10.3
COMM	140	CNDX[44]	conductivity_X44	215-220 m	(mS/m)	-9999999	f10.3
COMM	141	CNDX[45]	conductivity_X45	220-225 m	(mS/m)	-9999999	f10.3
COMM	142	CNDX[46]	conductivity_X46	225-230 m	(mS/m)	-9999999	f10.3
COMM	143	CNDX[47]	conductivity_X47	230-235 m	(mS/m)	-9999999	f10.3
COMM	144	CNDX[48]	conductivity_X48	235-240 m	(mS/m)	-9999999	f10.3
COMM	145	CNDX[49]	conductivity_X49	240-245 m	(mS/m)	-9999999	f10.3
COMM	146	CNDX[50]	conductivity_X50	245-250 m	(mS/m)	-9999999	f10.3
COMM	147	CNDX[51]	conductivity_X51	250-255 m	(mS/m)	-9999999	f10.3
COMM	148	CNDX[52]	conductivity_X52	255-260 m	(mS/m)	-9999999	f10.3
COMM	149	CNDX[53]	conductivity_X53	260-265 m	(mS/m)	-9999999	f10.3
COMM	150	CNDX[54]	conductivity_X54	265-270 m	(mS/m)	-9999999	f10.3
COMM	151	CNDX[55]	conductivity_X55	270-275 m	(mS/m)	-9999999	f10.3
COMM	152	CNDX[56]	conductivity_X56	275-280 m	(mS/m)	-9999999	f10.3
COMM	153	CNDX[57]	conductivity_X57	280-285 m	(mS/m)	-9999999	f10.3
COMM	154	CNDX[58]	conductivity_X58	285-290 m	(mS/m)	-9999999	f10.3
COMM	155	CNDX[59]	conductivity_X59	290-295 m	(mS/m)	-9999999	f10.3
COMM	156	CNDX[60]	conductivity_X60	295-300 m	(mS/m)	-9999999	f10.3
COMM	157	CNDX[61]	conductivity_X61	300-305 m	(mS/m)	-9999999	f10.3
COMM	158	CNDX[62]	conductivity_X62	305-310 m	(mS/m)	-9999999	f10.3
COMM	159	CNDX[63]	conductivity_X63	310-315 m	(mS/m)	-9999999	f10.3
COMM	160	CNDX[64]	conductivity_X64	315-320 m	(mS/m)	-9999999	f10.3
COMM	161	CNDX[65]	conductivity_X65	320-325 m	(mS/m)	-9999999	f10.3
COMM	162	CNDX[66]	conductivity_X66	325-330 m	(mS/m)	-9999999	f10.3
COMM	163	CNDX[67]	conductivity_X67	330-335 m	(mS/m)	-9999999	f10.3
COMM	164	CNDX[68]	conductivity_X68	335-340 m	(mS/m)	-9999999	f10.3
COMM	165	CNDX[69]	conductivity_X69	340-345 m	(mS/m)	-9999999	f10.3
COMM	166	CNDX[70]	conductivity_X70	345-350 m	(mS/m)	-9999999	f10.3
COMM	167	CNDX[71]	conductivity_X71	350-355 m	(mS/m)	-9999999	f10.3
COMM	168	CNDX[72]	conductivity_X72	355-360 m	(mS/m)	-9999999	f10.3
COMM	169	CNDX[73]	conductivity_X73	360-365 m	(mS/m)	-9999999	f10.3
COMM	170	CNDX[74]	conductivity_X74	365-370 m	(mS/m)	-9999999	f10.3
COMM	171	CNDX[75]	conductivity_X75	370-375 m	(mS/m)	-9999999	f10.3
COMM	172	CNDX[76]	conductivity_X76	375-380 m	(mS/m)	-9999999	f10.3
COMM	173	CNDX[77]	conductivity_X77	380-385 m	(mS/m)	-9999999	f10.3
COMM	174	CNDX[78]	conductivity_X78	385-390 m	(mS/m)	-9999999	f10.3
COMM	175	CNDX[79]	conductivity_X79	390-395 m	(mS/m)	-9999999	f10.3
COMM	176	CNDX[80]	conductivity_X80	395-400 m	(mS/m)	-9999999	f10.3
COMM	177	CNDX[81]	conductivity_X81	400-405 m	(mS/m)	-9999999	f10.3
COMM	178	CNDX[82]	conductivity_X82	405-410 m	(mS/m)	-9999999	f10.3
COMM	179	CNDX[83]	conductivity_X83	410-415 m	(mS/m)	-9999999	f10.3
COMM	180	CNDX[84]	conductivity_X84	415-420 m	(mS/m)	-9999999	f10.3
COMM	181	CNDX[85]	conductivity_X85	420-425 m	(mS/m)	-9999999	f10.3
COMM	182	CNDX[86]	conductivity_X86	425-430 m	(mS/m)	-9999999	f10.3
COMM	183	CNDX[87]	conductivity_X87	430-435 m	(mS/m)	-9999999	f10.3
COMM	184	CNDX[88]	conductivity_X88	435-440 m	(mS/m)	-9999999	f10.3
COMM	185	CNDX[89]	conductivity_X89	440-445 m	(mS/m)	-9999999	f10.3
COMM	186	CNDX[90]	conductivity_X90	445-450 m	(mS/m)	-9999999	f10.3
COMM	187	CNDX[91]	conductivity_X91	450-455 m	(mS/m)	-9999999	f10.3
COMM	188	CNDX[92]	conductivity_X92	455-460 m	(mS/m)	-9999999	f10.3
COMM	189	CNDX[93]	conductivity_X93	460-465 m	(mS/m)	-9999999	f10.3
COMM	190	CNDX[94]	conductivity_X94	465-470 m	(mS/m)	-9999999	f10.3
COMM	191	CNDX[95]	conductivity_X95	470-475 m	(mS/m)	-9999999	f10.3
COMM	192	CNDX[96]	conductivity_X96	475-480 m	(mS/m)	-9999999	f10.3
COMM	193	CNDX[97]	conductivity_X97	480-485 m	(mS/m)	-9999999	f10.3
COMM	194	CNDX[98]	conductivity_X98	485-490 m	(mS/m)	-9999999	f10.3
COMM	195	CNDX[99]	conductivity_X99	490-495 m	(mS/m)	-9999999	f10.3
COMM	196	CNDX[100]	conductivity_X100	495-500 m	(mS/m)	-9999999	f10.3
COMM	197	CNDZ[1]	conductivity_Z01	0-5 m	(mS/m)	-9999999	f10.3
COMM	198	CNDZ[2]	conductivity_Z02	5-10 m	(mS/m)	-9999999	f10.3
COMM	199	CNDZ[3]	conductivity_Z03	10-15 m	(mS/m)	-9999999	f10.3
COMM	200	CNDZ[4]	conductivity_Z04	15-20 m	(mS/m)	-9999999	f10.3
COMM	201	CNDZ[5]	conductivity_Z05	20-25 m	(mS/m)	-9999999	f10.3
COMM	202	CNDZ[6]	conductivity_Z06	25-30 m	(mS/m)	-9999999	f10.3
COMM	203	CNDZ[7]	conductivity_Z07	30-35 m	(mS/m)	-9999999	f10.3
COMM	204	CNDZ[8]	conductivity_Z08	35-40 m	(mS/m)	-9999999	f10.3
COMM	205	CNDZ[9]	conductivity_Z09	40-45 m	(mS/m)	-9999999	f10.3
COMM	206	CNDZ[10]	conductivity_Z10	45-50 m	(mS/m)	-9999999	f10.3
COMM	207	CNDZ[11]	conductivity_Z11	50-55 m	(mS/m)	-9999999	f10.3
COMM	208	CNDZ[12]	conductivity_Z12	55-60 m	(mS/m)	-9999999	f10.3

COMM	209	CNDZ[13]	conductivity_Z13	60-65 m	(mS/m)	-9999999	f10.3
COMM	210	CNDZ[14]	conductivity_Z14	65-70 m	(mS/m)	-9999999	f10.3
COMM	211	CNDZ[15]	conductivity_Z15	70-75 m	(mS/m)	-9999999	f10.3
COMM	212	CNDZ[16]	conductivity_Z16	75-80 m	(mS/m)	-9999999	f10.3
COMM	213	CNDZ[17]	conductivity_Z17	80-85 m	(mS/m)	-9999999	f10.3
COMM	214	CNDZ[18]	conductivity_Z18	85-90 m	(mS/m)	-9999999	f10.3
COMM	215	CNDZ[19]	conductivity_Z19	90-95 m	(mS/m)	-9999999	f10.3
COMM	216	CNDZ[20]	conductivity_Z20	95-100 m	(mS/m)	-9999999	f10.3
COMM	217	CNDZ[21]	conductivity_Z21	100-105 m	(mS/m)	-9999999	f10.3
COMM	218	CNDZ[22]	conductivity_Z22	105-110 m	(mS/m)	-9999999	f10.3
COMM	219	CNDZ[23]	conductivity_Z23	110-115 m	(mS/m)	-9999999	f10.3
COMM	220	CNDZ[24]	conductivity_Z24	115-120 m	(mS/m)	-9999999	f10.3
COMM	221	CNDZ[25]	conductivity_Z25	120-125 m	(mS/m)	-9999999	f10.3
COMM	222	CNDZ[26]	conductivity_Z26	125-130 m	(mS/m)	-9999999	f10.3
COMM	223	CNDZ[27]	conductivity_Z27	130-135 m	(mS/m)	-9999999	f10.3
COMM	224	CNDZ[28]	conductivity_Z28	135-140 m	(mS/m)	-9999999	f10.3
COMM	225	CNDZ[29]	conductivity_Z29	140-145 m	(mS/m)	-9999999	f10.3
COMM	226	CNDZ[30]	conductivity_Z30	145-150 m	(mS/m)	-9999999	f10.3
COMM	227	CNDZ[31]	conductivity_Z31	150-155 m	(mS/m)	-9999999	f10.3
COMM	228	CNDZ[32]	conductivity_Z32	155-160 m	(mS/m)	-9999999	f10.3
COMM	229	CNDZ[33]	conductivity_Z33	160-165 m	(mS/m)	-9999999	f10.3
COMM	230	CNDZ[34]	conductivity_Z34	165-170 m	(mS/m)	-9999999	f10.3
COMM	231	CNDZ[35]	conductivity_Z35	170-175 m	(mS/m)	-9999999	f10.3
COMM	232	CNDZ[36]	conductivity_Z36	175-180 m	(mS/m)	-9999999	f10.3
COMM	233	CNDZ[37]	conductivity_Z37	180-185 m	(mS/m)	-9999999	f10.3
COMM	234	CNDZ[38]	conductivity_Z38	185-190 m	(mS/m)	-9999999	f10.3
COMM	235	CNDZ[39]	conductivity_Z39	190-195 m	(mS/m)	-9999999	f10.3
COMM	236	CNDZ[40]	conductivity_Z40	195-200 m	(mS/m)	-9999999	f10.3
COMM	237	CNDZ[41]	conductivity_Z41	200-205 m	(mS/m)	-9999999	f10.3
COMM	238	CNDZ[42]	conductivity_Z42	205-210 m	(mS/m)	-9999999	f10.3
COMM	239	CNDZ[43]	conductivity_Z43	210-215 m	(mS/m)	-9999999	f10.3
COMM	240	CNDZ[44]	conductivity_Z44	215-220 m	(mS/m)	-9999999	f10.3
COMM	241	CNDZ[45]	conductivity_Z45	220-225 m	(mS/m)	-9999999	f10.3
COMM	242	CNDZ[46]	conductivity_Z46	225-230 m	(mS/m)	-9999999	f10.3
COMM	243	CNDZ[47]	conductivity_Z47	230-235 m	(mS/m)	-9999999	f10.3
COMM	244	CNDZ[48]	conductivity_Z48	235-240 m	(mS/m)	-9999999	f10.3
COMM	245	CNDZ[49]	conductivity_Z49	240-245 m	(mS/m)	-9999999	f10.3
COMM	246	CNDZ[50]	conductivity_Z50	245-250 m	(mS/m)	-9999999	f10.3
COMM	247	CNDZ[51]	conductivity_Z51	250-255 m	(mS/m)	-9999999	f10.3
COMM	248	CNDZ[52]	conductivity_Z52	255-260 m	(mS/m)	-9999999	f10.3
COMM	249	CNDZ[53]	conductivity_Z53	260-265 m	(mS/m)	-9999999	f10.3
COMM	250	CNDZ[54]	conductivity_Z54	265-270 m	(mS/m)	-9999999	f10.3
COMM	251	CNDZ[55]	conductivity_Z55	270-275 m	(mS/m)	-9999999	f10.3
COMM	252	CNDZ[56]	conductivity_Z56	275-280 m	(mS/m)	-9999999	f10.3
COMM	253	CNDZ[57]	conductivity_Z57	280-285 m	(mS/m)	-9999999	f10.3
COMM	254	CNDZ[58]	conductivity_Z58	285-290 m	(mS/m)	-9999999	f10.3
COMM	255	CNDZ[59]	conductivity_Z59	290-295 m	(mS/m)	-9999999	f10.3
COMM	256	CNDZ[60]	conductivity_Z60	295-300 m	(mS/m)	-9999999	f10.3
COMM	257	CNDZ[61]	conductivity_Z61	300-305 m	(mS/m)	-9999999	f10.3
COMM	258	CNDZ[62]	conductivity_Z62	305-310 m	(mS/m)	-9999999	f10.3
COMM	259	CNDZ[63]	conductivity_Z63	310-315 m	(mS/m)	-9999999	f10.3
COMM	260	CNDZ[64]	conductivity_Z64	315-320 m	(mS/m)	-9999999	f10.3
COMM	261	CNDZ[65]	conductivity_Z65	320-325 m	(mS/m)	-9999999	f10.3
COMM	262	CNDZ[66]	conductivity_Z66	325-330 m	(mS/m)	-9999999	f10.3
COMM	263	CNDZ[67]	conductivity_Z67	330-335 m	(mS/m)	-9999999	f10.3
COMM	264	CNDZ[68]	conductivity_Z68	335-340 m	(mS/m)	-9999999	f10.3
COMM	265	CNDZ[69]	conductivity_Z69	340-345 m	(mS/m)	-9999999	f10.3
COMM	266	CNDZ[70]	conductivity_Z70	345-350 m	(mS/m)	-9999999	f10.3
COMM	267	CNDZ[71]	conductivity_Z71	350-355 m	(mS/m)	-9999999	f10.3
COMM	268	CNDZ[72]	conductivity_Z72	355-360 m	(mS/m)	-9999999	f10.3
COMM	269	CNDZ[73]	conductivity_Z73	360-365 m	(mS/m)	-9999999	f10.3
COMM	270	CNDZ[74]	conductivity_Z74	365-370 m	(mS/m)	-9999999	f10.3
COMM	271	CNDZ[75]	conductivity_Z75	370-375 m	(mS/m)	-9999999	f10.3
COMM	272	CNDZ[76]	conductivity_Z76	375-380 m	(mS/m)	-9999999	f10.3
COMM	273	CNDZ[77]	conductivity_Z77	380-385 m	(mS/m)	-9999999	f10.3
COMM	274	CNDZ[78]	conductivity_Z78	385-390 m	(mS/m)	-9999999	f10.3
COMM	275	CNDZ[79]	conductivity_Z79	390-395 m	(mS/m)	-9999999	f10.3
COMM	276	CNDZ[80]	conductivity_Z80	395-400 m	(mS/m)	-9999999	f10.3
COMM	277	CNDZ[81]	conductivity_Z81	400-405 m	(mS/m)	-9999999	f10.3
COMM	278	CNDZ[82]	conductivity_Z82	405-410 m	(mS/m)	-9999999	f10.3
COMM	279	CNDZ[83]	conductivity_Z83	410-415 m	(mS/m)	-9999999	f10.3
COMM	280	CNDZ[84]	conductivity_Z84	415-420 m	(mS/m)	-9999999	f10.3
COMM	281	CNDZ[85]	conductivity_Z85	420-425 m	(mS/m)	-9999999	f10.3
COMM	282	CNDZ[86]	conductivity_Z86	425-430 m	(mS/m)	-9999999	f10.3
COMM	283	CNDZ[87]	conductivity_Z87	430-435 m	(mS/m)	-9999999	f10.3
COMM	284	CNDZ[88]	conductivity_Z88	435-440 m	(mS/m)	-9999999	f10.3
COMM	285	CNDZ[89]	conductivity_Z89	440-445 m	(mS/m)	-9999999	f10.3
COMM	286	CNDZ[90]	conductivity_Z90	445-450 m	(mS/m)	-9999999	f10.3
COMM	287	CNDZ[91]	conductivity_Z91	450-455 m	(mS/m)	-9999999	f10.3
COMM	288	CNDZ[92]	conductivity_Z92	455-460 m	(mS/m)	-9999999	f10.3
COMM	289	CNDZ[93]	conductivity_Z93	460-465 m	(mS/m)	-9999999	f10.3
COMM	290	CNDZ[94]	conductivity_Z94	465-470 m	(mS/m)	-9999999	f10.3
COMM	291	CNDZ[95]	conductivity_Z95	470-475 m	(mS/m)	-9999999	f10.3
COMM	292	CNDZ[96]	conductivity_Z96	475-480 m	(mS/m)	-9999999	f10.3
COMM	293	CNDZ[97]	conductivity_Z97	480-485 m	(mS/m)	-9999999	f10.3

```
COMM   294  CNDZ[98]         conductivity_Z98  485-490 m    (mS/m)     -9999999  f10.3
COMM   295  CNDZ[99]         conductivity_Z99  490-495 m    (mS/m)     -9999999  f10.3
COMM   296  CNDZ[100]        conductivity_Z100 495-500 m    (mS/m)     -9999999  f10.3
COMM
COMM  Total number of lines :   41
COMM
COMM   Flt     Line   Start X    Start Y     End X     End Y       Kms
COMM
COMM     5    40010    320209    8627282    320262    8619636     7.65
COMM     5    40020    320470    8619569    320466    8627287     7.72
COMM     5    40030    320659    8627339    320663    8619664     7.68
COMM     5    40040    320865    8619596    320868    8627287     7.69
COMM     5    40050    321062    8627288    321054    8619641     7.65
COMM     6    40060    321273    8619585    321261    8627274     7.69
COMM     6    40070    321475    8627290    321460    8619641     7.65
COMM     6    40080    321670    8619592    321661    8627249     7.66
COMM     6    40090    321872    8627311    321873    8619618     7.69
COMM     6    40100    322073    8619606    322066    8627296     7.69
COMM     6    40110    322269    8627331    322269    8619587     7.74
COMM     6    40120    322471    8619580    322474    8627276     7.70
COMM     6    40130    322673    8627323    322662    8619574     7.75
COMM     6    40140    322864    8619566    322872    8627272     7.71
COMM     6    40150    323068    8627286    323058    8619628     7.66
COMM     6    40160    323251    8619551    323265    8627300     7.75
COMM     6    40170    323473    8627313    323447    8619601     7.71
COMM     6    40180    323655    8619627    323675    8627255     7.63
COMM     6    40190    323856    8627315    323864    8619616     7.70
COMM     6    40200    324061    8619586    324060    8627279     7.69
COMM     6    40210    324268    8627338    324264    8619671     7.67
COMM     6    40220    324540    8619623    324463    8627249     7.63
COMM     6    40230    324686    8627305    324660    8619686     7.62
COMM     6    40240    324858    8619665    324864    8627283     7.62
COMM     6    40250    325067    8627305    325067    8619714     7.59
COMM     6    40260    325272    8619669    325259    8627294     7.63
COMM     8    40271    325477    8627338    325487    8619735     7.60
COMM     6    40280    325648    8619709    325651    8627265     7.56
COMM     6    40290    325864    8627335    325862    8619716     7.62
COMM     6    40300    326072    8619711    326044    8627235     7.52
COMM     8    40311    326259    8627301    326275    8619740     7.56
COMM     6    40320    326450    8619702    326458    8627235     7.53
COMM     6    40330    326658    8627301    326680    8619735     7.57
COMM     6    40340    326857    8619719    326854    8627286     7.57
COMM     6    40350    327062    8627276    327073    8619745     7.53
COMM     6    40360    327263    8619719    327248    8627254     7.54
COMM     6    40370    327463    8627304    327457    8619805     7.50
COMM     6    40380    327723    8619788    327647    8627249     7.46
COMM     8    40391    327850    8627286    327865    8619783     7.50
COMM     8    47011    328528    8624536    319644    8624552     8.88
COMM     6    47020    319638    8620502    328469    8620533     8.83
COMM
COMM  Total Kilometres :        315.31
```

APPENDIX IV – List of all Supplied Digital Data

List of ASCII located data files and document files

Located File	Description
1715_Tempest_report.doc	Acquisition and processing report (Word format)
<AreaName>_final.hdr	Located data header
<AreaName>_final.asc	Located raw and final EM, CDI and DTM data in ASCII format
<AreaName>_final.gdb	Located raw and final EM, CDI and DTM data in Geosoft database
<AreaName>_final.i3	Geosoft import file

List of gridded data files (in ER-mapper format)

Grid Name	Description
<Area>_EMX<window>	X-component EM (windows 1-15)
<Area>_EMX<window>.ers	X-component EM header
<Area>_EMZ<window>	Z-component EM (windows 1-15)
<Area>_EMZ<window>.ers	Z-component EM header
<Area>_TConX	X-component Time Constant (in milliseconds)
<Area>_TConX.ers	X-component Time Constant header
<Area>_TConZ	Z-component Time Constant (in milliseconds)
<Area>_TConZ.ers	Z-component Time Constant header
<Area>_Dtm	Derived topography
<Area>_Dtm.ers	Derived topography header

List of stacked CDI and CDI-multiplot images (in .png format)

Grid Name	Description
CdtSect_<line><component>.png	Stacked CDI sections (eg. CdtSect_3001X.png)
TEM<flight><line><component>.png	CDI-multiplot images (eg. TEM004300101X.png)

APPENDIX V – List of all Supplied Products

As detailed in appendix IV:

1 CD-ROM containing
- final ER-mapper grids
- final EM, CDI and ancillary data in Profile Analyst databases
- final ASCII located data, headers and import templates
- image files (.png) of stacked and multiplot-style CDI sections
- digital flight path map (.map) and plotfile (.prn)
- digital copy of acquisition and processing report

Hardcopy of acquisition and processing report.

APPENDIX VI – EMflow Description Files

X-Component Descriptor File: 1715_x.dsc

```
FILE FORMAT VERSION
9
SYSTEM NAME
TEMPEST 25 Hz X component
VERSION
1.0
DEFINED BY
MCO
DATE DEFINED
20050603
TIME SCALING
1500  0.02   [sec]
WAVEFORM TYPE
halfperiod
0.02   [sec]
WAVEFORM NORMALIZED BY
total field
_________________________________________________________
  TxRx  TxRy  TxRz  TyRx  TyRy  TyRz  TzRx  TzRy  TzRz
     0     0     0     0     0     0    15     0     0
_________________________________________________________
                         ++++++++
                         + TzRx +
                         ++++++++
_________________________________________________________
TRANSMITTER CURRENT WAVEFORM
undefined
_________________________________________________________
RECEIVER PRIMARY FIELD
calibrated
AMPLITUDE SCALING
1  1   [---]
4
        TIME      CURRENT        ERROR  [ppm]
           0            0            0
           1       28.452            0
        1499       28.452            0
        1500            0            0
_________________________________________________________
RECEIVER SAMPLING
15
       START          END       WEIGHT
         0.5          1.5            1
         2.5          3.5            1
         4.5          5.5            1
         6.5          9.5            1
        10.5         15.5            1
        16.5         25.5            1
        26.5         41.5            1
        42.5         65.5            1
        66.5        101.5            1
       102.5        157.5            1
       158.5        245.5            1
       246.5        383.5            1
       384.5        599.5            1
       600.5        929.5            1
       930.5       1499.5            1
_________________________________________________________
TRANSMITTER GEOMETRY
moving dipole
z
      0       0       1
XYZ POSITION:
      0       0       0
_________________________________________________________
RECEIVER GEOMETRY
moving dipole
x
```

```
      1       0       0
XYZ POSITION:
   -120       0     -35
_________________________________________________________
DATA FORMAT
Geosoft format (1 yes, 0 no)
     0
Sample file name (if available)
D:\Jobs_Active\J1715\j1715_1\emf\emf_rawXZ.asc
Number of comment lines at the beginning of each data file
     0
Number of items in each data record
    40
POSITION (INDEX) OF CHANNELS IN EACH DATA RECORD
channel   ????  TxRx   TxRy   TxRz   TyRx   TyRy   TyRz   TzRx   TzRy   TzRz
     1     0     0      0      0      0      0      0     11      0      0
     2     0     0      0      0      0      0      0     12      0      0
     3     0     0      0      0      0      0      0     13      0      0
     4     0     0      0      0      0      0      0     14      0      0
     5     0     0      0      0      0      0      0     15      0      0
     6     0     0      0      0      0      0      0     16      0      0
     7     0     0      0      0      0      0      0     17      0      0
     8     0     0      0      0      0      0      0     18      0      0
     9     0     0      0      0      0      0      0     19      0      0
    10     0     0      0      0      0      0      0     20      0      0
    11     0     0      0      0      0      0      0     21      0      0
    12     0     0      0      0      0      0      0     22      0      0
    13     0     0      0      0      0      0      0     23      0      0
    14     0     0      0      0      0      0      0     24      0      0
    15     0     0      0      0      0      0      0     25      0      0
----------------------
line          1   1
FID           3   1
east          4   1
north         5   1
z_topo        7   1
altitude      8   1
Rx_pitch      0   0
Rx_roll       0   0
Rx_yaw        0   0
Tx_pitch      0   0
Tx_roll       0   0
Tx_yaw        0   0
TMI           0   2
z(ASL)        0   2
----------------------
```

Z-Component Descriptor File: 1715_z.dsc

```
FILE FORMAT VERSION
9
SYSTEM NAME
TEMPEST 25 Hz Z component
VERSION
1.0
DEFINED BY
MCO
DATE DEFINED
20050603
TIME SCALING
1500  0.02   [sec]
WAVEFORM TYPE
halfperiod
0.02   [sec]
WAVEFORM NORMALIZED BY
total field
_________________________________________________________
  TxRx  TxRy  TxRz  TyRx  TyRy  TyRz  TzRx  TzRy  TzRz
     0     0     0     0     0     0     0     0    15
_________________________________________________________
                         ++++++++
                         + TzRz +
                         ++++++++
_________________________________________________________
```

```
TRANSMITTER CURRENT WAVEFORM
undefined
________________________________________________________
RECEIVER PRIMARY FIELD
calibrated
AMPLITUDE SCALING
1  1   [---]
4
        TIME      CURRENT        ERROR  [ppm]
           0            0            0
           1       28.452            0
        1499       28.452            0
        1500            0            0
________________________________________________________
RECEIVER SAMPLING
15
       START          END       WEIGHT
         0.5          1.5            1
         2.5          3.5            1
         4.5          5.5            1
         6.5          9.5            1
        10.5         15.5            1
        16.5         25.5            1
        26.5         41.5            1
        42.5         65.5            1
        66.5        101.5            1
       102.5        157.5            1
       158.5        245.5            1
       246.5        383.5            1
       384.5        599.5            1
       600.5        929.5            1
       930.5       1499.5            1
________________________________________________________
TRANSMITTER GEOMETRY
moving dipole
z
      0       0       1
XYZ POSITION:
      0       0       0
________________________________________________________
RECEIVER GEOMETRY
moving dipole
x
      1       0       0
XYZ POSITION:
   -120       0     -35
________________________________________________________
DATA FORMAT
Geosoft format (1 yes, 0 no)
     0
Sample file name (if available)
D:\Jobs_Active\J1715\j1715_1\emf\emf_rawXZ.asc
Number of comment lines at the beginning of each data file
     0
Number of items in each data record
    40
POSITION (INDEX) OF CHANNELS IN EACH DATA RECORD
channel   ????  TxRx  TxRy  TxRz  TyRx  TyRy  TyRz  TzRx  TzRy  TzRz
     1     0     0     0     0     0     0     0     0     0    26
     2     0     0     0     0     0     0     0     0     0    27
     3     0     0     0     0     0     0     0     0     0    28
     4     0     0     0     0     0     0     0     0     0    29
     5     0     0     0     0     0     0     0     0     0    30
     6     0     0     0     0     0     0     0     0     0    31
     7     0     0     0     0     0     0     0     0     0    32
     8     0     0     0     0     0     0     0     0     0    33
     9     0     0     0     0     0     0     0     0     0    34
    10     0     0     0     0     0     0     0     0     0    35
    11     0     0     0     0     0     0     0     0     0    36
    12     0     0     0     0     0     0     0     0     0    37
    13     0     0     0     0     0     0     0     0     0    38
    14     0     0     0     0     0     0     0     0     0    39
    15     0     0     0     0     0     0     0     0     0    40
----------------------
line          1   1
FID           3   1
```

```
east          4   1
north         5   1
z_topo        7   1
altitude      8   1
Rx_pitch      0   0
Rx_roll       0   0
Rx_yaw        0   0
Tx_pitch      0   0
Tx_roll       0   0
Tx_yaw        0   0
TMI           0   2
z(ASL)        0   2
----------------------
```