SPECTREM AIR LIMITED

ANGLO AMERICAN EXPLORATION (AUSTRALIA) PTY LTD

LOGISTICAL REPORT FOR SPECTREM SURVEY OF THE LYND - BLOCK 1 AREA (AUSTRALIA) COVERING TENEMENTS EPM15915, 15646, 18239, 16070 AND 18110.

December 2009

KEYWORDS

Lynd - Block 1, Australia, Anglo American Exploration (Australia) Pty Ltd, SPECTREM, Airborne, Electromagnetic, Magnetic, Radiometric

SUMMARY

In November 2009, Spectrem Air Limited conducted an airborne electromagnetic survey over the Lynd - Block 1 area.

Good data quality was achieved for this 25 Hz Lynd 1 survey with X9 and Z9 noise levels were fairly low at around 200 PPM.

Unfortunately despite a very careful examination of the Spectrem AEM data no good sulphide conductors were detected in the Lynd 1 area.

However a few poor conductors were detected. These AEM anomalies, which have been given a D or lower grade rating, should be integrated with the available geological / GIS information and reviewed with the Spectrem team if necessary.

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CIRCULATION LIST

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1 INTRODUCTION

Between 10 to 21 November 2009, Spectrem Air Limited conducted an airborne electromagnetic, magnetic and radiometric survey over the Lynd Block 1 project in Australia. A total of 5 070 line kilometres were surveyed. The general location of the survey is shown in Figure 1.

Details of the survey can be found in Appendix 1. The system specifications are presented in Appendix 2 and the standard Spectrem Air data processing stream is described in Appendix 3.

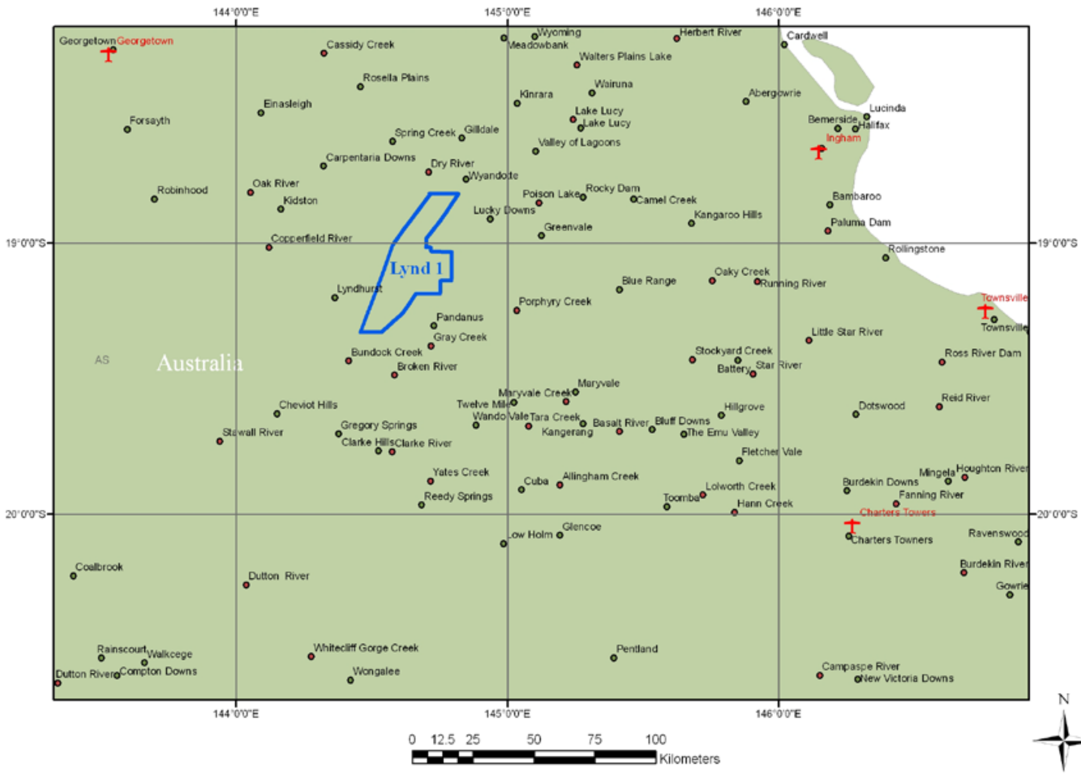

Figure 1 - Survey Location

A map of the total magnetic field (Figure 2) and of the conductivity Tau Z (Figure 3) of the Lynd Block 1 project are shown below.

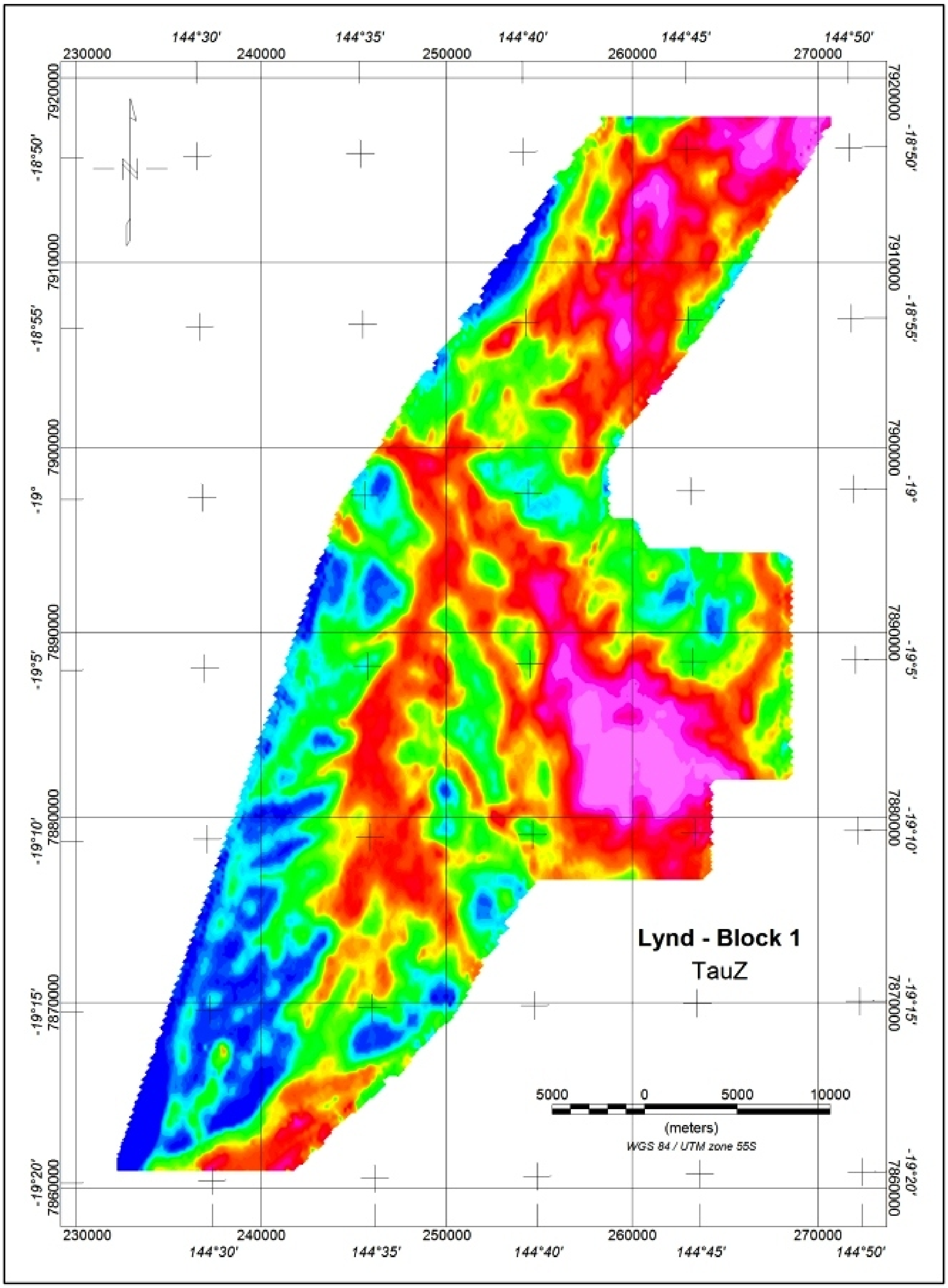

Figure 2 - An image of the EM Tau Z (LYND - Block 1)

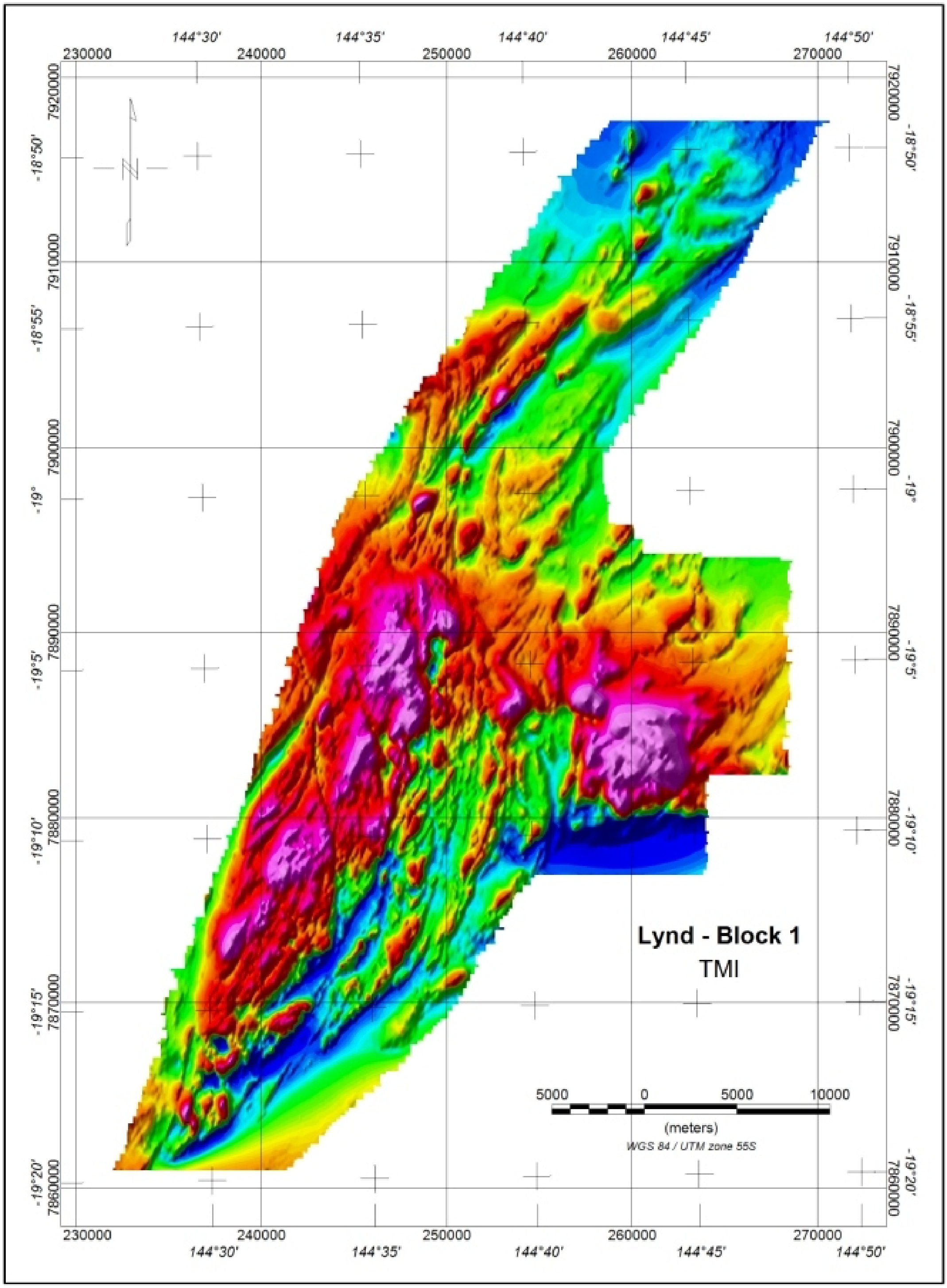

Figure 3 - An image of the Total Filed Magnetic Intensity (LYND - Block 1)

2 AEM INTERPRETATION – LYND - BLOCK 1

Good outcrop was present over approximately 15% of the area surveyed. Over the remaining 85% of the region regolith cover consisting of either alluvium/colluvium or weathered bedrock etc was present. The thickness of this cover was variable from 0 to around 70 meters. In most areas the cover is relatively thin (i.e. probably less than 20 meters). However there were some areas where the cover was up to 70 meters thick with conductance values as high as 14 siemens. In these areas of relatively thick and moderately conductive cover AEM modeling has shown that the Spectrem System would easily have detected good sulphide conductors located in the bedrock under this cover at depths as deep as 150 meters below the surface.

Conductivity-depth images (CDI's) were generated for all the flight lines in the surveyed area. From these CDI's the thickness of the cover can very easily be interpreted. If required a map of the cover thickness in the surveyed area can be made. A qualitative indication of the cover thickness in the surveyed area can be obtained from the Z channel time constant map or from the EMZ5 map.

The average EMX9 and EMZ9 noise levels for the surveyed area were around 300 PPM. With improved "Data compensation" these noise levels were eventually reduced to around 200 PPM. This is noise which correlates through all the windowed data and it is a low noise level for 25 Hz data. As discussed above AEM modeling has shown that we should easily be able to detect good, vertically dipping bedrock conductors located under moderately conductive (14 siemens) cover at depths of up to 150 meters below the surface provided that the EMX9 AND EMZ9 noise levels do not exceed 300 PPM.

Unfortunately, despite a very careful examination of the Spectrem AEM data no good sulphide conductors were detected in the Lynd 1 area.

However, a few poor conductors were detected which were plotted on the AEM anomaly map. These poor conductors are not targets recommended for any ground follow up work but they may be some limited geological interest. These poor conductors are now discussed as follows:-

On line 11340 fid 30270, X = 237954, Y = 7867616 there is a localized, surficial conductor which is possibly due to weathering over a mafic or ultramafic rock body. The conductivity-thickness product (conductance) of this thin, near surface weathering is very low ranging between 2 and 4 siemens. No ground followup is recommended on this poor surficial conductor unless the possible mafic/ultramiafic body is thought to be of interest. A negative magnetic anomaly is associated with this poor surficial conductor.

Another very poor surficial conductor is present close to this one centered around line 11250, fiducial 20961, X = 237286, Y = 7865824. This north-south striking surficial conductor has similar characteristics to the first mentioned conductor and it also has an associated negative magnetic anomaly.

A north-east striking lithological conductor is present centered around line 11130, fiducial 10881, X = 241563, Y = 7863409. This 20 siemen lithological conductor appears to be fairly thick and it dips at around 30 to 45 degrees south eastwards. The lithological conductor is located in non magnetic rocks and it has no magnetic association. This non magnetic lithological conductor is not recommended for any ground followup work. The AEM and magnetic data indicate that the lithology here is considerably different compared to the rest of the Lynd 1 area. Note that a probable extension of this north-east striking lithological conductor is located on line 11020, fiducial 2101, X = 236929, Y = 7861202.
On line 12550, fiducial 31906, X = 257100, Y = 7891809 there is a probable lithological conductor striking north-north-east and dipping 60 degrees westwards. It's conductance value is very low at 4 siemens.

On line 12720, fiducial 9140, X = 258538, Y = 7895213 there is a north-north-east striking conductor which has the following parameters:- Conductance = 14 siemens, dip fairly steep, possible small magnetic association. This is probably a lithological conductor but a power line was noted on one flight line by the pilots close to this 1.5 kilometer long conductor.

On line 12540, fiducial 30687, X = 263293, Y = 7891615 there is a curved conductor striking roughly north- south and extending over a 1.6 kilometer strike length. The AEM anomalies in this zone have very low conductance values ranging between 4 and 6 siemens. The anomalies have peak shapes and amplitudes typical of those due to cultural sources such as well grounded fences. A fence was noted by the pilots on two of the anomalies in the zone. However some of the AEM anomalies had good magnetic associations. This conductor is recommended for checking on the ground. Note that another conductor with identical AEM anomaly parameters is present on line 12640, fiducial 15764, X = 264681, Y = 7893615. This conductor is probably due to culture.

3 APPENDIX 1: SURVEY DETAILS

3.1.1 Logistics

The specific details of the survey were as follows:

Base of operations	Ingam - Australia
Flying Dates	25 September to 06 November 2009
Survey type	Electromagnetic, magnetic, radiometric, terrain
Aircraft type	DC3 – TP67
EM Base Frequency	25 Hz
Nominal aircraft altitude	90 m
Nominal aircraft speed	60 m/s
Acceptable Kilometres flown: LYND - Block 1	5 070 Line kilometres
Nominal flight-line spacing LYND - Block 1	200 m
Nominal flight-line direction: LYND - Block 1	90 degrees
Nominal tie-line spacing: LYND - Block 1	2 000 m
Nominal tie-line direction: LYND - Block 1	00 degrees

3.1.2 Datum

All coordinates provided in this report, in maps and in processed digital data-sets have the following datum parameters.

Datum	WGS84
Projection	UTM 55 S
Type	Transverse Mercator

3.1.3 Survey Area Coordinates

The corner coordinates of the survey areas were:

	Easting (m)	Northing (m)
LYND - Block 1	258752	7917774
	270066	7917829
	263428	7907042
	257975	7899659
	257975	7895865
	259682	7895865
	259834	7894347
	267810	7894004
	267752	7882396
	263557	7882396
	263421	7876877
	254075	7876839
	249323	7869020
	240838	7860892
	232737	7860926
	241029	7884982
	244879	7896590
	248863	7902672
	259212	7917774
	259212	7917850
	258752	7917774

4 APPENDIX 2: SYSTEM SPECIFICATIONS

SPECTREM simultaneously takes electromagnetic, total field magnetic and radiometric measurements. Both the electromagnetic and magnetic sensors are towed behind the aircraft in "birds" while the radiometric crystals are installed inside the cabin. The geometry of the system is shown below in Figure 2. Other system specifications are listed below.

4.1.1 EM system

Transmitter height above ground	107 m
Tx – Rx vertical separation	37.1 m
Tx – Rx horizontal separation	122.9 m
Transmitter coil axis	Vertical
Receiver coil axes	X : horizontal, parallel to flight direction Y : horizontal, perpendicular to flight Z : vertical, perpendicular to flight direction
Current waveform	Square wave
Base frequencies for this survey	25 Hz
Transmitter loop area	420 m^2
RMS current	920 to 960 amperes
RMS dipole moment	386 400 to 403 200 $A.m^2$
Recording Rate	5 Hz
Window distribution	Pseudo-binary
Digitising rate	38 400 Hz /component

Window Times for 25 Hz

Frequency	Window	Window Center	Window Width (μs)
25	1	26.0	26.0
25	2	65.1	52.1
25	3	143.2	104.2
25	4	299.5	208.3
25	5	612.0	416.7
25	6	1237.0	833.3
25	7	2487.0	1666.7
25	8	4987.0	3333.3
25	9	9987.0	6666.7
25	10	16653.6	6666.7

4.1.2 Magnetic system

Bird height above ground	71 m
Bird location	19 m below and 41 m behind centre of
Sensor	Scintrex CS-2 Sensor with SPECTREM Counter/Sync System
Recording Rate	5 Hz
Sensitivity	0.01 nT
Resolution	0.1 nT

4.1.3 Positioning system

Sensor	Novatel OEMV-3 GPS receiver with Fugro Omnistar differential corrections
Recording Rate	5 Hz

4.1.4 Other sensors

Radar Altitude	Collins with 5 Hz sampling with 0.3 m
Laser Altitude	Riegl with 5 Hz sampling with 0.03 m
Barometric Pressure	Rose Mount with 1 Hz sampling
Temperature (OAT)	PT-100 RTD with 1 Hz sampling
Analogue Chart Recorder	RMS GR-33

5 APPENDIX 3: DATA PROCESSING

The EM data were processed in Johannesburg using Oasis Montaj and proprietary software.

5.1 Electromagnetic Processing

5.1.1 Aircraft Processing

Some of the most important EM data processing was carried out on the aircraft as it acquired the data. The first processing stage was stacking the data to 512 samples. The data was then deconvolved to remove system response and transformed to a square wave. A square transmitter waveform was chosen as a periodic approximation of the step response.

In the next stage of processing the data was binned into 8 channels or windows. As the SPECTREM system makes its measurement while the transmitter is switched on, it is necessary to separate the primary (transmitted) field from the (induced) secondary field. The assumption is made that the induced field will have decayed to a minimal amount at the time the last channel is sampled. As the last channel only measured the primary field, it can be subtracted from the other channels to separate the secondary field. Hence there are actually 8 channels with geological information in the final data.

5.1.2 Profile data

The spikes in the line data have been removed using a 3 point Naudy filter. The line data have also been drift corrected and micro-levelled. The drift is particularly noticeable on the later time channels and has been applied to channels 4 to 8. This is an iterative process, with the assumption that there is a constant drift on a single line. This is reasonable if the lines are short. The processing steps are:

- The channel data are clipped retaining the data in the resistive areas where the response should be close to zero.
- The average of the clipped data is then calculated and subtracted from the channel data.

The steps are then repeated, refining the correction.

Decorrugation and micro-levelling has been applied to all the channels to reduce small residual errors that have not been corrected through the drift correction method.

5.1.3 Apparent Conductivity

The apparent conductivity was calculated from its channel amplitudes and the aircraft height. An apparent conductivity is the conductivity of a half space that would produce an amplitude equivalent to the measured response. It is useful in providing a physically sensible unit and partially compensates for aircraft ground clearance variations. The unit for apparent conductivity is milliSiemens/meter.

5.1.4 Grids

The data were gridded using an Akima spline. System lag was corrected before gridding.

A decorrugation filter was applied to reduce the herringbone effects created by geometrical asymmetry inherent in AEM systems

5.2 Magnetic Processing

The leveling processing included:

- Tie-line levelling
- Decorrugation
- Micro-levelling

5.2.1 Tie-line Levelling

Tie line levelling is used to remove the diurnal variation and errors due to instrument drift, both are assumed to vary slowly over time.

Tie-line levelling is an iterative process:

- Calculate the mis-closures at the crossover points of the tie and traverse lines. The mis-closure is the difference between the magnetic value on the tie line and the traverse line. The mis-closures are weighted by the gradient of the total field at the crossover point.

$$Weight = 1 / e^{(0.1 \times gradient)}$$

- The error is approximated by a piecewise polynomial as a function of time along a flight and then along a tie line.

These steps are repeated until a good fit has been obtained.

5.2.2 Decorrugation

This is a grid based operation designed to reduce the residual errors that the tie-line leveling does not remove. These are due to inaccuracies in the crossovers, localised diurnal activity, and local altitude variations.

Elongated anomalies with the following characteristics are removed:

- 2 times the line spacing perpendicular to the line direction
- 2 times the tie line spacing parallel to the line direction
- small dynamic range

5.2.3 Micro-levelling

Applies the corrections made to the grid to the profile data and thereby enhances the line data by removing the final residual errors. The micro-levelled data are then gridded. The lag correction is 40m.

5.3 DEM processing

Initially, the GPS height and the radar altimeter channels are visually inspected and any spikes or discontinuities are removed. A Low Pass or Naudy Filter is then applied to both channels. The GPS height channel is then gridded and the resultant grid is checked. Due to the nature of the GPS data, it is normally necessary at this stage to perform some degree of decorrugation on the grid with the corrections then written back to the database.

The radar altimeter channel is then subtracted from the corrected GPS height channel in the database and the resultant channel is gridded and verified.

5.4 Radiometric Processing

The processing of the radiometric data uses the full 256 channel spectra for most of the corrections. This processing allows us to use the information from the full spectrum to enhance the regions of interest in the spectrum, namely, potassium, uranium and thorium.

6 APPENDIX 4: DELIVERABLES

6.1 Digital Products

6.1.1 Grids / Profile / Map Data

(Grids supplied in Geosoft format)

	Grids	Line Data	Maps
EM Data			
EMX1 to EMX8 / EMZ1 to EMZ8	Y	Y	-
Tau X or Tau Z	Y	-	Y
Anomaly Map	N/A	N/A	N/A
Conductivity Grids at Various Depths	-	-	-
TF Magnetic Data			
TFMI	Y	Y	Y
Terrain			
DEM	Y	Y	-
Radiometric Data			
TC, K, U, Th	Y	Y	-
CDI Data			
CDI Data - Individual Lines (All lines & Tie Lines)	-	Y	-
Conductivity 3D Voxel Model	-	-	-
Interpretation			
Preliminary Geological Interpretation	-	-	-

6.1.2 Report

- This anomaly selection, data interprertation and logistics report.

6.1.3 Autopick Databases

- Autopick databases in MS Excel format (copy attached to this report)

7 APPENDIX 5: AEM ANOMALY SELECTION

Interpretation of AEM data should follow two approaches, one using profile data for EM anomaly selection and the other using gridded data to produce images for secondary interpretation.

7.1 Electromagnetic Anomaly Selection

The EM profiles were interpreted using the Autopick software developed by SPECTREM. Anomaly selections were made on the basis of anomaly shape, decay characteristics and magnetic correlation. Interpreting profile data is important as it contains detail that is lost in the later, grid based, secondary interpretation.

7.1.1 Conductor Parameterisation and Classification

The EM anomaly interpreter picks and parameterises all EM anomalies of interest in a survey area using a SPECTREM proprietary software suite called Autopick. Using Autopick, the physical location of the electromagnetic conductor can be recorded, and various parameters associated with the conductor can be assigned. These parameters include an anomaly grade, the conductivity-thickness product of the conductor, its mid-time (window 4) residual X channel amplitude, its estimated depth below ground surface, its dip with respect to the nominal survey direction, and the magnitude of its associated magnetic anomaly.

The anomaly shapes recorded by the SPECTREM electromagnetic system can be classified into three types - cultural, surficial and bedrock.

Cultural conductors are made conductors such as fences, power-lines, buried pipes and other metal structures. These give rise to anomalies if they form closed conducting loops, either by being well grounded in a conducting environment, or due to their physical geometry. Cultural conductors can be flagged as such in Autopick in order to reduce the possibility of following these up in the field.

Surficial conductors are flat-lying conductors which occur on or just beneath the ground surface. They generate anomalies which are characteristically broad, of poor conductivity, and large in amplitude. Examples are Quaternary cover and conductive regolith.

Bedrock conductors are typically steeply-dipping narrow zones of high conductivity situated in a relatively resistive host environment. Strike length may be considerable. These conductors present an interpretative problem in selecting from a large number of bedrock anomalies those which are more likely to be due to economic base metal mineralisation. Anomalies which are seen as more favorable are given a higher grade.

7.1.2 EM Anomaly Grading

An anomaly grading scheme has been devised to assist in prioritising which anomalies should first be considered for ground follow-up. This grading scheme is essentially geophysical, being a cumulative assessment by the interpreter of the likelihood of a particular anomaly being a prospective mineral target. Anomaly grade takes cognisance of such features of the anomaly as its peak shape (width and amplitude), its conductivity-thickness product (CTP) and its magnetic association.

Massive sulphide bodies are usually fairly narrow and of short strike length, and they are often highly conductive. If sufficient pyrrhotite or magnetite is present, a magnetic anomaly may be associated with the EM anomaly. Stratiform deposits, however, commonly contain disseminated sulphide mineralisation, and electromagnetic responses over such bodies may be diffuse to almost non-existent. Strike length can be considerable in the case of stratiform deposits, and magnetic signatures, if any, tend to parallel the trend of the regional geology.

SPECTREM EM anomalies are graded A, B, C or D, with grade A anomalies being the most favorable.

7.1.3 Complications of Anomaly Interpretation

In the grading process, small, discrete conductors were given a better grade than larger bodies, which were assumed to be lithological. Lithological conductors are generally formational (i.e. composed of a particular stratigraphic unit), with extended strike lengths, broader anomalies, and moderate to large electromagnetic responses. Often their conductivity is due to graphitic content rather than economic mineralisation. However the conclusion should not be drawn that larger conductors are definitely not mineralised. If mineralisation is disseminated it may have produced a broader, low amplitude EM response. An ore body's response may also be masked by nearby lithological or surficial conductors.

The anomaly picking process is used to directly detect an ore body. This is not the only method through which SPECTREM should be applied. It is important to remember the geological mapping capabilities of the system, which are covered in the Data Imaging section.

7.1.4 Estimated Conductor Depth

Caution needs to be taken when using the depth estimates provided in the EM anomaly listings. Autopick uses as its reference model a 300m by 300m wire loop conductor, which approximates a typical volcanogenic massive sulphide target, but bears very little resemblance to a body of appreciably different dimensions, such as a typical stratiform deposit. For this reason, depth estimates reported by Autopick are unreliable for bodies of dimensions very much greater than 300m by 300m (reported depths are too shallow) and very much less (reported depths are too deep).

8 APPENDIX 6: SOFTWARE VERSIONS

SpecDAS acquisition	1.16
Spectrem processing - SDALOG	1.06
Spectrem processing - SDASPEC	4.01
Spectrem processing - LEVEL	1.03
Autopick	EMPICK 1.03
Geosoft	6.3 (30) HF2
CDI	1.00

9 APPENDIX 7: ANOMALY LISTING

These are the EM anomalies interpreted through Autopick. They are stored digitally in a Microsoft Excel Worksheet stored in the report directory on the CD. The columns for the anomaly listing are:

Line #	line number
Fiducial	fiducial number
Lag	lag in fiducials applied to anomaly peak position before plotting
Head	heading of line
NomH	nominal survey heading
X	UTM X coordinate
Y	UTM Y coordinate
Type	model type, C=culture, ?=possible culture, P=probable culture,
CTP	Conductivity thickness product in Siemens
X4	EM window X4 residual amplitude (pp2t, parts per two thousand of
Depth	depth calculated for a 300m X 300m plate with the same response
Dip	dip of conductor (degrees)
Dip dir	dip direction of conductor
Strike	strike of conductor
Grade	EM anomaly grade, assigned by interpreter
Mag	Residual magnetic anomaly in nT

9.1 LYND - BLOCK 1 – Anomalies List

Lynd1 anomalies.csv