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SUMMARY REPORT ON MAGNETOMETER SURVEYS (FALL 2003) OVER THE TORNGAT PROPERTIES AND SUBSEQUENT DATA PROCESSING

Diamond Discoveries International Corp.

Summary Report on Magnetometer Surveys (Fall 2003) over the Torngat Properties and Subsequent Data Processing

by

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Introduction

This report contains a brief description of the magnetometer surveys completed on behalf of Diamond Discoveries International Corp. (DDI) and includes a brief synopsis of data processing required to generate digital data submitted to Mercator Geological Services Limited (Dartmouth, Nova Scotia) for map presentation and reporting.

Survey Description

The magnetometer surveys were carried out using a "walking-mag" method whereby a reading is taken at a specific time as the operator moves along a traverse. It is the author's impression via conversation with Mr. Mark Connell that the reading cycle was 3 seconds. This might equate to sub-metre station spacing. Positioning was determined via a Global Position System (GPS); however, the details of this equipment and procedures were not presented to the author. Line plots from survey data indicate relatively consist positioning; however, sub-metre accuracy is unlikely. This has a bearing on the line-to-line correlation of very short wavelength magnetic anomalies.

Data were recorded primarily on east-west lines with some north south and other orientations. Data were recorded continuously (i.e. snake mode) with no line breaks as direction was reversed. Line spacing varies from 10-130 m with a nominal average of 30-50 m. Line spacing at several orders of magnitude greater than station spacing isolates any along line detail for all but continuous high-amplitude isolated anomalies.

The magnetometer data was not tied to a base station or corrected for diurnal variations. Extensive solar activity was documented during the fall of 2003 and coupled with regularly occurring spherics generated significant short wavelength (~0.5 - 3 m) noise. The noise envelope generated by uncorrected or unleveled survey data is beyond the anticipated target signature given previous experience by the author in this geological setting. The typical width and magnetic susceptibility of dykes (e.g. mafic or kimberlitic) can be expected to generate short wavelength low-amplitude magnetic anomalies, which are similar in character to the ambient noise present in virtually every survey line. It should also be noted that uncorrected magnetic data is not acceptable for assessment credit in most jurisdictions and clear reference must be made where this data is presented.

Data Format

The digital data was e-mailed to the author by Mr. David Lister on December 1, 2003. The data consisted of 29 text files containing survey points in ASCII X,Y,Z format (Table 1). The magnetic total field data was presented in UTM NAD83 coordinates. There were no data in files 16 and 29 and no corresponding geological targets or areas for files 23, 26, and 27. The data files were compiled into a single master XYZ file for editing and processing.

Table 1. Summary of data and associated targets with nomenclature for digital data.

Grid Area	Report Reference	Survey Reference
A Dyke 24P/07	AD-	L25
C Dyke 24P/07	CD-	No data
Champagne East 24P/07	CHA-	L13, L14
Champagne North Extension 24P/07	CNE-	L24
Dan's Dyke 24P/07	DSD-	L18
E-Dyke 24P/07	ED-	L17, L21
H Dyke 24P/07	HD-	L9, L10, L11, L12
Holy Smoke Dyke 24P/02	HSD-	L1, L2
Olympic Ridge and Henri South Extension 24P/07	HSO-	L7, L8, L28
Ned's Dyke 24P/02	ND-	L15
N-Martina Dyke 24P/07	NMD-	L3, L4
Round Lake 24P/07	RL-	L6, L20.1
St. Pierre Extension 24P/07	SPE-	L5, L22
T2 East and West 24P/10	T2-	L19, L20

Data Editing

Data editing consisted of manually reviewing the data points and removing spurious points and other suspect data as indicated by the quality factor information included in the raw data files. Lines were split (i.e. 20 into 20 and 20.1) where these data referenced different survey areas.

Data Processing

Data processing involved a series of filters and derivatives in order to remove noise or where this was not possible, highlight possible target signals based on amplitude orientation and wavelength. The edited raw total field data (-RAWmag) was gridded using variable cell sizes (2-5 m). This process generates an artificial bias in colour contouring because of the large line spacing; however, the survey design, left no other presentation method. Several enhanced and processed data sets were generated for each grid to minimize the appearance and/or effect of these gridding artifacts. These included low-pass (-LoPass) and band-pass (-Filter) grids in addition to upward continued grids (-Mag-DUP) and horizontal (-Mag-DX and –Mag-DY) and vertical (-Mag-DZ) derivatives. Low-pass, band-pass, and upward continued data were used to reduce noise in the total field data whereas the horizontal and vertical derivatives were used to isolate dyke-like signatures.

The success of these processes varied from grid to grid (Table 2); however, it is imperative to note that given the geophysical setting and the physical characteristics of the target dykes a properly designed and executed survey would generate far more interpretable results.

Table 2. Summary of processed data.

Grid Area	Report Reference	Processing Results
A Dyke 24P/07	AD-	Good data, one clear anomaly and structures identified
C Dyke 24P/07	CD-	No data
Champagne East 24P/07	CHA-	Spiky data, good geological signal, possible dyke signatures
Champagne North Extension 24P/07	CNE-	Poor coherency, possible signatures?
Dan's Dyke 24P/07	DSD-	Moderate data quality, one possible dyke signature (subtle response)
E-Dyke 24P/07	ED-	Poor coherency, possible subtle responses
H Dyke 24P/07	HD-	Noisy data, numerous dyke-like responses
Holy Smoke Dyke 24P/02	HSD-	One main dyke signature present, may be others (east lines)
Olympic Ridge and Henri South Extension 24P/07	HSO-	Spiky data dominated by geology, subtle cross-cutting anomalies?
Ned's Dyke 24P/??	ND-	One simple dyke signature(?) superimposed on geology
N-Martina Dyke 24P/07	NMD-	Poor coherency, possible signatures (subtle negative anomalies)?
Round Lake 24P/07	RL-	Generally poor coherency. Interesting circular anomalies with associate dyke-like signatures
St. Pierre Extension 24P/07	SPE-	Dominated by geology some subtle cross-cutting features
T2 East and West 24P/10	T2-	Spiky data by generally good with several dyke-like signatures

Data Presentation

Digital gridded data and survey lines have been generated in a geo-referenced MapInfo database. All gridded data are presented as colour contour/shaded relief images with black line contours and survey lines. File naming indicates cell size (e.g. xxx-1m.grd) and contour interval in nanotesla (e.g. xxx-100nt.xxx) or nanotesla per meter (e.g. xxx-10ntm.xxx) for gradient data. A summary of presentation information, including primary images/grids (workspace files) and other pertinent info is shown in Table 3.

Table 3. Summary of data opened in MapInfo workspaces.

Grid Area	Report Reference	Total Field Data	Enhanced Data	Shading
A Dyke	AD-	RAWmag	DZ	090/30
C Dyke	CD-	No data	No data	No data
Champagne East	CHA-	RAWmag	DX	090/30
Champagne North Extension	CNE-	RAWmag	DX	090/30
Dan's Dyke	DSD-	RAWmag	Filter	090/30
E-Dyke	ED-	Lo-Pass	Filter	090/30
H Dyke	HD-	RAWmag	DZ	090/30
Holy Smoke Dyke	HSD-	Lo-Pass	DX	090/30
Olympic Ridge and Henri South Extension	HSO-	RAWmag	Filter	090/30
Ned's Dyke	ND-	Lo-Pass	DZ	090/30
N-Martina Dyke	NMD-	RAWmag	DZ	090/30
Round Lake	RL-	RAWmag	DZ	180/30
St. Pierre Extension	SPE-	RAWmag	DZ	090/30
T2 East and West	T2-	RAWmag	DZ	180/30

Each survey area has the same number and type of files; however, in some instances different data are presented based in the quality of the raw data and/or the best image for highlighting dyke-like signatures (Table 3).

Conclusions and Recommendations

The magnetometer surveys were generally successful in mapping some dykes; however, the general results are hampered severely by poor survey design, layout and data acquisition. It is evident, even from these poorly collected data, that much greater signal to noise ratio and in turn interpretability (i.e. exploration results) could be achieved by using a base station to correct for diurnal variation. Furthermore, data recorded at discrete intervals (i.e. 1m) along separate lines could be presented in a more interpretable manner. Whilst it is understood that the targets are narrow dykes there are other limitations such as sensor height and line spacing that render a "walking-mag" survey ineffective. It is crucial that line spacing be no more than ten times (10X) individual station spacing. This is common convention but given the very narrow target widths cross-line correlation would also be much better served.

It is evident that the dyke targets represent a subtle target by both size and susceptibility contrast parameters. However, they are detectable by magnetometer surveys given the local geological setting. The success that a survey might achieve is limited in this case by design and acquisition parameters.