B-115

OPERATIONS REPORT

TRI-SENSOR HIGH SENSITIVITY MAGNETIC AIRBORNE SURVEY

TIMMINS PROJECT

ONTARIO

for 2.27289

PORCUPINE JOINT VENTURE

CONTRACT ORDER WA9D00143

by

TERRAQUEST LTD.

November 26, 2003

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1.0 INTRODUCTION

This report describes the specification and parameters of an airborne geophysical survey carried out for PORCUPINE JOINT VENTURE, 1 Gold Mine Road, South Porcupine, ON, P0N 1H0, attention Mr. Bill McRae, telephone 705-235-6309 fax 705-235-6316. The survey was performed by Terraquest Ltd., 1366 Boulder Creek Crs., Mississauga, Ontario, Canada L5J 4P5, telephone 905-403-0026, fax 905-403-0065 and email info@terraquest.ca.

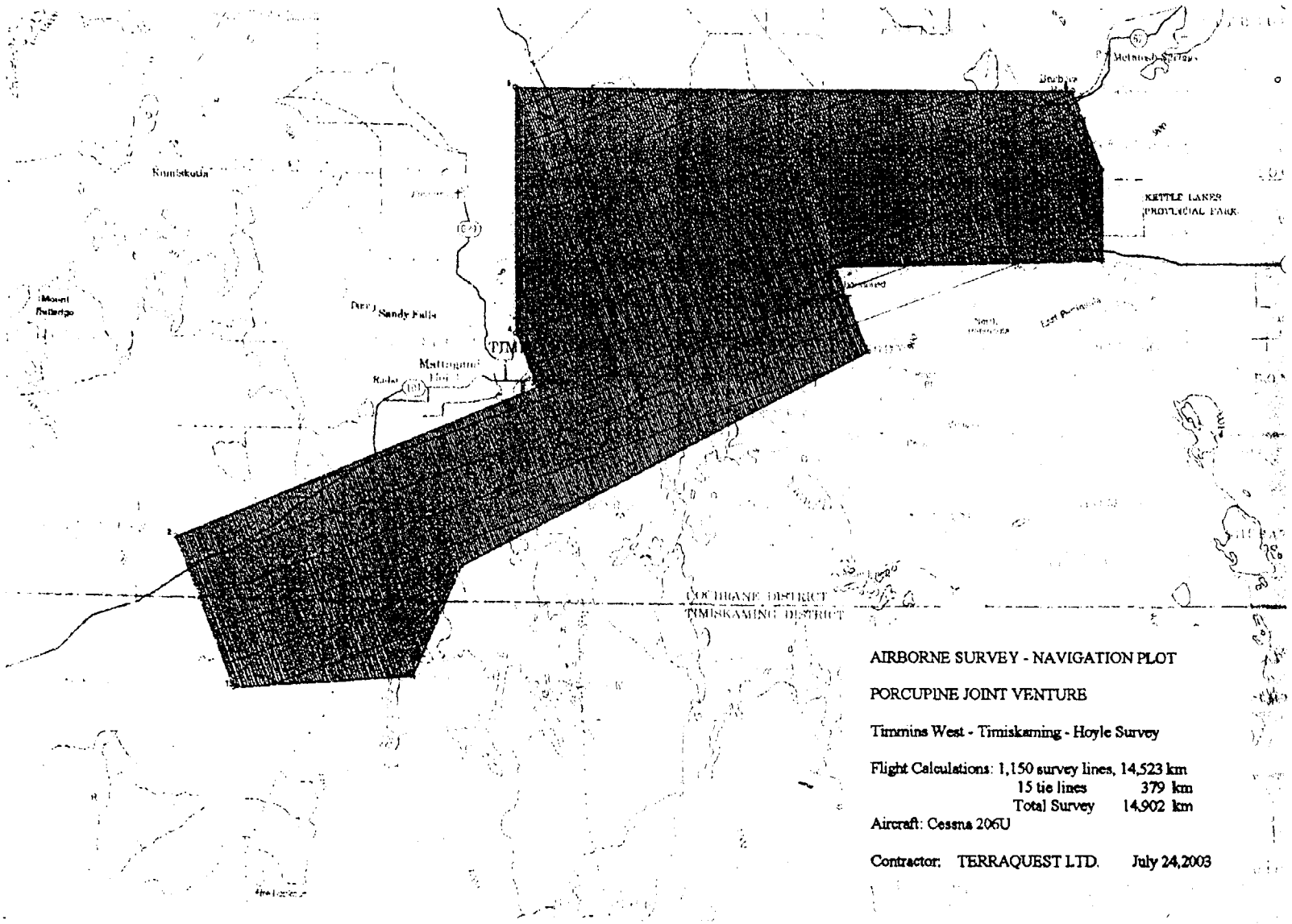
The purpose of the survey of this type is to collect geophysical data that can be used to prospect directly for anomalous magnetic and conductive areas in the earth's crust which may be caused by or related to economic minerals. Secondly, the geophysical patterns may be used indirectly for exploration by mapping the geology in detail, including the faults, shear zones, folding, alteration zones and other structures.

To obtain this data, the area was systematically traversed by an aircraft carrying geophysical equipment along parallel flight lines spaced at even intervals and oriented so as to intersect the geology and structure in a way as to provide optimum contour patterns of the geophysical data.

2.0 SURVEY AREA

This survey area is in northern Ontario, in the immediate vicinity of Timmins, extending 30 kilometres northeast of Timmins and 20 kilometres southwest of Timmins. It covers Murphy, Hoyle and Matheson townships completely and portions of German, Tisdale, Whitney, Cody, Bristol, Ogden, Deloro, Thorneloe and Price townships. The survey is irregular in shape. The northeast dimension (base line) measures approximately 55 kilometres and the northwest dimension (flight lines) ranges from 5 to 22 kilometres. The centre of the survey is 48 degrees 30 minutes and 81 degrees 15 minutes west. The survey coordinates in the NAD27 datum Zone 17 are as follows:

```
0  B115 Timmins Project, Lines
1  Z 17
2    459065.0   5351641.0       AREA CORNER 1
2    455757.0   5360207.0       AREA CORNER 2
2    476632.0   5368889.0       AREA CORNER 3
2    475330.0   5371852.0       AREA CORNER 4
2    475330.0   5385800.0       AREA CORNER 5
2    507375.0   5385800.0       AREA CORNER 6
2    509050.0   5381325.0       AREA CORNER 7
2    509050.0   5376140.0       AREA CORNER 8
2    493455.0   5375737.0       AREA CORNER 9
2    495526.0   5370964.0       AREA CORNER 10
2    472168.0   5358695.0       AREA CORNER 11
2    469359.0   5352389.0       AREA CORNER 12
2    459065.0   5351641.0       AREA CORNER 13
3    459065.0   5351641.0    SW WAYPOINTS 1
4         1146                  NUMBER OF LINES
5         50.0                  SPACING, m.
6    460058.8   5348471.9       MASTER LINE BL
7    449677.2   5376995.2       MASTER LINE TL
8           75                  MAX CROSS TRACK, m.
9     22  -160  -190            DELTA X/Y/Z
10           1                  LOG FPR EVERY 1 SECS
11 0.9996000000       0.0       0.0 K0, X/Y SHIFT
14         200                  LINES EXTENDED BEYOND AREA
16          10                  FIRST LINE NUMBER
17   459065.0  5351641.0 340.00 MASTER POINT, HEADING
```


Kapuskasing
Mount Rutledge
Sandy Falls
Matheson
KETTLE LAKES PROVINCIAL PARK
COCHRANE DISTRICT
TIMISKAMING DISTRICT
AIRBORNE SURVEY - NAVIGATION PLOT
PORCUPINE JOINT VENTURE
Timmins West - Timiskaming - Hoyle Survey
Flight Calculations: 1,150 survey lines, 14,523 km
15 tie lines 379 km
Total Survey 14,902 km
Aircraft: Cessna 206U
Contractor: TERRAQUEST LTD. July 24,2003

```
20 CLARKE-1866 6378206.4   294.9786982   5      ELLIPSOID
21          0                            NO EQUATORIAL CROSSING
30         20    9600  N  1  8  RS-232 PORT 2 INCOMING FORMAT
31         16    9600  O  1  8  RS-232 PORT 1 OUTGOING FORMAT
38          0                            METRIC SYSTEM
39          5                            RACE TRACK
80       0.00                            PLANNED ALTITUDE, units
83          0                            GPS ALTITUDE FOR VERTICAL BAR
85        100                            MAX VERTICAL BAR SCALE
102  UTM                                 UTM X/Y SCALE
```

3.0 EQUIPMENT SPECIFICATIONS

3.1 AIRCRAFT

The survey was carried using a single engine Cessna 206U aircraft registration C-GGLS, which carries three high sensitivity magnetometers. It is equipped with long range tanks, outboard tanks (total 8 hours range), tundra tires, cargo door and full avionics.

The aircraft has been extensively modified to support a tail stinger and two wing tip extensions. The transverse separation between the wing tip sensors is 13.5 metres and the longitudinal separation to the tail sensor is 7.2 metres. Considerable effort has been made to remove all ferruginous materials near the sensors and to ensure that the aircraft electrical system does not create any interference or noise. The figure of merit using Geological Survey of Canada standards is approximately 9 nT uncompensated and approximately 0.8 to 1.2 nT compensated depending on the latitude and geological environment.

The aircraft is owned and operated by Terraquest Ltd. under full Canadian Ministry of Transport approval and certification for specialty flying including airborne geophysical surveys. The aircraft is maintained at base operations by a regulatory AMO facility, Leggat Aviation Inc.

3.2 AIRBORNE GEOPHYSICAL EQUIPMENT

The primary airborne geophysical equipment includes three high sensitivity cesium vapour magnetometers. Ancillary support equipment includes a tri-axial fluxgate magnetometer, video camera, video recorder, radar altimeter, barometric altimeter, GPS receiver, GPS receiver with a real-time correction service, and a navigation system. The navigation system comprises a left/right-up/down indicator for the pilot and a screen showing the survey area, planned flight lines, and the real time flight path. All data were collected and stored by the data acquisition system. The following provides detailed equipment specifications:

Cesium Vapour Magnetometer Sensor (mounted in tail stinger and wing tip extensions)

Model	CS-2
Manufacturer	Scintrex
Resolution	0.001 nT counting at 0.1 per second
Sensitivity	+/- 0.005 nT
Dynamic Range	15,000 to 100,000 nT
Fourth Difference	0.02 nT

Tri-Axial Fluxgate Magnetic Sensor (for compensation, mounted in midpart of tail stinger)

Model	MAG-03MC
Manufacturer	Bartington Instruments Ltd.
Input	24-34 VDC, >30 milliamps
Field Range	+/- 100,000 nanotesla
Internal noise	at 1Hz to 1 kHz: 0.6 nT rms.

Bandwidth	0 to 1 kHz maximally flat, -12 dB/octave roll off beyond 1 kHz
Freq. Response	1 to 100 Hz:+/-0.5%; 100 to 500 Hz:+/-1.5%; 0.5 to 1 kHz:+/-5.0%
Calibration. Accuracy	+/-0.5%
Orthogonality	+/-0.5% worst case
Package alignment	+/-0.5% over full temperature range
Scaling Error	absolute:+/-0.5%; between axes: +/-0.5%

VLF-EM System: This system was mounted on the aircraft and recorded data, but was not part of any contractual obligation nor have the data been processed. The VLF-EM uses 3 orthogonal coils mounted in tube projected forward from the midpoint of the port wing, coupled with a rack mounted receiver-console to measure the total field strength and quadrature components of the VLF field using the transmitter in Maine NAA frequency 24 kHz.

Model	TOTEM 2A
Manufacturer	Hertz Industries
Accuracy	1%
Sampling Interval	0.5 seconds

Video Camera (mounted in belly of aircraft)

Model	VDC-2982 (colour)
Manufacturer	Sanyo
Serial Number	698000-30
Specifications	½", 470hr, 1.3LX, 12 VDC, C/CS, EI/ES, backlite compensation
Lens	Rainbow 2/3", 4.7 mm, F1.8-360, auto iris

Video Recorder

Model	Camcorder model VL-239
Manufacturer	Sharp
Media	8mm cassette
Serial Number	610516300

Radar Altimeter

Model	KRA-10A
Manufacturer	King
Serial Number	071-1114-00
Accuracy	5% up to 2,500 feet
Calibrate accuracy	1%
Output	Analog for pilot, converted to digital for data acquisition

Barometric Altimeter

Model	LX18001AN
Manufacturer	Sensym
Source	coupled to aircraft barometric system

Navigation Interface (console mounted in rack with remote displays for pilot)

Model	PNAV 2001
Manufacturer	Picodas Group Inc.
Data input	real time processing of GPS output data
Pilot readout	left/right and up/down pilot indicator
Operator readout	screen modes: map, survey and line
Data recording	all data recorded in real time by PDAS 1000

Real-Time GPS Correction (connects to Novatel GPS receiver see below)

Model	Landstar Mark III
Manufacturer	Racal
Antenna	post type
Operating temperature	0-50 °C

Broadcast Services	Service Satellite Link: American Satellite Corp. (AMSC) L band broadcast (1525 to 1559 MHz satellite band Data update 2 seconds, Data latency 5-6 seconds Cold acquisition 12 seconds Reacquisition 7 seconds

Power supplies:

1) PC6B converter to convert 13.75 volt aircraft power to 27.5 volts DC.
2) Power distribution unit located in the instrument rack, manufactured by Picodas Group Inc., interfaces with the aircraft power and provides filtered and continuous power at 13.75 and 27.5 VDC to components.
3) The 1000A console manufactured by Picodas Group Inc. contains three 32 VDC switching power supply for the cesium vapour magnetometer sensors; console also provides switching power for fluxgate magnetometer (real time magnetic compensation), radar altimeter, barometric altimeter, and ancillary equipment.

Data Acquisition System (mounted in rack)

Model	PDAS 1000
Manufacturer	Picodas Group Inc.
Operating System	MSDOS
Microprocessor	80486dx-66 CPU
Coprocessor	Intel 80486dx
Memory	on board 8 MB, page interleaving, shadow RAM for BIOS, EMS 4.0
Clock	real time, hardware implementation of MC14618 in the integrated peripheral controller
I/O slots	5 AT and 3 PC compatible slots
Display	electroluminescent 640 x 400 pixels
Graphic display	scrolling analog chart with 5 windows operator selectable, freeze display capability to hold image for inspection
Recording media	standard hard drive with extra shock mounts, standard floppy drive and quarter inch tape backup (QIC format)
Sampling	selectable sampling for each input type: 1.0, 0.5, 0.25, 0.2, 0.1 seconds
Inputs	12 differential analog input with16 bit resolution
Serial ports	2 RS-232C (expandable)
Parallel ports	10 definable 8 bit I/O; 2 definable 8 bit outputs

The PDAS 1000 contains several boards as described below:

Magnetometer Board (three boards, one for each magnetometer sensor)

Model	PCB
Manufacturer	Picodas Group Inc.
Input range	20,000 – 100,000 nT
Sampling	1,000 per second
Bandwidth	selectable 0.7, 1.0 or 2.0 Hz
Resolution	0.0001 nT
Microprocessor	TMS 9995
Firmware	8 Kbit EPROM board resident
Internal crystal	18,432 kHz
Crystal accuracy	absolute <0.01%
Host interfacing	8 kByte dual port memory
Address selection	within 20 bit addressing in 8 kByte software selectable steps
Input signal	TTL, CMOS, open collectible compatible or sine wave with decoupler
Input impedance	TTL>1 kOhm

Magnetic compensation for aircraft and heading effects is done in real time. Raw magnetic values are also stored and thus compensation with different variable can be performed at a later date.

GPS Differential Receiver Board

Model	GPS card 3951 R
Manufacturer	Novatel
Antenna	Model 511, low profile
Channels	12
Position update	0.2 second for navigation
Accuracy	position with SA implement 100 metres, with no SA 10 metres, velocity 0.1 knot time recovery 1pps, 100 nsec pulse width
Data recording	all raw GPS and positional data logged by PDAS1000

Analog Processor Board

Model	PCB
Manufacturer	Picodas Group Inc.
	Provides separate A/D converter for each analog input with no multiplexing; each channel is sampled at a rate of 1,000 samples per second with digital processing applied

3.3 BASE STATION EQUIPMENT

High sensitivity magnetic base station data was provided by a cesium vapour magnetometer logging onto a notebook and with time synchronization from the GPS base station receiver.

The magnetometer is the same as used in the aircraft, a CS-2 magnetometer manufactured by Scintrex. The processor is also the same as used in the aircraft but is housed in a portable box model MEP-710, manufactured by Picodas Group Inc. The logging software is written by Picodas Group Inc., BASEMAG version 5.02 for an IBM compatible PC (notebook) with RS232 input. It supports real time graphics, automatic startup, compressed data storage, selectable start/stop times, plotting of data to screen or printer at user-selected scales, and fourth-digital difference and diurnal quality flags which are set by user in BASEPLOT. Time recorded is taken from the base GPS receiver.

The GPS base station data are provided by a GPS receiver, with logging onto a notebook..

Model	MX 4200D
Manufacturer	Magnavox
Serial number	5057
Type	continuous tracking, L1 frequency, C/A ode (SPS), 6-channel independent
Receiver sensitivity	-143 dBm Costas threshold
Logging rate	1 per second

4.0 SURVEY SPECIFICATIONS

4.1 LINES AND DATA

Survey lines	14,710 km
Tie lines	415 km
Perimeter lines	125 km
Total	15,250 km
Plotted data	16,758 km (including overlaps)
Survey Line Interval	50 metres
Tie Line Interval	2 kilometres
Survey Line Direction	340 degrees
Tie Line Direction	067 degrees

Terrain Clearance	45 metres (mean terrain clearance)
Average Ground Speed	60 metres/second
Magnetic Sample Interval	6 metres
VLF-EM Interval	30 metres

4.2 TOLERANCES

Line Spacing: Reflights will take place if the final differentially corrected flight path deviates from the intended flight path by +/-25 metres over a distance greater than 1 kilometre.

Terrain Clearance: The aircraft terrain clearance was smoothly maintained at 45 metres MTC in a drape mode. Reflights will take place if the final differentially corrected altitude deviates from the flight altitude by +/-35% over a distance of one kilometre or more.

Diurnal Magnetic Variation: The airborne survey will be confined to periods in which the diurnal activity is 2 nT or less over a chord of 30 seconds in length.

GPS Data: GPS data shall include at least four satellites for accurate navigation and flight path recovery. There shall be no significant gaps in any of the digital data including GPS and magnetic data.

4.3 NAVIGATION AND RECOVERY

The satellite navigation system was used to ferry to the survey sites and to survey along each line. The survey coordinates of each area outline was supplied by the client and was used to establish the survey boundaries and the flight lines. The NAD27 ellipsoid was used with x-y-z delta shifts of 22, -160, and -190 respectively. The UTM zone is 17.

The flight path guidance accuracy is variable depending upon the number and condition (health) of the satellites employed. The selective availability normally imposed by the military was at a minimum during this period and consequently the accuracy was for the most part better than 10 metres. Real-time correction using the Racal (receiver and broadcast services) improves the accuracy to nominally about 3 metres or less in the horizontal direction and 4-5 metres in the vertical direction.

A three dimensional digital model of the proposed fly surface was created from existing NTS topographic data, and incorporated the climb and descent flight characteristics of the particular aircraft. Application of this technique was limited by the variability of the real-time corrected GPS signal with respect to the vertical position. At times the accuracy of GPSz (vertical) was routinely variable by up to 10 metres and occasionally 20 metres. At this survey mean terrain clearance (45 metres), this variation was detrimental to both safety and the desired quality of drape surface. In addition the topographic relief is quite low. A superior drape surface was obtained by relying on radar altimeter data.

The town of Timmins lies within the survey boundaries and Canadian Aviation Regulations requires a minimum altitude of 1000 feet (305 metres) over built up areas. Transport Canada would not provide special dispensation for this contract to fly lower over Timmins. This departure from the desired survey flight surface was modeled and inserted into the three dimensional fly surface, however it was too general and ended up being too conservative due to lack of local detail. The model had the aircraft climbing too soon and thereby loosing magnetic resolution around the town. For this reason it was decided to utilize the visual method and concentrate on getting as close to the town limits as possible before climbing up and over at regulation altitude. This technique was successful in obtaining good quality, low survey altitude in the immediate vicinity about the town, but this sacrificed good height continuity between the flight lines over the town itself. In consultation with the client, it was decided that the data around the town was more important than over the town, so this technique was adopted. This flight strategy and resultant data required different processing techniques over Timmins (see section 4.4).

The contract called for a mean terrain clearance of 60 metres, however after local surveillance by the pilot, he confirmed that he could fly safely at a lower altitude and he selected a nominal mean terrain clearance of 45 metres.

A video camera recorded the ground image along the flight path. A video display screen in the cockpit enabled the operator to monitor the flight path during the survey.

4.4 OPERATIONAL LOGISTICS

The base of operations was in Timmins, Ontario. The base station (combined high sensitivity magnetic and GPS) was set up on Saturday July 26, 20003 at the airport, well away from cultural interference. The crew and field processing facilities were set up at the Super 8 Motel.

The survey was flown successfully in 60 flights GLS420-479 from July 26th to September 20th, 2003 including all testing, calibration, and survey flights. Operations were delayed by normal required aircraft maintenance, some equipment maintenance, diurnal and weather. Survey was performed on 39 days of which 16 were restricted by weather. There were 8 days lost to weather and 1 day to diurnal.

Personnel are listed in Appendix 1. Daily log is provided in Appendix 111.

5.0 DATA PROCESSING

The data were copied and taken to the hotel after every flight where they were reviewed thoroughly for quality control and tolerances on all channels. This included any corrections to the flight path, making flight path plots, importing the base station data, creating a database on a flight by flight basis, and posting the data. All data were checked for continuity and integrity. Any errors or omission or data beyond tolerances were flagged for reflight and the crew was notified ready for their flight in the morning.

The final processing was performed by CGI Controlled Geophysics Inc. in Thornhill, Ontario. This involved tie line leveling in the standard manner by tying the survey lines to the tie lines using GEOSOFT software. The total field from the tail stinger sensor was gridded and microlevelled in the Fourier domain (generally less than 1 nT corrections) to reduce any linear noise along the flight path without degrading the geologic signal. The vertical magnetic gradient was calculated from the final processed total magnetic field gridded data. The final levelled datasets were gridded and were contoured.

Most of the data were amenable to normal processing techniques; however data over the town of Timmins required special treatment due to variable flight heights (see section 4.3). At this location the data had to be tweaked manually, line by line, adjusting the values according to their relative altitudes to obtain continuity between the lines.

The measured horizontal magnetic gradient was obtained as follows. a) The raw transverse gradient is the value from the left sensor minus the value from the right sensor divided by their separation. b) The raw longitudinal gradient is the difference between the tail sensor and the average of the left and right sensors, and divided by the longitudinal separation. c) The raw gradients are then DC shifted to account for line heading effects and differences in the sensors. d) The gradients are then rotated from aircraft centric components to true geographic components; these are the final North and East gradients, which are listed in the database.

The data were plotted at scales of 1:50,000 and at 1:20,000 and archived on CD-ROM.

6.0 SUMMARY

An airborne tri-sensor high sensitivity magnetic survey was performed at 45 metre mean terrain clearance, 50 metre line intervals, 2000 metre tie line interval, and data sample points at 6 metres along the flight lines. A high sensitivity magnetic and a GPS base station located in Timmins, Ontario recorded the diurnal magnetic activity and reference GPS data during the survey for adherence to survey tolerances.

The data were subjected to final processing to produce digital files: a) total magnetic field, and b) calculated vertical magnetic gradient with measured longitudinal and transverse magnetic gradients. Map plots of these products were made at 1:50,000 and 1:20,000 scales. All data have been archived on a CD-ROM.

Respectfully Submitted,
TERRAQUEST LTD.

Charles Q. Barrie, M.Sc.

GEOLOGICAL ASSOCIATION OF CANADA
CHARLES Q. BARRIE
FELLOW

APPENDIX I

PERSONNEL

Field:	Pilot	Todd Whitley
	Operators	Philip Briggs
	Processor	Kwame Barko, Geophysicist
Office:	Geophysicist	Chris Vaughan
	Manager	Charles Barrie

APPENDIX II

CERTIFICATE OF QUALIFICATION

I, Charles Barrie, certify that I:

1) am registered as a Fellow with the Geological Association of Canada and work professionally as a geologist,
2) hold an Honours degree in Geology from McMaster University, Canada, obtained in 1977,
3) hold an M.Sc. in Geology from Dalhousie University, Canada, obtained in 1980,
4) am a member of the Prospectors and Developers Association of Canada,
5) am a member of the Canadian Institute of Mining , Metallurgy and Petroleum,
6) have worked as a geologist for over twenty five years,
7) am employed by and am an owner of Terraquest Ltd., specializing in high sensitivity airborne geophysical surveys, and
8) have prepared this operations and specifications report pertaining to airborne data collected by Terraquest Ltd..

Mississauga, Ontario, Canada

Signed

Charles Q. Barrie, M.Sc.
Vice President, Terraquest Ltd.

APPENDIX III

Daily Log:

26/07/03	SATURDAY	TIMMINS
	Set up base station at airport	
	Flew test flight G420: GPS apron test, lag, etc.	
27/07/03	SUNDAY	TIMMINS
	Flew flight Gls421 (apron test, anomaly test, comp flight)	
28/07/03	MONDAY	TIMMINS
	On stand by	
	Grounded due to weather.	
29/07/03	TUESDAY	TIMMINS
	Flew flight Gls422 (lag test, GPS test with dtm)	
30/07/03	WEDNESDAY	TIMMINS
	Flew Gls423 lines 10 to 320	
	Flew Gls424 lines 330 to 460	
31/07/03	THURSDAY	TIMMINS
	Flew flight Gls425 lines 470 to 870	
	Grounded rest of day due to thunder storms	
01/08/03	FRIDAY	TIMMINS
	Flew flight Gls426 lines 880 1140	
	Grounded rests of day due to thunder storms	
02/08/03	SATURDAY	TIMMINS
	Flew flight Gls427 lines 1150 to 1420	
	Grounded rests of day due to thunder storms	
03/08/03	SUNDAY	TIMMINS
	Flew flight Gls428 lines 1111 to 1800	
	Flew flight Gls429 lines 1810 to 1910	
04/08/03	MONDAY	TIMMINS
	Grounded due to poor visibility and rain.	
05/08/03	TUESDAY	TIMMINS
	Grounded due to Thunder storms	
06/08/03	WEDNESDAY	TIMMINS
	Grounded morning due to low visibility	
	Flew Gls431 reflys 461, 1481 and lines 2010 to 2250	
	Flew Gls432 lines 2260 to 2340	
07/08/03	THURSDAY	TIMMINS
	Grounded for morning due to low vis and rain.	
	Flew Gls433 lines 2350 to 2750	
08/08/03	FRIDAY	TIMMINS

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Grounded for morning due to low cloud ceiling.
Flew flight Gls434 lines 2760 to 2870, but had to come back due to rain and low cloud cover.

09/08/03 SATURDAY TIMMINS
Flew flight Gls435 mag test
Flew flight Gls436 lines 2900 to 3460

10/08/03 SUNDAY TIMMINS
Flew flight Gls437 lines 3470 to 3930
Flew flight Gls438 lines 3940 to 4000

11/08/03 MONDAY TIMMINS
Flew flight Gls439 2882 to 4400
Todd left for Hearst for maintenance

12/08/03 TUESDAY TIMMINS
Todd in Hearst for maintenance

13/08/03 WEDNESDAY TIMMINS
Todd in Hearst for maintenance

14/08/03 THURSDAY TIMMINS
Flew flight Gls440 lines 4410 to 4740
Flew flight Gls441 lines 4751 to 4770

15/08/03 FRIDAY TIMMINS
Flew flight Gls442 lines 3180 to 4910
Flew flight Gls443 tie lines 5150 to 5120

16/08/03 SATURDAY TIMMINS
Flew flight Gls444 lines 4920 to 5190
Flew flight Gls445 lines 5200 to 5240 and moved to Grid B (east side) because of mine blasting around 5:30. Grid B lines 1000 to 1180

17/08/03 SUNDAY TIMMINS
Flew flight Gls446 lines 5250 to 5410 and comp flight lines 9442 to 9446.
Flew flight Gls447 lines 5420 to 5520 and grid B lines 1190 to 1410.

18/08/03 MONDAY TIMMINS
Grounded from flying due to mag storms

19/08/03 TUESDAY TIMMINS
Flew flight Gls448 lines 5530 to 5570, but had to land due to thunderstorms.
Flew flight Gls449 lines 5580 to 5750

20/08/03 WEDNESDAY TIMMINS
Grounded for morning due to low visibility and rain.
Flew flight Gls450 lines 5750 to 5860

21/08/03 THURSDAY TIMMINS
Flew flight Gls451 lines 5870 to 6000
Grounded for rest of day due to high wind.

22/08/03 FRIDAY TIMMINS
Plane is in maintenance for the day.

23/08/03 SATURDAY TIMMINS
Flew flight Gls452 lines 6010,6020, and 6030 but had to come back because of high wind and turbulence. This continued for rest of day

24/08/03 SUNDAY TIMMINS
Flew flight Gls453 lines 6011 to 6250
Flew flight Gls454 lines 6260 to 6300, but had to come back because of rain and poor visibility.

25/08/03 MONDAY TIMMINS
Flew flight Gls455, but had to return because of video problems.
Flew flight Gls456 lines 6310 to 6530

26/08/03 TUESDAY TIMMINS
Plane grounded due to video problems all day.
Van was taken in to speedy to fix brake line and get oil change. Price $150

27/08/03 WEDNESDAY TIMMINS
Phil looked for new video camera around Timmins
Ordered new camera that will replace old one.
Will arrive tomorrow midday.
Took defective camera into Pro-tech paid $65 for them to look at it.

28/08/03 THURSDAY TIMMINS
They sent the wrong camera. Needed 12 VDC. The right camera will be coming in at 10:00 tomorrow.

29/08/03 FRIDAY TIMMINS
Received new camera. Sanyo VCC-5774 Colour CDD Camera.
Phil installed new camera in plane.
Grounded for rest of day due to gusting winds.

30/08/03 SATURDAY TIMMINS
Flew flight Gls457 lines 6540 to 6760
Flew flight Gls458 lines 6770 to 7030

31/08/03 SUNDAY TIMMINS
Flew flight Gls459 lines 7040 to 7170

01/09/03 MONDAY TIMMINS
Flew flight Gls460 lines 6781, 7171, and lines 7180 to 7450.
Flew flight Gls461 lines 7460 to 7760.

02/09/03 TUESDAY TIMMINS
Flew flight Gls462 lines 7770 to 8080.
Flew flight Gls463 lines 8090 to 8470.

03/09/03 WEDNESDAY TIMMINS
Grounded due to rain and poor visibility.

04/09/03 THURSDAY TIMMINS
Grounded most of day due to weather.
Flew flight Gls464 lines 8480 to 8760

05/09/03 FRIDAY TIMMINS

Flew flight Gls465 lines 8770 to 9190
Flew flight Gls466 lines 9200 to 9570

06/09/03 SATURDAY TIMMINS
Flew flight Gls467 lines 7471, 8751, and 9121. Lines 9580 to 9950
Flew flight Gls468 lines 9950 to 1000.9 and lines from grid B 1500 to 1850

07/09/03 SUNDAY TIMMINS
Flew flight Gls469 line 9811 and lines 1420 to 1940
Todd takes plane in for maintenance.

08/09/03 MONDAY TIMMINS
Plane is in maintenance.

09/09/03 TUESDAY TIMMINS
Plane is in maintanace.
Todd returns from maintenance in the evening.

10/09/03 WEDNESDAY TIMMINS
Flew flight Gls470 lines 1950 to 2370
Flew flight Gls471 lines 2360 to 2471 and ties 5210 to 5140

11/09/03 THURSDAY TIMMINS
Flew flight Gls472 tie lines 5130 to 5010, 5220, and comp flight lines
8615 to 8645(4 files).
Flew flight Gls473 lines 5240 to 5280 and re flights starting 161 and up to 651.

12/09/03 FRIDAY TIMMINS
Flew Gls474 re flights 701 to 971 and re flights ties 5241 to 5291.
Grounded for rest of day due to high winds and turbulence.

13/09/03 SATURDAY TIMMINS
Flew Gls475 flew remaining re flights at West End. Lines 971 to 1091. Flew 4 boundary lines 9316 to 9346.
Plane was grounded for rest of day due to high winds and turbulence.

14/09/03 SUNDAY TIMMINS
Grounded due to rain

15/09/03 MONDAY TIMMINS
Grounded due to rain

16/09/03 TUESDAY TIMMINS
Grounded due to rain

17/09/03 WEDNESDAY TIMMINS
Flew flight Gls476 lines over city re flights 4091,4131,4151,4171,4211,and 4271.
Flew flight Gls477 lines 7011 to 7091 and did plane testing lines 6111 to 6181.

18/09/03 THURSDAY TIMMINS
Flew flight Gls478 lines 4262,5916,5926,5936,9996 (railway test), 5956,5966.
Plus a flight test lines 6017 to 6087.
B115 is done.

19/09/03 FRIDAY TIMMINS
On stand by.

20/09/03 SATURDAY TIMMINS
Flew flight Gls479 tie lines 5010 to 5120 and lines 10 to 80
End of survey.

APPENDIX IV

DOCUMENTATION FOR THE FIELD DATA – B115 (GLS)

The channel descriptions for B115.GDB are:

FID	Fiducials
LON	Longitude (WGS84)
LAT	Latitude (WGS84)
GALT	GPS altitude (WGS84)
X_NAD27	X coordinate (NAD27)
Y_NAD27	Y coordinate (NAD27)
ALT_NAD27	GPS altitude (NAD27)
GTIME	GPS time (weekly seconds)
Time	GPS time (reduced to daily seconds)
TIME_UTC	UTC time
RAD	Radar altimeter (feet)
RADM	Radar altimeter (simply converted to metres by a factor of 0.3048)
BARO	Barometric reading
Distance	Distance cumulatively calculated between points
MAG1	Left MAG sensor values
MAG2	Right MAG sensor values
MAG3	Tail MAG sensor values
CMA1	Compensated MAG1 data
CMA2	Compensated MAG2 data
CMA3	Compensated MAG3 data
CMA1DiaLev	Compensated MAG1 (Diurnal removed, 57300nT added)
CMA2DiaLev	Compensated MAG2 (Diurnal removed, 57300nT added)
CMA3DiaLev	Compensated MAG3 (Diurnal removed, 57300nT added)
CMA1_Lag	Compensated MAG1 (Diurnal removed, 57300nT added and 0.42 seconds lag corrected)
CMA2_Lag	Compensated MAG2 (Diurnal removed, 57300nT added and 0.42 seconds lag corrected)
CMA3_Lag	Compensated MAG3 (Diurnal removed, 57300nT added and 0.42 seconds lag corrected)
Diurnal	Diurnal looked up from the daily base mag readings

APPENDIX V

TIMMINS MAGNETIC ANOMALY CLOVER LEAF (HEADING TEST) Sept 18, 2003

Terraquest Ltd.

Line	Direction	Fid	X	Y	Mag3	Mag2	Mag1	Mag3Diff	Mag2Diff	Mag1Diff
6057	W	492.30	454981.5067	5366008.4810	57381.3150	57410.6240	57417.5290	4.7701	2.5950	-1.5510
6067	E	585.80	454989.646	5366012.7849	57385.8260	57416.0820	57414.4170	0.2591	-2.8630	1.5610
6077	W	705.90	454988.6709	5366010.1248	57379.9910	57406.0630	57414.2020	6.0941	7.1560	1.7760
6087	E	814.60	454982.2426	5366006.1741	57389.8530	57420.0840	57417.6960	-3.7679	-6.8650	-1.7180
6017	N	47.10	454991.8382	5366007.5985	57386.9850	57411.3960	57416.5430	-0.8999	1.8230	-0.5650
6027	S	161.00	454981.0311	5366008.2068	57393.5760	57420.0170	57418.2680	-7.4909	-6.7980	-2.2900
6037	N	251.10	454991.3713	5366009.3363	57388.7470	57413.9160	57416.7650	-2.6619	-0.6970	-0.7870
6047	S	361.70	454990.798	5366011.6418	57382.3880	57407.5700	57412.4040	3.6971	5.6490	3.5740
				Average	**57386.0851**	**57413.2190**	**57415.9780**			
							Total	0.0000	0.0000	-0.0000
							Total (North) 340	-3.5617	1.1260	-1.3520
							Total (South) 160	-3.5087	-9.7280	-0.1570
							Total (East) 70	-3.5087	-9.7280	-0.1570
							Total (West) 250	10.8643	9.7510	0.2250
							Average (North) 340	-1.7809	0.5630	-0.6760
							Average (South) 160	-1.7544	-4.8640	-0.0785
							Average (East) 70	-1.7544	-4.8640	-0.0785
							Average (West) 250	5.4321	4.8755	0.1125
							Average Heading Error N-S	-0.0265	5.4270	-0.5975
							Average Heading Error E-W	-7.1865	-9.7395	-0.1910

Work Report Summary

Transaction No: W0460.00357 **Status:** APPROVED
Recording Date: 2004-FEB-27 **Work Done from:** 2003-JUL-26
Approval Date: 2004-MAR-04 **to:** 2003-SEP-20

Client(s):

130666 KINROSS GOLD CORPORATION
300210 PLACER DOME (CLA) LIMITED/PLACER DOME (CLA) LIMITEE

Survey Type(s):

AMAG

Work Report Details:

Claim#	Perform	Perform Approve	Applied	Applied Approve	Assign	Assign Approve	Reserve	Reserve Approve	Due Date
G 6000250	$412	$412	$0	$0	$388	388	$24	$24	
G 6060094	$206	$206	$0	$0	$0	0	$206	$206	
G 6060095	$414	$414	$0	$0	$400	400	$14	$14	
G 6060096	$412	$412	$0	$0	$400	400	$12	$12	
P 1180852	$412	$412	$1,600	$1,600	$0	0	$0	$0	2005-MAR-04
P 1204654	$412	$412	$1,600	$1,600	$0	0	$0	$0	2004-APR-19
P 3001497	$1,030	$1,030	$0	$0	$1,030	1,030	$0	$0	2005-MAY-06
P 3003939	$412	$412	$0	$0	$158	158	$254	$254	2005-JUN-02
P 3010892	$206	$206	$0	$0	$0	0	$206	$206	2005-MAR-21
P 3010893	$618	$618	$0	$0	$0	0	$618	$618	2005-MAR-21
P 3012788	$412	$412	$0	$0	$0	0	$412	$412	2005-JUN-02
	$4,946	$4,946	$3,200	$3,200	$2,376	$2,376	$1,746	$1,746	

External Credits: $0

Reserve:

$1,746 Reserve of Work Report#: W0460.00357

$1,746 Total Remaining

Status of claim is based on information currently on record.

42A10SW2034 2.27289 MATHESON

900

Ministry of
Northern Development
and Mines

Ministère du
Développement du Nord
et des Mines

Ontario

GEOSCIENCE ASSESSMENT OFFICE
933 RAMSEY LAKE ROAD, 6th FLOOR
SUDBURY, ONTARIO
P3E 6B5

Tel: (888) 415-9845
Fax:(877) 670-1555

Date: 2004-MAR-04

CHRISTINE M. SAARI
KINROSS GOLD CORPORATION
P.O. BAG 1000
SCHUMACHER, ONTARIO
P0N 1G0 CANADA

Submission Number: 2.27289
Transaction Number(s): W0460.00357

Dear Sir or Madam

Subject: Approval of Assessment Work

We have approved your Assessment Work Submission with the above noted Transaction Number(s). The attached Work Report Summary indicates the results of the approval.

At the discretion of the Ministry, the assessment work performed on the mining lands noted in this work report may be subject to inspection and/or investigation at any time.

If you have any question regarding this correspondence, please contact STEVEN BENETEAU by email at steve.beneteau@ndm.gov.on.ca or by phone at (705) 670-5855.

Yours Sincerely,

for Ron C. Gashinski
Senior Manager, Mining Lands Section

Cc: Resident Geologist

Kinross Gold Corporation
(Claim Holder)

Placer Dome (Cla) Limited/Placer Dome (Cla) Limitee
(Assessment Office)

Assessment File Library

Placer Dome (Cla) Limited/Placer Dome (Cla) Limitee
(Claim Holder)

Christine M. Saari
(Agent)

42A10SW2034 2.27289 MATHESON

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ONTARIO CANADA

MINISTRY OF NORTHERN DEVELOPMENT AND MINES

PROVINCIAL MINING RECORDER'S OFFICE

Mining Land Tenure Map

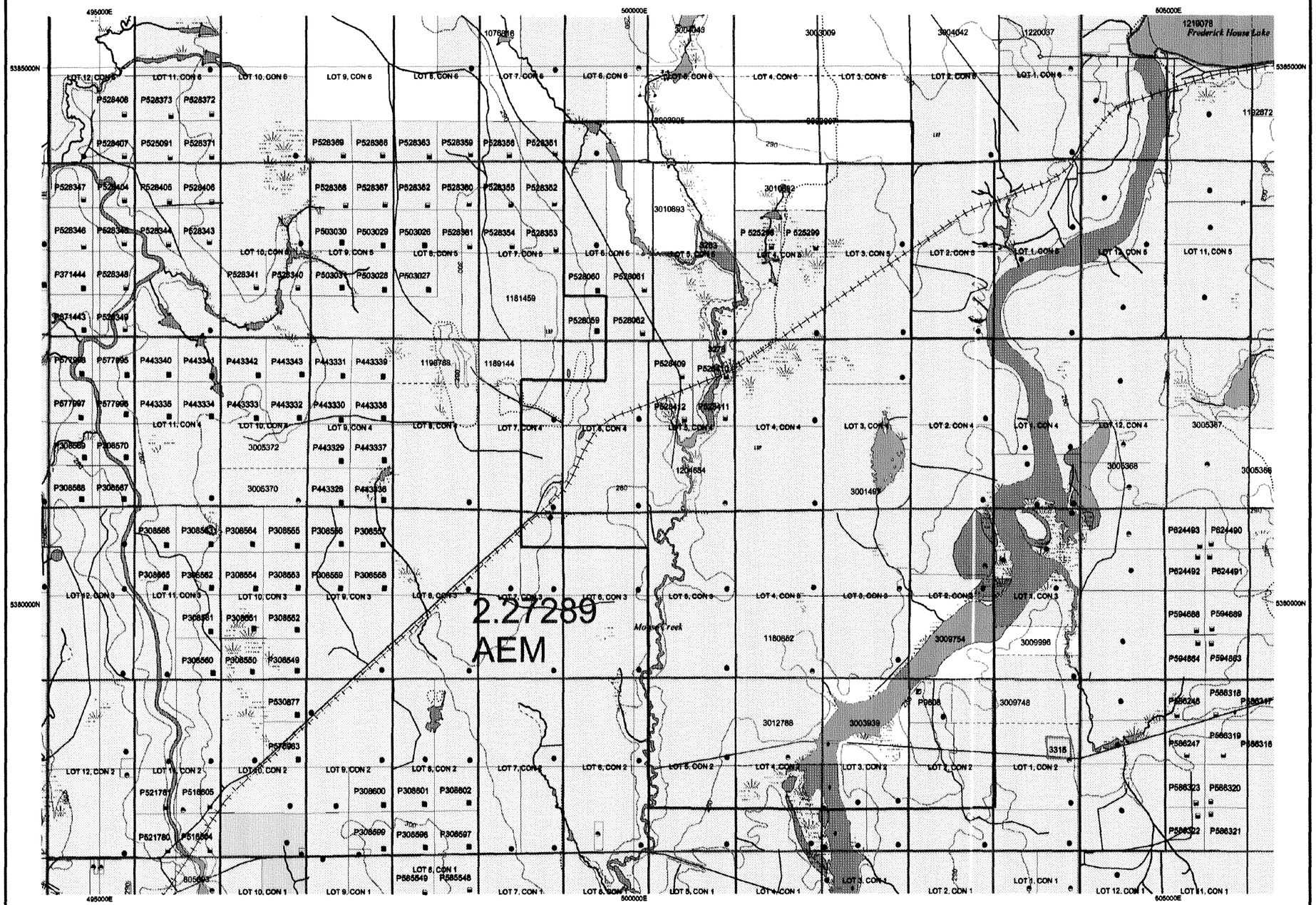
Date / Time of Issue: Fri Mar 26 15:26:27 EST 2004

TOWNSHIP / AREA
MATHESON

PLAN
G-3982

ADMINISTRATIVE DISTRICTS / DIVISIONS

Mining Division	Porcupine
Land Titles/Registry Division	COCHRANE
Ministry of Natural Resources District	TIMMINS



TOPOGRAPHIC

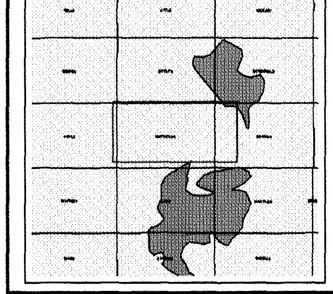
- Administrative Boundaries
- Township
- Concession, Lot
- Provincial Park
- Indian Reserve
- Cliff, Pit & Pile
- Contour
- Mine Shafts
- Mine Headframe
- Railway
- Road
- Trail
- Natural Gas Pipeline
- Utilities
- Tower

Land Tenure

Freehold Patent
- Surface And Mining Rights
- Surface Rights Only
- Mining Rights Only

Leasehold Patent
- Surface And Mining Rights
- Surface Rights Only
- Mining Rights Only

Licence of Occupation
- Uses Not Specified
- Surface And Mining Rights
- Surface Rights Only
- Mining Rights Only
- Land Use Permit
- Order In Council (Not open for staking)
- Water Power Lease Agreement
- Mining Claim: 1234567
- Filed Only Mining Claims: 1234567



LAND TENURE WITHDRAWALS

1234 Areas Withdrawn from Disposition

Mining Acts Withdrawal Types
- Wsm Surface And Mining Rights Withdrawn
- Ws Surface Rights Only Withdrawn
- Wm Mining Rights Only Withdrawn

Order In Council Withdrawal Types
- W'sm Surface And Mining Rights Withdrawn
- W's Surface Rights Only Withdrawn
- W'm Mining Rights Only Withdrawn

Na IMPORTANT NOTICES

Scale 1:40000

700m 0m 2.1km

LAND TENURE WITHDRAWAL DESCRIPTIONS

Identifier	Type	Date	Description
3263	Wsm	Jan 1, 2001	FLOODING RIGHTS RESERVED TO DUCKS UNLIMITED (FILE #M890.00057) OCTOBRE 31, 1988
3278	Wsm	Jan 1, 2001	FLOODING RIGHTS RESERVED TO DUCKS UNLIMITED (FILE #M890.00057) OCTOBRE 31, 1988
3315	Wsm	Jan 1, 2001	PENDING APPLICATION UNDER THE PUBLIC LANDS ACT NOTICE RECEIVED 92-NOV-17 (AGRICULTURAL)
W.53/76	Ws	Jan 1, 1980	W.53/76 10/9/76 S.R.O. 16539

Those wishing to stake mining claims should consult with the Provincial Mining Recorders' Office of the Ministry of Northern Development and Mines for additional information on the status of the lands shown hereon. This map is not intended for navigational, survey, or land title determination purposes as the information shown on this map is compiled from various sources. Completeness and accuracy are not guaranteed. Additional information may also be obtained through the local Land Titles or Registry Office, or the Ministry of Natural Resources.

The information shown is derived from digital data available in the Provincial Mining Recorders' Office at the time of downloading from the Ministry of Northern Development and Mines web site.

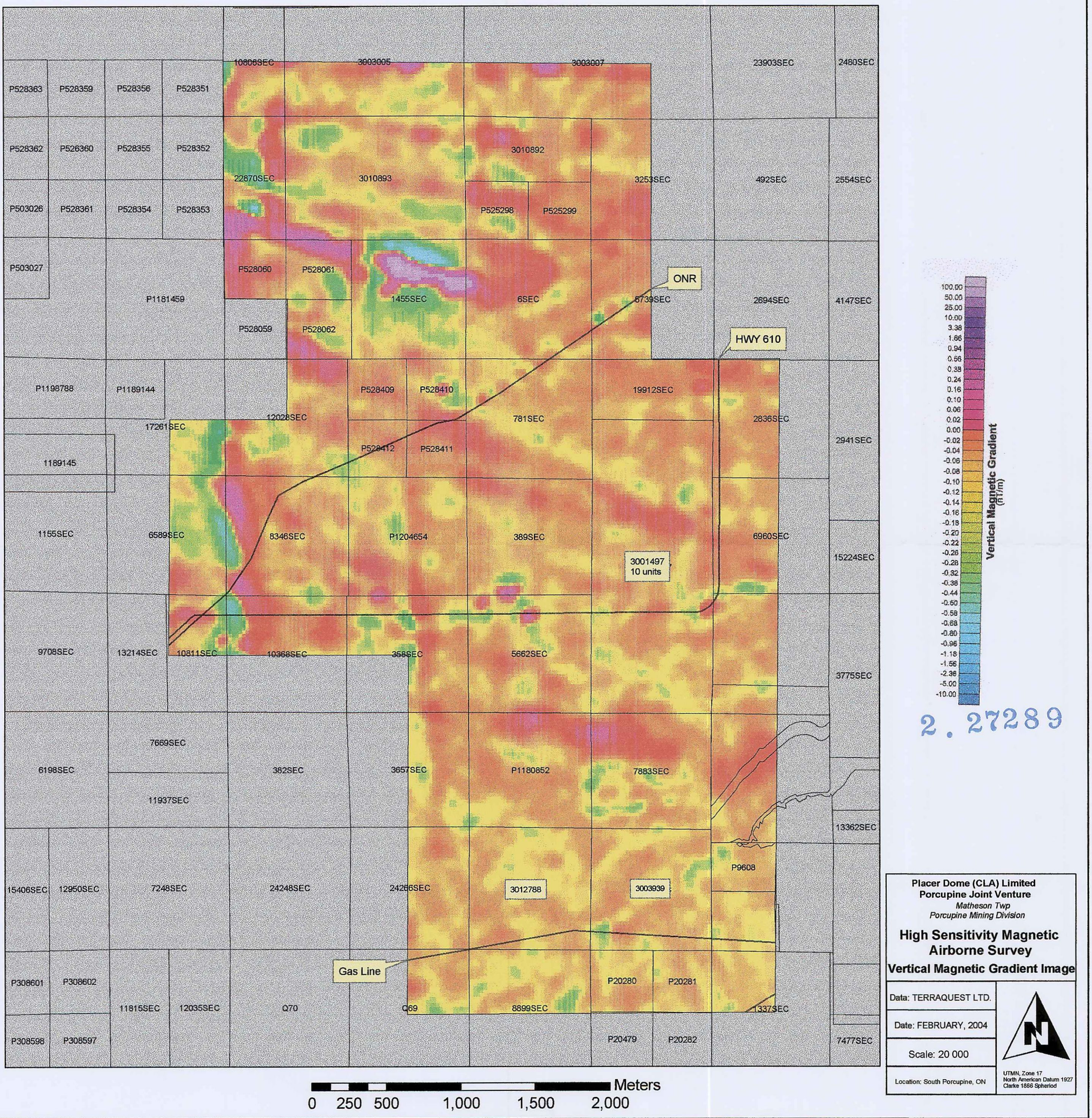
General Information and Limitations

Contact Information:
Provincial Mining Recorders' Office
Willet Green Miller Centre 933 Ramsey Lake Road
Sudbury ON P3E 6B5
Home Page: www.mndm.gov.on.ca/MNDM/MINES/LANDS/miamnpge.htm

Toll Free
Tel: 1 (888) 415-9845 ext 5716
Fax: 1 (877) 670-1444

Map Datum: NAD 83
Projection: UTM (6 degree)
Topographic Data Source: Land Information Ontario
Mining Land Tenure Source: Provincial Mining Recorders' Office

This map may not show unregistered land tenure and interests in land including certain patents, leases, easements, right of ways, flooding rights, licences, or other forms of disposition of rights and interest from the Crown. Also certain land tenure and land uses that restrict or prohibit free entry to stake mining claims may not be illustrated.



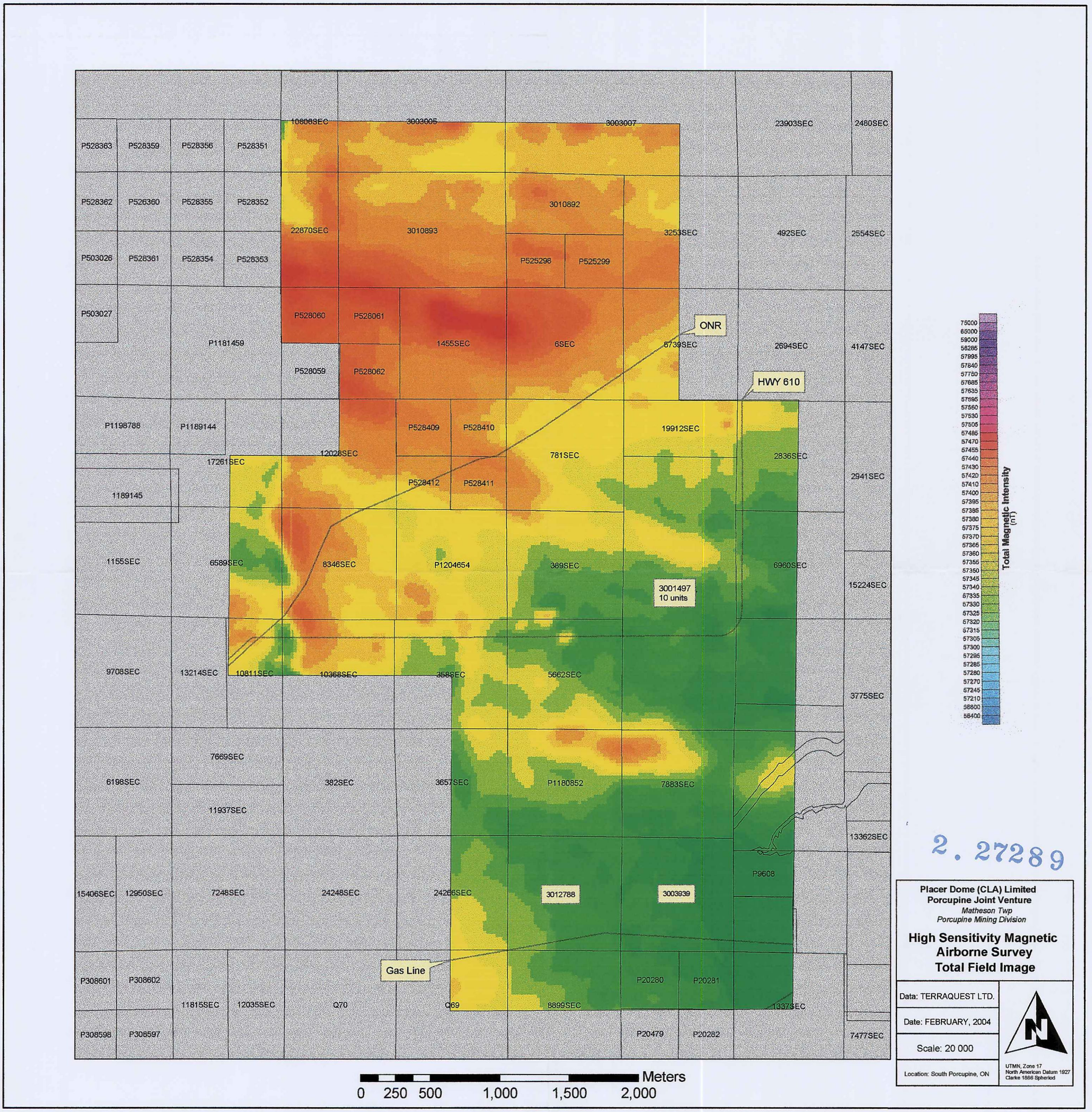
2.27289

Placer Dome (CLA) Limited
Porcupine Joint Venture
Matheson Twp
Porcupine Mining Division

High Sensitivity Magnetic Airborne Survey

Vertical Magnetic Gradient Image

Data: TERRAQUEST LTD.	
Date: FEBRUARY, 2004	
Scale: 20 000	
Location: South Porcupine, ON	UTMN, Zone 17 North American Datum 1927 Clarke 1866 Spheriod



2.27289

Placer Dome (CLA) Limited
Porcupine Joint Venture
Matheson Twp
Porcupine Mining Division

High Sensitivity Magnetic Airborne Survey Total Field Image

Data: TERRAQUEST LTD.	
Date: FEBRUARY, 2004	
Scale: 20 000	
Location: South Porcupine, ON	UTMN, Zone 17 North American Datum 1927 Clarke 1866 Spheriod