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**ASSESSMENT REPORT**

describing

**VTEM AND MAGNETOMETER SURVEYS**

at the

**EUREKA PROPERTY**

Eureka 1-56	YC12951-YC13006
57-60	YC13701-YC13704
73-84	YC13717-YC13728
97-112	YC13741-YC13756
121-182	YC13765-YC13826
189-202	YC13833-YC13846

NTS 1150/10

Latitude 63°32'N; Longitude 138°52'W

in the

Dawson Mining District  
Yukon Territory

prepared by

Archer, Cathro & Associates (1981) Limited

for

**ANFIELD VENTURES INC.**  
and  
**STRATEGIC METALS LTD.**

by

D. Gregory, B.Sc. Geology, GIT  
February 2009

## **TABLE OF CONTENTS**

	<b><u>PAGE</u></b>
INTRODUCTION	1
PROPERTY LOCATION, CLAIM DATA AND ACCESS	1
HISTORY AND PREVIOUS WORK	1
GEOMORPHOLOGY	3
REGIONAL GEOLOGY	3
PROPERTY GEOLOGY	6
SOIL AND SILT GEOCHEMISTRY	7
MINERALIZATION	7
GEOPHYSICAL SURVEYS	9
DISCUSSION AND CONCLUSIONS	10
REFERENCES	12

## **APPENDICES**

- I STATEMENT OF QUALIFICATIONS
- II REPORT ON HELICOPTER-BORNE VERSATILE TIME DOMAIN  
ELECTROMAGNETIC (VTEM) GEOPHYSICAL SURVEY

## **FIGURES**

<u>No.</u>	<u>Description</u>	<u>Follows page</u>
1	Property Location	1
2	Claim Locations	1
3	Tectonic Setting	3
4	Regional Geology	4
5	Property Geology	6
6	Soil and Silt Gold Geochemistry	7
7	Rock and Pit Sample Gold Geochemistry	7
8	Trenches and Drill Hole Locations	8
9	Drill Hole Locations and Sections - Wealth Showing	8
10	B-field and Magnetics	10
11	dB/dt and Magnetics	10

## **TABLES**

<u>No.</u>	<u>Description</u>	<u>Page</u>
I	Regional Lithologies	4
II	Significant Drill Results	9

## **INTRODUCTION**

The Eureka property consists of 164 mineral claims that are under option to Anfield Ventures Inc. from Strategic Metals Ltd., which owns them subject to a 1% net smelter return royalty held by StrataGold Corporation.

The property is situated in the central part of the Tintina Gold Belt, a loosely defined 2100 km long zone of gold and silver deposits extending across Alaska and Yukon (Figure 1). Important deposits in generally similar geological settings within the belt include the Pogo deposit and the recently discovered White Gold deposit. The Eureka claims cover the headwaters of productive placer creeks that are part of the legendary Klondike Goldfields.

This report describes a helicopter-borne versatile time domain electromagnetic (VTEM) survey conducted between July 9 and 12, 2008. The program was managed by Archer, Cathro & Associates (1981) Limited. Appendix I contains the author's Statement of Qualifications.

## **PROPERTY LOCATION, CLAIM DATA AND ACCESS**

The property is located in west-central Yukon at latitude 63°32' north and longitude 138°52' west on NTS map sheet 1150/10. It consists of 164 contiguous mineral claims registered with the Dawson Mining Recorder in the name of Archer Cathro which holds them in trust for Strategic. Claim registration data are listed below while the locations of individual claims are shown on Figure 2.

<u>Claim Name</u>	<u>Grant Number</u>	<u>Expiry Date*</u>
Eureka 1-56	YC12951-YC13006	February 15, 2016
57-60	YC13701-YC13704	February 15, 2016
73-84	YC13717-YC13728	February 15, 2016
97-112	YC13741-YC13756	February 15, 2016
121-182	YC13765-YC13826	February 15, 2016
189-202	YC13833-YC13846	February 15, 2016

\*Expiry date includes 2008 work which has been filed for assessment credit but not yet accepted.

The property is accessed via the Hunker Creek-South Klondike road system which leaves the Klondike Highway about 20 km east of Dawson City. The access road is seasonally maintained by the territorial government, and the entire 90 km distance to the property is usually suitable for two-wheel drive vehicles. Access to various parts of the property is provided by a network of 4 x 4 roads and bulldozer trails.

## **HISTORY AND PREVIOUS WORK**

The creeks draining the Eureka property have been explored for placer gold since the gold rush era of 1898. Extensive hand mining by shafts and ground sluicing was carried out until the early

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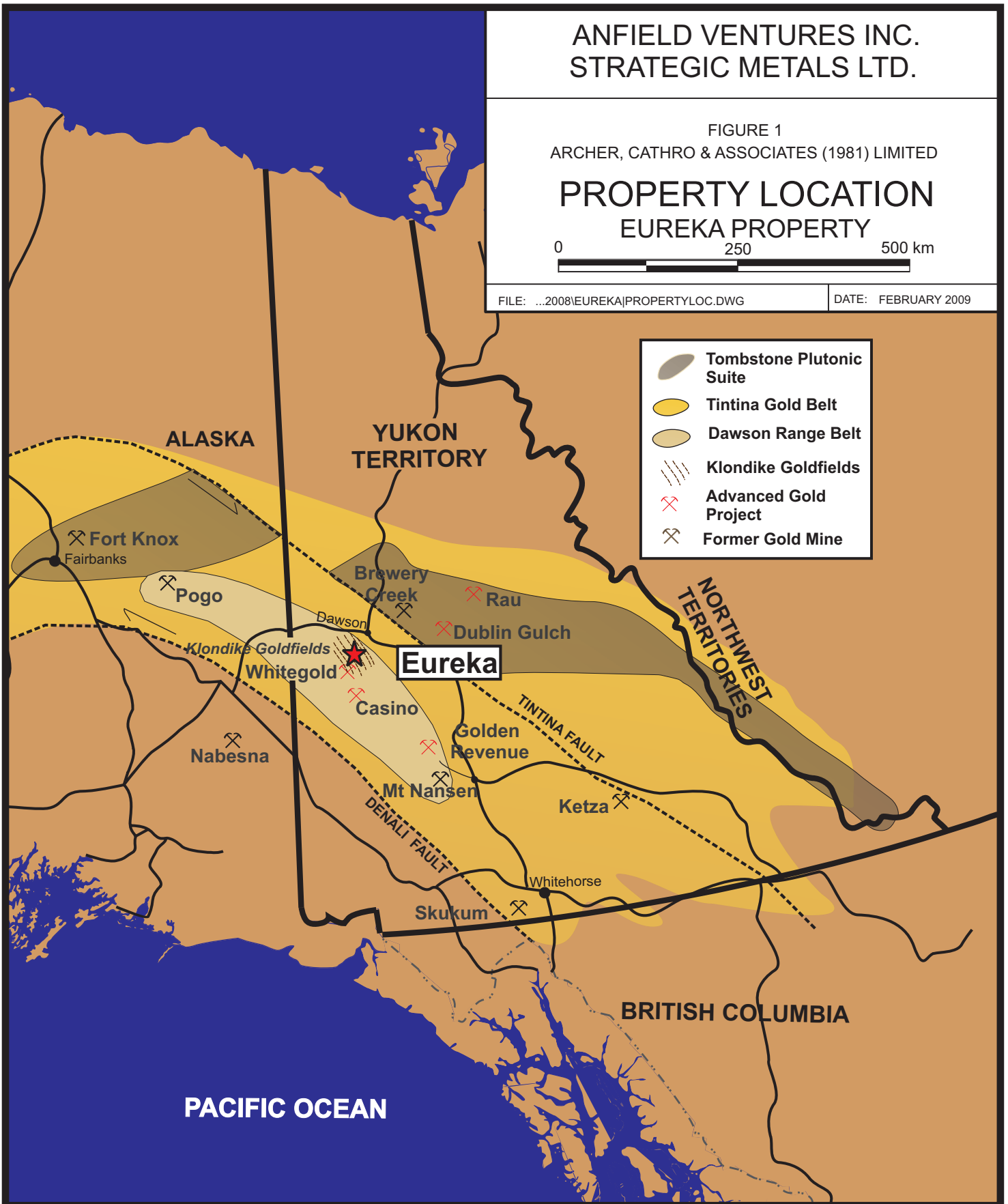
FIGURE 1  
ARCHER, CATHRO & ASSOCIATES (1981) LIMITED

## PROPERTY LOCATION EUREKA PROPERTY

0 250 500 km

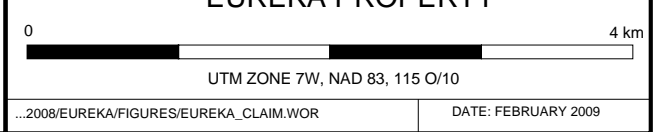
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DATE: FEBRUARY 2009

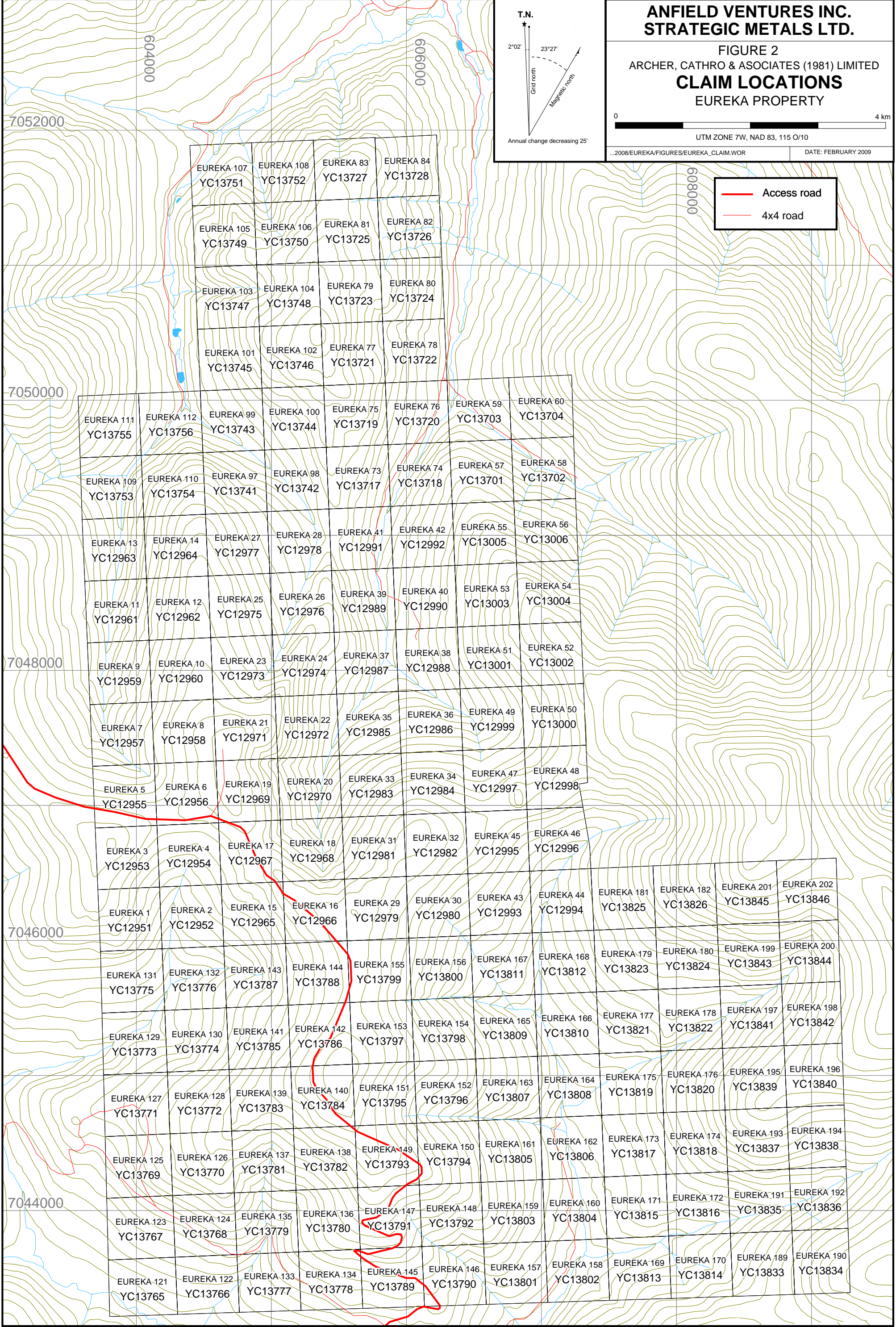


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**FIGURE 2  
ARCHER, CATHRO & ASSOCIATES (1981) LIMITED  
CLAIM LOCATIONS  
EUREKA PROPERTY**



...2008/EUREKA/FIGURES/EUREKA\_CLAIM.WOR      DATE: FEBRUARY 2009



	Access road
	4x4 road

EUREKA 107 YC13751	EUREKA 108 YC13752	EUREKA 83 YC13727	EUREKA 84 YC13728				
EUREKA 105 YC13749	EUREKA 106 YC13750	EUREKA 81 YC13725	EUREKA 82 YC13726				
EUREKA 103 YC13747	EUREKA 104 YC13748	EUREKA 79 YC13723	EUREKA 80 YC13724				
EUREKA 101 YC13745	EUREKA 102 YC13746	EUREKA 77 YC13721	EUREKA 78 YC13722				
EUREKA 111 YC13755	EUREKA 112 YC13756	EUREKA 99 YC13743	EUREKA 100 YC13744	EUREKA 75 YC13719	EUREKA 76 YC13720	EUREKA 59 YC13703	EUREKA 60 YC13704
EUREKA 109 YC13753	EUREKA 110 YC13754	EUREKA 97 YC13741	EUREKA 98 YC13742	EUREKA 73 YC13717	EUREKA 74 YC13718	EUREKA 57 YC13701	EUREKA 58 YC13702
EUREKA 13 YC12963	EUREKA 14 YC12964	EUREKA 27 YC12977	EUREKA 28 YC12978	EUREKA 41 YC12991	EUREKA 42 YC12992	EUREKA 55 YC13005	EUREKA 56 YC13006
EUREKA 11 YC12961	EUREKA 12 YC12962	EUREKA 25 YC12975	EUREKA 26 YC12976	EUREKA 39 YC12989	EUREKA 40 YC12990	EUREKA 53 YC13003	EUREKA 54 YC13004
EUREKA 9 YC12959	EUREKA 10 YC12960	EUREKA 23 YC12973	EUREKA 24 YC12974	EUREKA 37 YC12987	EUREKA 38 YC12988	EUREKA 51 YC13001	EUREKA 52 YC13002
EUREKA 7 YC12957	EUREKA 8 YC12958	EUREKA 21 YC12971	EUREKA 22 YC12972	EUREKA 35 YC12985	EUREKA 36 YC12986	EUREKA 49 YC12999	EUREKA 50 YC13000
EUREKA 5 YC12955	EUREKA 6 YC12956	EUREKA 19 YC12969	EUREKA 20 YC12970	EUREKA 33 YC12983	EUREKA 34 YC12984	EUREKA 47 YC12997	EUREKA 48 YC12998
EUREKA 3 YC12953	EUREKA 4 YC12954	EUREKA 17 YC12967	EUREKA 18 YC12968	EUREKA 31 YC12981	EUREKA 32 YC12982	EUREKA 45 YC12995	EUREKA 46 YC12996
EUREKA 1 YC12951	EUREKA 2 YC12952	EUREKA 15 YC12965	EUREKA 16 YC12966	EUREKA 29 YC12979	EUREKA 30 YC12980	EUREKA 43 YC12993	EUREKA 44 YC12994
EUREKA 131 YC13775	EUREKA 132 YC13776	EUREKA 143 YC13787	EUREKA 144 YC13788	EUREKA 155 YC13799	EUREKA 156 YC13800	EUREKA 167 YC13811	EUREKA 168 YC13812
EUREKA 129 YC13773	EUREKA 130 YC13774	EUREKA 141 YC13785	EUREKA 142 YC13786	EUREKA 153 YC13797	EUREKA 154 YC13798	EUREKA 165 YC13809	EUREKA 166 YC13810
EUREKA 127 YC13771	EUREKA 128 YC13772	EUREKA 139 YC13783	EUREKA 140 YC13784	EUREKA 151 YC13795	EUREKA 152 YC13796	EUREKA 163 YC13807	EUREKA 164 YC13808
EUREKA 125 YC13769	EUREKA 126 YC13770	EUREKA 137 YC13781	EUREKA 138 YC13782	EUREKA 149 YC13793	EUREKA 150 YC13794	EUREKA 161 YC13805	EUREKA 162 YC13806
EUREKA 123 YC13767	EUREKA 124 YC13768	EUREKA 135 YC13779	EUREKA 136 YC13780	EUREKA 147 YC13791	EUREKA 148 YC13792	EUREKA 159 YC13803	EUREKA 160 YC13804
EUREKA 121 YC13765	EUREKA 122 YC13766	EUREKA 133 YC13777	EUREKA 134 YC13778	EUREKA 145 YC13789	EUREKA 146 YC13790	EUREKA 157 YC13801	EUREKA 158 YC13802
						EUREKA 171 YC13815	EUREKA 172 YC13816
						EUREKA 173 YC13817	EUREKA 174 YC13818
						EUREKA 175 YC13819	EUREKA 176 YC13820
						EUREKA 177 YC13821	EUREKA 178 YC13822
						EUREKA 179 YC13823	EUREKA 180 YC13824
						EUREKA 181 YC13825	EUREKA 182 YC13826
						EUREKA 183 YC13827	EUREKA 184 YC13828
						EUREKA 185 YC13829	EUREKA 186 YC13830
						EUREKA 187 YC13831	EUREKA 188 YC13832
						EUREKA 189 YC13833	EUREKA 190 YC13834
						EUREKA 191 YC13835	EUREKA 192 YC13836
						EUREKA 193 YC13837	EUREKA 194 YC13838
						EUREKA 195 YC13839	EUREKA 196 YC13840
						EUREKA 197 YC13841	EUREKA 198 YC13842
						EUREKA 199 YC13843	EUREKA 200 YC13844
						EUREKA 201 YC13845	EUREKA 202 YC13846

1940s. Production records ceased during World War II and resumed in 1959 with the advent of modern mining methods. Reported production figures to 2006 from Eureka Creek total 67,830.11 ounces of gold. Similarly, the recorded gold production from Black Hills Creek immediately to the south totals about 94,506.59 ounces between 1975 and 2006 (Mining Inspection Division, 1998 and Placer Mining Section, 1983, 1985 and 1991).

Hard rock exploration in the area is poorly documented prior to 1988. The first recorded work was done on the Reka claims by Dawson Eldorado Gold Mines Ltd. and Wealth Resources Ltd., which conducted mapping and soil sampling along the ridge system separating upper Eureka Creek from Childs Creek, a tributary of Black Hills Creek. The claims were staked to cover the probable source area of an exceptionally anomalous Geological Survey of Canada (GSC) reconnaissance stream sediment sample collected from the headwaters Eureka Creek. That sample returned 89 ppb gold, 38 ppm arsenic, 0.85 ppm antimony and 110 ppb mercury, which represent 90th to 98th percentile values for each of those elements (GSC, 1986). Exploration on those claims identified three areas where north trending breccia zones coincide with gold-in-soil anomalies containing values up to 496 ppb (van Angeren, 1988).

Despite encouraging results, the Reka claims were subsequently allowed to lapse, and in 1992 the area was restaked by Wealth and Pacific Mariner Exploration Ltd. as the Clara claims. Minor soil sampling and ground geophysical surveys were carried out between 1992 and 1994, focussing on north trending breccia fault zones located near the headwaters of Eureka Creek. Some bulldozer and excavator trenching was performed in 1994 across gold-in-soil anomalies and/or VLF-EM conductors. Assays obtained from trench sampling reportedly returned up to 640 ppb gold across 2 m (Southam, 1995).

The EG and CG claims were located immediately east of the Clara claims and were worked intermittently by J. Christie between 1992 and 1995. Work on those claims consisted of stream sediment sampling and reconnaissance soil sampling.

A comprehensive study of the placer gold from Eureka and Childs Creeks was conducted by Archer Cathro during winter 1998-1999. Gold recovered from the upper reaches of both creeks is described as a mixture of coarse and fine grains with average fineness increasing downstream from 640 to 735. The gold grains are generally angular. Some contain inclusions of dark quartz while others are attached to larger white quartz fragments. All of these attributes suggest the gold is near source.

Most of the placer gold from the main creeks in the Klondike Goldfields closer to Dawson City is thought to have been reworked from the White Channel Gravels, a gold-bearing unconsolidated paleog gravel unit that caps many hills in the area. This gold is characterized by high fineness and high degree of rounding or flattening. The original source of this gold is unknown but its fineness and shape suggest it has travelled some distance. No White Channel Gravels or other paleog gravel sources for gold have been identified in the vicinity of Eureka and Childs Creeks, again suggesting local provenance from lode sources.

The results of the placer gold study prompted Nordac Resources Ltd. (now Strategic) to stake the initial 72 Eureka claims and a number of adjoining Arminus claims to cover potential lode

source areas early in 1999. Later that spring Nordac formed the Eureka Joint Venture with Expatriate Resources Ltd. and it staked an additional 314 claims.

During summer 1999 Nordac and Expatriate explored the properties with geological mapping and geochemical surveys (Wengzynowski, 2000). All claims comprising the Armenius property and some of the Eureka claims were later allowed to lapse.

In February 2002, Viceroy Resource Corporation optioned the Eureka property and explored in two areas with reverse circulation percussion drill holes totalling 390 m (Diment, 2002). The Viceroy drilling did not meet its expectations and the option was allowed to expire.

Expatriate assigned its rights concerning the Eureka property to StrataGold in January 2003 as part of a corporate reorganization.

Strategic and StrataGold signed an agreement in spring 2006 that allowed Strategic to earn a 100% interest in the property by funding the 2006 exploration program. StrataGold retains a 1% net smelter return royalty interest in any production from the property.

In summer of 2006, Strategic explored two of the three known zones on the property (the Wealth and Childs showings) with a total of 1151 m of excavator trenching and completed 823 m of percussion drilling in ten holes at the Wealth Showing. Results were generally favourable.

### **GEOMORPHOLOGY**

The Eureka property is located in the Dawson Range, an area of low mountains and hills developed where creeks and rivers have incised an old peneplane. Elevations in the vicinity of the property range from 560 m near the confluence of Eureka Creek and Indian River to 1300 m along the ridge separating Eureka Creek from Black Hill Creek. The area escaped Pleistocene glaciation and as a result the landscapes are mature with dendritic drainages forming radial fans off the flanks of upland domes. All creeks draining the property are tributaries of the Yukon River.

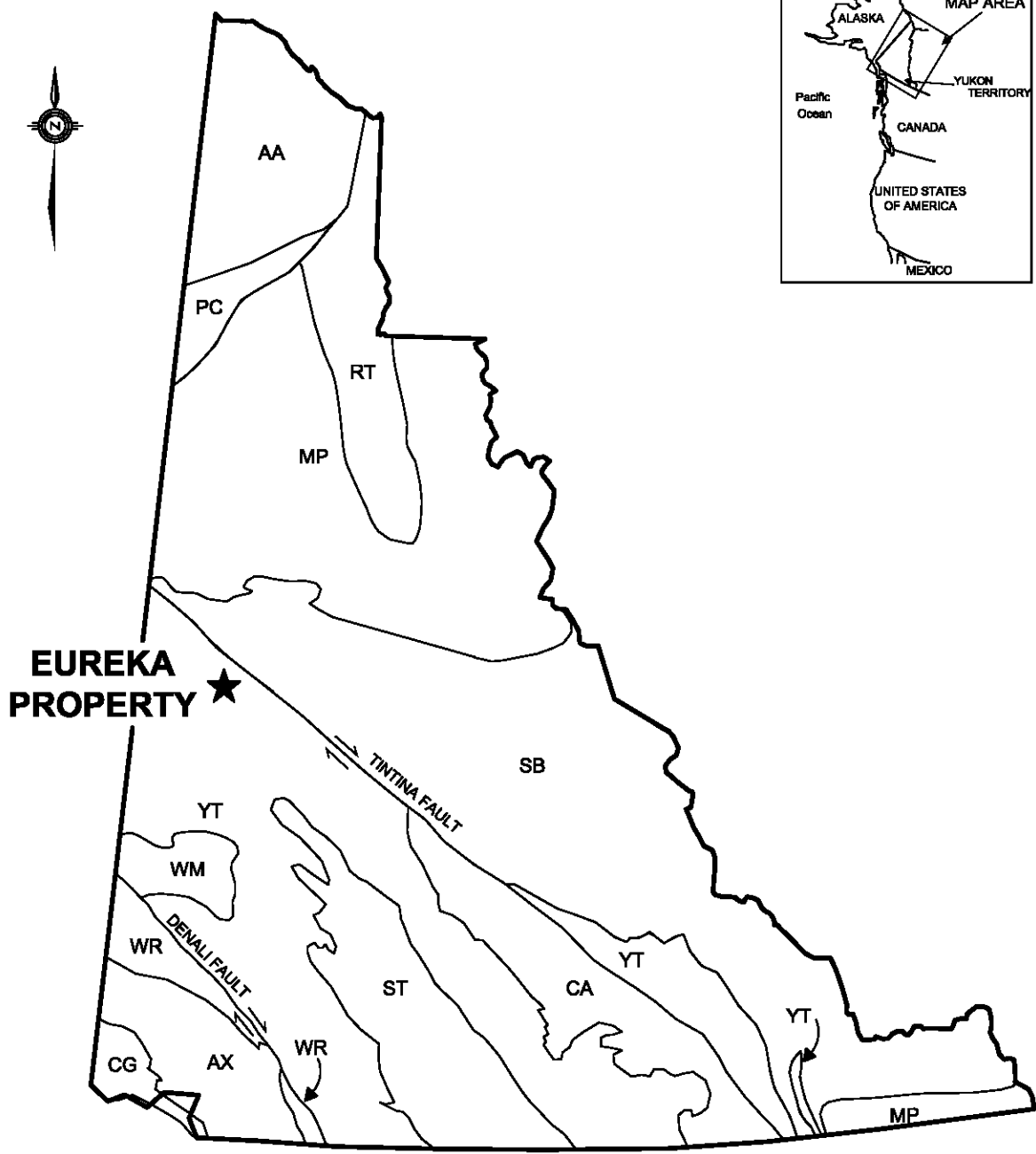
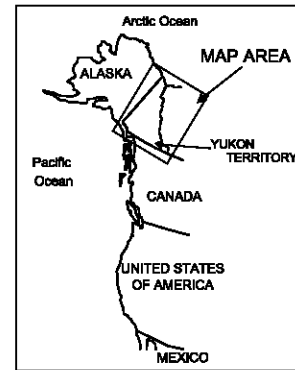
North facing slopes are blanketed by moss and Labrador tea covering 5 to 100 cm of organic matter and silty soil. Permafrost is prevalent where the organic layer exceeds 50 cm thickness. Conversely, southern slopes generally exhibit silty soil with little organic material or permafrost.

Vegetation is characterized by mature poplar stands along the Indian River and lower creek valleys, giving way to stunted black spruce and willow then thick growths of buckbrush, willow and juniper atop the domes. In 2004 the Eureka area was extensively burned by a forest fire leaving little vegetation.

### **REGIONAL GEOLOGY**

The Eureka property is located within the Yukon-Tanana Terrane (YTT) about 50 km southwest of the Tintina Fault (Figure 3).





**EUREKA  
PROPERTY** ★

TINTINA FAULT

DENALI FAULT

**ANCESTRAL NORTH AMERICA**

- MP Mackenzie Platform
- SB Selwyn Basin
- RT Richardson Trough

**TERRANES**  
Displaced Continental Margin

- AA Arctic Alaska
- CA Cessiar
- PC Porcupine

Pericratonic Terranes

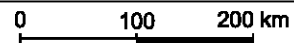
- YT Yukon-Tanana / Slide Mountain

**ACCRETED TERRANES**

- ST Stikinia / Cache Creek
- AX Alexander
- WR Wrangellia
- CG Chugach
- WM Windy McKinley

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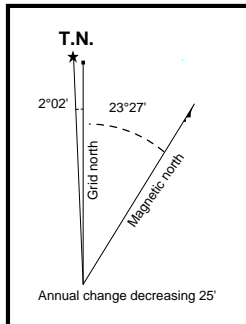
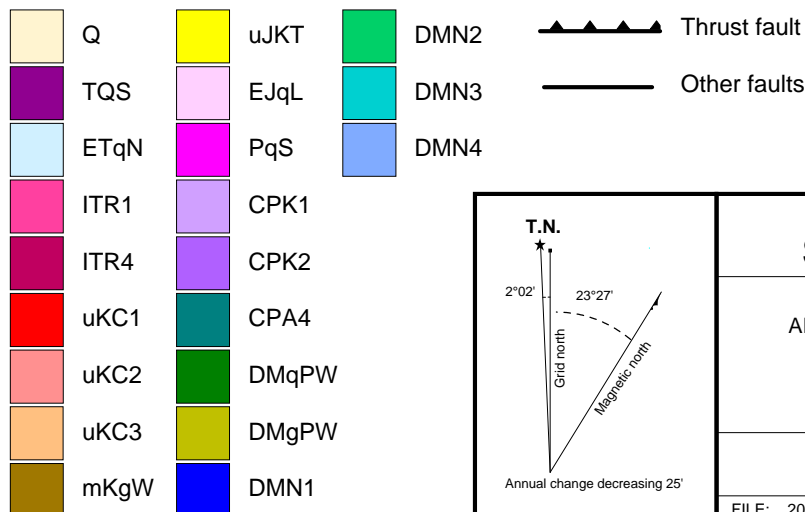
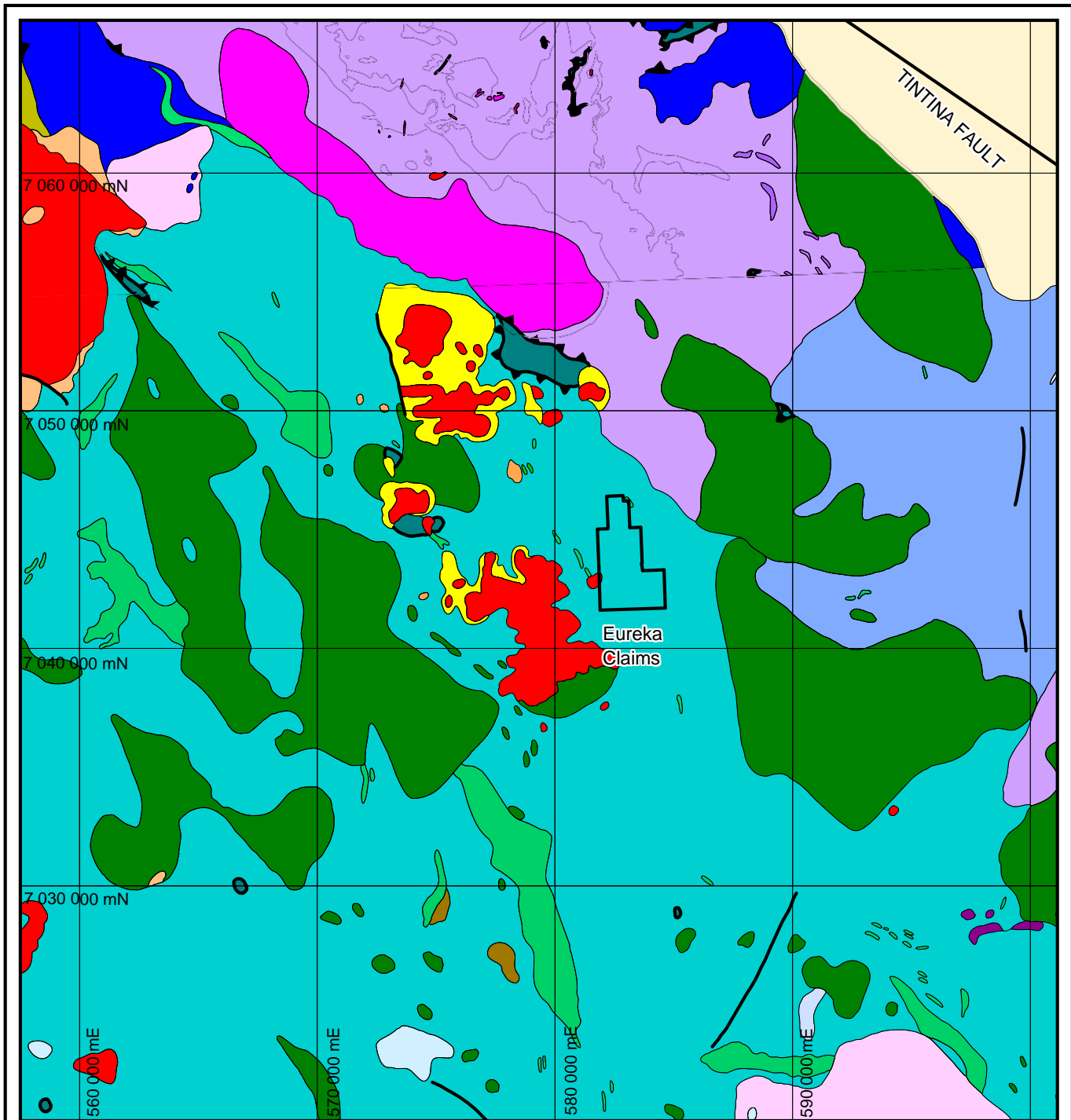
**FIGURE 3**  
ARCHER, CATHRO & ASSOCIATES (1981) LIMITED  
**TECTONIC SETTING  
EUREKA PROPERTY**



Local geology of the Klondike district is dominated by a series of regional scale thrust faults that cut Paleozoic-age metamorphic and metaplutonic rocks of the YTT. Post-thrust, Mid to Late Cretaceous volcanic flows and granitic plutons are common in the southern and western parts of the district. Table I contains a brief summary of the main lithologies in the area of the Eureka property while Figure 4 illustrates the distribution of those lithologies.

**Table I: Regional Lithologies**

Unit	Period	Description
Q	Quaternary	Unconsolidated silt, sand and gravel of predominantly fluvial origin.
TQS	Quaternary and Tertiary	<b>Selkirk Volcanics:</b> Resistant, brown weathering, columnar jointed, vesicular to massive basalt flows with minor pillow basalt, basaltic tuff and breccia.
ETqN	Early Tertiary	<b>Nisling Range Suite:</b> Series of felsic intrusives ranging from granodiorite to mafic-poor granitic compositions.
ITR1	Lower Tertiary to Eocene	<b>Ross Volcanics (1):</b> Mixture of basalt necks and pillows and gabbroic intrusives, dominantly found along the Tintina Fault.
ITR4	Lower Tertiary to Eocene	<b>Ross Volcanics (4):</b> Mixture of rhyolitic flows and tuffs, dominantly found along the Tintina Fault.
uKC1	Upper Cretaceous	<b>Carmacks Group (1):</b> Volcanic succession dominantly olivine basalt and breccia; hornblende feldspar porphyry and andesite and dacite flows with minor sandy tuff, granite boulder conglomerate, agglomerate and associated epiclastic rocks.
uKC3	Upper Cretaceous	<b>Carmacks Group (3):</b> Medium bedded, poorly sorted, coarse- to fine-grained sandstone, pebble conglomerate, shale, tuff and coal; massive to thick bedded locally derived granite or quartzite pebble to boulder conglomerate.
mKgW	Mid Cretaceous	<b>Whitehorse Suite:</b> Felsic intrusives ranging from quartz monzonite to leucogranite composition.
uJKT	Lower Cretaceous to Upper Jurassic	<b>Tantalus:</b> Massive to thick bedded chert pebble conglomerate and gritty quartz-chert-feldspar sandstone with interbedded dark grey shale, argillite, siltstone, arkose and coal.
EJqL	Early Jurassic	<b>Long Lake Suite:</b> Massive to weakly foliated, fine- to coarse-grained biotite, biotite-muscovite and hornblende quartz monzonite to granite. Contains abundant pegmatite and aplite phases with orthoclase commonly megacrystic.
PqS	Mid Permian	<b>Sulphur Creek Suite:</b> Moderately to strongly foliated biotite quartz monzonite gneiss.
CPK1	Carboniferous to Permian	<b>Klondike Schist (1):</b> Tan to rusty and black weathering muscovite and/or chloritic quartzite and quartz-muscovite-chlorite schist; quartz and/or feldspar augen-bearing quartz-muscovite (+/-chlorite) schist; includes augen gneiss and amphibolite.
CPK2	Carboniferous to Permian	<b>Klondike Schist (2):</b> Resistant white weathering, white sugary marble with a ductile flow fabric; crystalline marble.



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FIGURE 4  
ARCHER, CATHRO & ASSOCIATES (1981) LIMITED

**REGIONAL GEOLOGY  
EUREKA PROPERTY**

0 10 km  
UTM ZONE 7W, NAD 83, 1150 10

FILE: ...2008/EUREKA/REGIONAL GEOLOGY.WOR FEBRUARY 2009

CPA4	Carboniferous to Permian	<b>Anvil Range Group (4):</b> Dunite, peridotite, gabbro, pyroxenite, harzburgite and minor diorite, hornblendite and diabase; serpentinite, orange weathering quartz-carbonate rock with minor green chromian muscovite, talc-carbonate schist and carbonatized ultramafic rocks.
DMqPW	Late Devonian to Mississippian	<b>Pelly Gneiss Suite:</b> Foliated equigranular, medium grained muscovite quartz monzonite moderately to strongly foliated K-feldspar augen quartz monzonitic to granitic gneiss.
DMgPW	Late Devonian to Mississippian	<b>Pelly Gneiss Suite:</b> Foliated medium grained, homogenous biotite granite gneiss to biotite or hornblende granodiorite gneiss; includes interfoliated amphibolite, quartz-mica schist and phyllites.
DMN1	Devonian, Mississippian and older (?)	<b>Nasina Assemblage (1):</b> Dark grey to black, fine grained graphitic and non-graphitic quartzite, grey micaceous quartzite and quartz-muscovite schist. Locally garnetiferous with minor graphitic stretched metaconglomerate and metagrit.
DMN2	Devonian, Mississippian and older (?)	<b>Nasina Assemblage (2):</b> Marble.
DMN3	Devonian, Mississippian and older (?)	<b>Nasina Assemblage (3):</b> Quartzite, micaceous quartzite, quartz-muscovite schist, and minor metaconglomerate and metagrit. May locally include significant Nisling Assemblage.
DMN4	Devonian, Mississippian and older (?)	<b>Nasina Assemblage (4):</b> Quartzite, micaceous quartzite, quartz-muscovite schist, and minor metaconglomerate and metagrit. May locally include significant Klondike Schist Assemblage.

Outcrop exposure is poor across most of the district and is generally confined to ridge crests, deeply incised drainages and road cuts.

### **Structure**

Four phases of deformation are observed in layered rocks of the YTT within the Klondike district. The deformation is thought to have occurred from Mid-Permian to Cretaceous during and following accretion of YTT to North America. Phase I involved Mid-Permian regional-scale metamorphism which resulted in penetrative foliation approximately parallel to original bedding. This fabric trends roughly northwest and dips gently to the northeast. Small-scale isoclinal folds were also developed at this time. The Phase II event occurred between Mid-Permian and Late Triassic and formed close spaced crenulation cleavage. At least three different sub-phases of crenulation cleavage are observed. The latest may be associated with the development of thrust faults, which are constrained to the period between Late Triassic and Early Jurassic. The onset of this faulting is also coincident with the emplacement of serpentinite bodies along the faults and small-scale isoclinal folding, kink banding and warping. The final phase of deformation is coeval with the emplacement of Cretaceous intrusive bodies and resulted in broad, low amplitude folding that masks and overprints the Phase I foliation. Steep faults are developed adjacent to some Cretaceous intrusions and are major controls for many drainages. Displacement on these structures is unknown but is believed to be minor.

## **PROPERTY GEOLOGY**

No property-wide detailed mapping has been done, mainly because of very limited bedrock exposure. Figure 5 shows the distribution of three main units and the location of prominent airphoto lineaments. Unit A is augen orthogneiss of the Devono-Mississippian Pelly Gneiss Suite. Unit B includes quartzite, phyllite and quartz-muscovite-biotite schist while Unit C is limestone. They likely belong to the Nasina Assemblage.

### **Unit A**

**Augen Orthogneiss** is grey and weathers as large blocky slabs. The matrix is well foliated and contains quartz, feldspar, biotite and muscovite. Augen are potassium feldspar ranging from 1 to 8 mm in diameter with aspect ratios of about 2:1.

### **Unit B**

**Quartz-muscovite-biotite schist** is dull greenish brown to grey and thinly foliated. It has been observed as homogeneous horizons over 10 m thick and as foliaform bands less than <0.5 m thick within quartzite. Chlorite, sericite and feldspar are common accessory minerals often developed parallel to foliation. Where the schist contains feldspar it is usually crumbly due to the alteration of feldspar to clay minerals. Elsewhere it forms platy slabs. This is the most abundant rock type observed on the property.

**Quartzite** is dark grey to white and blocky weathering. It forms resistant knobs near the top of ridge crests. The matrix is weakly to moderately sucrosic and often contains variable quantities of biotite and muscovite, which define foliation planes. None of the specimens tested was calcareous.

**Phyllite** is grey-blue to black, non-graphitic and recessive weathering. This unit was only observed at three locales, two of which were in old trenches. At all three sites, the phyllite is strongly clay altered and has a gougy and/or crumbly texture.

### **Unit C**

**Limestone** is cream coloured, buff weathering and competent. The matrix is coarsely crystalline and contains variable amounts of biotite and muscovite. Near the headwaters of Childs Creek, the limestone is locally skarnified and exhibits diopside, garnet and minor sulphides.

### **Structure**

Eureka and Childs Creeks, which drain the uplands west of Eureka Dome, are believed to coincide with high angle, north and northwest trending faults. Displacement along these faults is unknown but the presence of strongly milled, quartz rich breccia zones suggests a complex, multi-stage history.

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FIGURE 5  
ARCHER, CATHRO & ASSOCIATES (1981) LIMITED  
**PROPERTY GEOLOGY**  
EUREKA PROPERTY

SCALE 1:50,000

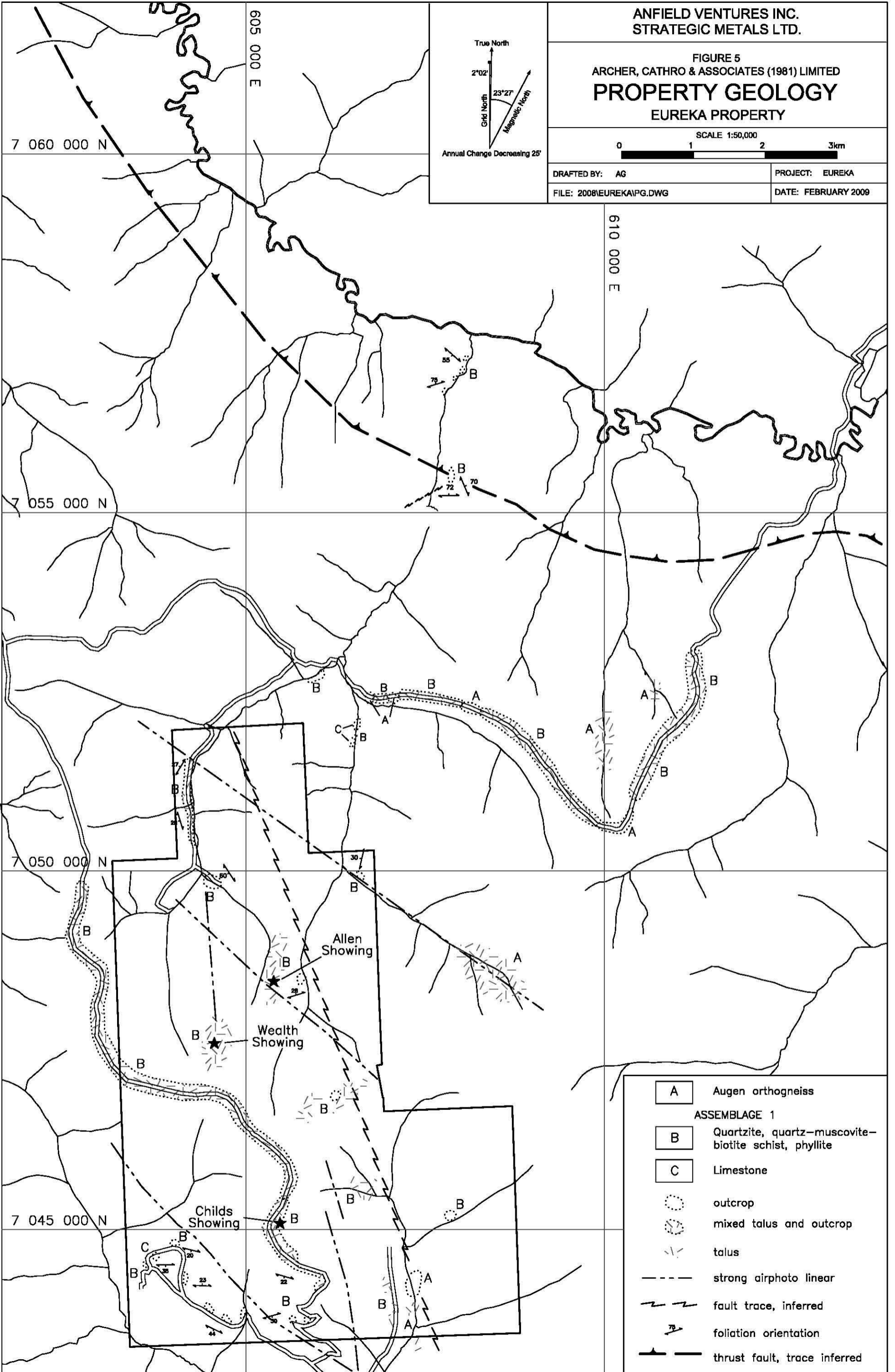
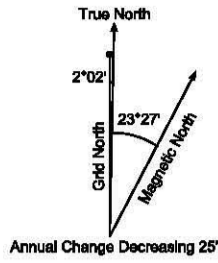
0 1 2 3km

DRAFTED BY: AG

PROJECT: EUREKA

FILE: 2008\EUREKA\PG.DWG

DATE: FEBRUARY 2009



- A Augen orthogneiss
- ASSEMBLAGE 1**
- B Quartzite, quartz-muscovite-biotite schist, phyllite
- C Limestone
- outcrop
- mixed talus and outcrop
- talus
- strong airphoto linear
- fault trace, inferred
- foliation orientation
- thrust fault, trace inferred

Abundant quartz vein float is present in all placer creeks but only a few veins have been observed cutting bedrock. They normally strike towards the northeast and dip steeply to the northwest. Fracturing is evident in most outcrops and talus fragments, especially in quartzite. Limonite after pyrite is common along fracture selvages.

Folding and warping are implied by erratic foliation attitudes observed across the property. No folds were seen at outcrop-scale and too few foliation measurements were taken to identify the axes of large-scale structures.

### **SOIL AND SILT GEOCHEMISTRY**

No reconnaissance- or grid-style geochemical surveys were done in 2008. Previous surveys showed that the best results for gold and most of its pathfinder elements are from soils taken in a 2000 by 500 m north-northeast trending area that encompasses the headwaters of Eureka Creek (Figures 6 and 7), covering both the Wealth and Allen Showings. Within this zone the most anomalous samples ranged between 100 and 500 ppb gold. Follow-up hand pitting and excavator trenching showed that the soil anomalies are associated with gold bearing breccias. Flakes of free gold were panned from soil at the bottom of two of the most anomalous soils pits.

Reconnaissance sampling along strike to the south also returned moderately to strongly anomalous values over a distance of about 4 km. Most of the samples taken along a road cut that winds through this area returned higher values than were obtained from nearby sample sites on undisturbed hillsides. This suggests that soils collected from deep in the soil profile by augers may give better results than those collected closer to surface from pits dug with mattocks or shovels.

Compilation of data from silt sampling by various parties shows background to moderately anomalous values from most streams on the property. Very strongly anomalous values were reported from four tributaries at Eureka Creek, immediately east of the claim block. Two high values were also reported from a tributary of Childs Creek in the southeast corner of the property.

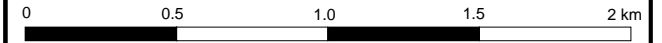
### **MINERALIZATION**

The Eureka property hosts two main types of gold mineralization: 1) auriferous quartz breccias that are found along high angle structures in the headwaters of Eureka Creek; and, 2) massive quartz veins with elevated but sub-economic concentrations of gold, which have not been noted in several parts of the property.

**Quartz breccia** is grey to white and contains varying amounts of orange to brown limonite. Specimens are subangular to well rounded and exhibit strong pitting on the weathered surfaces. They are autoclastic in nature and moderately to strongly milled. Cement that heals the fragments appears to be rock-flour developed during brecciation. Samples of the breccia generally show positive correlations between gold, silver, arsenic, molybdenum and lead. Antimony and bismuth values are very low. The highest assay from surface came from a piece of strongly limonitic breccia float with remnant pyrite that was collected from the Allen

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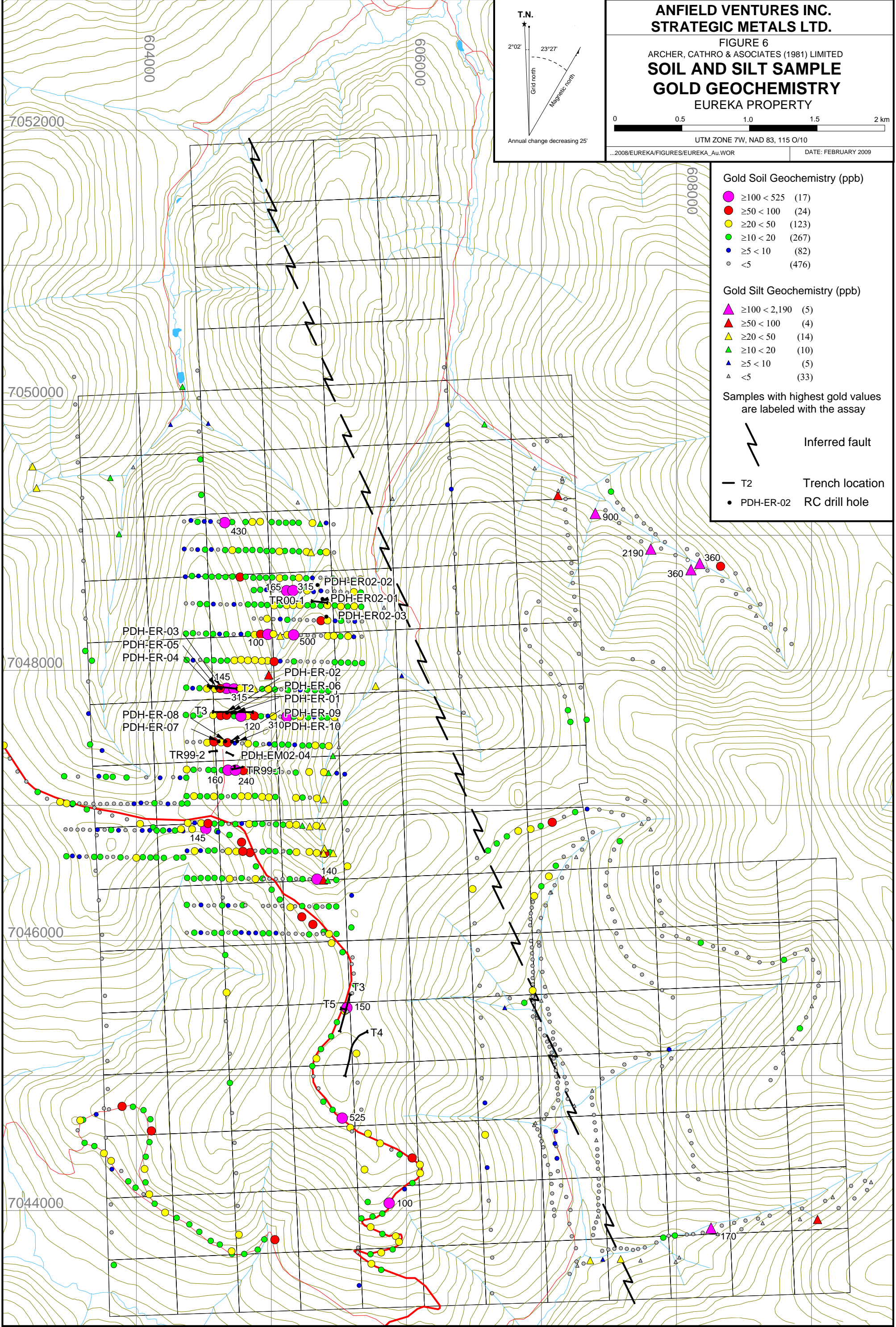
**FIGURE 6  
ARCHER, CATHRO & ASSOCIATES (1981) LIMITED  
SOIL AND SILT SAMPLE  
GOLD GEOCHEMISTRY  
EUREKA PROPERTY**



UTM ZONE 7W, NAD 83, 115 O/10

...2008/EUREKA/FIGURES/EUREKA\_Au.WOR

DATE: FEBRUARY 2009



**Gold Soil Geochemistry (ppb)**

●	≥100 < 525	(17)
●	≥50 < 100	(24)
●	≥20 < 50	(123)
●	≥10 < 20	(267)
●	≥5 < 10	(82)
○	< 5	(476)

**Gold Silt Geochemistry (ppb)**

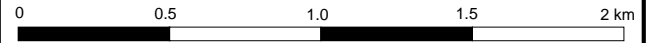
▲	≥100 < 2,190	(5)
▲	≥50 < 100	(4)
▲	≥20 < 50	(14)
▲	≥10 < 20	(10)
▲	≥5 < 10	(5)
▲	< 5	(33)

- Samples with highest gold values are labeled with the assay
- Inferred fault
  - T2 Trench location
  - PDH-ER-02 RC drill hole



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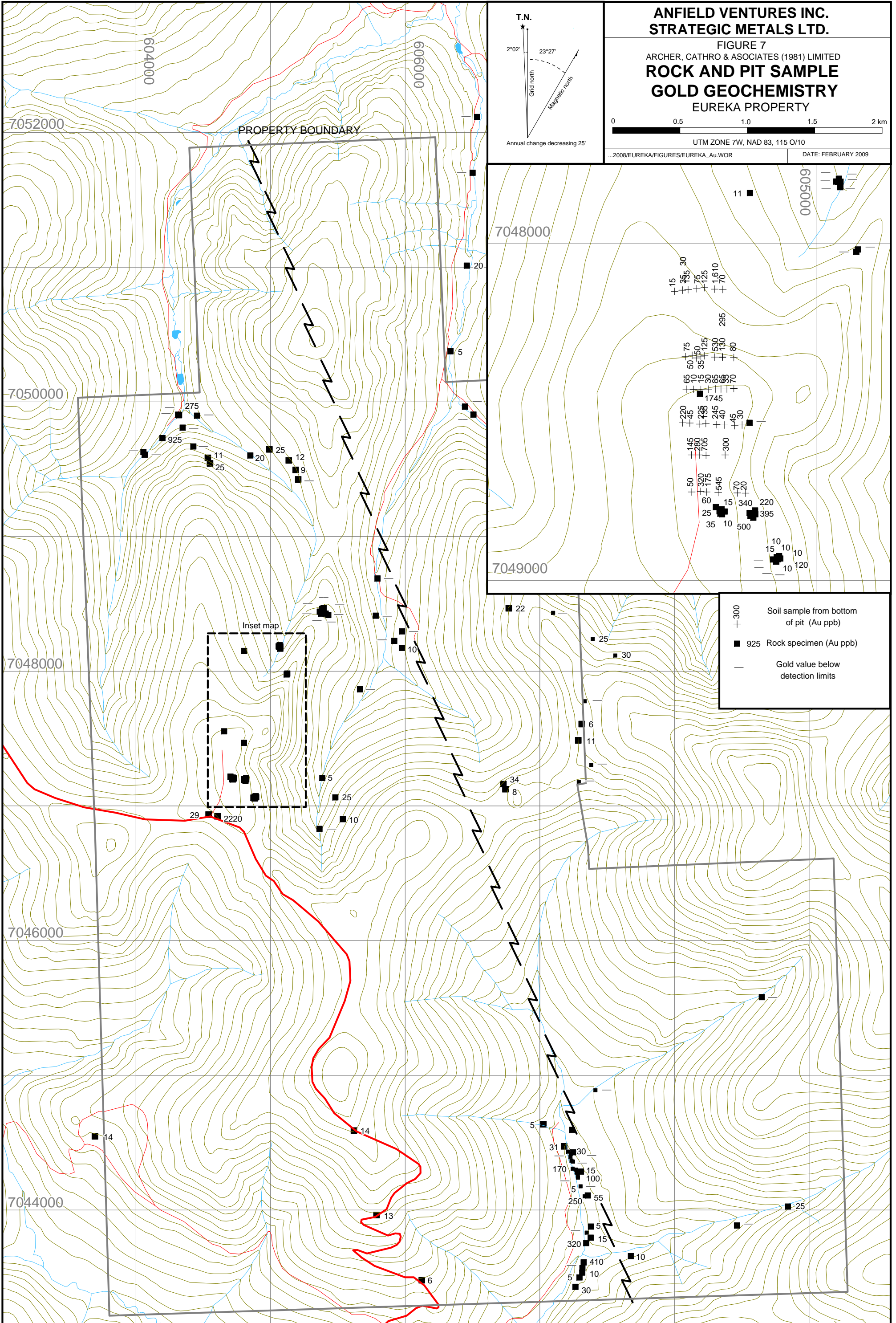
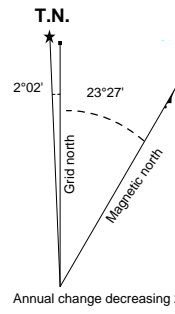
**FIGURE 7  
ARCHER, CATHRO & ASSOCIATES (1981) LIMITED  
ROCK AND PIT SAMPLE  
GOLD GEOCHEMISTRY  
EUREKA PROPERTY**



UTM ZONE 7W, NAD 83, 115 O/10

...2008/EUREKA/FIGURES/EUREKA\_Au.WOR

DATE: FEBRUARY 2009



Showing. This sample returned 15 g/t gold, 25.5 g/t silver, 3510 ppm arsenic and 23 ppm molybdenum (Wengzynowski, 2000). Float specimens of similar material, collected between the Allen and Wealth showings, yielded values ranging from 120 to 1745 ppb gold.

**Quartz vein** material is usually clear to white, strongly fractured and sub-rounded. Rusty pits after sulphides occur as dissemination and along fractures. Remnant sulphides in order of decreasing abundance are pyrite, galena, chalcopyrite and arsenopyrite. Textural variations between vein specimens are predominantly attributed to the degree of fracturing. Some vein specimens exhibit crackle brecciation, but they are distinguished from the milled quartz breccias because their fragments are very angular and their matrices comprise only a small percentage of the rock.

Previous work has outlined three areas of gold mineralization known as the Allen, Wealth and Childs showings (Figure 8).

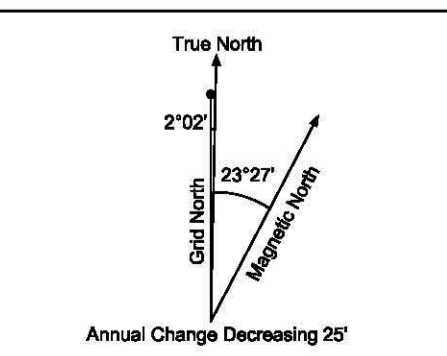
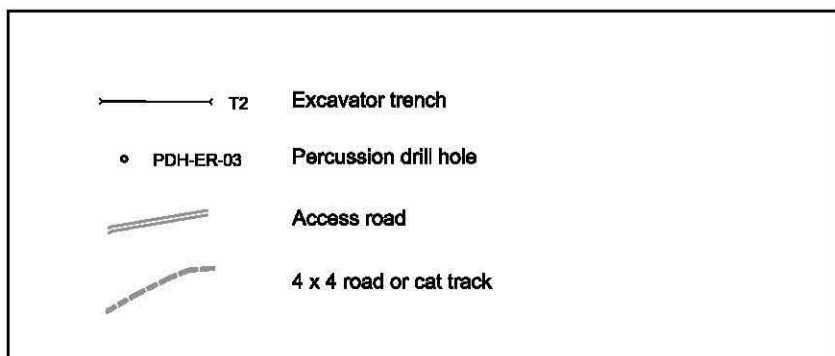
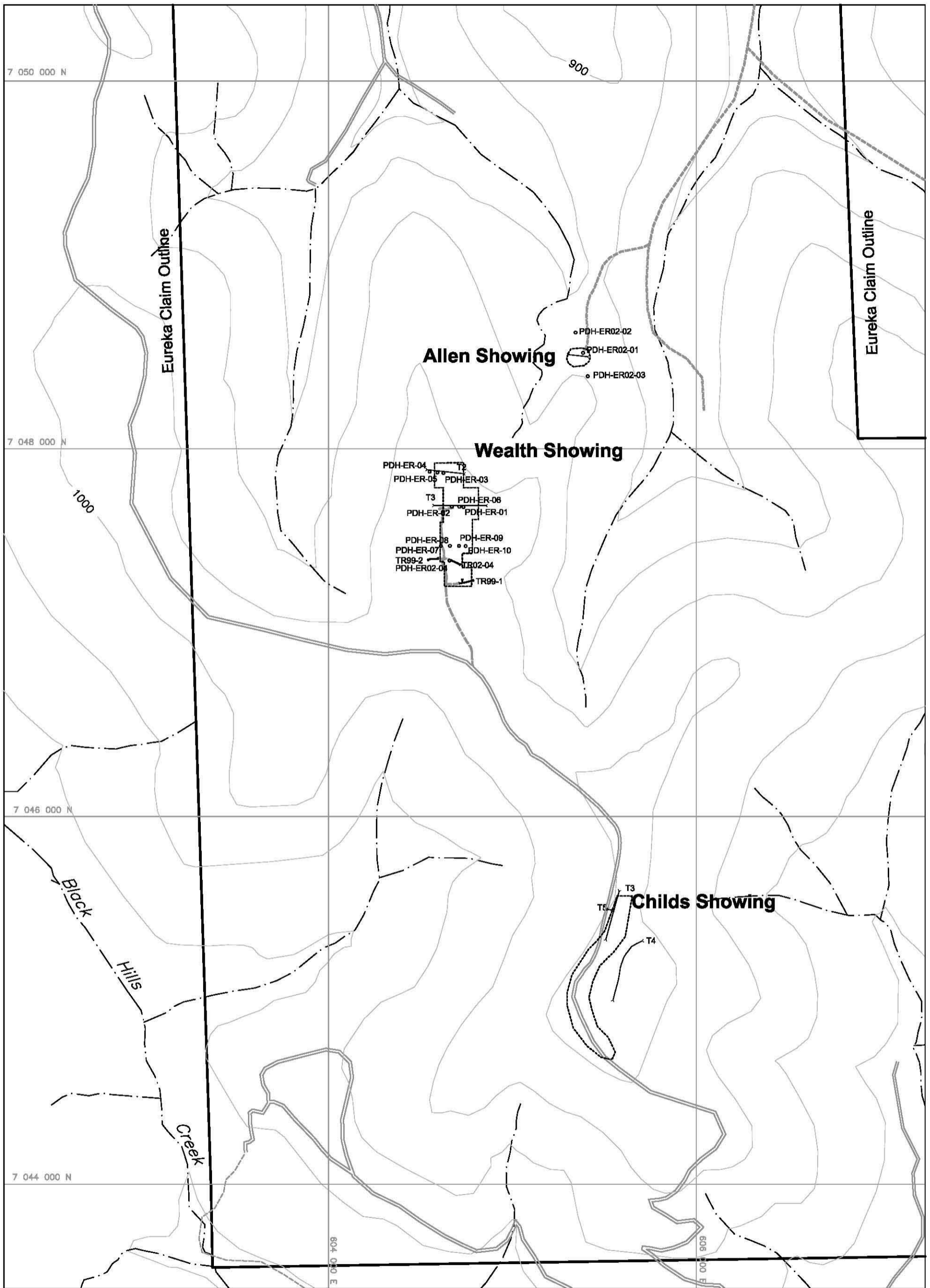
### **Allen Showing**

The Allen Showing is exposed in a trench cut along a north trending ridge near the upper reaches of Eureka Creek. It consists of a breccia and clay alteration zone that is from 2 to 5 m wide and trends approximately north to north-northwest. Select rock samples returned up to 15 g/t from this zone, but a chip sample returned only 0.44 g/t across 4 m. None of the three holes drilled by Viceroy at the Allen Showing intersected significant gold mineralization.

### **Wealth Showing**

The Wealth Showing lies within a 600 by 250 m gold-in-soil anomaly (>20 to 315 ppb Au) located 800 m southwest of the Allen Showing. Five trenches excavated across the Wealth Showing exposed quartz breccias and associated alteration halos (Figure 9). The highest gold assay for surface came from trenches in clay-rich zones exposed in the northern part of the showing. Those intervals included 0.54 g/t gold across 20 m in T1 and 0.75 g/t gold across 10 m and 1.06 g/t gold across 2 m in T2 (Wengzynowski, 2006). The intensity of clay alteration and the gold contents are lower in three trenches further to the south; with highs of 0.41 g/t gold across 6.0 m and 0.34 g/t gold across 6.5 m in trenches TR-99-01 and TR-02-04 respectively.

Percussion drilling completed in 2006 focussed on the north and central parts of the Wealth Showing with three holes drilled along each of two section lines beneath trenches T1 and T2 and four holes along a section line approximately 200 m to the south of T1 (Figure 8). Significant intersections are shown in Table II. On the northern section line PDH-ER-05 returned 1.38 g/t gold across 3.05 m approximately down dip of trench chip sample that yielded 1.06 g/t across 2 m and PDH-ER-03, PDH-ER-05 and PDH-ER-04 returned 0.30 g/t gold across 15.25 m, 0.59 g/t gold across 18.30 m and 0.48 g/t across 3.05 m, respectively, down dip from a chip sample that graded 0.75 g/t gold across 10 m. Both PDH-ER-04 and PDH-ER-05 were abandoned while in mineralization. Holes on the central section line were disappointing yielding only 0.32 g/t gold across 9.15 m in PDH-ER-06 and 0.42 g/t gold across 3.05 m in PDH-ER-02. The best results were obtained from the holes drilled along the southern section line. Here, several breccia zones

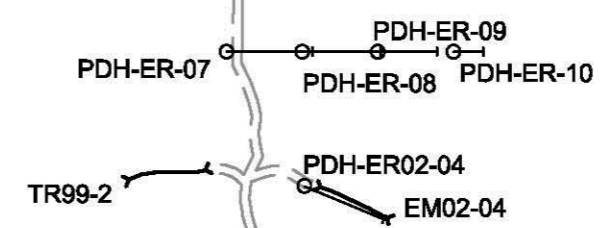
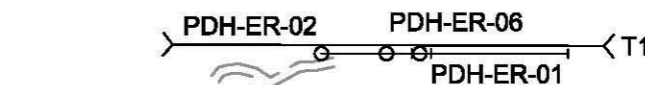
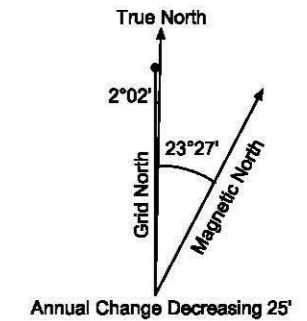
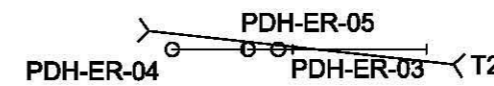
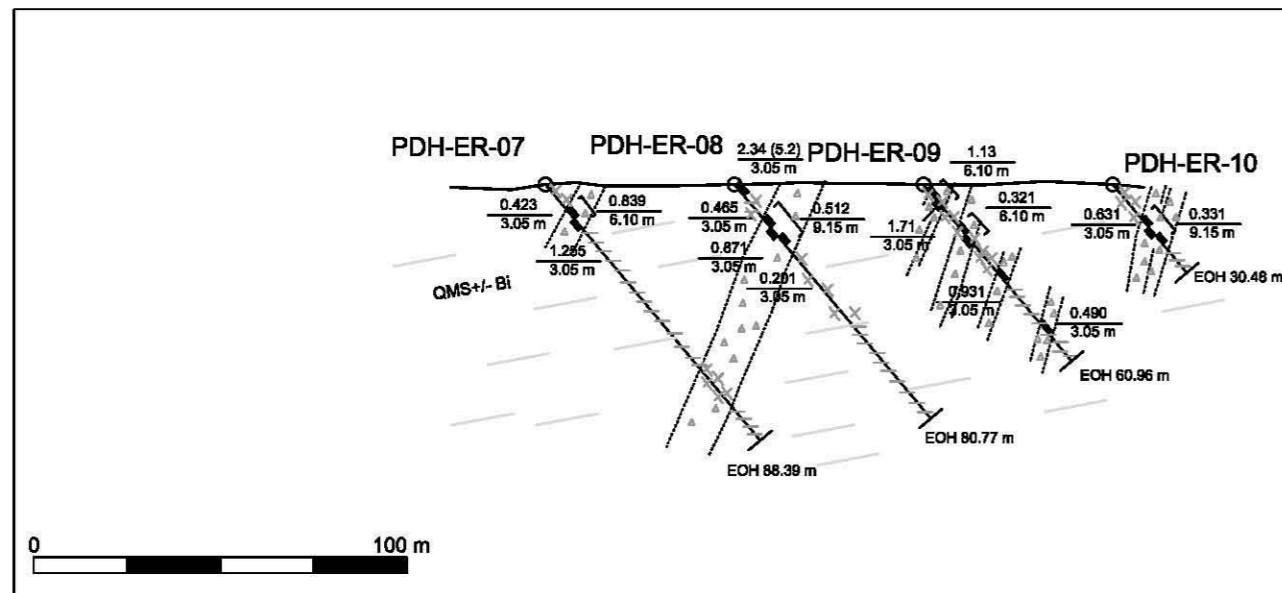
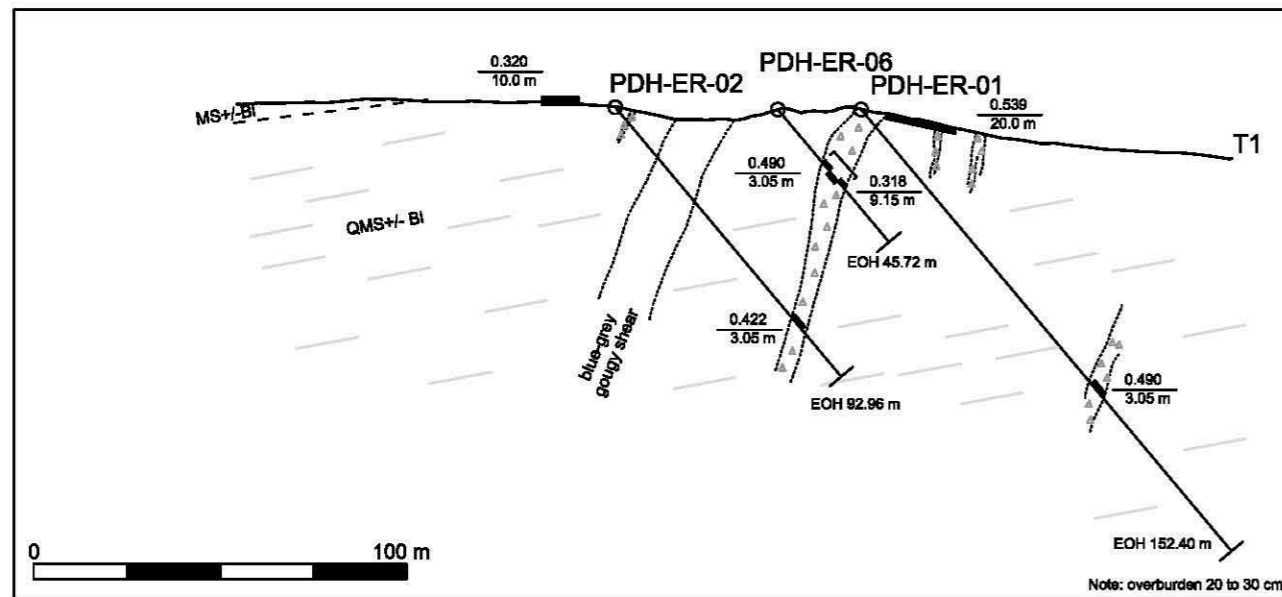
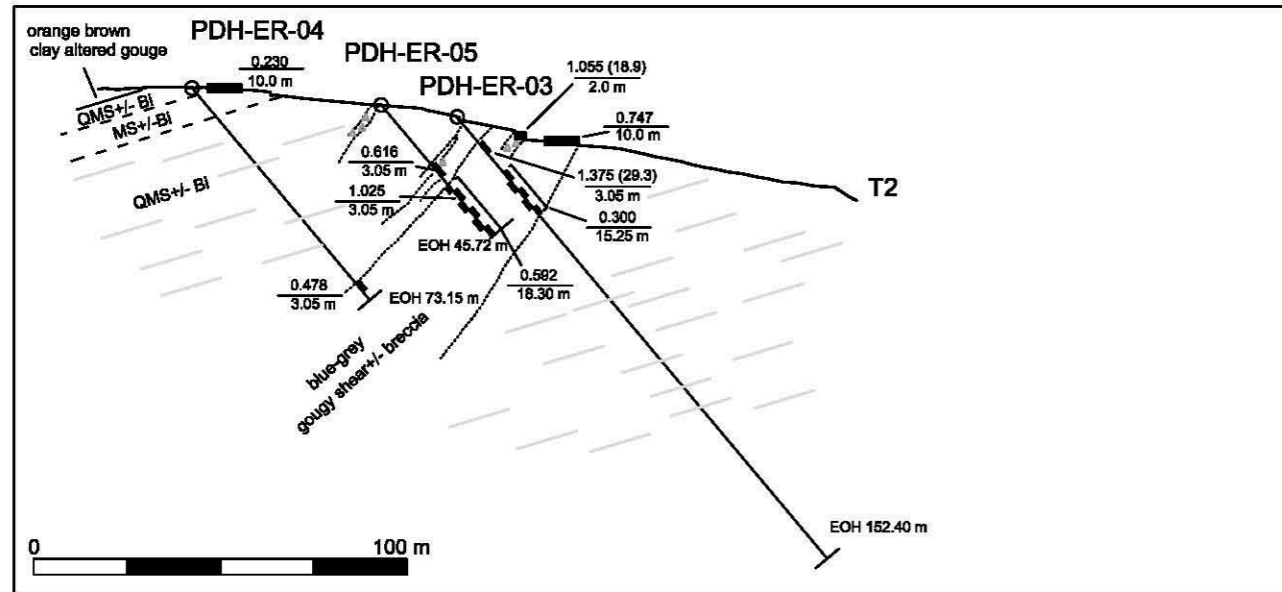


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**FIGURE 8**  
ARCHER, CATHRO & ASSOCIATES (1981) LIMITED  
**TRENCHES AND DRILL HOLE  
LOCATIONS  
EUREKA PROPERTY**

0 0.5 1.0 km  
UTM ZONE 7V, NAD 83, 115010

FILE: ...2008/EUREKA/F\_5-TR LOC.DWG DATE: JANUARY 2009



- ××× Quartz+oxide fragments
  - △△ Breccia
  - ≡ Biotite-muscovite-quartz schist +/- pyrite
- 0.331 (29.8) = g/t Au (g/t Ag)  
9.15 m metres

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**FIGURE 9**  
ARCHER, CATHRO & ASSOCIATES (1981) LIMITED  
**DRILL HOLE LOCATIONS  
AND SECTIONS**  
WEALTH SHOWING  
EUREKA PROPERTY

were encountered, including some of the highest grades yet observed on the property. Results included 2.34 g/t gold over 3.05 m and 1.13 g/t gold over 6.10 m.

**Table II: Significant Drill Results**

Drill Hole	Section Line	Au (g/t)	Sample Interval (m)
PDH-ER-05	T2	1.38	3.05
PDH-ER-05	T2	0.59	18.30
PDH-ER-03	T2	0.30	15.25
PDH-ER-04	T2	0.48	3.05
PDH-ER-06	T1	0.32	9.15
PDH-ER-02	T1	0.42	3.05
PDH-ER-07	200 m south of T1	0.84	6.10
PDH-ER-08	200 m south of T1	2.34	3.05
PDH-ER-08	200 m south of T1	0.51	9.15
PDH-ER-09	200 m south of T1	1.13	6.10
PDH-ER-09	200 m south of T1	0.32	3.05
PDH-ER-09	200 m south of T1	0.93	3.05
PDH-ER-09	200 m south of T1	0.49	3.05
PDH-ER-10	200 m south of T1	0.33	9.15

### **Childs Showing**

Three trenches have been excavated in the vicinity of the Childs Showing (Figure 8). They were designed to better test gold-bearing breccia zones exposed in an old bulldozer trench and a hand trench.

Trenches T3 and T4 were excavated subparallel to the trend of the breccia zones. They encountered a 2 to 5 m wide zone traceable for roughly 500 m along strike. Chip samples collected obliquely across this zone in trench T3 were weakly elevated for gold, yielding 0.23 g/t across 4 m, while the same zone sampled in trench T4 returned a weighted average grade of 0.72 g/t gold across an approximate true width of 4 m (Wengzynowski, 2006).

Trench T5 was excavated perpendicular to the trend hosting of breccia zone. It exposed a parallel breccia zone, a chip sample from which returned 0.48 g/t gold across a true width of 5.5 m.

### **GEOPHYSICAL SURVEYS**

Between July 9 and July 12, 2008, helicopter-borne magnetometer and VTEM surveys were conducted over the Eureka property by Geotech Ltd. of Aurora, Ontario. The surveys were flown with an Astar 350 B3 helicopter operated by TRK Helicopters Ltd. from a temporary base in Dawson City. Appendix II contains Geotech's report describing equipment used, survey methodology and results obtained. A CD attached to that report features the digital survey data.

A total of 469 line-km were flown on north-south lines spaced 100 m apart. Average height above ground was 40 m for the VTEM bird and 62 m for the magnetic sensor. Survey results are presented as dB/dt and total magnetics (Figure 10) and B-field and total magnetics (Figure 11).

Magnetic response was generally subdued over the survey area with total magnetic intensity varying from 57302 to 57392 nT. A sharp, northerly trending break separates two fields with higher values in the northeast and lower values in the southwest. This break coincides with a linear topographic feature, which probably represents a major fault. About 1.5 km to the west there is much weaker magnetic feature that parallels the main break. This secondary feature follows the axis of the main soil geochemical anomaly, crossing through the Wealth and Childs Showings.

The dB/dt and B-field surveys both show a weak to moderate linear anomaly that starts in the southeast corner of the survey area and extends north-northeast approximately a third of the way up the grid. This anomaly coincides with the inferred fault and may reflect increased conductivity in saturated clay gouge similar to that observed in other smaller fault zones exposed in trenches.

### **DISCUSSION AND CONCLUSIONS**

The Eureka property covers structurally hosted, gold bearing breccia zones near the headwaters of Eureka and Childs Creeks. These zones are primarily developed in moderately west dipping, north trending structures that cut gently dipping quartz rich schists.

Trenching and reverse circulation percussion drilling at the Wealth Showing have identified up to seven subparallel breccia zones that are interpreted to comprise an aggregate thickness of about 40 m within a 160 m wide section. The zones are relatively evenly spaced along the section lines and individual obtain maximum thicknesses of about 20 m.

Gold values are highest within and directly adjacent to the breccia zones. Typical pathfinder elements, such as arsenic and bismuth, are more erratically distributed exhibiting excellent correlation with gold in some intervals and very little in others.

Results from exploration at the Wealth and Childs Showings have confirmed the general link between gold and breccia zones. Although the gold grades and widths encountered to date are not economic, there is good geological and assay continuity, both laterally and vertically between the various trenches and drill holes at the Wealth Showing. It is possible that the breccia zones may change in character at depth or along strike becoming wider or richer. The mineralization zones are open to extension, and it is also possible that they could attain greater widths in the vicinity of structural junctions. A large part of the Eureka property has only been lightly explored. Thus, potential still exists for higher grade zones or low grade bulk tonnage style gold mineralization.

VTEM and magnetic surveys completed in 2008 appear to have identified a major fault and recognise a secondary magnetic anomaly in the vicinity of the Wealth and Childs Showings.

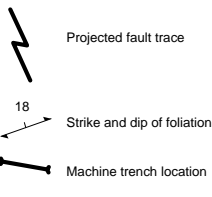
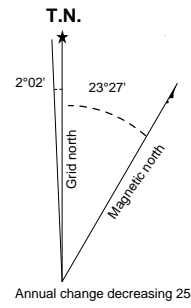




UTM ZONE 7W, NAD 83, 115 O/10

...2008/EUREKA/FIGURES/B-FIELD.WOR

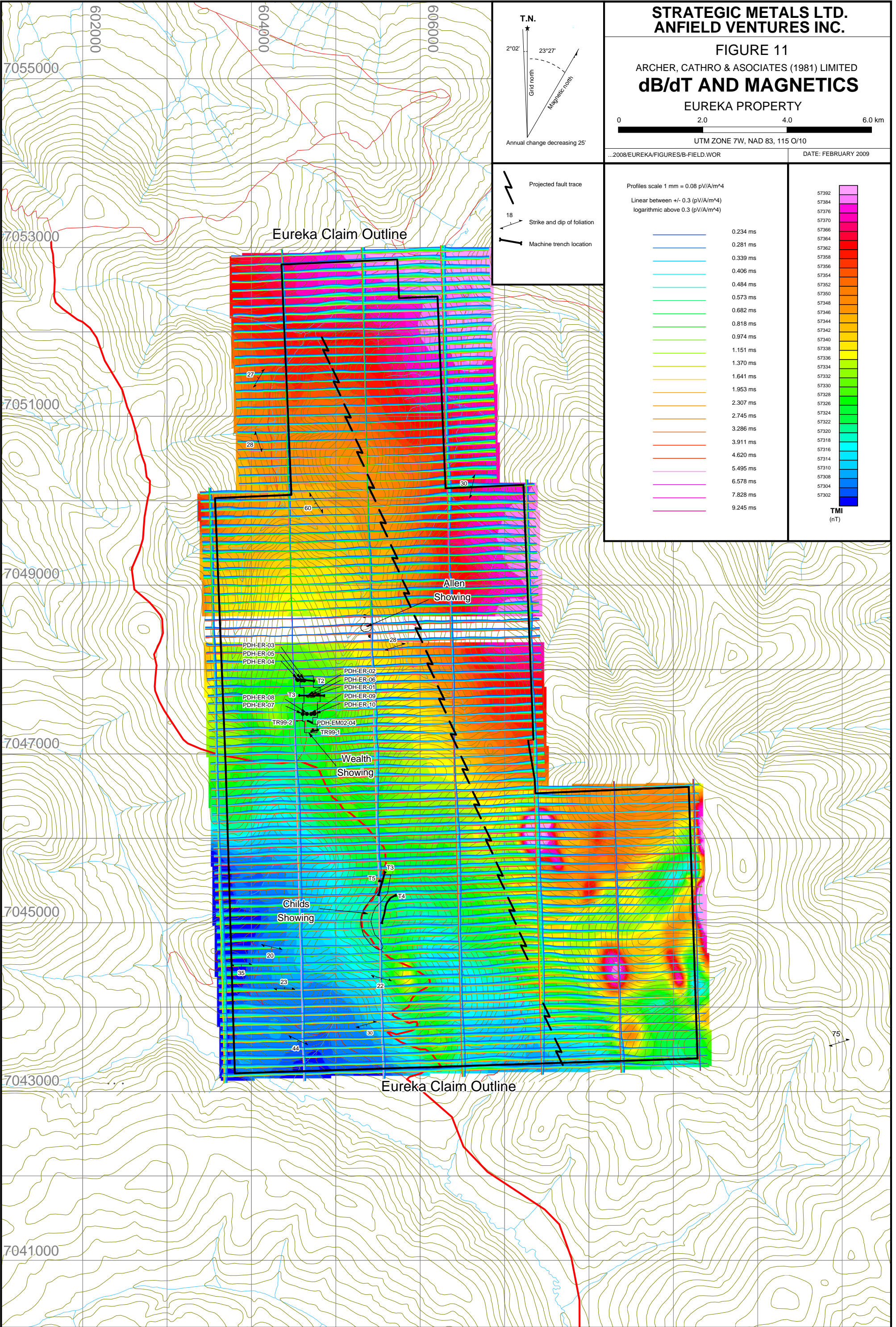
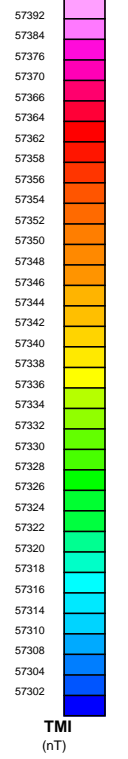
DATE: FEBRUARY 2009



Profiles scale 1 mm = 0.08 pV/A/m<sup>4</sup>

Linear between +/- 0.3 (pV/A/m<sup>4</sup>)  
logarithmic above 0.3 (pV/A/m<sup>4</sup>)

- 0.234 ms
- 0.281 ms
- 0.339 ms
- 0.406 ms
- 0.484 ms
- 0.573 ms
- 0.682 ms
- 0.818 ms
- 0.974 ms
- 1.151 ms
- 1.370 ms
- 1.641 ms
- 1.953 ms
- 2.307 ms
- 2.745 ms
- 3.286 ms
- 3.911 ms
- 4.620 ms
- 5.495 ms
- 6.578 ms
- 7.828 ms
- 9.245 ms





Although the secondary anomaly is very weak it could be significant, possibly marking minor pyrrhotite in the breccia zones at depth.

The recent discovery of highly prospective gold mineralization at White Gold property by Underworld Resources should be a stimulus to continue exploration at the Eureka property. The White Gold property lies 50 km to the southwest and is hosted in structural zones within the same general package of rocks.

Future work at Eureka property should include closely spaced soil auger sampling coupled with continued excavator trenching. Additional claims should be staked to cover the very anomalous silt samples reported from creeks immediately to the east of the property.

Respectfully submitted,

ARCHER, CATHRO & ASSOCIATES (1981) LIMITED

D. Gregory, GIT

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2006 Excavator Trenching and Percussion Drilling at the Eureka Property, Dawson Mining District Yukon Territory.

**APPENDIX I**  
**STATEMENT QUALIFICATIONS**

## **STATEMENT OF QUALIFICATIONS**

I, Daniel Gregory, geologist, with business addresses in Vancouver, British Columbia and Whitehorse, Yukon Territory and residential address in Vancouver, British Columbia, do hereby certify that:

1. I graduated from the University of British Columbia in 2007 with a B.Sc. (Hons.) in Geology.
2. From 2004 to present, I have been actively engaged in mineral exploration in the Yukon Territory.
3. I am a Geoscientist in Training (GIT) with the Association of Professional Engineers and Geoscientists of British Columbia (Member Number 153805).

Daniel Gregory, B.Sc., GIT

ARCHER, CATHRO & ASSOCIATES (1981) LIMITED  
1016 – 510 West Hastings Street  
Vancouver, B.C. V6B 1L8

Telephone: 604-688-2568

Fax: 604-688-2578

AFFIDAVIT

I, Joan Mariacher, of Vancouver, B.C. make oath and say:

That to the best of my knowledge the attached Statement of  
Expenditures for exploration work on the Eureka mineral  
claims on Claim Sheet 1150/10 is accurate.

  
Joan Mariacher

Sworn before me at Vancouver, B.C.

this 12th day of December 2008.



Notary Public, Yukon Territory



Statement of Expenditures  
Eureka Mineral Claims  
December 12, 2008

Contract VTEM Survey

Geotech Ltd.

\$112,939.47





# Geotech Ltd.

245 Industrial Parkway North, Aurora ON L4G 4C4

<b>Bill To</b>
Archer, Cathro & Associates (1981) Limite 1016-510 West Hastings Street Vancouver, BC Canada V6B 1L8



Date	Invoice #
4/30/2008	991388

*Paid*

Terms	Project
Due on receipt	8077

Description	Amount						
Helicopter-borne time domain electromagnetic geophysical survey with VTEM system Interim Billing - Fifty percent (50%) of the estimated total charge plus GST is payable on execution of the agreement  Contract ( Yukon and northern BC.)	433,180.00						
For an estimated 2948 line km basic survey charge @\$70/km	\$206,360.00						
Charges per block 15 blocks @\$2000/block	\$30,000.00						
Charges per day for estimated 51 days @\$6000/day	\$306,000.00						
Helicopter time charges for estimated 150 hours @\$1800/hr	\$270,000.00						
Helicopter mob/demob	\$28,000.00						
Crew and equipment mob/demob	\$26,000.00						
Minimum Survey Charge	\$866,360.00						
50% of the Minimum Survey Charge	\$433,180.00						
Business Number: 110859469							
<i>21659.00</i> <i>Antimony - 21568.55</i> <i>Anger, Alvin - 32349.31</i> <i>Bob - 16887.44</i> <i>Andie to [redacted] - 67578.64</i> <i>Stewart - 30525.24</i> <i>GH - 12773.72</i>	<i>Brandham - 67103.08</i> <i>MV - 42286.00</i> <i>Planta - 53776.02</i> <i>Silver Street - 9936.68</i> <i>Degei - 42137.11</i> <i>Simon - 17596.70</i> <i>Zalco - 18731.57</i> <i>Vansee</i> <i>ZAKED 444839.00</i>						
Please Remit By Bank Transfer To: Royal Bank of Canada 3300 Highway #7 West, Suite 100, Concord, Ontario L4K 4M3 SWIFT:ROYCCAT2 Transit#00192 Account#1114834	<table border="1"> <tr> <td>Subtotal</td> <td>Can\$433,180.00</td> </tr> <tr> <td>GST</td> <td>Can\$21,659.00</td> </tr> <tr> <td><b>Total</b></td> <td><b>Can\$454,839.00</b></td> </tr> </table>	Subtotal	Can\$433,180.00	GST	Can\$21,659.00	<b>Total</b>	<b>Can\$454,839.00</b>
Subtotal	Can\$433,180.00						
GST	Can\$21,659.00						
<b>Total</b>	<b>Can\$454,839.00</b>						





# Geotech Ltd.

245 Industrial Parkway North, Aurora, ON L4G 4C4

<b>BILL TO:</b>
Archer, Cathro & Associates (1981) Limite 1016-510 West Hastings Street Vancouver, BC Canada V6B 1L8



<b>DATE:</b>	<b>INVOICE:</b>
7/30/2008	991575

<b>TERMS:</b>	<b>Project</b>
Due on receipt	8077

Description	Amount																					
Helicopter-borne time domain electromagnetic geophysical survey with VTEM system Interim Billing - Ninety Five (95%) of the estimated total charge plus GST is payable before receipt of preliminary data	389,862.00																					
Contract (Yukon and northern BC.)																						
For an estimated 2948 line km basic survey charge @\$70/km	\$206,360.00																					
Charges per block 15 blocks @\$2000/block	\$30,000.00																					
Charges per day for estimated 51 days @\$6000/day	\$306,000.00																					
Helicopter time charges for estimated 150 hours @\$1800/hr	\$270,000.00																					
Helicopter mob/demob	\$28,000.00																					
Crew and equipment mob/demob	\$26,000.00																					
Minimum Survey Charge	\$866,360.00																					
95% of the Minimum Survey Charge	\$823,042.00																					
Less Previous Billing Invoice 991388	(\$433,180.00)																					
<b>Total Amount Owing</b>	<b>\$389,862.00</b>																					
Business Number: 110859469																						
<table border="0"> <tr> <td>A ✓ Anthony - 10143.58</td> <td>A ✓ Caribou - 23150.62</td> </tr> <tr> <td>A ✓ Aron - 15563.82</td> <td>A ✓ Earth - 20098.57</td> </tr> <tr> <td>A ✓ Bob - 34147.50</td> <td>A ✓ Fairbanks - 14025.54</td> </tr> <tr> <td>A ✓ Bob - 9091.98</td> <td>A ✓ BK - 6922.00</td> </tr> </table>	A ✓ Anthony - 10143.58	A ✓ Caribou - 23150.62	A ✓ Aron - 15563.82	A ✓ Earth - 20098.57	A ✓ Bob - 34147.50	A ✓ Fairbanks - 14025.54	A ✓ Bob - 9091.98	A ✓ BK - 6922.00	<table border="0"> <tr> <td>A ✓ Groundhog - 30242.92</td> </tr> <tr> <td>A ✓ Ham - 25151.29</td> </tr> <tr> <td>A ✓ Hobo - 25409.88</td> </tr> <tr> <td>A ✓ Mor - 8640.76</td> </tr> <tr> <td>A ✓ Nick - 60523.69</td> </tr> <tr> <td>A ✓ Peter - 25470.10</td> </tr> <tr> <td>A ✓ Ron - 9880.86</td> </tr> <tr> <td>A ✓ Silver Sheet - (3847.18)</td> </tr> <tr> <td>A ✓ Ross - 25409.88</td> </tr> <tr> <td>A ✓ Jagui - 21102.80</td> </tr> <tr> <td>A ✓ Jimbo - 9232.41</td> </tr> <tr> <td>A ✓ Zebco - 9500.64</td> </tr> <tr> <td><b>389862.00</b></td> </tr> </table>	A ✓ Groundhog - 30242.92	A ✓ Ham - 25151.29	A ✓ Hobo - 25409.88	A ✓ Mor - 8640.76	A ✓ Nick - 60523.69	A ✓ Peter - 25470.10	A ✓ Ron - 9880.86	A ✓ Silver Sheet - (3847.18)	A ✓ Ross - 25409.88	A ✓ Jagui - 21102.80	A ✓ Jimbo - 9232.41	A ✓ Zebco - 9500.64	<b>389862.00</b>
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<b>389862.00</b>																						

Please Remit By Bank Transfer To:  
ROYAL BANK OF CANADA  
3300 Highway#7 West,  
Suite100,Concord,  
Ontario L4K 4M3  
SWIFT:ROYCCAT2  
TRANSIT # 00192  
ACCOUNT #1114834

Subtotal	Can\$389,862.00
GST	Can\$19,493.10
<b>TOTAL</b>	<b>Can\$409,355.10</b>



# Geotech Ltd.

245 Industrial Parkway North, Aurora, ON L4G 4C4

<b>BILL TO:</b>
Archer, Cathro & Associates (1981) Limite 1016-510 West Hastings Street Vancouver, BC V6B 1L8



DATE:	INVOICE:
10/16/2008	991706

TERMS:	Project
Due on receipt	8077

Description	Amount
Helicopter-borne time domain electromagnetic geophysical survey with VTEM system Final Billing - One Hundred Percent (100%) of the total charge plus GST payable right before delivery of the products described in Schedule E of the contract.	194,157.85
Contract (Yukon and Northern BC)	
For 2948 line km Vtem basic survey charge @\$70/km	\$206,360.00
Charges per block for 15 blocks @\$2,000/block	\$30,000.00
Charges per day for 46 days @\$6,000/day	\$276,000.00
Helicopter time charges for 189.5 hours @\$1,800/hr	\$341,100.00
Helicopter mobilization	\$28,000.00
Crew and equipment mobil/demob	\$26,000.00
100% Minimum Survey Charge	\$907,460.00
Plus	
Additional 1449.5 line km Vtem survey charge @ \$70/km	\$101,465.00
Additional charges per block for 5 blocks @\$2,000/block	\$10,000.00
Fuel slinging by TRK Helicopters	\$3,420.00
Less Fuel used for tests	(\$5,145.15)
<b>Total Survey Charge</b>	<b>\$1,017,199.85</b>
Less Previous Billing	
Inv# 991388	(\$433,180.00)
Inv# 991575	(\$389,862.00)
<b>Net Billable Amount</b>	<b>\$194,157.85</b>
Business Number: 110859469	

↗ Antimony - 3278.9  
 ↗ Au - 5309.30  
 ↗ Blast - 24560.21  
 ↗ Bob - 3223.45  
 ↗ Crisco - 1675.24  
 ↗ Eureka - 9934.25  
 ↗ Fairweather - 457338  
 ↗ Soudan - 10081.83  
 ↗ GK - 2383.65  
 ↗ Ham - 18841.93  
 ↗ Hobo - 19006.30  
 ↗ Mr - (2795.30)  
 ↗ Nick - 40470.73  
 ↗ Plat - 8432.03

**POSTED**

Please Remit By Bank Transfer To:  
 ROYAL BANK OF CANADA  
 3300 Highway#7 West,  
 Suite 100, Concord,  
 Ontario L4K 4M3  
 SWIFT:ROYCAT2  
 TRANSIT #00192  
 ACCOUNT #1114834

↗ Ran - 8280.58  
 ↗ Ren - 19006.30  
 ↗ Zagi - 11246.44  
 ↗ Jimm - 3219.68  
 ↗ Zuko - 3241.34  
 ↗ SilverShot - (6089.50)  
 ↗ VTEM - (5145.15)

Subtotal	Can\$194,157.85
GST	Can\$9,707.89
<b>TOTAL</b>	<b>Can\$203,865.74</b>



**APPENDIX II**

**REPORT ON A HELICOPTER-BORNE VERSATILE TIME DOMAIN  
ELECTROMAGNETIC (VTEM) GEOPHYSICAL SURVEY**

**REPORT ON A HELICOPTER-BORNE  
VERSATILE TIME DOMAIN ELECTROMAGNETIC (VTEM)  
GEOPHYSICAL SURVEY**



**Eureka Project**

**Yukon, Canada**

**For:**

**ARCHER CATHRO & ASSOCIATES LTD.**

**By**

**Geotech Ltd.**

**245 Industrial Parkway North  
Aurora, Ont., CANADA, L4G 4C4**

**Tel: 1.905.841.5004**

**Fax: 1.905.841.0611**

**[www.geotech.ca](http://www.geotech.ca)**

**Email: [info@geotech.ca](mailto:info@geotech.ca)**

**Survey flown during June, 2008**

**Project 8077**

**January 2009**

## TABLE OF CONTENTS

<b>Executive Summary</b> .....	<b>3</b>
<b>1. INTRODUCTION</b> .....	<b>4</b>
1.1 General Considerations.....	4
1.2 Survey Location and Specifications.....	5
1.3 Topographic Relief and Cultural Features.....	5
<b>2. DATA ACQUISITION</b> .....	<b>6</b>
2.1 Survey Area.....	6
2.2 Survey Operations.....	6
2.3 Flight Specifications.....	7
2.4 Aircraft and Equipment.....	7
2.4.1 Survey Aircraft.....	7
2.4.2 Electromagnetic System.....	7
2.4.3 Airborne magnetometer.....	11
2.4.4 Radar Altimeter.....	11
2.4.5 GPS Navigation System.....	11
2.4.6 Digital Acquisition System.....	11
2.4.7 Base Station.....	12
<b>3. PERSONNEL</b> .....	<b>13</b>
<b>4. DATA PROCESSING AND PRESENTATION</b> .....	<b>14</b>
4.1 Flight Path.....	14
4.2 Electromagnetic Data.....	14
4.3 Magnetic Data.....	15
<b>5. DELIVERABLES</b> .....	<b>16</b>
5.1 Survey Report.....	16
5.2 Maps.....	16
5.3 Digital Data.....	16
<b>6. CONCLUSIONS AND RECOMMENDATIONS</b> .....	<b>20</b>
6.1 Conclusions.....	20
6.2 Recommendations.....	20

### LIST OF FIGURES

Figure 1 - Property Location.....	4
Figure 2 - Google Earth Image with Flight Paths.....	5
Figure 3 - VTEM Configuration.....	8
Figure 4 - VTEM Waveform & Sample Times.....	8
Figure 5 - VTEM system configuration.....	10

### LIST OF TABLES

Table 1 - Survey blocks.....	6
Table 2 - Survey schedule.....	6
Table 3 – Decay Sampling Scheme.....	9
Table 4 – Acquisition Sampling Rates.....	11
Table 5 – Geosoft GDB Data Format.....	17

### APPENDICES

A. Survey location maps.....	21
B. Survey Block Coordinates.....	25
C. VTEM Waveform.....	26
D. Geophysical Maps.....	27
E. Modelling VTEM Data.....	32

# REPORT ON A HELICOPTER-BORNE VERSATILE TIME DOMAIN ELECTROMAGNETIC SURVEY

Eureka Project  
Yukon, Canada

## **Executive Summary**

During July 9<sup>th</sup> to July 12<sup>th</sup>, 2008 Geotech Ltd. carried out a helicopter-borne geophysical survey for Archer Cathro & Associates Ltd. over one (1) block of the Eureka Project situated near Dawson City, Yukon, Canada.

Principal geophysical sensors included a versatile time domain electromagnetic (VTEM) system, and a caesium magnetometer. Ancillary equipment included a GPS navigation system and a radar altimeter. A total of 469 line-kilometres were flown.

The survey operations were based out of Dawson City, Yukon. In-field data quality assurance and preliminary processing were carried out on a daily basis during the acquisition phase. Preliminary and final data processing, including generation of final digital data and map products were undertaken from the office of Geotech Ltd. in Aurora, Ontario.

The processed survey results are presented as electromagnetic stacked profiles, and as a colour grid of the B-field EM late time channels and total magnetic intensity.

Digital data includes all electromagnetic and magnetic products, plus ancillary data including the waveform.

The survey report describes the procedures for data acquisition, processing, final image presentation and the specifications for the digital data set. No formal interpretation is included.

# 1. INTRODUCTION

## 1.1 General Considerations

These services are the result of the Agreement made between Geotech Ltd. and Archer Cathro & Associates Ltd. to perform a helicopter-borne geophysical survey one (1) block on the Eureka property located near Dawson City, Yukon, Canada (Figure 1).

Matthew Dumala acted on behalf of Archer Cathro & Associates Ltd. during the data acquisition and data processing phases of this project.

The geophysical surveys consisted of helicopter borne EM using the versatile time-domain electromagnetic (VTEM) system and aeromagnetics using a caesium magnetometer. A total of 469 line-km of geophysical data were acquired during the survey. The survey area is shown in Figure 2.

The crew was based out of Dawson City, Yukon for the acquisition phases of the survey. Survey flying started on July 9<sup>th</sup> and was completed on July 12<sup>th</sup>, 2008.

Data quality control and quality assurance, and preliminary data processing were carried out on a daily basis during the acquisition phase of the project. Final data processing followed immediately after the end of the survey. Final reporting, data presentation and archiving were completed from the Aurora office of Geotech Ltd. in January, 2009.

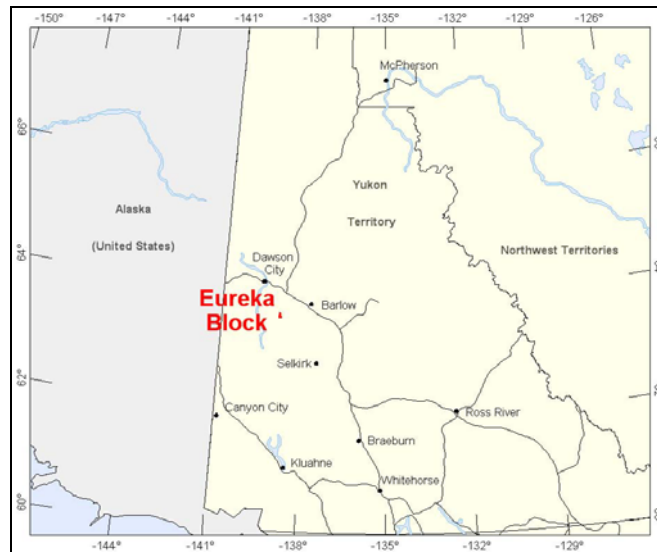


Figure 1 - Property Location



## 1.2 Survey Location and Specifications

The Eureka block (63°31'46.94"N, 138°52'38.34"W) is located approximately 63 kilometres south-east of Dawson City, Yukon, the base of operations for the survey.

The survey block was flown in a N 89° E direction with a traverse line spacing of 100 metres, as depicted in Figure 2. Tie lines were flown perpendicular to the traverse lines at a spacing of 940 metres in the direction of N 179° E. For more detailed information on the flight spacing and direction see Table 1.

## 1.3 Topographic Relief and Cultural Features

Topographically, the property exhibits high relief, with elevations ranging from 570 to 1296 metres above sea level (see Figure 2). There are a number of small rivers, streams and lakes located throughout the block. Cultural features such as roads, trails and buildings are also present. The survey block is covered by NTS (National Topographic Survey) of Canada sheets 115O10 and 115O07.



Figure 2 - Google Earth Image with Flight Paths

## 2. DATA ACQUISITION

### 2.1 Survey Area

The survey block (see Location map, Figure 2) and general flight specifications are as follows:

**Table 1** - Survey blocks

Survey block	Line spacing (m)	Area (Km <sup>2</sup> )	Planned Line-km	Actual Line-km <sup>1</sup>	Flight direction	Line number
Eureka	Traverse: 100	41.8	419	424	N 89°E	L2500 – L3470
	Tie: 940		50	50	N 179°E	T3500 – T3560
<b>TOTAL</b>		41.8	469	474		

Survey block boundaries co-ordinates are provided in Appendix B.

### 2.2 Survey Operations

Survey operations were based out of Dawson City, Yukon from July 9<sup>th</sup> to July 12<sup>th</sup>, 2008. The following table shows the timing of the flying.

**Table 2** - Survey schedule

Date	Flight #	Flown km	Block	Crew location	Comments
09-July-08	31 - 34	248	EUREKA	Dawson City, Yukon	Production
10-July-08	35	48	EUREKA	Dawson City, Yukon	Limited production – low ceiling, rain, high winds
11-July-08	36	102	EUREKA	Dawson City, Yukon	Limited production – low ceiling, high winds
12-July-08	37	71	EUREKA	Bedrock Motel, Mayo, Yukon	Production, mobilization

<sup>1</sup>NOTE: Actual line-km represents the total line-km contained in the final databases. These line-km normally exceed the Planned line-km, as outlined in the contract-proposal and defined in the survey NAV files.

## 2.3 Flight Specifications

The helicopter was maintained at a mean height of 75 metres above the ground where possible (due to rugged terrain) with a nominal survey speed of 80 km/hour. This allowed for a nominal EM sensor terrain clearance of 40 metres and a magnetic sensor clearance of 62 metres. The data recording rates of the data acquisition was 0.1 second for electromagnetics, magnetometer and 0.2 second for altimeter and GPS. This translates to a geophysical reading about every 2 metres along flight track. Navigation was assisted by a CDGPS receiver and data acquisition system, which reports GPS co-ordinates as latitude/longitude and directs the pilot over a pre-programmed survey grid.

The operator was responsible for monitoring of the system integrity. He also maintained a detailed flight log during the survey, tracking the times of the flight as well as any unusual geophysical or topographic feature.

On return of the aircrew to the base camp the survey data was transferred from a compact flash card (PCMCIA) to the data processing computer. The data were then uploaded via ftp to the Geotech office in Aurora for daily quality assurance and quality control by qualified personnel, operating remotely.

## 2.4 Aircraft and Equipment

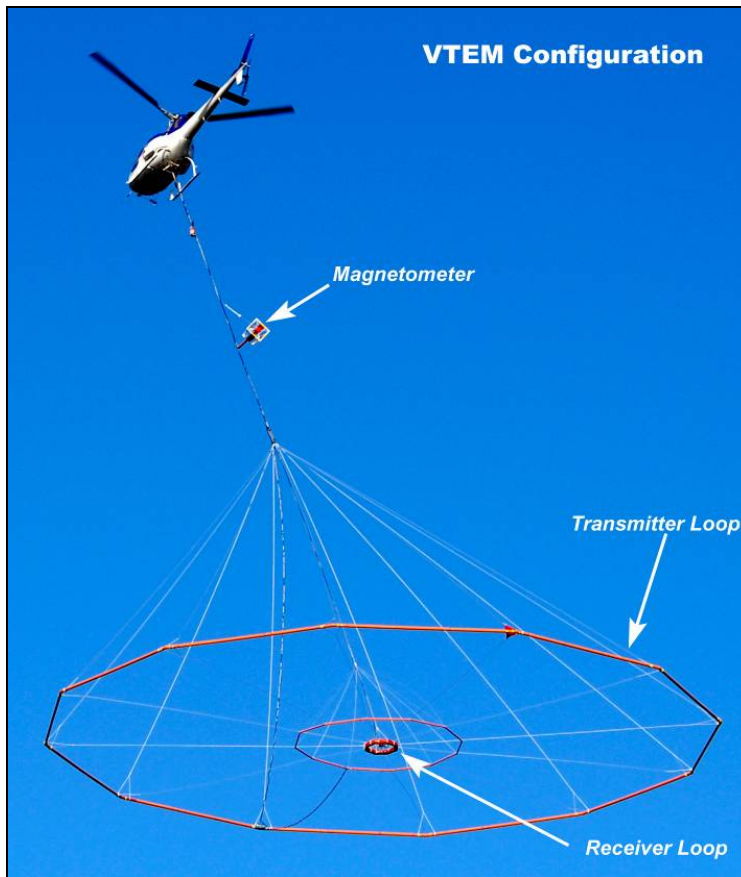
### 2.4.1 Survey Aircraft

The survey was flown using a Eurocopter Aerospatiale (Astar) 350 B3 helicopter. The helicopters were operated by TRK Helicopters Ltd, registration C-GTRK. Installation of the geophysical and ancillary equipment was carried out by Geotech Ltd.

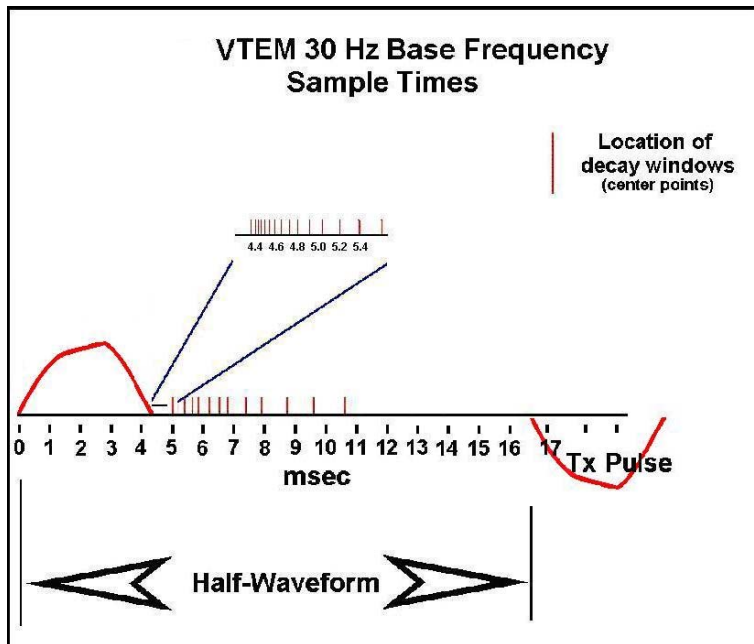
### 2.4.2 Electromagnetic System

The electromagnetic system was a Geotech Time Domain EM (VTEM) system. The configuration is as indicated in Figure 3 below.

Receiver and transmitter coils are concentric and Z-direction oriented. The coils were towed at a mean distance of 35 metres below the aircraft as shown in Figure 5. The receiver decay recording scheme is shown diagrammatically in Figure 4.



**Figure 3 - VTEM Configuration**



**Figure 4 – VTEM Short Pulse Waveform & Sample Times**

The VTEM decay sampling scheme is shown in Table 3 below. Twenty six measurement gates (ch 10-35) were used for the final data processing in the range from 120 to 9245  $\mu$  sec, as shown in Table 5.

**Table 3 – Decay Sampling Scheme**

<b>VTEM Decay Sampling scheme<sup>2</sup></b>				
<b>Array Index</b>	<b>( Microseconds )</b>			
	<b>Time Gate</b>	<b>Start</b>	<b>End</b>	<b>Width</b>
0	0			
1	10	10	21	11
2	21	16	26	11
3	31	26	37	11
4	42	37	47	11
5	52	47	57	10
6	62	57	68	11
7	73	68	78	11
8	83	78	91	13
9	99	91	110	19
10	120	110	131	21
11	141	131	154	24
12	167	154	183	29
13	198	183	216	34
14	234	216	258	42
15	281	258	310	53
16	339	310	373	63
17	406	373	445	73
18	484	445	529	84
19	573	529	628	99
20	682	628	750	123
21	818	750	896	146
22	974	896	1063	167
23	1151	1063	1261	198
24	1370	1261	1506	245
25	1641	1506	1797	292
26	1953	1797	2130	333
27	2307	2130	2526	396
28	2745	2526	3016	490
29	3286	3016	3599	583
30	3911	3599	4266	667
31	4620	4266	5058	792
32	5495	5058	6037	979
33	6578	6037	7203	1167
34	7828	7203	8537	1334
35	9245	8537	10120	1584

<sup>2</sup> Note: Measurement time-delays are referenced to time-zero marking the end of the transmitter current turn-off, as illustrated in Figure 6 and Appendix C.

VTEM system parameters:

Transmitter Section

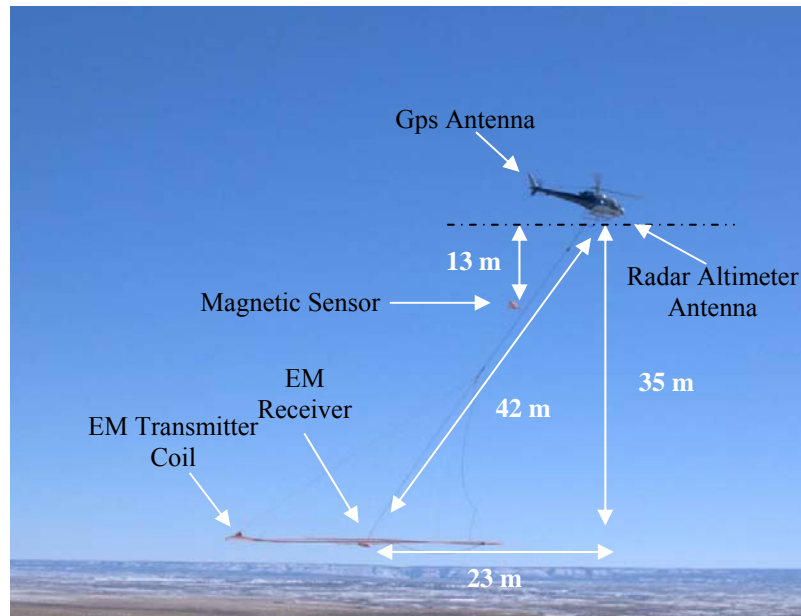
- Transmitter coil diameter: 26 m
- Number of turns: 4
- Transmitter base frequency: 30 Hz
- Peak current: 262 A
- Pulse width: 4.2 ms
- Pulse width: Duty cycle: 25%
- Peak dipole moment: 556,400 nIA
- Nominal terrain clearance: 75 m where possible

Receiver Section

- Receiver coil diameter: 1.2 m
- Number of turns: 100.
- Effective coil area: 113.04 m<sup>2</sup>
- Wave form shape: trapezoid
- Power Line Monitor: 60 Hz

Magnetometer

- Nominal terrain clearance: 62 m



**Figure 5 - VTEM system configuration**

### 2.4.3 Airborne magnetometer

The magnetic sensor utilized for the survey was a Geometrics optically pumped caesium vapour magnetic field sensor, mounted in a separate bird, 13 metres below the helicopter, as shown in Figure 5. The sensitivity of the magnetic sensor is 0.02 nanoTesla (nT) at a sampling interval of 0.1 seconds. The magnetometer sends the measured magnetic field strength as nanoTesla to the data acquisition system via the RS-232 port.

### 2.4.4 Radar Altimeter

A Terra TRA 3000/TRI 40 radar altimeter was used to record terrain clearance. The antenna was mounted beneath the bubble of the helicopter cockpit (Figure 5).

### 2.4.5 GPS Navigation System

The navigation system used was a Geotech PC104 based navigation system utilizing a NovAtel's CDGPS (Canada-Wide Differential Global Positioning System Correction Service) enable OEM4-G2-3151W GPS receiver, Geotech navigate software, a full screen display with controls in front of the pilot to direct the flight and an NovAtel GPS antenna mounted on the helicopter tail (Figure 5). As many as 11 GPS and two CDGPS satellites may be monitored at any one time. The positional accuracy or circular error probability (CEP) is 1.8 m, with CDGPS active, it is 1.0 m. The co-ordinates of the block were set-up prior to the survey and the information was fed into the airborne navigation system.

### 2.4.6 Digital Acquisition System

A Geotech data acquisition system recorded the digital survey data on an internal compact flash card. Data is displayed on an LCD screen as traces to allow the operator to monitor the integrity of the system. The data type and sampling interval as provided in Table 4.

**Table 4 – Acquisition Sampling Rates**

<b>DATA TYPE</b>	<b>SAMPLING</b>
TDEM	0.1 sec
Magnetometer	0.1 sec
GPS Position	0.2 sec
Radar Altimeter	0.2 sec

#### **2.4.7 Base Station**

A combined magnetometer/GPS base station was utilized on this project. A Geometrics Caesium vapour magnetometer was used as a magnetic sensor with a sensitivity of 0.001 nT. The base station was recording the magnetic field together with the GPS time at 1 Hz on a base station computer.

The base station magnetometer sensor was installed 100 metres behind the Trans North helipad, close to the riverbank, in Dawson City Yukon (64°03'02.8"N, 139°25'50.2"W), away from electric transmission lines and moving ferrous objects such as motor vehicles. The base station data were backed-up to the data processing computer at the end of each survey day.



### 3. PERSONNEL

The following Geotech Ltd. personnel were involved in the project.

Field:

Project Managers:	Les Moschuk (office)
Data QC/QA:	Nick Venter (office)
Crew Chief:	Colin Lennox
System Operator:	Matt Bernas

The survey pilot and the mechanical engineer were employed directly by the helicopter operator – TRK Helicopters Ltd.

Pilot:	Roy Stevenson
Mechanical Engineer:	Chris Ward

Office:

Preliminary Data Processing:	Nick Venter
Final Data Processing:	Neil Fiset
Mapping/Reporting:	Kyle Orłowski

Data acquisition phase was carried out under the supervision of Andrei Bagrianski, P. Geo, Surveys Manager. Processing phase was carried out under the supervision of Jean Legault, P. Geo, Manager of Processing and Interpretation. The overall contract management and customer relations were by Paolo Berardelli.

## 4. DATA PROCESSING AND PRESENTATION

Data compilation and processing were carried out by the application of Geosoft OASIS Montaj and programs proprietary to Geotech Ltd.

### 4.1 Flight Path

The flight path, recorded by the acquisition program as WGS 84 latitude/longitude, was converted into the NAD83 Datum, UTM Zone 7 North coordinate system in Oasis Montaj.

The flight path was drawn using linear interpolation between x, y positions from the navigation system. Positions are updated every second and expressed as UTM easting's (x) and UTM northing's (y).

### 4.2 Electromagnetic Data

A three stage digital filtering process was used to reject major spheric events and to reduce system noise. Local spheric activity can produce sharp, large amplitude events that cannot be removed by conventional filtering procedures. Smoothing or stacking will reduce their amplitude but leave a broader residual response that can be confused with geological phenomena. To avoid this possibility, a computer algorithm searches out and rejects the major spheric events. The filter used was a 16 point non-linear filter.

The signal to noise ratio was further improved by the application of a low pass linear digital filter. This filter has zero phase shift which prevents any lag or peak displacement from occurring, and it suppresses only variations with a wavelength less than about 1 second or 15 metres. This filter is a symmetrical 1 sec linear filter.

The results are presented as stacked profiles of EM voltages for the time gates, in linear - logarithmic scale for both B-field and dB/dt response. B-field time channel recorded at 1.641 milliseconds after the termination of the impulse is also presented as contour colour image. A de-corrugation and micro levelling was applied to the B-field 1.641 millisecond grid to reduce the effects, due to varying radar clearance resulting from roughed terrain.

Graphical representations of the VTEM transmitter current waveform output voltage of the receiver coil are shown in Appendix C.

Generalized modeling results of VTEM data, written by consultant Roger Barlow and

Nasreddine Bournas, P. Geo., are shown in Appendix E.

### **4.3 Magnetic Data**

The processing of the magnetic data involved the correction for diurnal variations by using the digitally recorded ground base station magnetic values. The base station magnetometer data was edited and merged into the Geosoft GDB database on a daily basis. The aeromagnetic data was corrected for diurnal variations by subtracting the observed magnetic base station deviations.

Tie line levelling was carried out by adjusting intersection points along traverse lines. A micro-levelling procedure was applied to remove persistent low-amplitude components of flight-line noise remaining in the data.

The corrected magnetic data was interpolated between survey lines using a random point gridding method to yield x-y grid values for a standard grid cell size of approximately 0.2 cm at the mapping scale. The Minimum Curvature algorithm was used to interpolate values onto a rectangular regular spaced grid.

## 5. DELIVERABLES

### 5.1 Survey Report

The survey report describes the data acquisition, processing, and final presentation of the survey results.

The survey report is provided in two paper copies and digitally in PDF format.

### 5.2 Maps

Final maps were produced at scale of 1:10,000. The coordinate/projection system used was NAD 83, UTM Zone 7 North. All maps show the flight path trace and topographic data; latitude and longitude are also noted on maps.

The preliminary and final results of the survey are presented as EM profiles, a late-time gate gridded EM channel, and color magnetic TMI contour maps. The following maps are presented on paper;

- VTEM B-field profiles, Time Gates 0.234 – 9.245 ms in linear - logarithmic scale over total magnetic intensity colour grid and.
- VTEM dB/dt profiles, Time Gates 0.234 – 9.245 ms in linear – logarithmic scale.
- VTEM B-field late time, Time Gate 1.641 ms colour image.
- Total magnetic intensity (TMI) colour image and contours.

### 5.3 Digital Data

- Two copies of the data and maps on DVD were prepared to accompany the report. Each DVD contains a digital file of the line data in GDB Geosoft Montaj format as well as the maps in Geosoft Montaj Map and PDF format.
- DVD structure.

There are two (2) main directories;

<b>Data</b>	contains databases, grids and maps, as described below.
<b>Report</b>	contains a copy of the report and appendices in PDF format.

Databases in Geosoft GDB format, containing the channels listed in Table 5.

**Table 5 – Geosoft GDB Data Format.**

<b>Channel Name</b>	<b>Description</b>
X:	X positional data (metres – NAD83, UTM zone 7 north)
Y:	Y positional data (metres – NAD83, UTM zone 7 north)
Z:	GPS antenna elevation (metres - ASL)
Lon:	Longitude data (degree – NAD83)
Lat:	Latitude data (degree – NAD83)
Date:	Flight Date (DD/MM/YYYY)
FltNo	Flight Number
Radar:	Helicopter terrain clearance from radar altimeter (metres - AGL)
RadarB:	EM Bird terrain clearance from radar altimeter (metres - AGL)
DEM:	Digital elevation model (metres)
Gtime:	GPS time (seconds of the day)
Mag1:	Raw Total Magnetic field data (nT)
Basemag:	Magnetic diurnal variation data (nT)
Mag2	Total Magnetic field diurnal variation corrected data (nT)
Mag3	Total Magnetic field final microlevelled data (nT)
SF[10]:	dB/dt 120 microsecond time channel pV/(A*m <sup>4</sup> )
SF[11]:	dB/dt 141 microsecond time channel pV/(A*m <sup>4</sup> )
SF[12]:	dB/dt 167 microsecond time channel pV/(A*m <sup>4</sup> )
SF[13]:	dB/dt 198 microsecond time channel pV/(A*m <sup>4</sup> )
SF[14]:	dB/dt 234 microsecond time channel pV/(A*m <sup>4</sup> )
SF[15]:	dB/dt 281 microsecond time channel pV/(A*m <sup>4</sup> )
SF[16]:	dB/dt 339 microsecond time channel pV/(A*m <sup>4</sup> )
SF[17]:	dB/dt 406 microsecond time channel pV/(A*m <sup>4</sup> )
SF[18]:	dB/dt 484 microsecond time channel pV/(A*m <sup>4</sup> )
SF[19]:	dB/dt 573 microsecond time channel pV/(A*m <sup>4</sup> )
SF[20]:	dB/dt 682 microsecond time channel pV/(A*m <sup>4</sup> )
SF[21]:	dB/dt 818 microsecond time channel pV/(A*m <sup>4</sup> )
SF[22]:	dB/dt 974 microsecond time channel pV/(A*m <sup>4</sup> )
SF[23]:	dB/dt 1151 microsecond time channel pV/(A*m <sup>4</sup> )
SF[24]:	dB/dt 1370 microsecond time channel pV/(A*m <sup>4</sup> )
SF[25]:	dB/dt 1641 microsecond time channel pV/(A*m <sup>4</sup> )
SF[26]:	dB/dt 1953 microsecond time channel pV/(A*m <sup>4</sup> )
SF[27]:	dB/dt 2307 microsecond time channel pV/(A*m <sup>4</sup> )
SF[28]:	dB/dt 2745 microsecond time channel pV/(A*m <sup>4</sup> )
SF[29]:	dB/dt 3286 microsecond time channel pV/(A*m <sup>4</sup> )
SF[30]:	dB/dt 3911 microsecond time channel pV/(A*m <sup>4</sup> )
SF[31]:	dB/dt 4620 microsecond time channel pV/(A*m <sup>4</sup> )

Channel Name	Description
SF[32]:	dB/dt 5495 microsecond time channel $pV/(A*m^4)$
SF[33]:	dB/dt 6578 microsecond time channel $pV/(A*m^4)$
SF[34]:	dB/dt 7828 microsecond time channel $pV/(A*m^4)$
SF[35]:	dB/dt 9245 microsecond time channel $pV/(A*m^4)$
BF[10]:	B-field 120 microsecond time channel $(pV*ms)/(A*m^4)$
BF[11]:	B-field 141 microsecond time channel $(pV*ms)/(A*m^4)$
BF[12]:	B-field 167 microsecond time channel $(pV*ms)/(A*m^4)$
BF[13]:	B-field 198 microsecond time channel $(pV*ms)/(A*m^4)$
BF[14]:	B-field 234 microsecond time channel $(pV*ms)/(A*m^4)$
BF[15]:	B-field 281 microsecond time channel $(pV*ms)/(A*m^4)$
BF[16]:	B-field 339 microsecond time channel $(pV*ms)/(A*m^4)$
BF[17]:	B-field 406 microsecond time channel $(pV*ms)/(A*m^4)$
BF[18]:	B-field 484 microsecond time channel $(pV*ms)/(A*m^4)$
BF[19]:	B-field 573 microsecond time channel $(pV*ms)/(A*m^4)$
BF[20]:	B-field 682 microsecond time channel $(pV*ms)/(A*m^4)$
BF[21]:	B-field 818 microsecond time channel $(pV*ms)/(A*m^4)$
BF[22]:	B-field 974 microsecond time channel $(pV*ms)/(A*m^4)$
BF[23]:	B-field 1151 microsecond time channel $(pV*ms)/(A*m^4)$
BF[24]:	B-field 1370 microsecond time channel $(pV*ms)/(A*m^4)$
BF[25]:	B-field 1641 microsecond time channel $(pV*ms)/(A*m^4)$
BF[26]:	B-field 1953 microsecond time channel $(pV*ms)/(A*m^4)$
BF[27]:	B-field 2307 microsecond time channel $(pV*ms)/(A*m^4)$
BF[28]:	B-field 2745 microsecond time channel $(pV*ms)/(A*m^4)$
BF[29]:	B-field 3286 microsecond time channel $(pV*ms)/(A*m^4)$
BF[30]:	B-field 3911 microsecond time channel $(pV*ms)/(A*m^4)$
BF[31]:	B-field 4620 microsecond time channel $(pV*ms)/(A*m^4)$
BF[32]:	B-field 5495 microsecond time channel $(pV*ms)/(A*m^4)$
BF[33]:	B-field 6578 microsecond time channel $(pV*ms)/(A*m^4)$
BF[34]:	B-field 7828 microsecond time channel $(pV*ms)/(A*m^4)$
BF[35]:	B-field 9245 microsecond time channel $(pV*ms)/(A*m^4)$
PLM:	Power Line monitor (60Hz)

Electromagnetic B-field and dB/dt data is found in array channel format between indexes 10 – 35, as described above.

- Database of the VTEM Waveform “VTEM\_waveform.gdb” in Geosoft GDB format, containing the following channels:

Time:            Sampling rate interval, 10.416 microseconds  
 Rx\_Volt:        Output voltage of the receiver coil (Volt)  
 Tx\_Curr:        Output current of the transmitter (Amp)

- Grids in Geosoft GRD format, as follows:

BF25\_Eureka:    B-Field Channel 25 (Time Gate 1.641 ms)  
 Mag3\_Eureka:    Total magnetic intensity (nT)

A Geosoft .GRD file has a .GI metadata file associated with it, containing grid projection information. A grid cell size of 25 metres was used.

- Maps at 1:10,000 in Geosoft MAP format, as follows:

8077\_Bfield\_\*\*: B-field profiles, Time Gates 0.234 – 9.245 ms in linear logarithmic scale over TMI.  
 8077\_dBdt\_\*\*: dB/dt profiles, Time Gates 0.234 – 9.245 ms in linear logarithmic scale.  
 8077\_BF25\_\*\*: B-field Time Gate 1.641 ms colour image.  
 8077\_TMI\_\*\*: Total magnetic intensity colour image and contours.

Note: \*\* represent map name i.e. (8077\_BF25\_Eureka\_South)

Maps are also presented in PDF and MapInfo format.

1:50,000 topographic vectors were taken from the NRCAN Geogratis database at; <http://geogratis.gc.ca/geogratis/en/index.html>.

- Google Earth files *8077\_Eureka\_ftlpath.kml* showing the flight path of each block. Free versions of Google Earth software from: <http://earth.google.com/download-earth.html>

## 6. CONCLUSIONS AND RECOMMENDATIONS

### 6.1 Conclusions

A helicopter-borne versatile time domain electromagnetic (VTEM) geophysical survey has been completed over the Eureka Project in the Yukon Territory, Canada.

The total area coverage is 41.8 km<sup>2</sup>. Total survey line coverage is 469 line kilometres. The principal sensors included a Time Domain EM system and a magnetometer. Results have been presented as stacked profiles and contour colour images at a scale of 1:10,000. No formal interpretation is included in this report.

### 6.2 Recommendations

Based on the geophysical results obtained, a number of interesting EM and magnetic anomaly groupings were identified across the property. We therefore recommend a more detailed interpretation of the EM and magnetic data, in conjunction with the known geology. It should include EM anomaly picking and magnetic derivative processing, as well as 3D inversion and modelling techniques to further characterize the observed anomalies and to more accurately determine their parameters (depth, conductance, dip, etc.) prior to ground follow up and drill testing.

Respectfully submitted<sup>6</sup>,

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Kyle Orłowski  
**Geotech Ltd.**

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Jean Legault, P. Geo, P. Eng  
**Geotech Ltd.**

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Neil Fiset  
**Geotech Ltd.**

January 2009

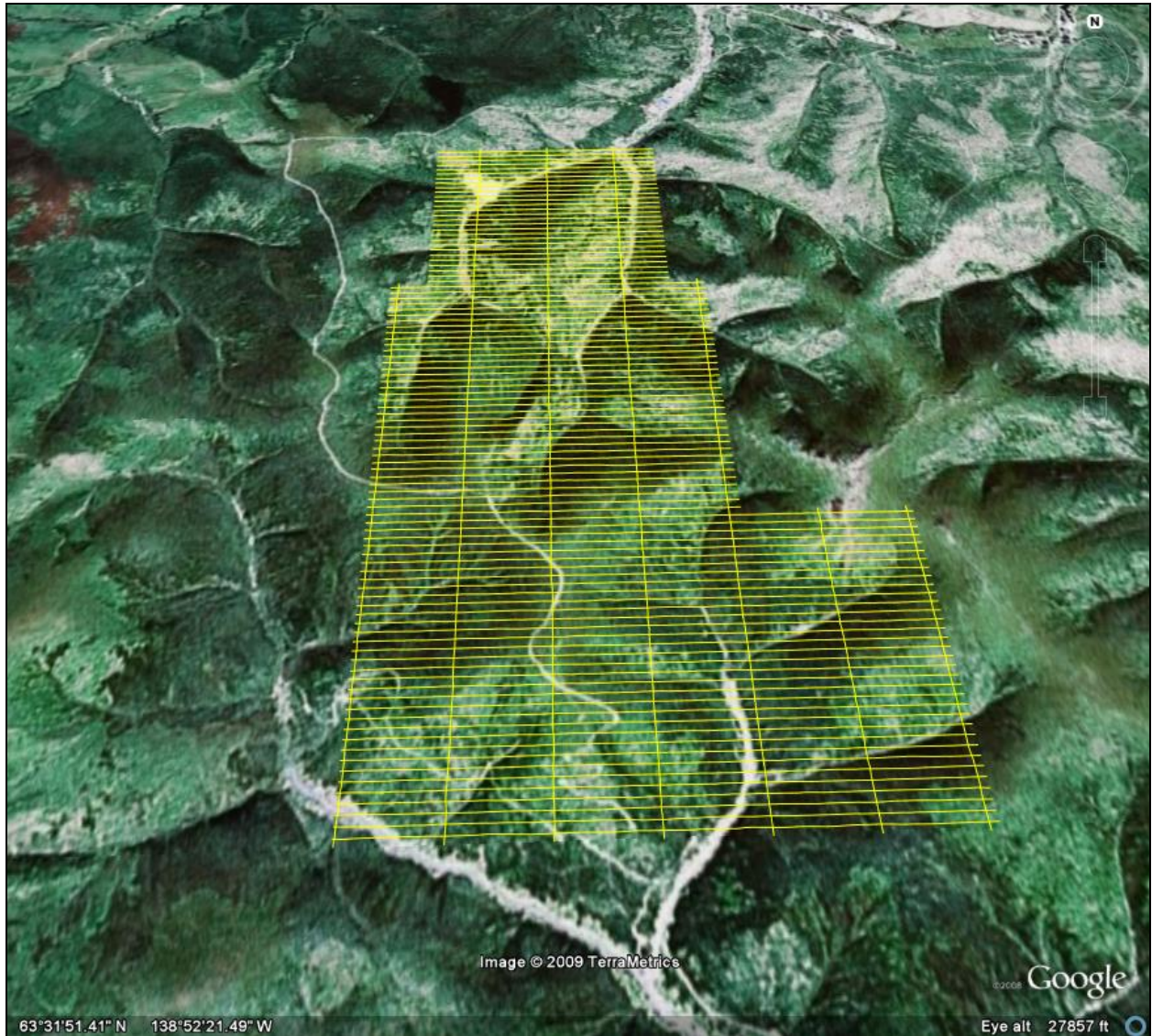
<sup>6</sup>Final data processing and interpretation of the EM and magnetic data were carried out by Neil Fiset, from the office of Geotech Ltd. in Aurora, Ontario, under the supervision of Jean Legault, P. Geo, Manager of Data Processing and Interpretation.



**APPENDIX A**  
**SURVEY BLOCK LOCATION MAPS**



**Google Earth Image: Eureka Project**



**Google Earth Image: Eureka Block**





## APPENDIX B

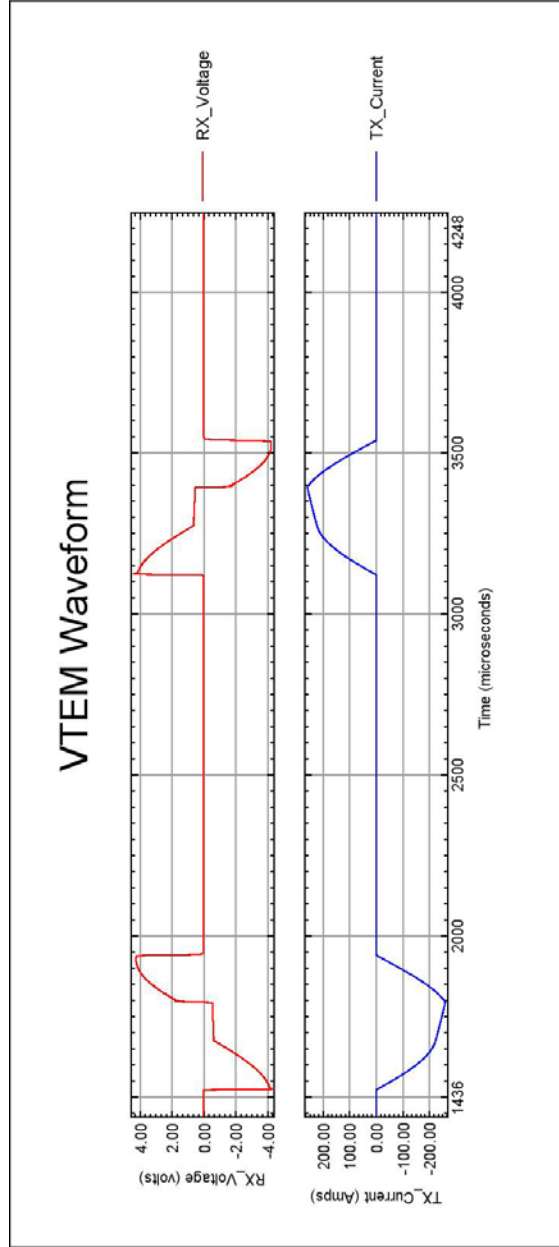
### SURVEY BLOCK COORDINATES

(NAD83, UTM Zone 7 North)

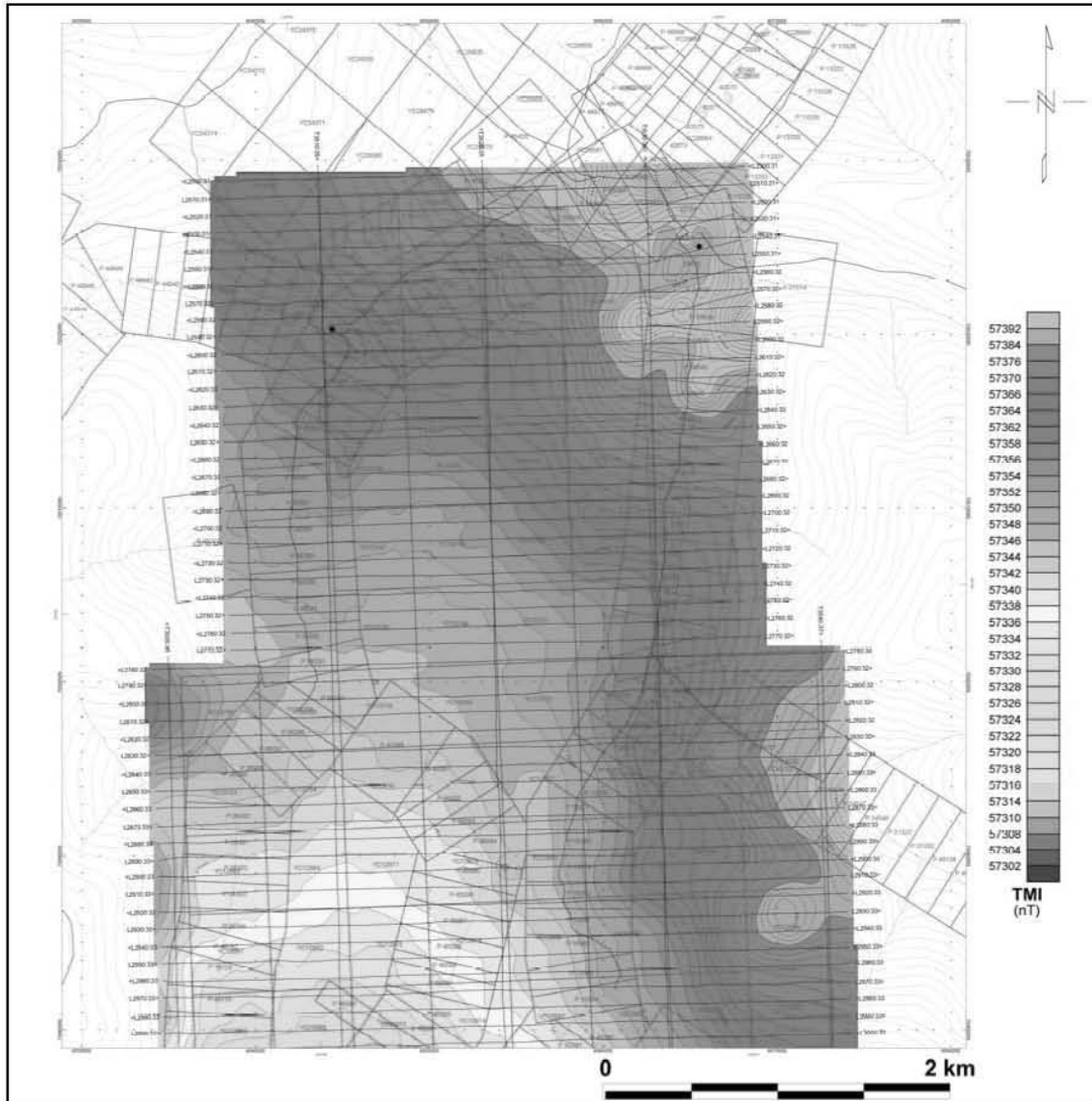
Eureka	
X	Y
603417	7050157
604362	7050157
604269	7052897
606307	7052952
606399	7050213
607325	7050250
607455	7046640
609270	7046695
609381.2	7043320
603679.4	7043160

# APPENDIX C

## VTEM WAVEFORM

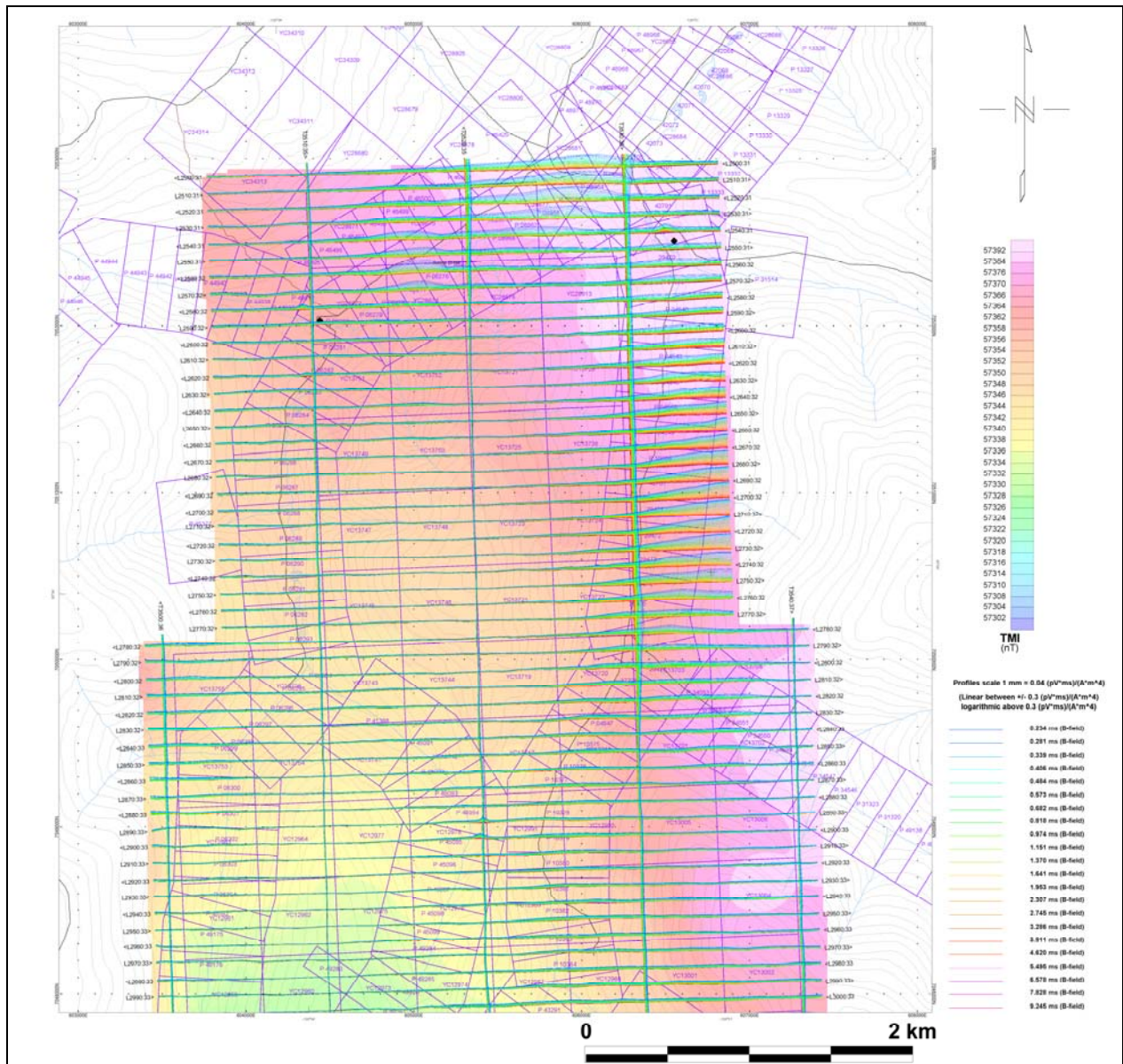


**APPENDIX D**  
**GEOPHYSICAL MAPS<sup>1</sup>**



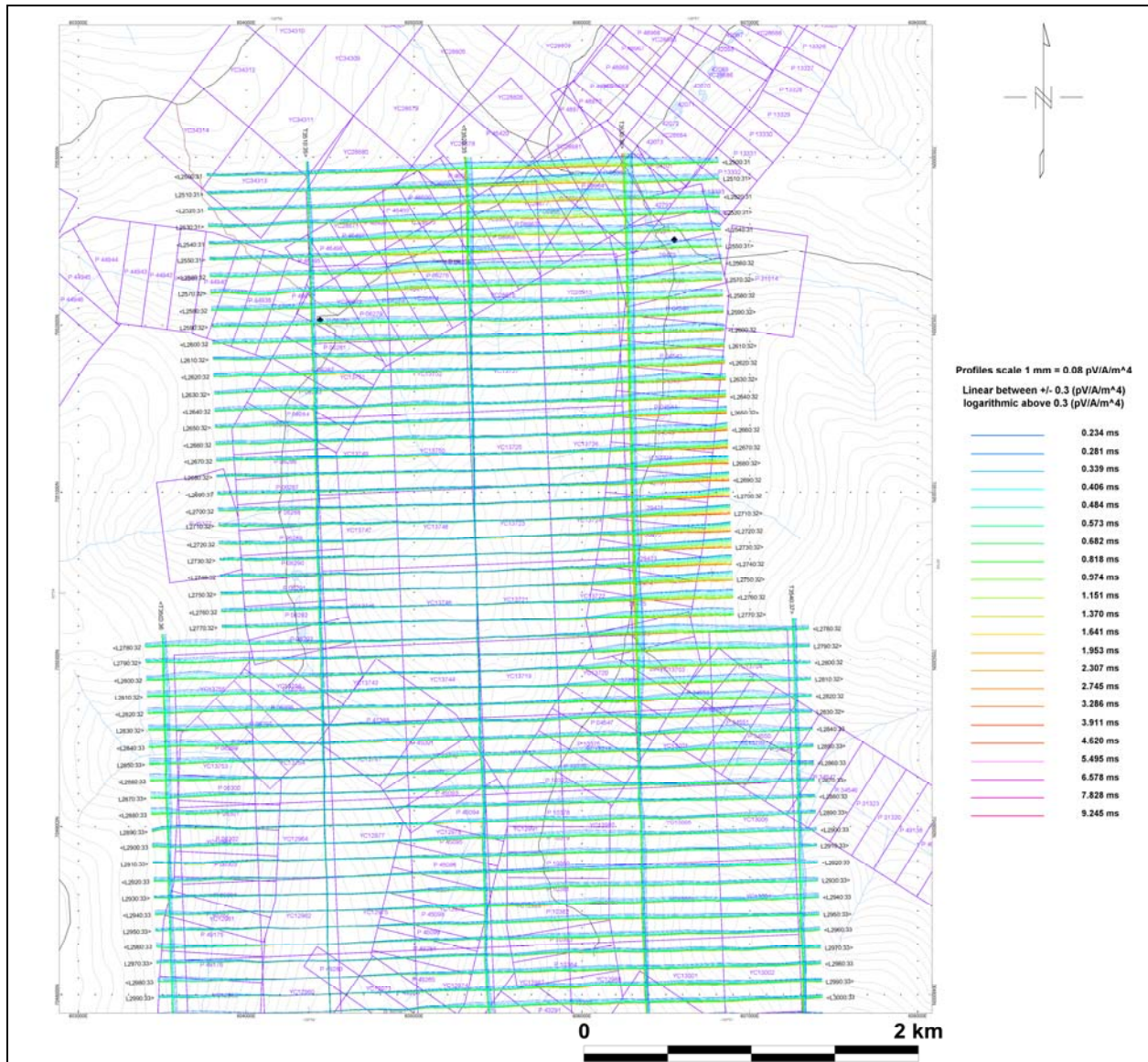
**Eureka Property - North: Total Magnetic Intensity (TMI)**

<sup>1</sup> Note: Present maps are a selection of the final geophysical maps. Full size geophysical maps are also available in PDF format on the final DVD.

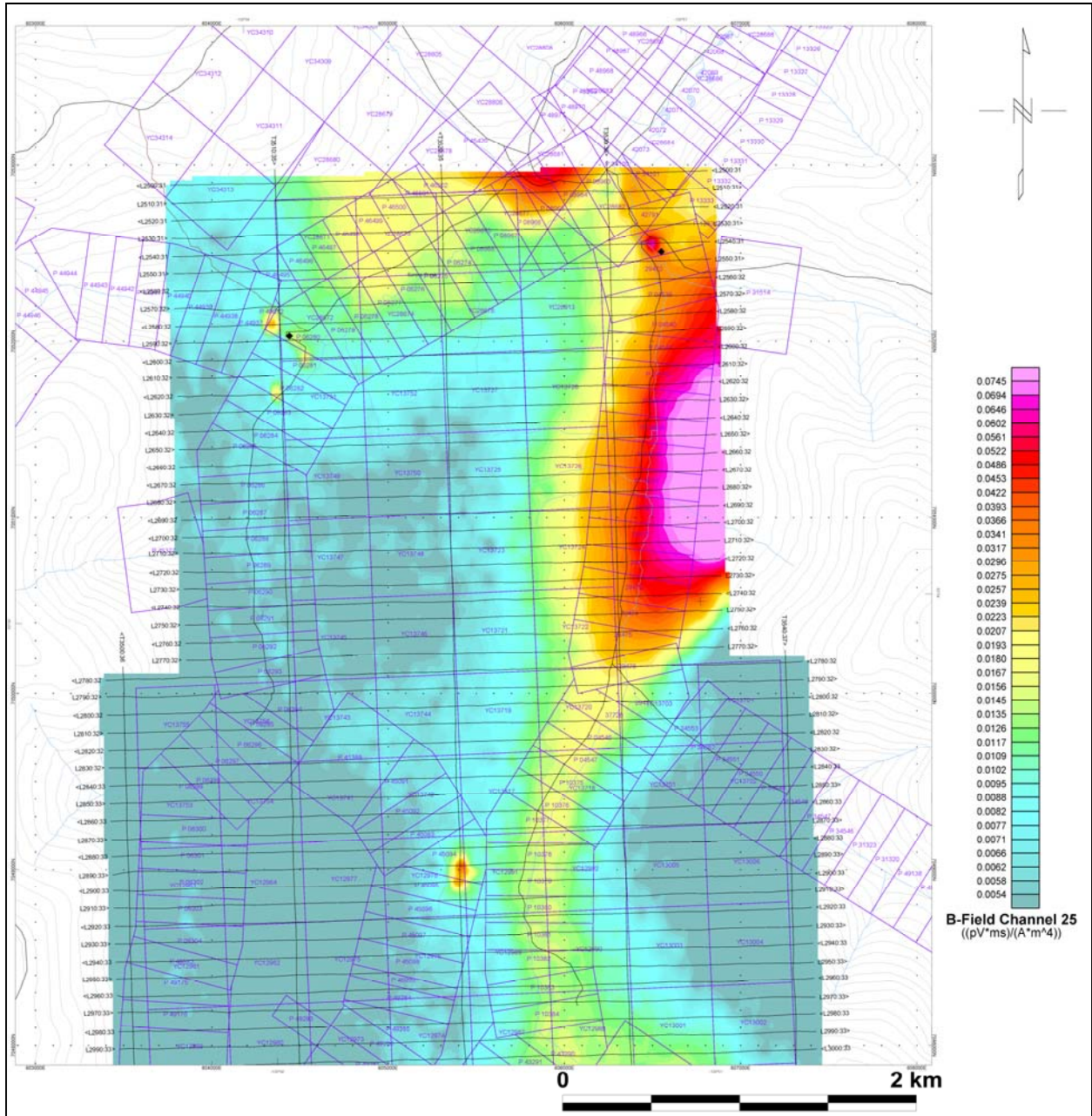


**Eureka Property - North: VTEM B-Field Profiles  
– Time Gates 0.234 to 9.245 ms, over TMI**

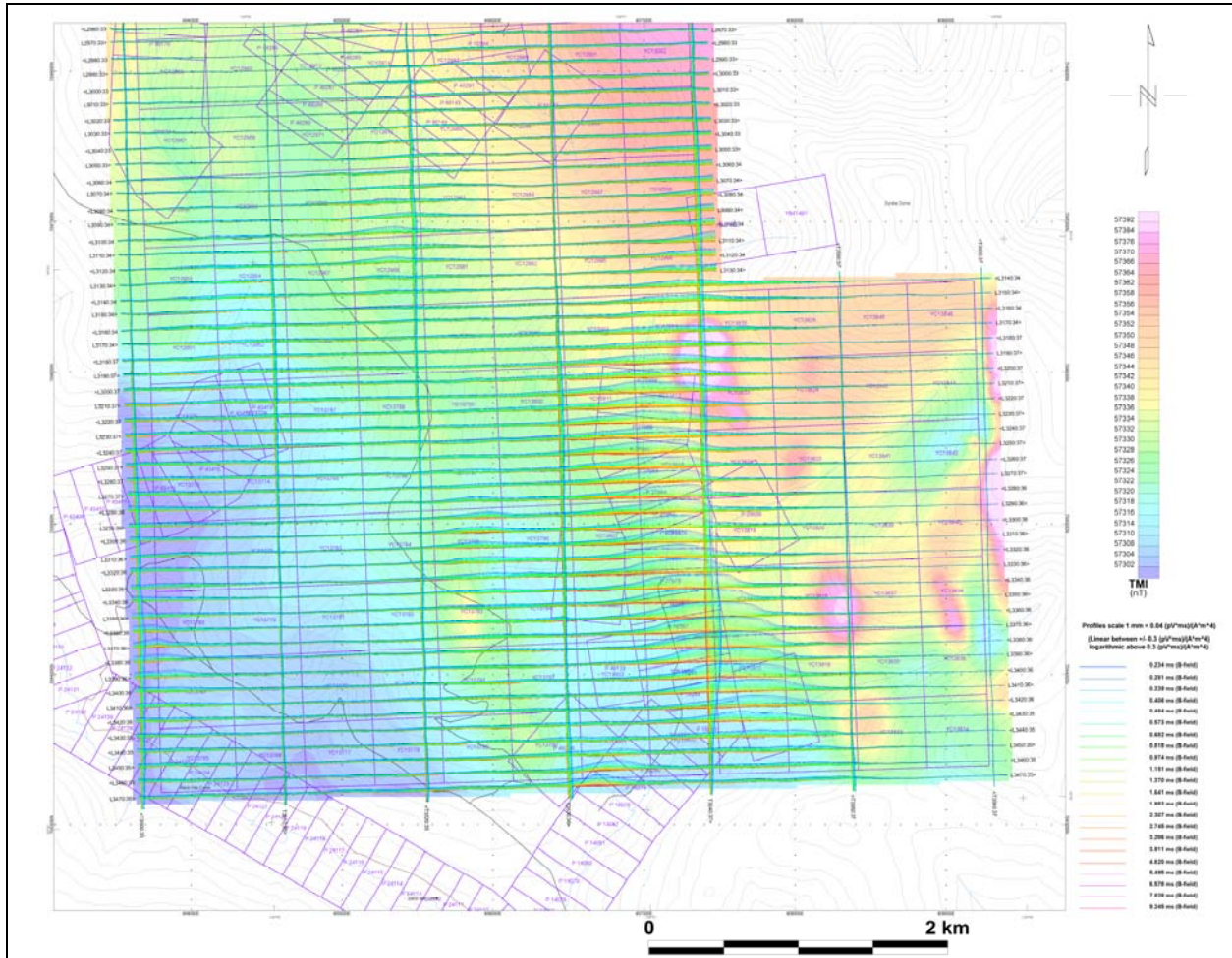




**Eureka Property - North: VTEM dB/dt Profiles  
 - Time Gates 0.234 to 9.245 ms**



**Eureka Property: VTEM B-Field Contours  
- Time Gate 1.641 ms**



**Eureka Property - South: VTEM B-Field Profiles  
 – Time Gates 0.234 to 9.245 ms, over TMI**

## APPENDIX E

### GENERALIZED MODELING RESULTS OF THE VTEM SYSTEM

#### Introduction

The VTEM system is based on a concentric or central loop design, whereby, the receiver is positioned at the centre of a 26.1 metres diameter transmitter loop that produces a dipole moment up to 556,400 nIA at peak current. The wave form is a bi-polar, modified square wave with a turn-on and turn-off at each end. With a base frequency of 30 Hz, the duration of each pulse is approximately 4.2 milliseconds followed by an off time where no primary field is present.

During turn-on and turn-off, a time varying field is produced (dB/dt) and an electro-motive force (emf) is created as a finite impulse response. A current ring around the transmitter loop moves outward and downward as time progresses. When conductive rocks and mineralization are encountered, a secondary field is created by mutual induction and measured by the receiver at the centre of the transmitter loop.

Measurements are made during the on and off-time, when only the secondary field (representing the conductive targets encountered in the ground) is present.

Efficient modeling of the results can be carried out on regularly shaped geometries, thus yielding close approximations to the parameters of the measured targets. The following is a description of a series of common models made for the purpose of promoting a general understanding of the measured results.

#### General Modeling Concepts

A set of models has been produced for the Geotech VTEM® system with explanation notes (see models C1 to C18). The Maxwell™ modeling program (EMIT Technology Pty. Ltd., Midland, AU) used to generate the following responses assumes a resistive half-space. The reader is encouraged to review these models, so as to get a general understanding of the responses as they apply to survey results. While these models do not begin to cover all possibilities, they give a general perspective on the simple and most commonly encountered anomalies.

When producing these models, a few key points were observed and are worth noting as follows:

- For near vertical and vertical plate models, the top of the conductor is always located directly under the centre low point between the two shoulders in the classic **M** shaped response.

- As the plate is positioned at an increasing depth to the top, the shoulders of the **M** shaped response, have a greater separation distance.
- When faced with choosing between a flat lying plate and a prism model to represent the target (broad response) some ambiguity is present and caution should be exercised.
- With the concentric loop system and Z-component receiver coil, virtually all types of conductors and most geometries are most always well coupled and a response is generated. Only concentric loop systems can successfully map this type great variety of targets.

### **Variation of Plate Depth**

Geometries represented by plates of different strike length, depth extent, dip, plunge and depth below surface can be varied with characteristic parameters like conductance of the target, conductance of the host and conductivity/thickness and thickness of the overburden layer.

Diagrammatic models for a vertical plate are shown in Figures C-1 & C-2 and C-5 & C-6 at two different depths, all other parameters remaining constant. With this transmitter-receiver geometry, the classic **M** shaped response is generated. Figures C-1 and C-2 show a plate where the top is near surface. Here, amplitudes of the dual peaks are higher and symmetrical with the zero centre positioned directly above the plate. Most important is the separation distance of the peaks. This distance is small when the plate is near surface and widens with a linear relationship as the plate (depth to top) increases. Figures C-5 and C-6 show a much deeper plate where the separation distance of the peaks is much wider and the amplitudes of the channels have decreased.

### **Variation of Plate Dip**

As the plate dips and departs from the vertical position, the peaks become asymmetrical. Figures C-3 & C-4 and C-7 and C-8 show a near surface plate dipping 80° at two different depths. Note that the direction of dip is toward the high shoulder of the response and the top of the plate remains under the centre minimum.

As the dip increases, the aspect ratio (Min/Max) decreases and this aspect ratio can be used as an empirical guide to dip angles from near 90° to about 30°. The method is not sensitive enough where dips are less than about 30°. For example, for a plate dipping 45°, the minimum shoulder starts to vanish. In Figures C-9 & C-10 and C-11 & C-12, a flat lying plate is shown, relatively near surface. Note that the twin peak anomaly has been replaced by a symmetrical shape with large, bell shaped, channel amplitudes which decay relative to the conductance of the plate.

In the special case where two plates are positioned to represent a synclinal structure. Note that the main characteristic is that the centre amplitudes are higher (approximately double) compared to the high shoulder of a single plate. This model is very representative of tightly folded formations where the conductors were once flat lying.

### **Variation of Prism Dip**

Finally, with thicker, prism models, another algorithm is required to represent current on the plate. A plate model is considered to be infinitely thin with respect to thickness and incapable of representing the current in the thickness dimension. A prism model is constructed to deal with this problem, thereby, representing the thickness of the body more accurately.

Figures C-13 & C-14 and C-15 & C-16 show the same prism at the same depths with variable dips. Aside from the expected differences asymmetry prism anomalies show a characteristic change from a double-peaked anomaly to single peak signatures.

## I. THIN PLATE

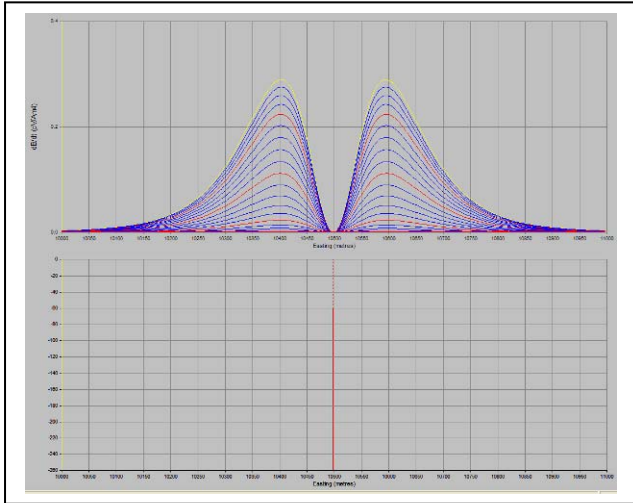


Figure C-1: dB/dt response of a shallow vertical thin plate. Depth=100 m, CT=20 S. The EM response is normalized by the dipole moment and the Rx area.

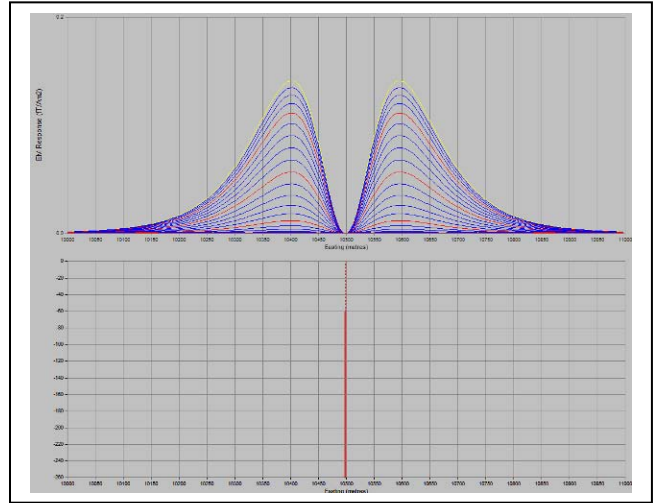


Figure C-2: B-field response of a shallow vertical thin plate. Depth=100 m, CT=20 S. The EM response is normalized by the dipole moment.

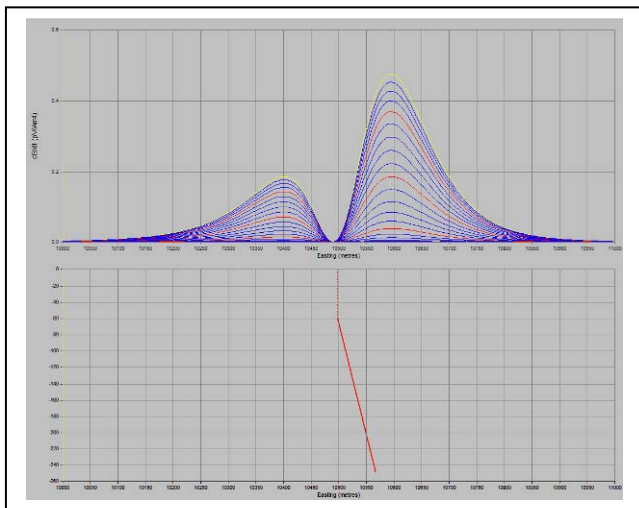


Figure C-3: dB/dt response of a shallow skewed thin plate. Depth=100 m, CT=20 S. The EM response is normalized by the dipole moment and the Rx area.

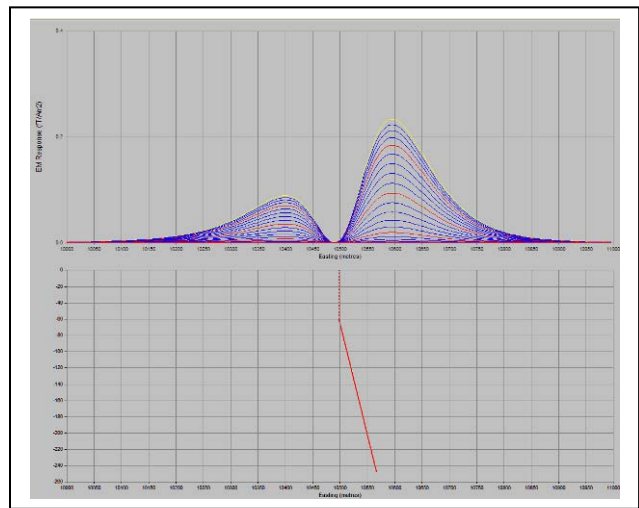


Figure C-4: B-field response of a shallow skewed thin plate. Depth=100 m, CT=20 S. The EM response is normalized by the dipole moment.

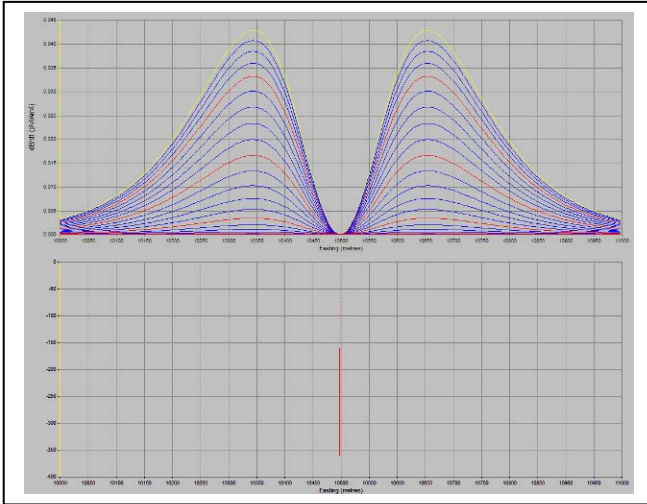


Figure C-5: dB/dt response of a deep vertical thin plate. Depth=200 m, CT=20 S. The EM response is normalized by the dipole moment and the Rx area.

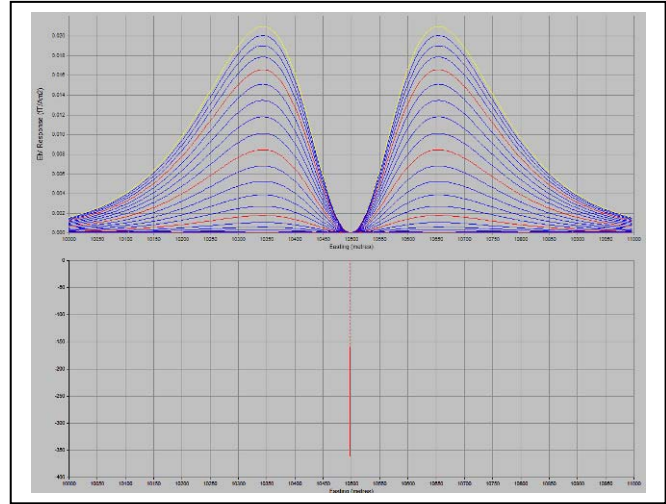


Figure C-6: B-Field response of a deep vertical thin plate. Depth=200 m, CT=20 S. The EM response is normalized by the dipole moment.

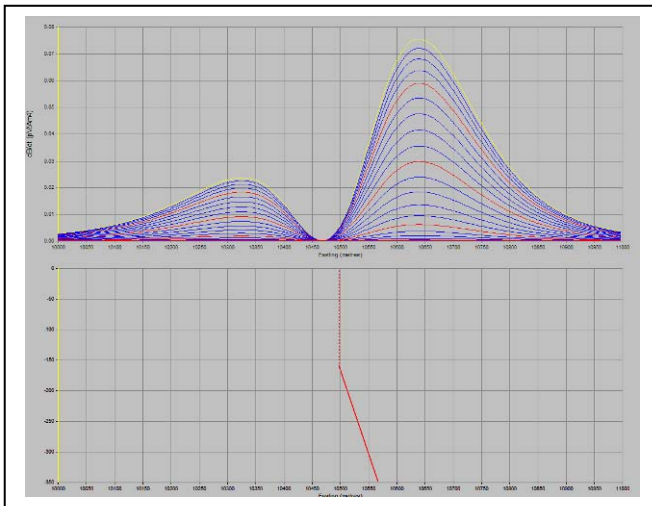


Figure C-7: dB/dt response of a deep skewed thin plate. Depth=200 m, CT=20 S. The EM response is normalized by the dipole moment and the Rx area.

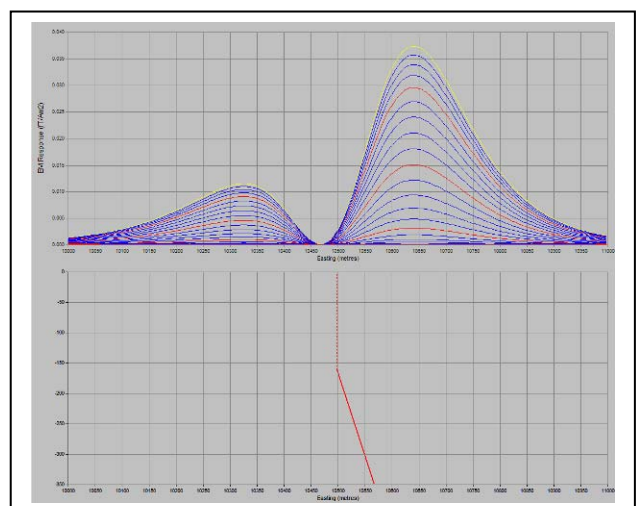


Figure C-8: B-field response of a deep skewed thin plate. Depth=200 m, CT=20 S. The EM response is normalized by the dipole moment.



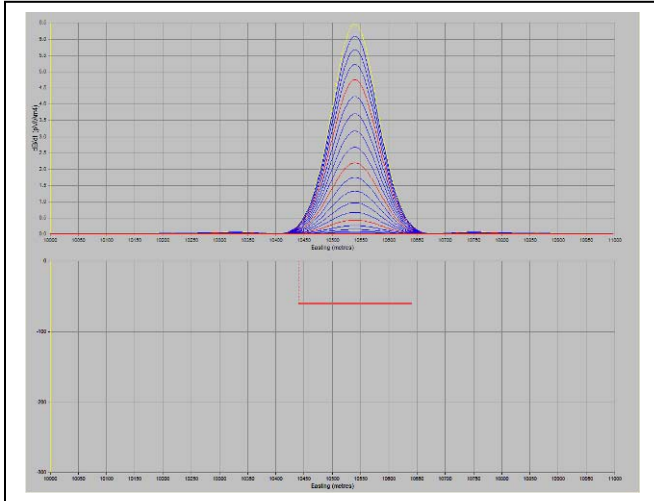


Figure C-9: dB/dt response of a shallow horizontal thin plate. Depth=100 m, CT=20 S. The EM response is normalized by the dipole moment and the Rx area.

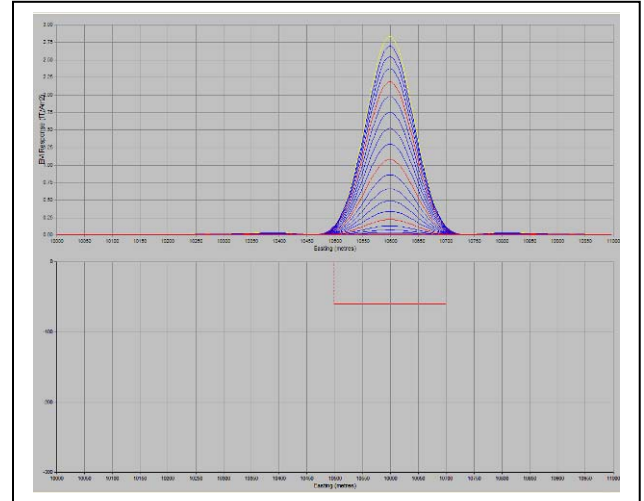


Figure C-10: B-Field response of a shallow horizontal thin plate. Depth=100 m, CT=20 S. The EM response is normalized by the dipole moment.

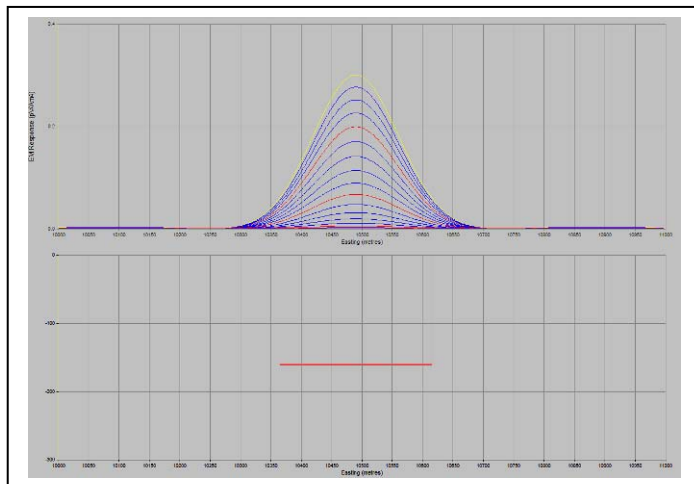


Figure C-11: dB/dt response of a deep horizontal thin plate. Depth=200 m, CT=20 S. The EM response is normalized by the dipole moment and the Rx area.

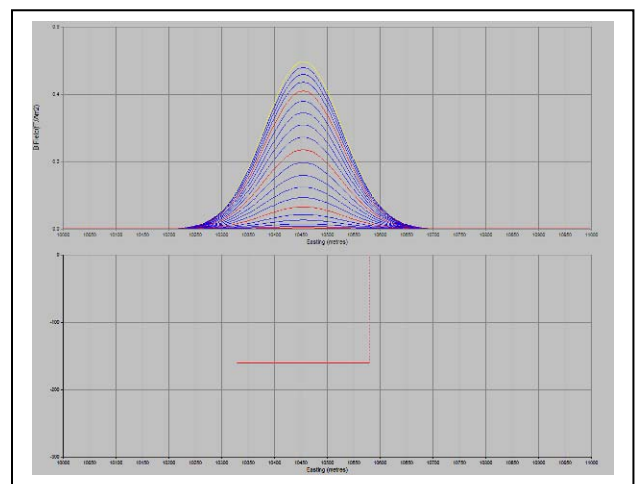


Figure C-12: B-Field response of a deep horizontal thin plate. Depth=200 m, CT=20 S. The EM response is normalized by the dipole moment.

## II. THICK PLATE

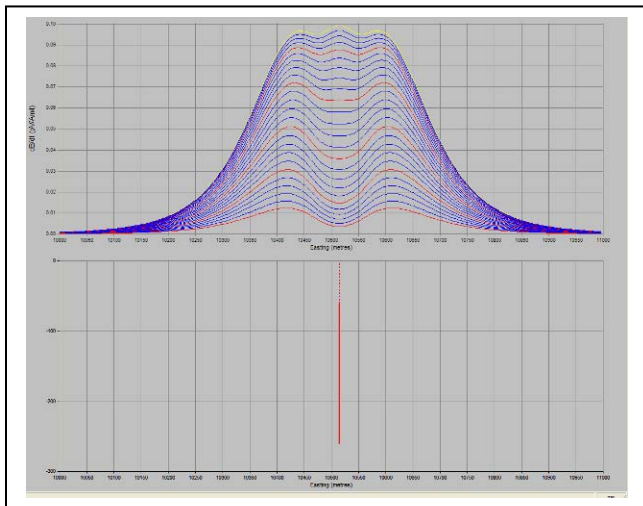


Figure C-13: dB/dt response of a shallow vertical thick plate. Depth=100 m, C=12 S/m, thickness=20 m. The EM response is normalized by the dipole moment and the Rx area.

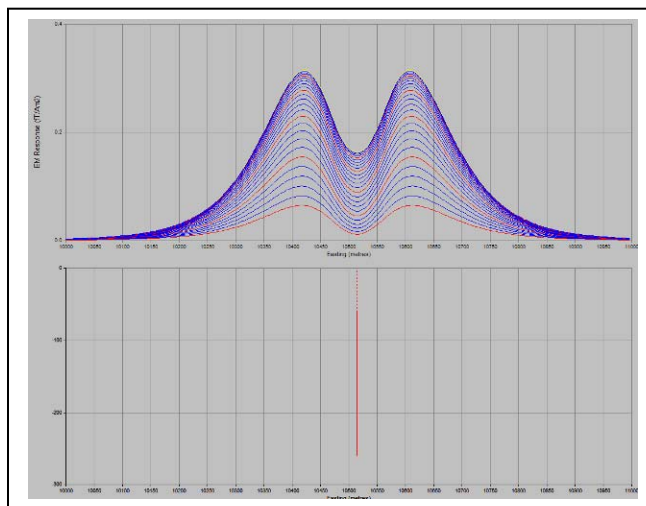


Figure C-14: B-Field response of a shallow vertical thick plate. Depth=100 m, C=12 S/m, thickness= 20 m. The EM response is normalized by the dipole moment.

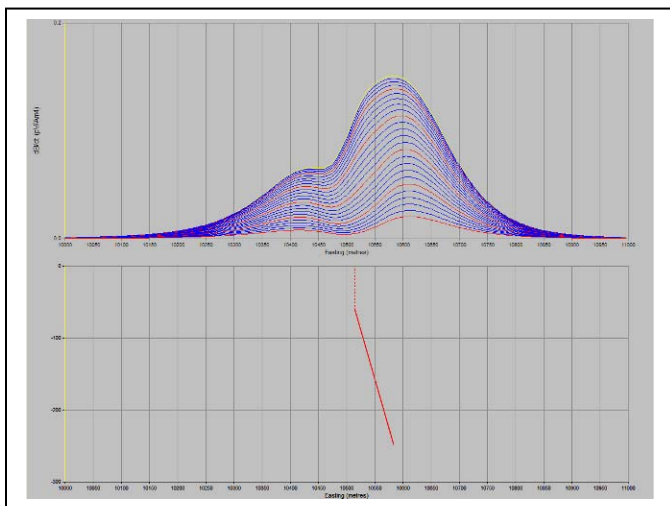


Figure C-15: dB/dt response of a shallow skewed thick plate. Depth=100 m, C=12 S/m, thickness=20 m. The EM response is normalized by the dipole moment and the Rx area.

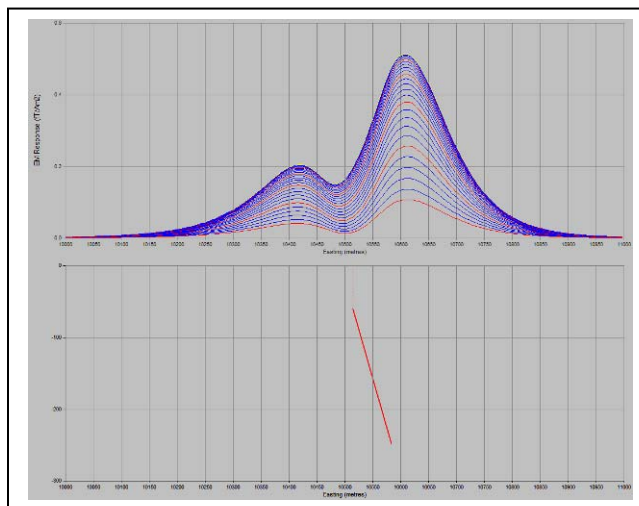


Figure C-16: B-Field response of a shallow skewed thick plate. Depth=100 m, C=12 S/m, thickness=20 m. The EM response is normalized by the dipole moment.

### III. MULTIPLE THIN PLATES

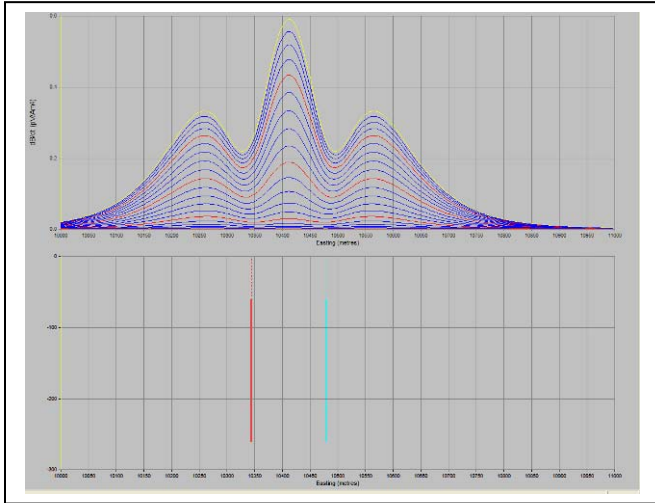


Figure C-17: dB/dt response of two vertical thin plates. Depth=100 m, CT=20 S. The EM response is normalized by the dipole moment and the Rx area.

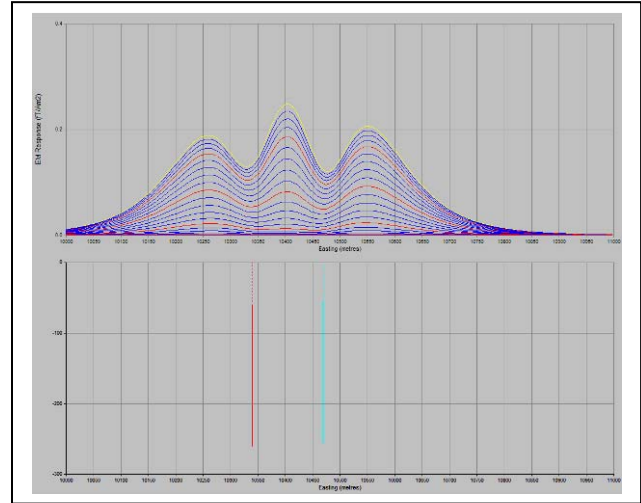


Figure C-18: B-Field response of two vertical thin plates. Depth=100 m, CT=20 S. The EM response is normalized by the dipole moment.

## General Interpretation Principals

### Magnetics

The total magnetic intensity responses reflect major changes in the magnetite and/or other magnetic minerals content in the underlying rocks and unconsolidated overburden. Precambrian rocks have often been subjected to intense heat and pressure during structural and metamorphic events in their history. Original signatures imprinted on these rocks at the time of formation have, in most cases, been modified, resulting in low magnetic susceptibility values.

The amplitude of magnetic anomalies, relative to the regional background, helps to assist in identifying specific magnetic and non-magnetic rock units (and conductors) related to, for example, mafic flows, mafic to ultramafic intrusives, felsic intrusives, felsic volcanics and/or sediments etc. Obviously, several geological sources can produce the same magnetic response. These ambiguities can be reduced considerably if basic geological information on the area is available to the geophysical interpreter.

In addition to simple amplitude variations, the shape of the response expressed in the wave length and the symmetry or asymmetry, is used to estimate the depth, geometric parameters and magnetization of the anomaly. For example, long narrow magnetic linears usually reflect mafic flows or intrusive dyke features. Large areas with complex magnetic patterns may be produced by intrusive bodies with significant magnetization, flat lying magnetic sills or sedimentary iron formation. Local isolated circular magnetic patterns often represent plug-like igneous intrusives such as kimberlites, pegmatites or volcanic vent areas.

Because the total magnetic intensity (TMI) responses may represent two or more closely spaced bodies within a response, the second derivative of the TMI response may be helpful for distinguishing these complexities. The second derivative is most useful in mapping near surface linears and other subtle magnetic structures that are partially masked by nearby higher amplitude magnetic features. The broad zones of higher magnetic amplitude, however, are severely attenuated in the vertical derivative results. These higher amplitude zones reflect rock units having strong magnetic susceptibility signatures. For this reason, both the TMI and the second derivative maps should be evaluated together.

Theoretically, the second derivative, zero contour or color delineates the contacts or limits of large sources with near vertical dip and shallow depth to the top. The vertical gradient map also aids in determining contact zones between rocks with a susceptibility contrast, however, different, more complicated rules of thumb apply.

### Concentric Loop EM Systems

Concentric systems with horizontal transmitter and receiver antennae produce much larger responses for flat lying conductors as contrasted with vertical plate-like conductors. The amount of current developing on the flat upper surface of targets having a substantial area in this dimension, are the direct result of the effective coupling angle, between the primary magnetic field and the flat surface area. One therefore, must not compare the amplitude/conductance of responses generated from flat lying bodies with those derived from near vertical plates; their ratios will be quite different for similar conductances.

Determining dip angle is very accurate for plates with dip angles greater than 30°. For angles less than 30° to 0°, the sensitivity is low and dips can not be distinguished accurately in the presence of normal survey noise levels.

A plate like body that has near vertical position will display a two shoulder, classic **M** shaped response with a distinctive separation distance between peaks for a given depth to top.

It is sometimes difficult to distinguish between responses associated with the edge effects of flat lying conductors and poorly conductive bedrock conductors. Poorly conductive bedrock conductors having low dip angles will also exhibit responses that may be interpreted as surficial overburden conductors. In some situations, the conductive response has line to line continuity and some magnetic correlation providing possible evidence that the response is related to an actual bedrock source.

The EM interpretation process used, places considerable emphasis on determining an understanding of the general conductive patterns in the area of interest. Each area has different characteristics and these can effectively guide the detailed process used.

The first stage is to determine which time gates are most descriptive of the overall conductance patterns. Maps of the time gates that represent the range of responses can be very informative.

Next, stacking the relevant channels as profiles on the flight path together with the second vertical derivative of the TMI is very helpful in revealing correlations between the EM and Magnetics.

Next, key lines can be profiled as single lines to emphasize specific characteristics of a conductor or the relationship of one conductor to another on the same line. Resistivity Depth sections can be constructed to show the relationship of conductive overburden or conductive bedrock with the conductive anomaly.

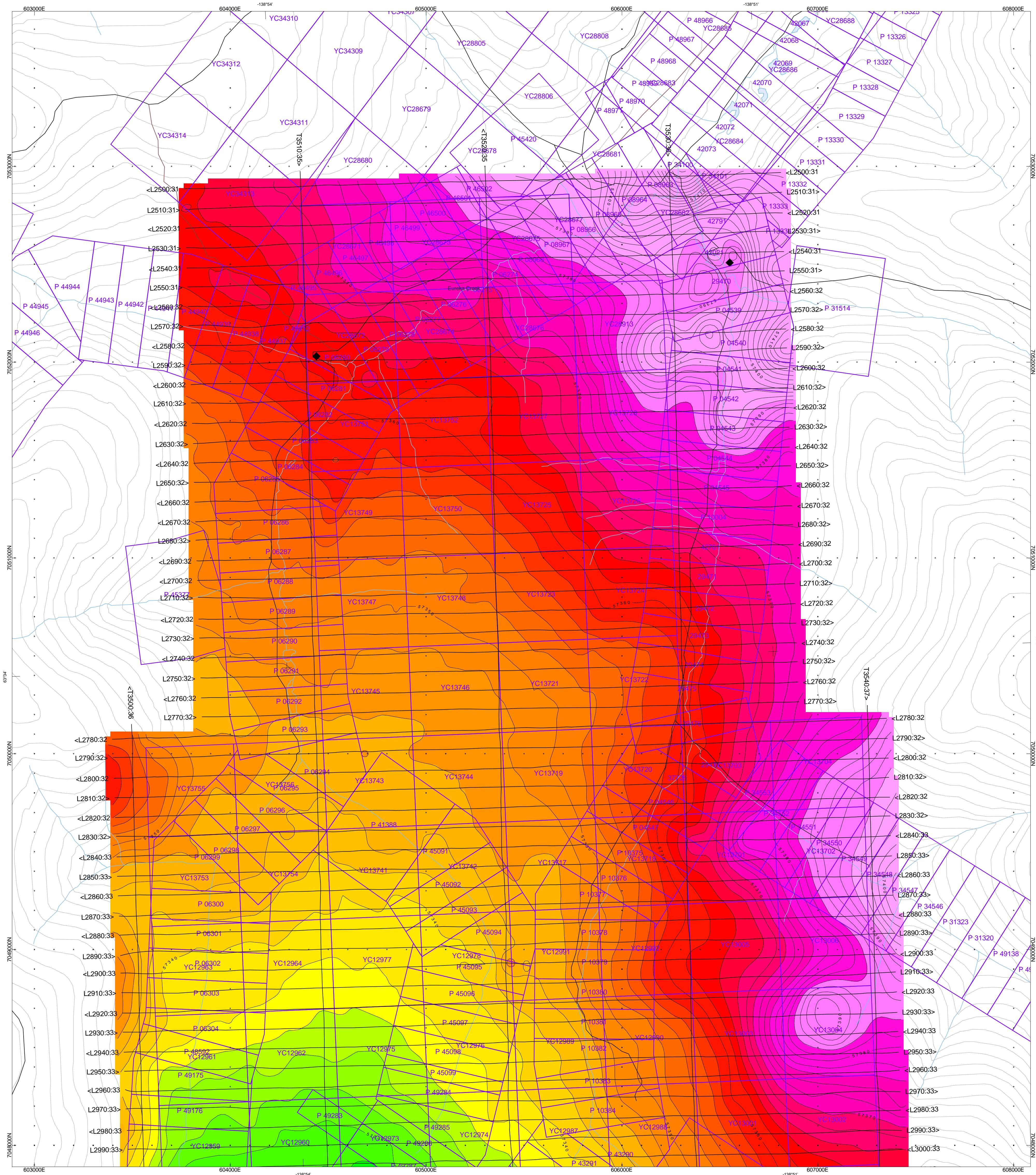
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Roger Barlow  
**Consultant**

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Nasreddine Bournas, P. Geo.  
**Geotech Ltd.**

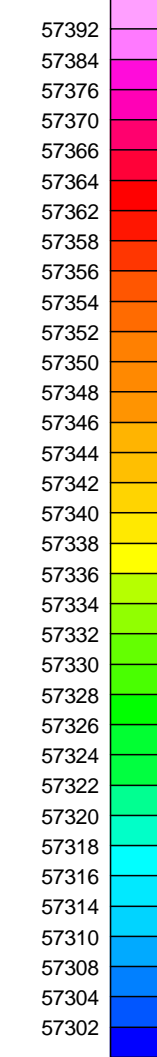
December 2008



**SURVEY SPECIFICATIONS:**  
 Survey Date: July 9th to July 12th, 2008  
 Survey Base: Dawson City, Yukon  
 Aircraft: Aerospaciale A-Star 350 B3 (C-GTRK)  
 Nominal Survey Line Spacing: 100 Meters  
 Nominal Survey Line Direction: N 89° E  
 Nominal Tie Line Spacing: 940 Meters  
 Nominal Tie Line Direction: N 179° E  
 Nominal Terrain Clearance: 75 Meters where possible  
 EM Loop: Towed at a mean distance of 35 meters below the Helicopter  
 Magnetic Sensor: Towed at a mean distance of 13 meters below the Helicopter

**INSTRUMENTS:**  
 Geotech Time Domain Electromagnetic System (VTEM)  
 Concentric Rx/Tx Geometry  
 Transmitter Loop: Diameter 26 Meters, Base Frequency 30 Hz  
 Dipole Moment: 556,400 nA  
 Transmitter Wave Form: Trapezoid, Pulse Width 4.2 ms.  
 Geometrics High Sensitivity Cesium Magnetometer  
 Mag Resolution: 0.02 nT at 10 samples/sec

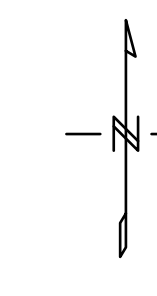
**MAP PROJECTION:**  
 Datum: NAD 83  
 Projection: Universal Transverse Mercator  
 Central Meridian: 141°W (Zone 7)  
 Central Scale Factor: 0.9996  
 False Easting/Northing: 500,000m/0m  
 Major Axis: 6378137.000  
 Eccentricity: 0.081819191  
 NTS: 115010, 115007



**TMI (nT)**

Contour Intervals (nT):  
 2  
 10  
 50

**TOPOGRAPHIC LEGEND:**  
 Buildings  
 Roads  
 Trails  
 Contours  
 Rivers & Streams  
 Lakes  
 Wetlands  
 Mining Rights



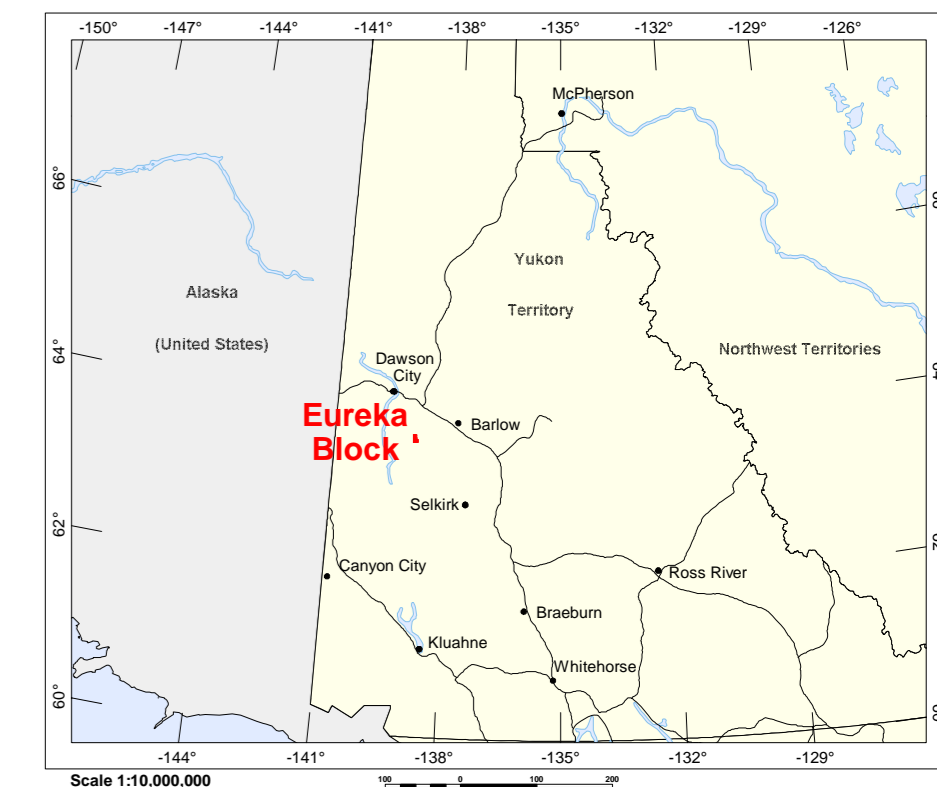
**Scale 1:10000**  
 (meters)  
 NAD83 / UTM zone 7N

The topographic data base was derived from 1:50,000 NRC (Natural Resources Canada) NTDB data. Background shading is derived from NASA SRTM ( Shuttle Radar Topography Mission) data. Inset data derived from Geomatics' 1:250,000 Canadian National Topographic database. Mineral Exploration Licences & Mining Claims are derived from the Government of Yukon, Geomatics Branch ([http://geomatics.yukon.ca/data\\_download.html](http://geomatics.yukon.ca/data_download.html))

**Archer Cathro & Associates Ltd.**  
 Eureka Block - North  
 Barlow Area, Yukon  
 Geotech VTEM System  
**TOTAL MAGNETIC INTENSITY (TMI)**

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[www.geotech.ca](http://www.geotech.ca)

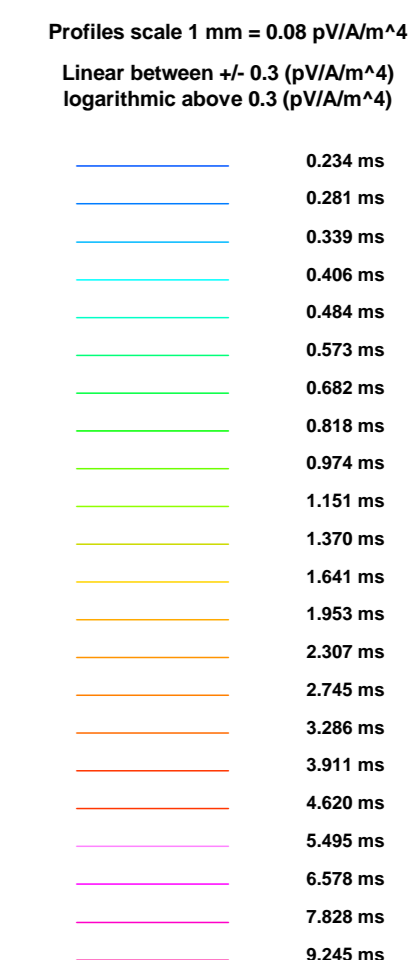
January 2009



**SURVEY SPECIFICATIONS:**  
 Survey Date: July 9th to July 12th, 2008  
 Survey Base: Dawson City, Yukon  
 Aircraft: Aerospatiale A-Star 350 B3 (C-GRK)  
 Nominal Survey Line Spacing: 100 Meters  
 Nominal Survey Line Direction: N 80° E  
 Nominal Tie Line Spacing: 940 Meters  
 Nominal Tie Line Direction: N 179° E  
 Nominal Terrain Clearance: 75 Metres where possible  
 EM Loop: Towed at a mean distance of 35 metres below the Helicopter  
 Magnetometer Sensor: Towed at a mean distance of 13 metres below the Helicopter

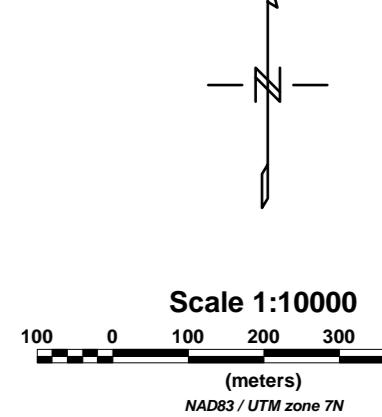
**INSTRUMENTS:**  
 Geotech Time Domain Electromagnetic System (VTEM)  
 Concentric Rx/Tx Geometry  
 Transmitter Loop: Diameter 26 Meters, Base Frequency 30 Hz  
 Dipole Moment: 556,400 nA  
 Transmitter Wave Form: Trapezoid, Pulse Width 4.2 ms.  
 Geometrics High Sensitivity Cesium Magnetometer  
 Mag Resolution: 0.02 nT at 10 samples/sec

**MAP PROJECTION:**  
 Datum: NAD 83  
 Projection: Universal Transverse Mercator  
 Central Meridian: 141°W (Zone 7)  
 Central Scale Factor: 0.9996  
 False Easting/Northing: 500,000m/0m  
 Major Axis: 6378137.000  
 Eccentricity: 0.081819191  
 NTS: 115010, 115007

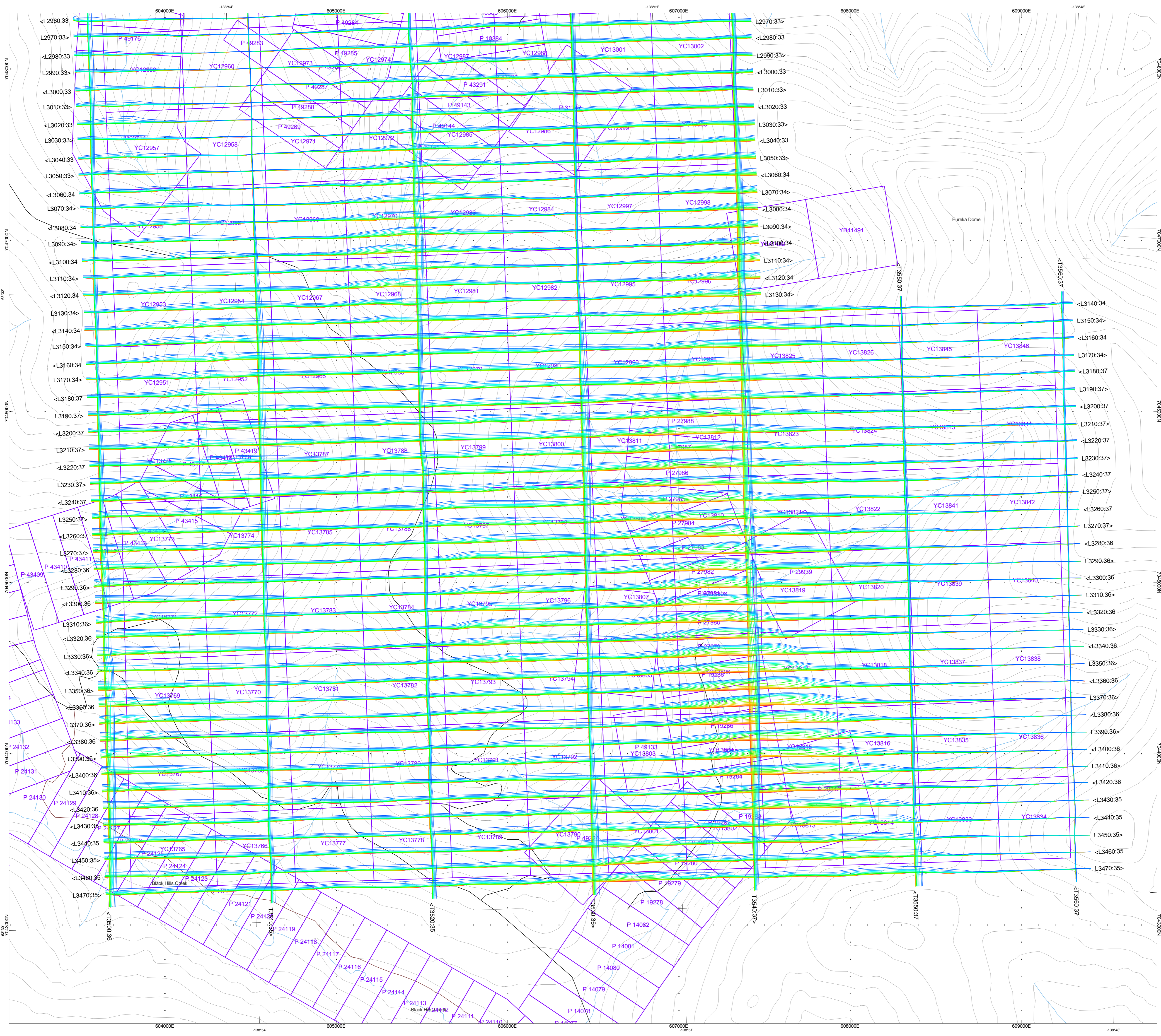


**TOPOGRAPHIC LEGEND:**

- ◆ Buildings
- ◆ Roads
- ◆ Trails
- ◆ Contours
- ◆ Rivers & Streams
- ◆ Lakes
- ◆ Wetlands
- ◆ Mining Rights



The topographic data base was derived from 1:50,000 NRC (Natural Resources Canada) DTB data. Background shading is based on NASA SRTM (Shuttle Radar Topography Mission) data. Inset data derived from Geocommunities 1:250,000 Canadian National Topographic database. Mineral Exploration Licenses & Mining Claims are derived from the Yukon, Geomatics Branch ([http://geomatics.yukon.ca/data\\_download.html](http://geomatics.yukon.ca/data_download.html))



**Archer Cathro & Associates Ltd.**  
 Eureka Block - South Barlow Area, Yukon

Geotech VTEM System  
 VTEM dB/dt PROFILES  
 TIME GATES 0.234 to 9.245 ms

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January 2009

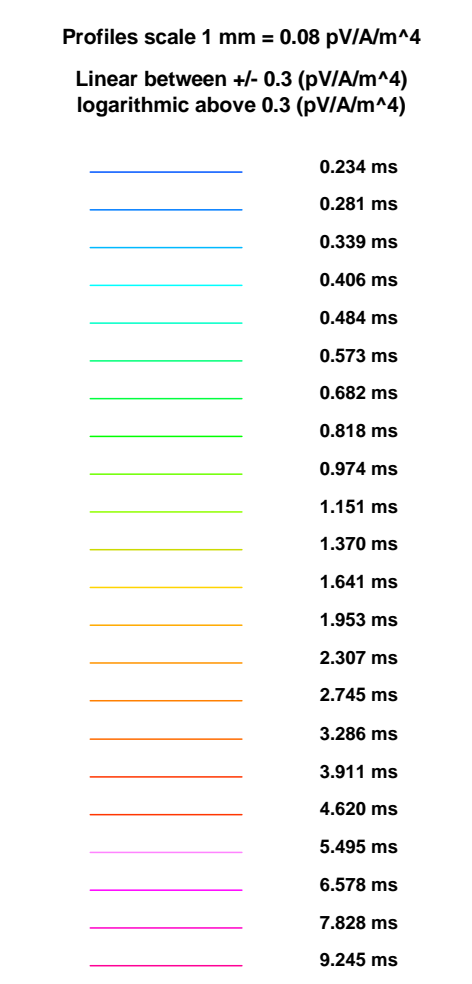




**SURVEY SPECIFICATIONS:**  
 Survey Date: July 9th to July 12th, 2008  
 Survey Base: Dawson City, Yukon  
 Aircraft: Aerospatiale A-Star 350 B3 (C-GTRK)  
 Nominal Survey Line Spacing: 100 Meters  
 Nominal Survey Line Direction: N 89° E  
 Nominal Tie Line Spacing: 940 Meters  
 Nominal Tie Line Direction: N 179° E  
 Nominal Terrain Clearance: 75 Meters where possible  
 EM Loop: Towed at a mean distance of 35 meters below the Helicopter  
 Magnetic Sensor: Towed at a mean distance of 13 meters below the Helicopter

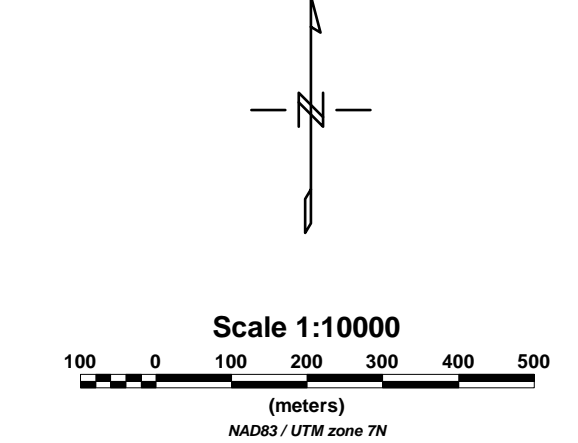
**INSTRUMENTS:**  
 Geotech Time Domain Electromagnetic System (VTEM)  
 Concentric Rx/Tx Geometry  
 Transmitter Loop: Diameter 26 Meters, Base Frequency 30 Hz  
 Dipole Moment: 556,400 nA  
 Transmitter Wave Form: Trapezoid, Pulse Width 4.2 ms.  
 Geometrics High Sensitivity Cesium Magnetometer  
 Mag Resolution: 0.02 nT at 10 samples/sec

**MAP PROJECTION:**  
 Datum: NAD 83  
 Projection: Universal Transverse Mercator  
 Central Meridian: 141°W (Zone 7)  
 Central Scale Factor: 0.9996  
 False Easting/Northing: 500,000m/0m  
 Major Axis: 6378137.000  
 Eccentricity: 0.081819191  
 NTS: 115010, 115007



**TOPOGRAPHIC LEGEND:**

- Buildings
- Roads
- Trails
- Contours
- Rivers & Streams
- Lakes
- Wetlands
- Mining Rights



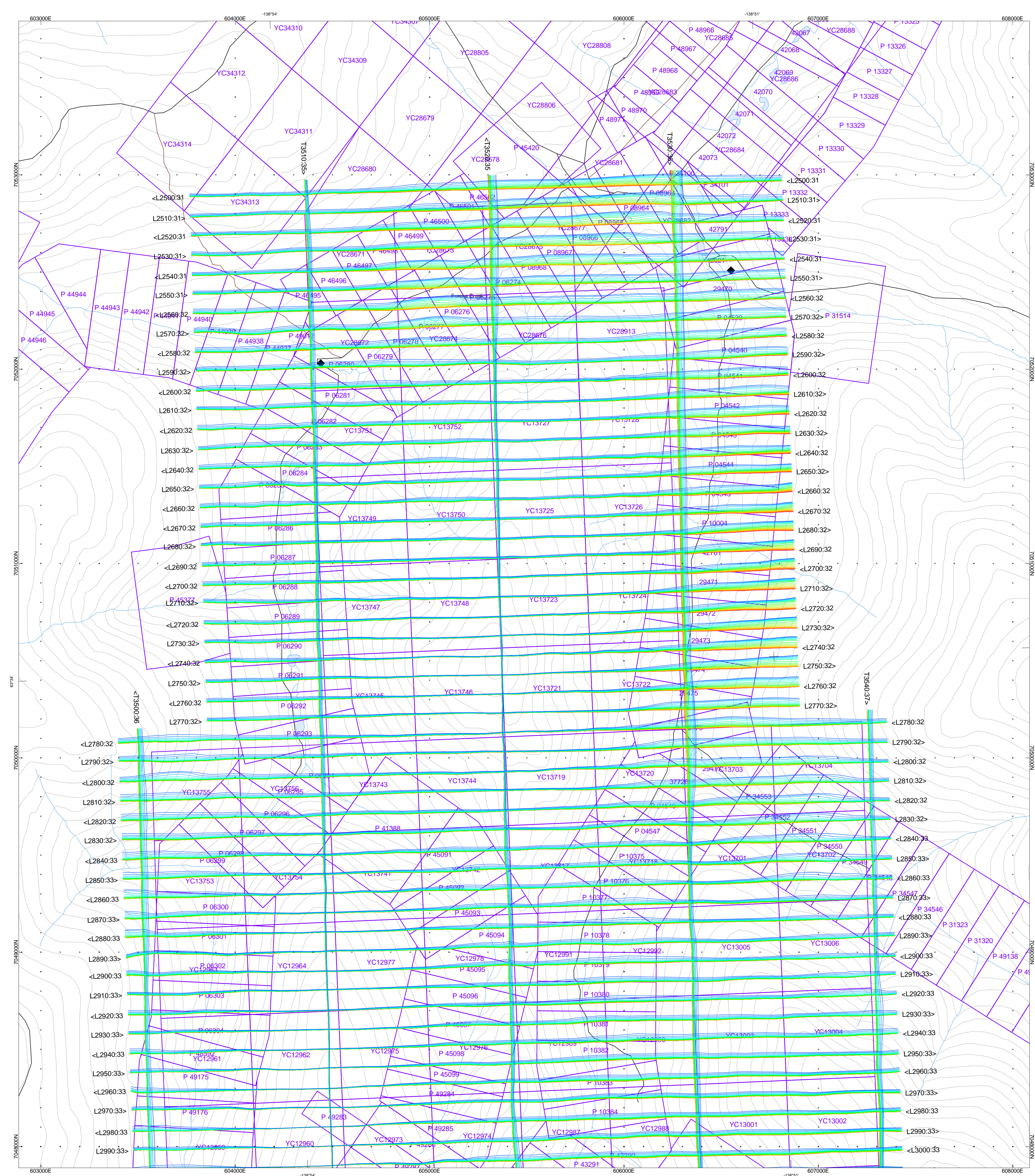
The topographic data base was derived from 1:50,000 NRC (Natural Resources Canada) NTDB data. Background shading is derived from NASA SRTM ( Shuttle Radar Topography Mission) data. Inset data derived from Geomatics Yukon's 1:250,000 Canadian National Topographic database. Mineral Exploration Licences & Mining Claims are derived from the Government of Yukon, Geomatics Branch ([http://geomatics.yukon.ca/data\\_download.html](http://geomatics.yukon.ca/data_download.html))

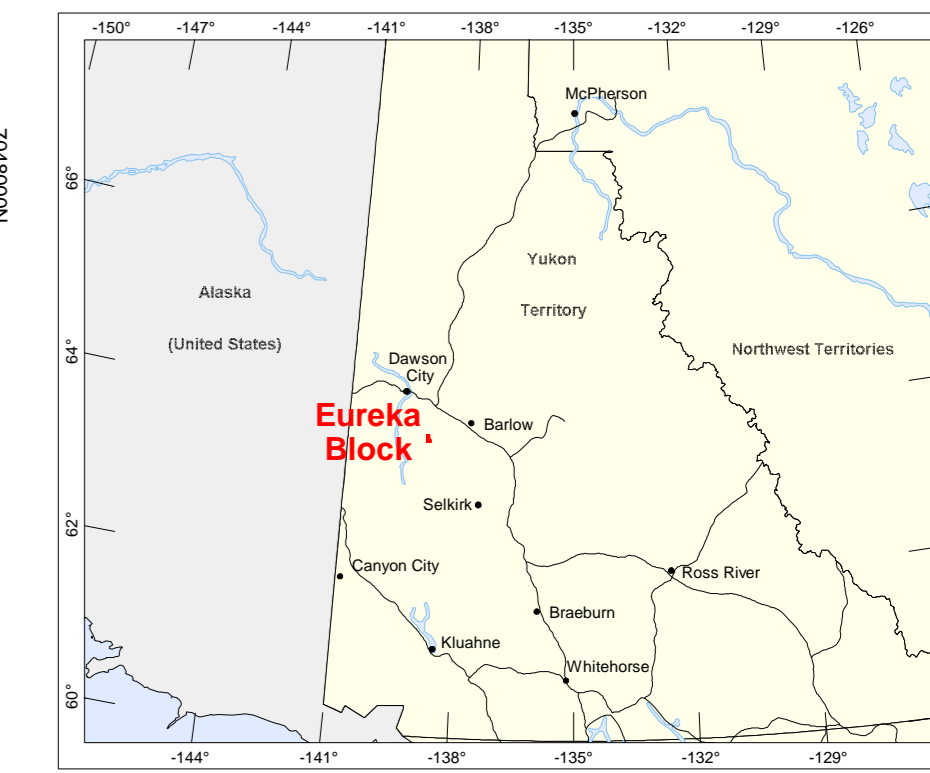
**Archer Cathro & Associates Ltd.**  
**Eureka Block - North Barlow Area, Yukon**

Geotech VTEM System  
**VTEM dB/dt PROFILES**  
**TIME GATES 0.234 to 9.245 ms**

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January 2009



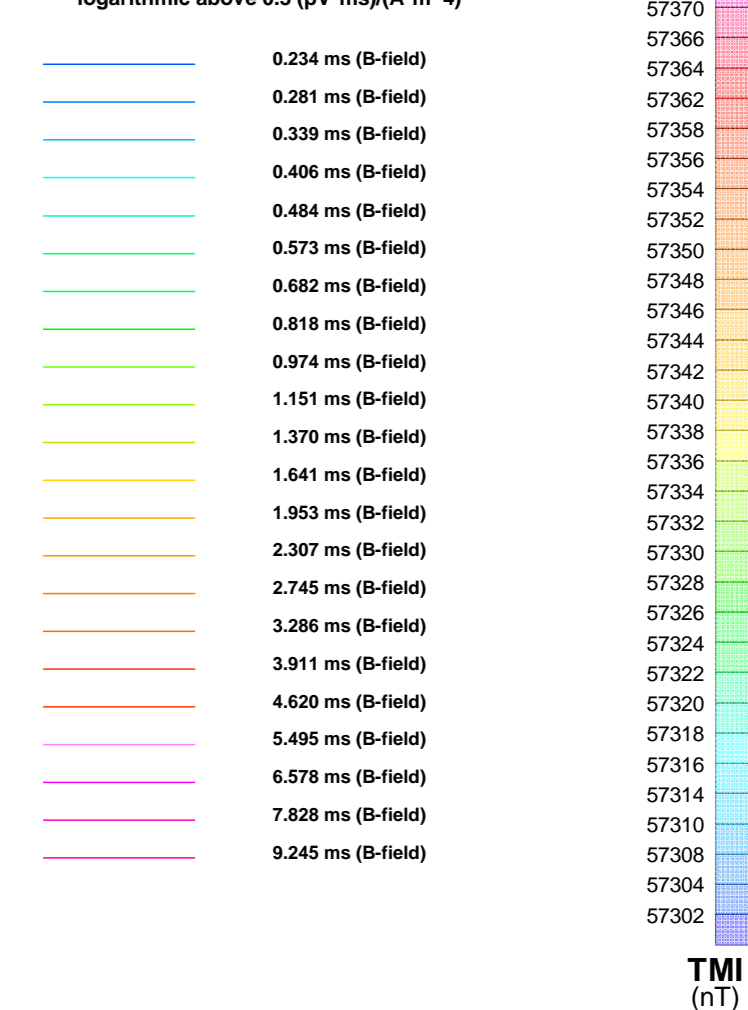


**SURVEY SPECIFICATIONS:**  
 Survey Date: July 9th to July 12th, 2008  
 Survey Base: Dawson City, Yukon  
 Aircraft: Aerospatiale A-Star 350 B3 (C-GTRK)  
 Nominal Survey Line Spacing: 100 Meters  
 Nominal Survey Line Direction: N 89° E  
 Nominal Tie Line Spacing: 140 Meters  
 Nominal Tie Line Direction: N 170° E  
 Nominal Terrain Clearance: 75 Metres where possible  
 EM Loop: Towed at a mean distance of 35 metres below the Helicopter  
 Magnetic Sensor: Towed at a mean distance of 13 metres below the Helicopter

**INSTRUMENTS:**  
 Geotech Time Domain Electromagnetic System (VTEM)  
 Concentric Rx/Tx Geometry  
 Transmitter Loop: Diameter 26 Metres, Base Frequency 30 Hz  
 Dipole Moment: 556,400 nIA  
 Transmitter Wave Form: Trapezoid, Pulse Width 4.2 ms.  
 Geometrics High Sensitivity Cesium Magnetometer  
 Mag Resolution: 0.02 nT at 10 samples/sec

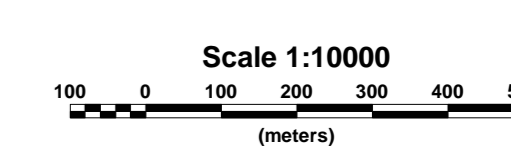
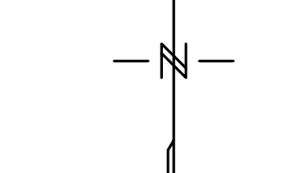
**MAP PROJECTION:**  
 Datum: NAD 83  
 Projection: Universal Transverse Mercator  
 Central Meridian: 141°W (Zone 7)  
 Central Scale Factor: 0.9995  
 False Easting/Northing: 500,000m/0m  
 Major Axis: 6378137.000  
 Eccentricity: 0.081819191  
 NTS: 115010, 115007

Profiles scale 1 mm = 0.04 (pV\*ms)/(A\*m<sup>4</sup>)  
 (Linear between +/- 0.3 (pV\*ms)/(A\*m<sup>4</sup>)  
 logarithmic above 0.3 (pV\*ms)/(A\*m<sup>4</sup>)



**TOPOGRAPHIC LEGEND:**

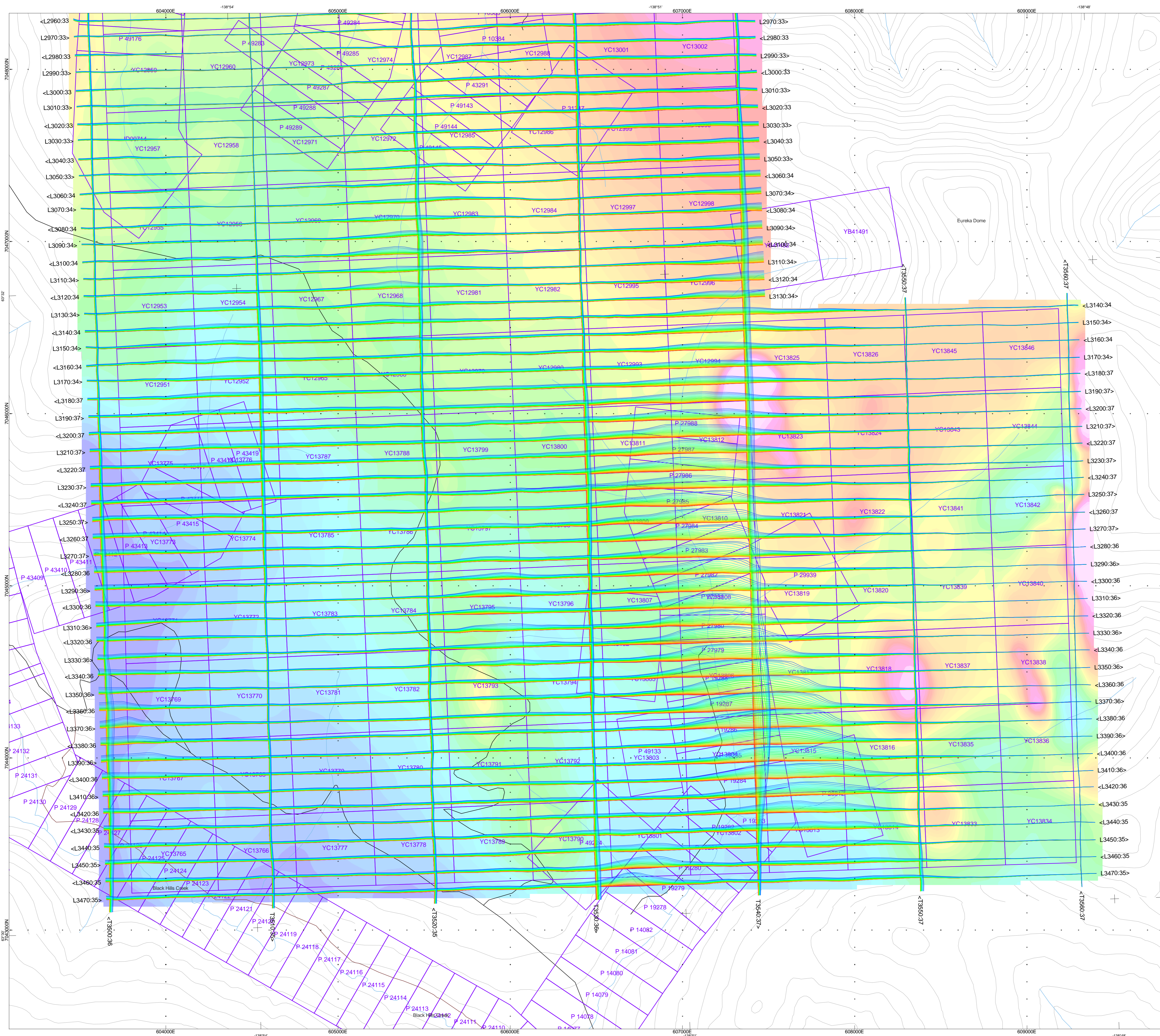
- Buildings
- Roads
- Trails
- Contours
- Rivers & Streams
- Lakes
- Wetlands
- Mining Rights



The topographic data was derived from 1:50,000 NRC (Natural Resources Canada) DTB data. The topographic shading is based on NASA SRTM (Shuttle Radar Topography Mission) data. Inset data derived from Geocommunities 1:250,000 Canadian National Topographic database. Mineral Exploration Licences & Mining Claims are derived from the Government of Yukon, Geomatics Branch ([http://geomatics.yukon.ca/datas\\_download.html](http://geomatics.yukon.ca/datas_download.html))

**Archer Cathro & Associates Ltd.**  
 Eureka Block - South  
 Barlow Area, Yukon  
 Geotech VTEM PROFILE  
 VTEM B-FIELD PROFILES  
 TIME GATES 0.234 to 9.245 ms  
 with TMI Colour Image

Flown and processed by Geotech Ltd.  
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[www.geotech.ca](http://www.geotech.ca)

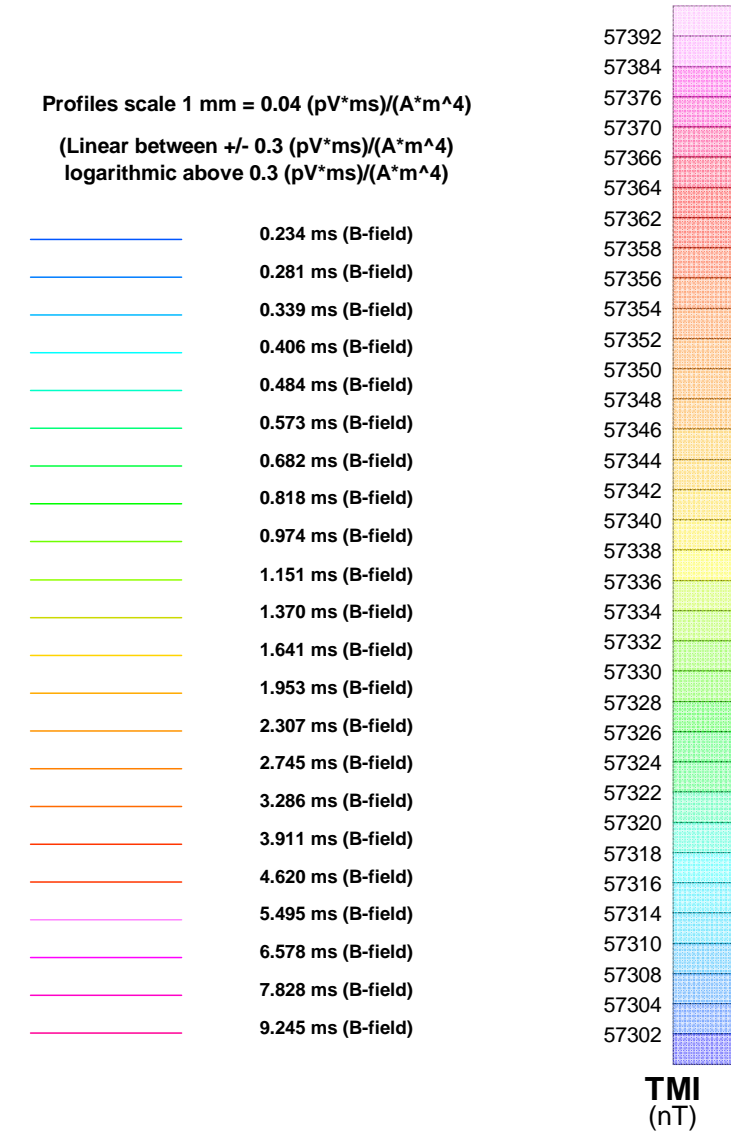




**SURVEY SPECIFICATIONS:**  
 Survey Date: July 9th to July 12th, 2008  
 Survey Base: Dawson City, Yukon  
 Aircraft: Aerospatiale A-Star 350 B3 (C-GTRK)  
 Nominal Survey Line Spacing: 100 Meters  
 Nominal Survey Line Direction: N 89° E  
 Nominal Tie Line Spacing: 940 Meters  
 Nominal Tie Line Direction: N 179° E  
 Nominal Terrain Clearance: 75 Meters where possible  
 EM Loop: Towed at a mean distance of 35 meters below the Helicopter  
 Magnetic Sensor: Towed at a mean distance of 13 meters below the Helicopter

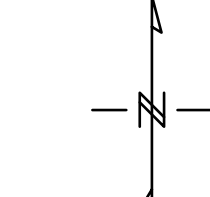
**INSTRUMENTS:**  
 Geotech Time Domain Electromagnetic System (VTEM)  
 Concentric Rx/Tx Geometry  
 Transmitter Loop: Diameter 26 Meters, Base Frequency 30 Hz  
 Dipole Moment: 556,400 nA  
 Transmitter Wave Form: Trapezoid, Pulse Width 4.2 ms.  
 Geometrics High Sensitivity Cesium Magnetometer  
 Mag Resolution: 0.02 nT at 10 samples/sec

**MAP PROJECTION:**  
 Datum: NAD 83  
 Projection: Universal Transverse Mercator  
 Central Meridian: 141°W (Zone 7)  
 Central Scale Factor: 0.9996  
 False Easting/Northing: 500,000m/0m  
 Major Axis: 6378137.000  
 Eccentricity: 0.081819191  
 NTS: 115010, 115007



**TOPOGRAPHIC LEGEND:**

- Buildings
- Roads
- Trails
- Contours
- Rivers & Streams
- Lakes
- Wetlands
- Mining Rights



**Scale 1:10000**  
 (meters)  
 NAD83 / UTM zone 7N

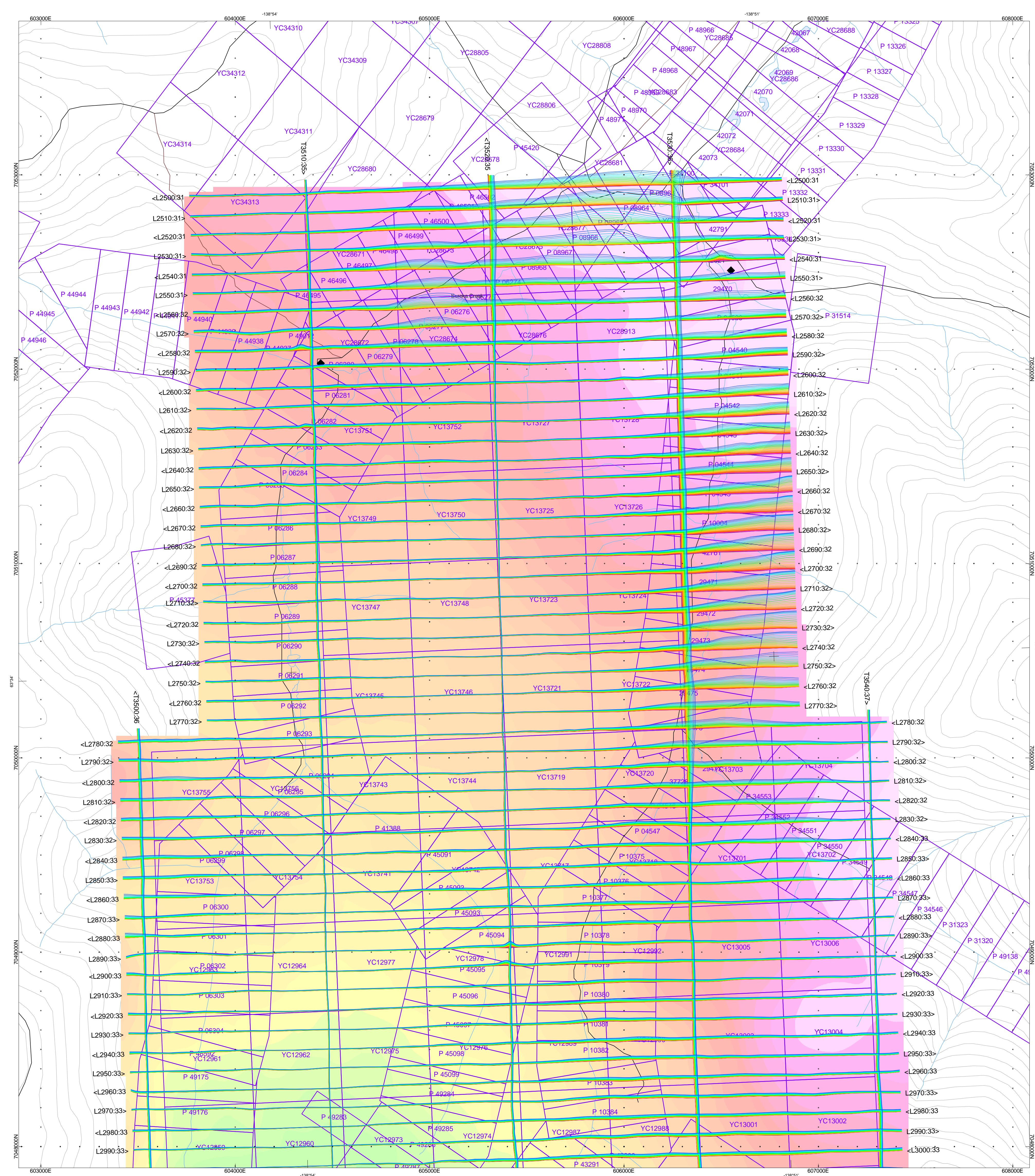
The topographic data base was derived from 1:50,000 NRC (Natural Resources Canada) NTDB data  
 Background shading is derived from NASA SRTM ( Shuttle Radar Topography Mission) data  
 Inset data derived from Geomatics Yukon (Canadian National Topographic database)  
 Mineral Exploration Licences & Mining Claims are derived from the Government of Yukon, Geomatics Branch  
 www.geocomm.com/www.geomatics.ca  
 (http://geomatics.yukon.ca/data\_download.html)

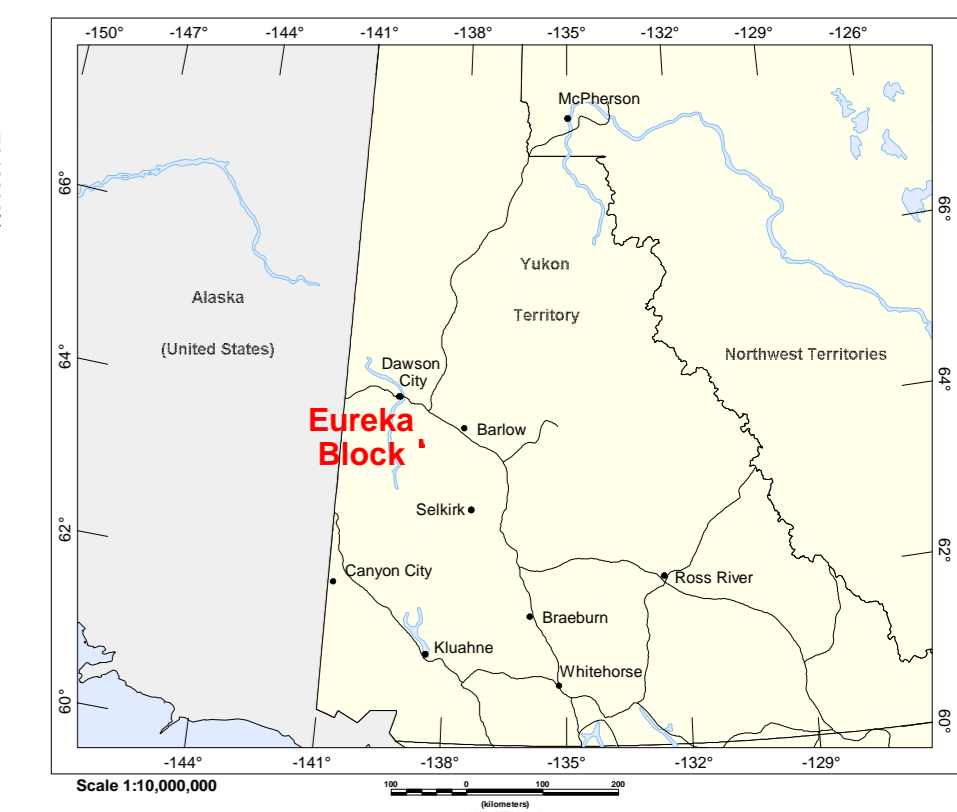
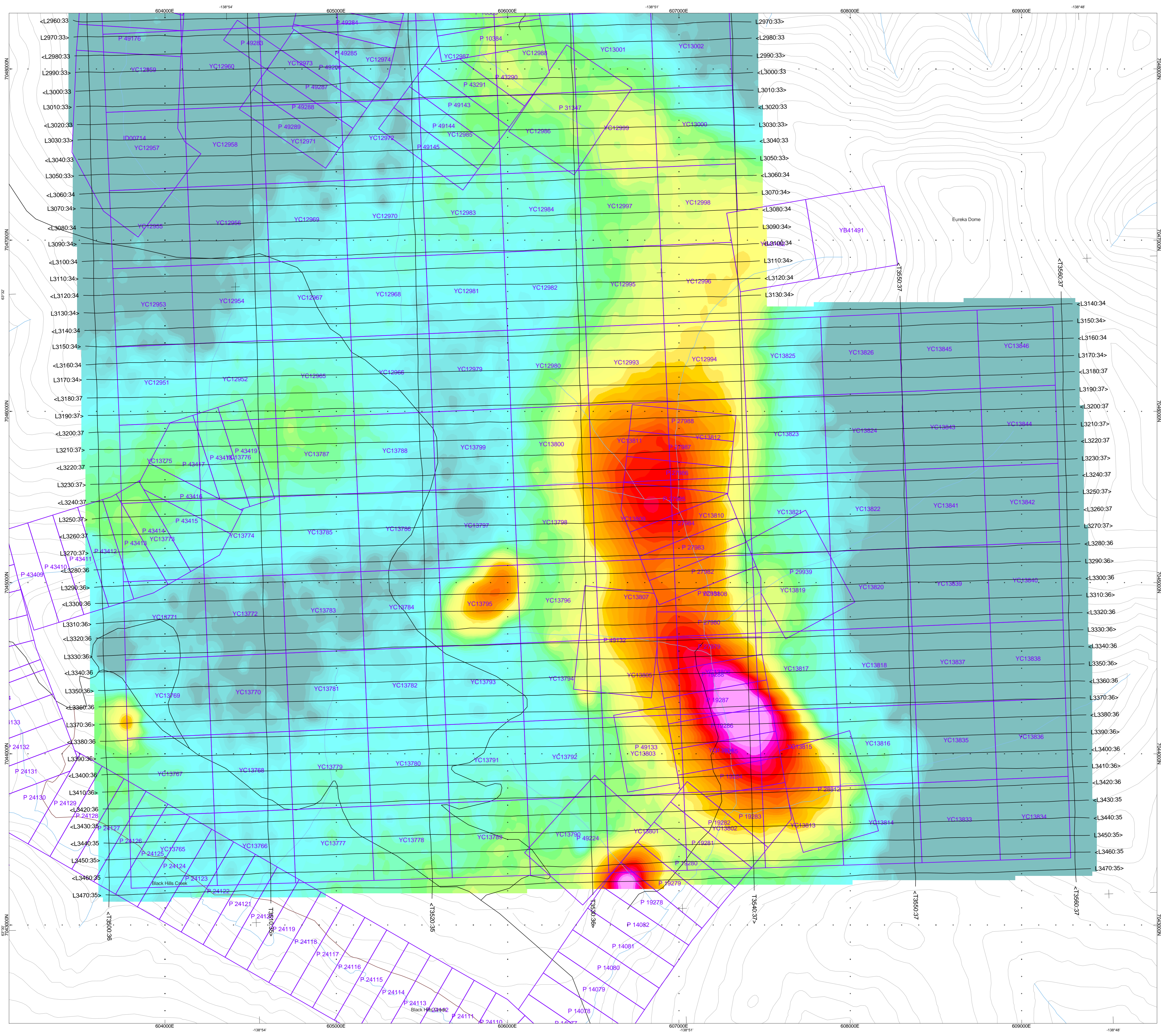
**Archer Cathro & Associates Ltd.**  
 Eureka Block - North  
 Barlow Area, Yukon

**Geotech VTEM System**  
**VTEM B-FIELD PROFILES**  
**TIME GATES 0.234 to 9.245 ms**  
**with TMI Colour Image**

**Flown and processed by Geotech Ltd.**  
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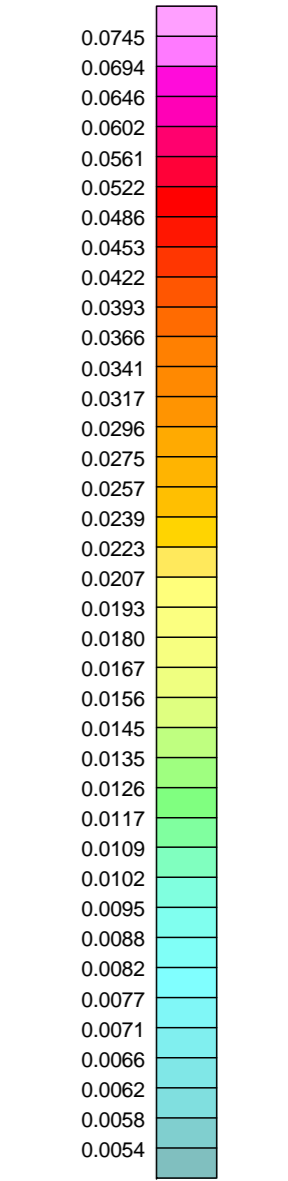




**SURVEY SPECIFICATIONS:**  
 Survey Date: July 9th to July 12th, 2008  
 Survey Base: Dawson City, Yukon  
 Aircraft: Aerospatiale A-Star 350 B3 (C-GTRK)  
 Nominal Survey Line Spacing: 100 Meters  
 Nominal Survey Line Direction: N 89° E  
 Nominal Tie Line Spacing: 940 Meters  
 Nominal Tie Line Direction: N 179° E  
 Nominal Terrain Clearance: 75 Metres where possible  
 EM Loop: Towed at a mean distance of 35 meters below the Helicopter  
 Magnetic Sensor: Towed at a mean distance of 13 meters below the Helicopter

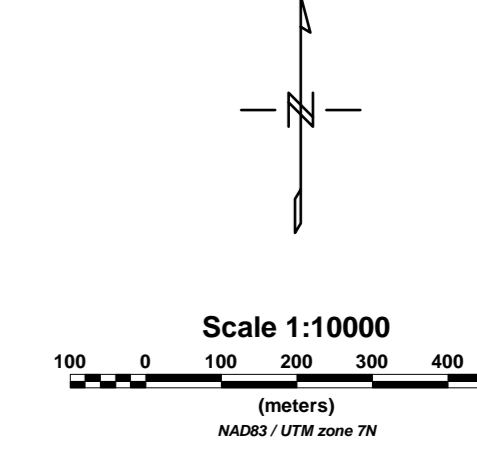
**INSTRUMENTS:**  
 Geotech Time Domain Electromagnetic System (VTEM)  
 Concentric Rx/Tx Geometry  
 Transmitter Loop: Diameter 26 Meters, Base Frequency 30 Hz  
 Dipole Moment: 556,400 nA  
 Transmitter Wave Form: Trapezoid, Pulse Width 4.2 ms.  
 Geometrics High Sensitivity Cesium Magnetometer  
 Mag Projection: 0.02 nT at 10 samples/sec

**MAP PROJECTION:**  
 Datum: NAD 83  
 Projection: Universal Transverse Mercator  
 Central Meridian: 141°W (Zone 7)  
 Central Scale Factor: 0.9996  
 False Easting/Northing: 500,000m/0m  
 Major Axis: 6378137.000  
 Eccentricity: 0.081819191  
 NTS: 115010, 115007



**TOPOGRAPHIC LEGEND:**

- ◆ Buildings
- ◆ Roads
- ◆ Trails
- ◆ Contours
- ◆ Rivers & Streams
- ◆ Lakes
- ◆ Wetlands
- ◆ Mining Rights

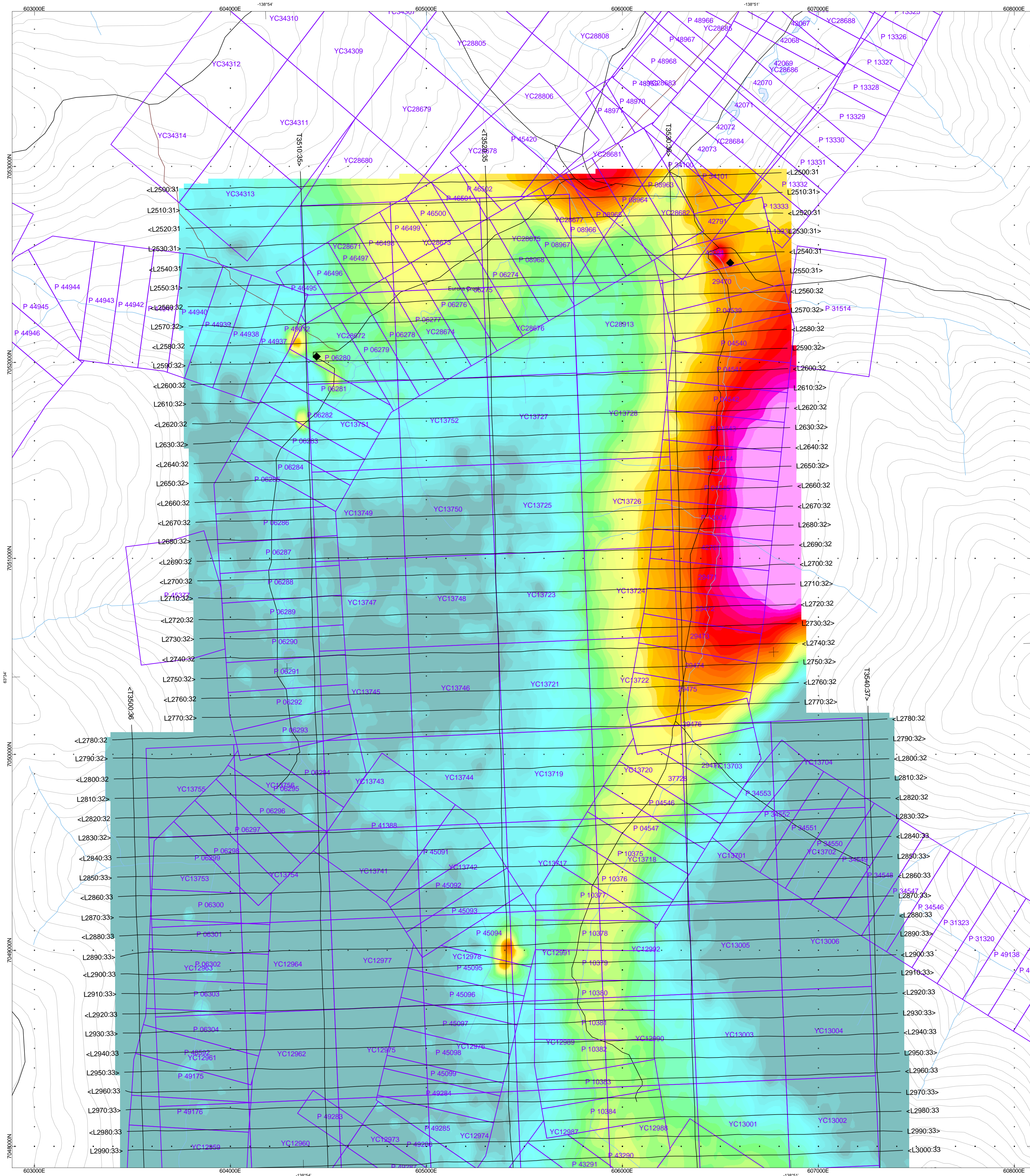


The topographic data base was derived from 1:50,000 NRC (Natural Resources Canada) DTB data. Background shading is based on NASA SRTM (Shuttle Radar Topography Mission) data. Inset data derived from Geocommunities 1:250,000 Canadian National Topographic database. Mineral Exploration Licenses & Mining Claims are derived from the Government of Yukon, Geomatics Branch ([www.geocomm.com/www/geocomm.ca](http://www.geocomm.com/www/geocomm.ca)).

**Archer Cathro & Associates Ltd.**  
 Eureka Block - South Barlow Area, Yukon

Geotech VTEM System  
 VTEM B-FIELD CHANNEL 25  
 TIME GATE 1.641 ms

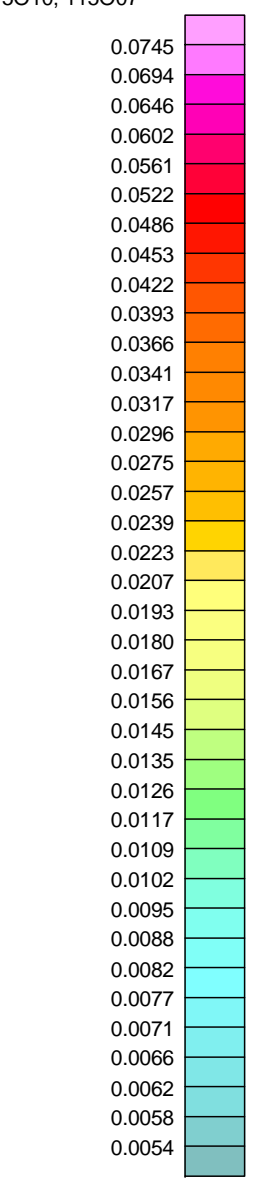
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[www.geotech.ca](http://www.geotech.ca)



**SURVEY SPECIFICATIONS:**  
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 Nominal Survey Line Spacing: 100 Meters  
 Nominal Survey Line Direction: N 89° E  
 Nominal Tie Line Spacing: 940 Meters  
 Nominal Tie Line Direction: N 179° E  
 Nominal Terrain Clearance: 75 Meters where possible  
 EM Loop: Towed at a mean distance of 35 meters below the Helicopter  
 Magnetic Sensor: Towed at a mean distance of 13 meters below the Helicopter

**INSTRUMENTS:**  
 Geotech Time Domain Electromagnetic System (VTEM)  
 Concentric Rx/Tx Geometry  
 Transmitter Loop: Diameter 26 Meters, Base Frequency 30 Hz  
 Dipole Moment: 556,400 nA  
 Transmitter Wave Form: Trapezoid, Pulse Width 4.2 ms.  
 Geometrics High Sensitivity Cesium Magnetometer  
 Mag Resolution: 0.02 nT at 10 samples/sec

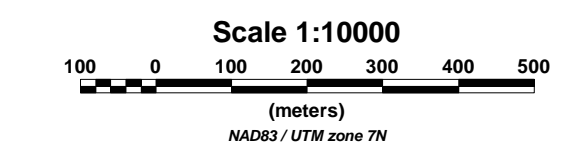
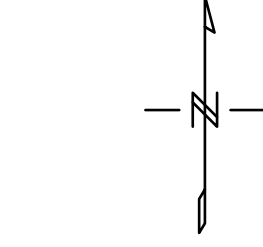
**MAP PROJECTION:**  
 Datum: NAD 83  
 Projection: Universal Transverse Mercator  
 Central Meridian: 141°W (Zone 7)  
 Central Scale Factor: 0.9996  
 False Easting/Northing: 500,000m/0m  
 Major Axis: 6378137.000  
 Eccentricity: 0.081819191  
 NTS: 115010, 115007



**B-Field Channel 25**  
 (pV·ms)/(A·m<sup>4</sup>)

**TOPOGRAPHIC LEGEND:**

- ◆ Buildings
- Roads
- Trails
- Contours
- Rivers & Streams
- Lakes
- Wetlands
- Mining Rights

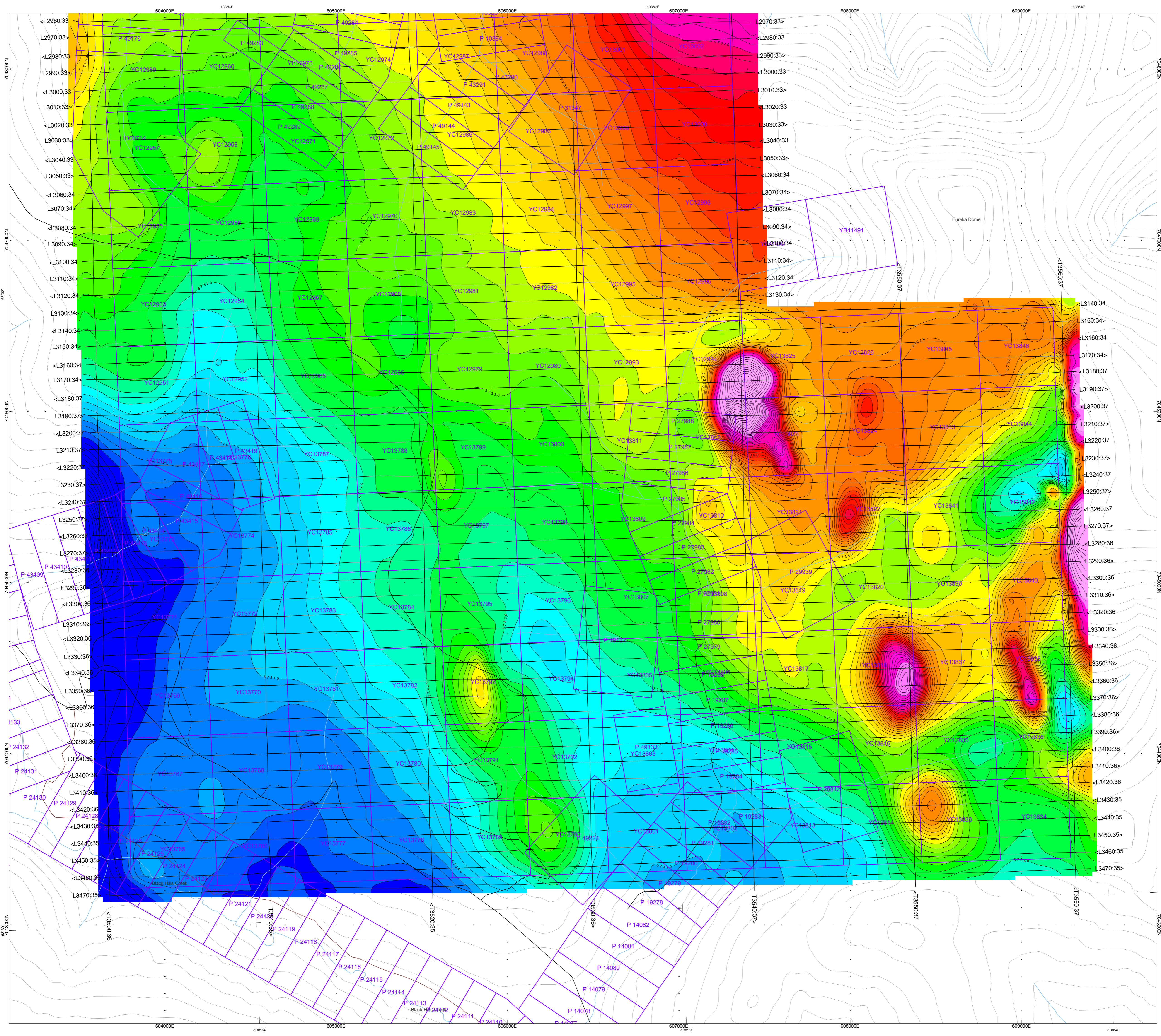


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 Background shading is derived from NASA SRTM (Shuttle Radar Topography Mission) data  
 Inset data derived from Geocommunities 1:250,000 Canadian National Topographic database  
 Mineral Exploration Licences & Mining Claims are derived from the Government of Yukon, Geomatics Branch  
[www.geocomm.com/www.geocomm.ca](http://www.geocomm.com/www.geocomm.ca)  
 ([http://geomatics.yukon.ca/data\\_download.html](http://geomatics.yukon.ca/data_download.html))

**Archer Cathro & Associates Ltd.**  
 Eureka Block - North  
 Barlow Area, Yukon

Geotech VTEM System  
**VTEM B-FIELD CHANNEL 25**  
 TIME GATE 1.641 ms

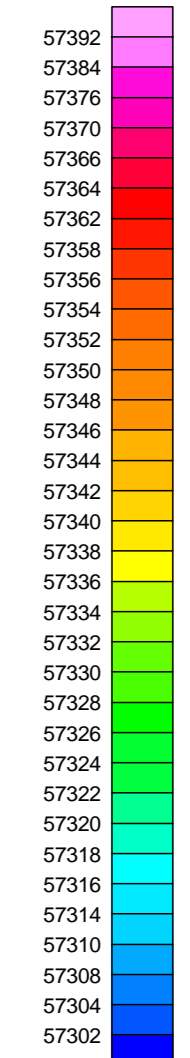
Flown and processed by Geotech Ltd.  
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[www.geotech.ca](http://www.geotech.ca)



**SURVEY SPECIFICATIONS:**  
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 Nominal Survey Line Direction: N 89° E  
 Nominal Tie Line Spacing: 940 Meters  
 Nominal Terrain Clearance: 75 Metres where possible  
 EM Loop: Towed at a mean distance of 35 metres below the Helicopter  
 Magnetic Sensor: Towed at a mean distance of 13 metres below the Helicopter

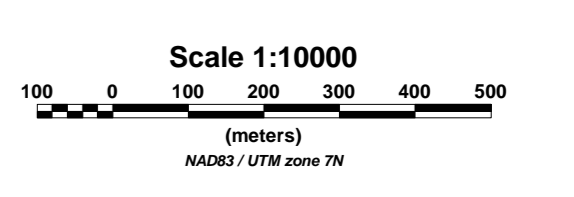
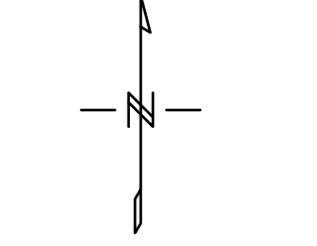
**INSTRUMENTS:**  
 Geotech Time Domain Electromagnetic System (VTEM)  
 Concentric Rx/Tx Geometry  
 Transmitter Loop: Diameter 26 Metres, Base Frequency 30 Hz  
 Dipole Moment: 556,400 nA  
 Transmitter Wave Form: Triangular, Pulse Width 4.2 ms.  
 Geometrics High Sensitivity Cesium Magnetometer  
 Mag Resolution: 0.02 nT at 10 samples/sec

**MAP PROJECTION:**  
 Datum: NAD 83  
 Projection: Universal Transverse Mercator  
 Central Meridian: 141°W (Zone 7)  
 Central Scale Factor: 0.9996  
 False Easting/Northing: 500,000m/0m  
 Major Axis: 6378137.000  
 Eccentricity: 0.081819191  
 NTS: 115010, 115007



**Contour Intervals (nT):**  
 5  
 10  
 50

**TOPOGRAPHIC LEGEND:**  
 Buildings  
 Roads  
 Trails  
 Contours  
 Rivers & Streams  
 Lakes  
 Wetlands  
 Mining Rights



The topographic data base was derived from 1:50,000 NRC (Natural Resources Canada) DTB data. Background shading is based from NASA SRTM (Shuttle Radar Topographic Mission) data. Inset data derived from Geocommunities 1:250,000 Canadian National Topographic database. Mineral Exploration Licences & Mining Claims are derived from the Government of Yukon, Geomatics Branch ([www.geocomm.com/www/geocomm.ca](http://www.geocomm.com/www/geocomm.ca)) ([http://geomatics.yukon.ca/data\\_download.html](http://geomatics.yukon.ca/data_download.html))

**Archer Cathro & Associates Ltd.**  
 Eureka Block - South  
 Barlow Area, Yukon

Geotech VTEM System  
**TOTAL MAGNETIC INTENSITY (TMI)**

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 Aurora, Ontario, Canada L4G 4C4  
[www.geotech.ca](http://www.geotech.ca)

January 2009