

Assessment Report for the

**CRAWFORD Property**

Fort Steele Mining Division

N.T.S. 82 F/ 10E

Latitude 49° 46' 56" N, Longitude 116° 39' 33"W

for

Jasper Mining Corporation  
1020, 833 - 4<sup>th</sup> Avenue S.W.  
Calgary, Alberta  
T2P 3T5

Submitted by:

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Submitted: June 26th, 2007

## **SUMMARY**

The Crawford property is located approximately 70 kilometres northwest of Cranbrook, east of Kootenay Lake in the Purcell Mountains. The property can be reached by way of an old logging road up Crawford Creek about 15 kilometres northeast of the town of Crawford Bay. Elevation ranges from 1325 to 2320 metres.

The CRAWFORD property is underlain by clastic sediments of the Horsethief Creek Group of Upper Proterozoic age, with Late Proterozoic to lower Cambrian strata of the Hamill Group occurring at the northwest corner of the property. These rocks have been subsequently intruded by a broadly elliptical quartz monzonite stock of Cretaceous(?) age, interpreted to be associated with the Fry Creek Batholith, a large intrusive complex located five kilometres to the north. The Fry Creek Batholith has been correlated to the Bayonne Magmatic Belt (BMB), comprised of Cretaceous age felsic intrusions extending from the Baldy Batholith north of Kamloops to the International Boundary with the United States south of Creston. The Sawyer Creek Stock, located 8 km to the southeast, is similarly correlated to the BMB and may represent an apophyse of the Fry Creek Batholith.

The 2006 program consisted of an airborne geophysical program undertaken by Aeroquest Limited. A total of 82.5 line km were flown with collection of electromagnetic, magnetic and radiometric data over the entirety of the property.

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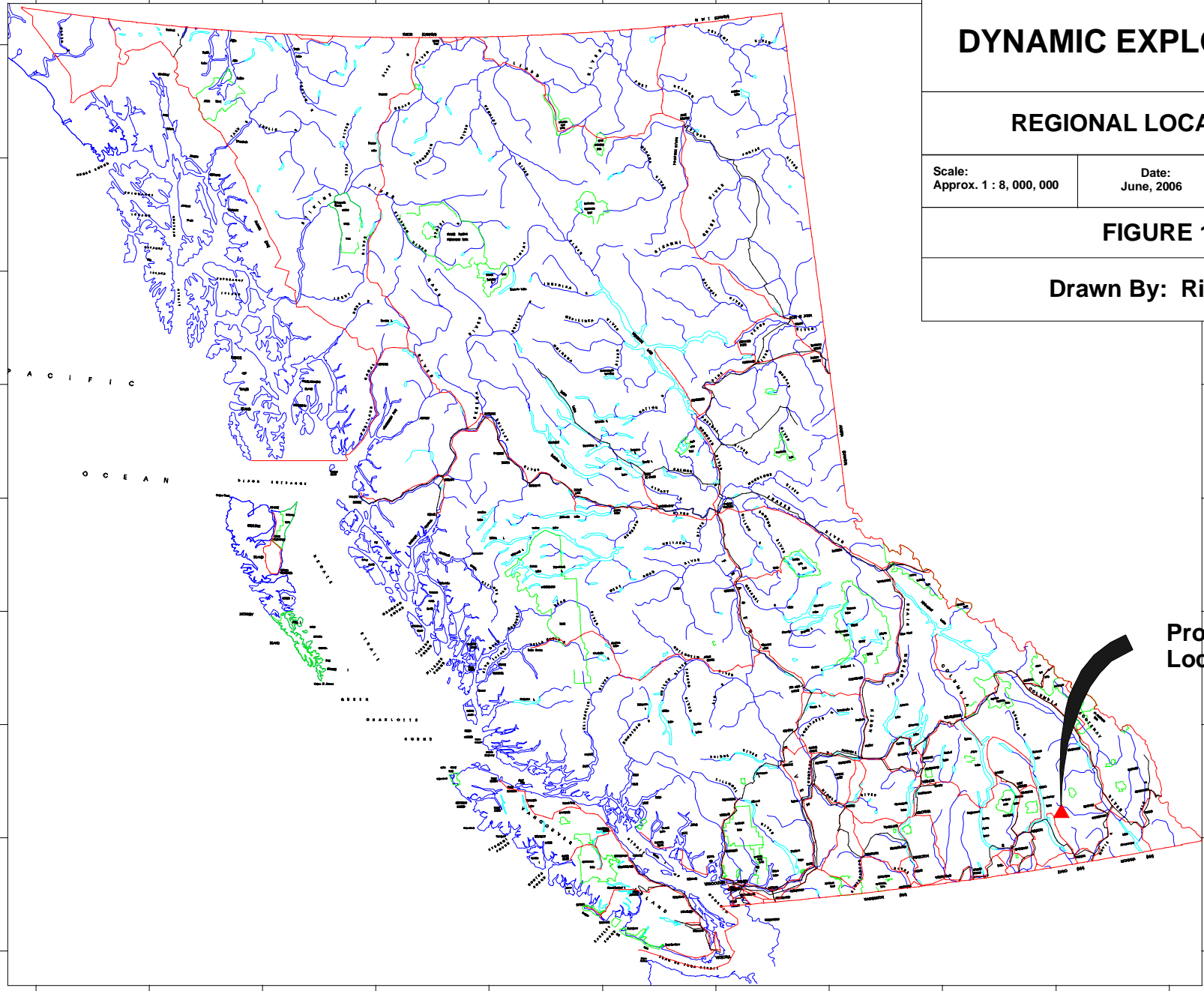
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## **INTRODUCTION**

The Crawford property is located approximately 70 kilometres northwest of Cranbrook (Fig. 1 to 3), east of Kootenay Lake in the Purcell Mountains. The property can be reached by way of an old logging road up Crawford Creek about 15 kilometres northeast of the town of Crawford Bay. Elevation ranges from 1325 to 2320 metres.

The CRAWFORD property is underlain by clastic sediments of the Horsethief Creek Group of Upper Proterozoic age, with Late Proterozoic to lower Cambrian strata of the Hamill Group occurring at the northwest corner of the property (Fig. 4). These rocks have been subsequently intruded by a broadly elliptical quartz monzonite stock of Cretaceous(?) age, interpreted to be associated with the Fry Creek Batholith, a large intrusive complex located five kilometres to the north. The Fry Creek Batholith has been correlated to the Bayonne Magmatic Belt (BMB), comprised of Cretaceous age felsic intrusions extending from the Baldy Batholith north of Kamloops to the International Boundary with the United States south of Creston. The Sawyer Creek Stock, located 8 km to the southeast, is similarly correlated to the BMB and may represent an apophyse of the Fry Creek Batholith.

The 2006 program consisted of an airborne geophysical program undertaken by Aeroquest Limited. A total of 82.5 line km were flown with collection of electromagnetic, magnetic and radiometric data over the entirety of the property.



# DYNAMIC EXPLORATION LTD

## REGIONAL LOCATION MAP

Scale:  
Approx. 1 : 8, 000, 000

Date:  
June, 2006

Mapsheet:  
N.T.S. 82F / 10E  
BCGS: 082F 077

### FIGURE 1

Drawn By: Rick Walker

Property  
Location

# DYNAMIC EXPLORATION LTD

## PROPERTY LOCATION MAP

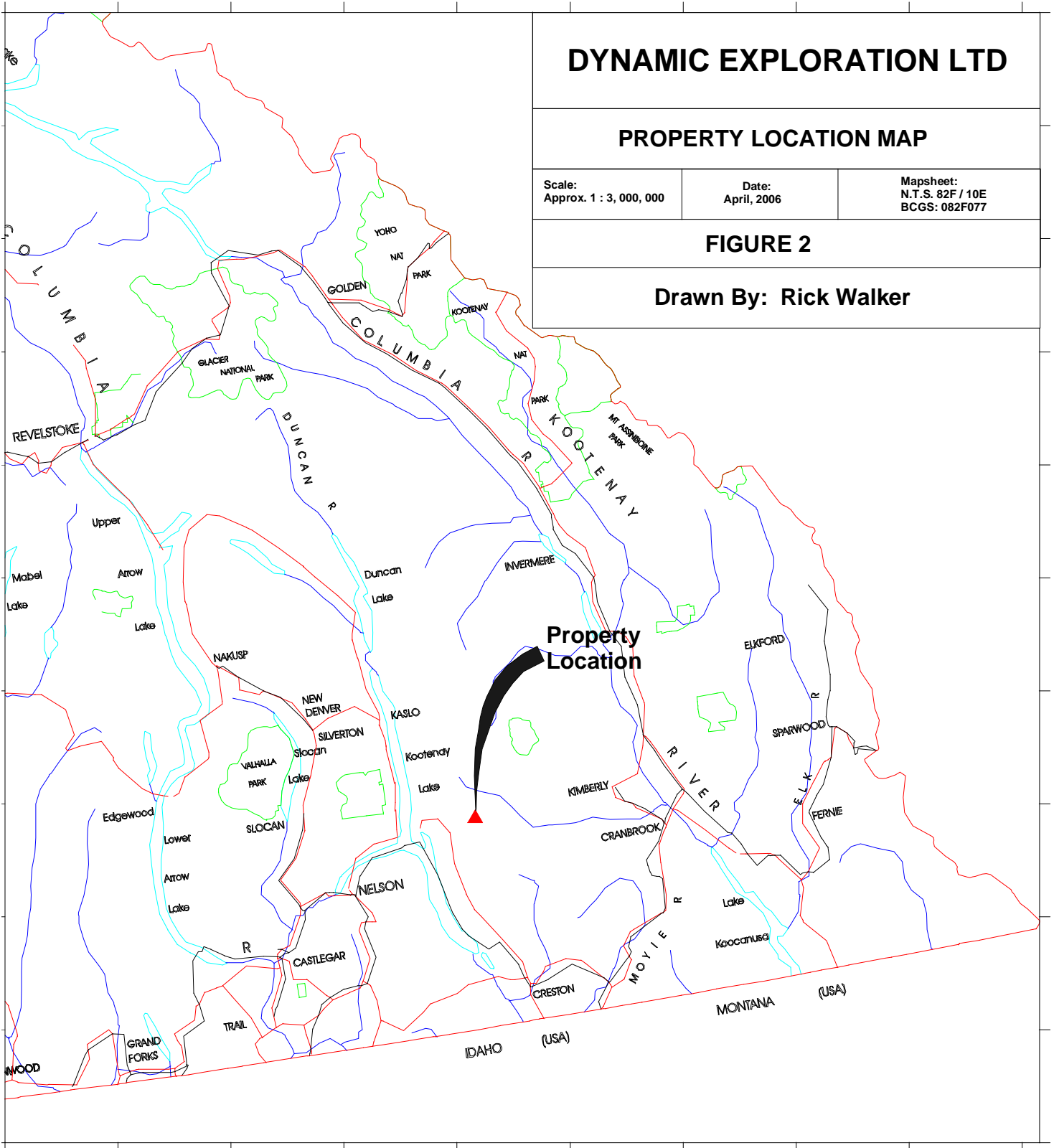
Scale:  
Approx. 1 : 3, 000, 000

Date:  
April, 2006

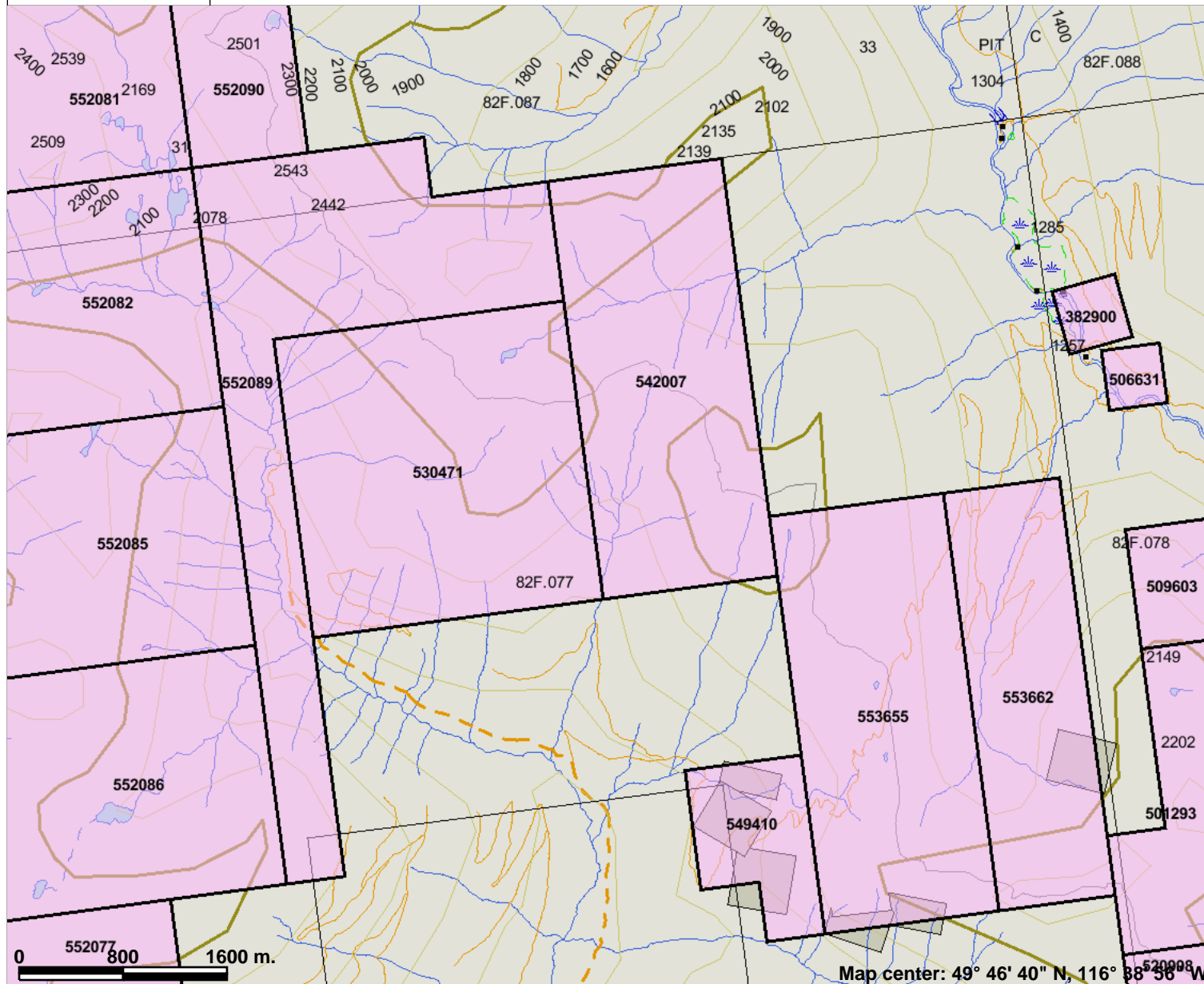
Mapsheet:  
N.T.S. 82F / 10E  
BCGS: 082F077

### FIGURE 2

Drawn By: Rick Walker



# Internet Mapping Framework



## Legend

- Indian Reserves
- National Parks
- Parks
- Mineral Tenures (Mineral - LRDW)
- Mineral Claim
- Mineral Lease
- Reserves (Mineral - LRDW Sites)**
- Placer Claim Designation
- Placer Lease Designation
- No Staking Reserve
- Conditional Reserve
- Release Required Reserve
- Surface Restriction
- Recreation Area
- Others
- Mining Division (MTO)
- Survey Parcels
- BCGS Grid
- Contours (1:250K)**
- Contour - Index
- Contour - Intermediate
- Area of Exclusion
- Area of Indefinite Contours
- Transportation - Points (TRIM)**
- Helipad
- Transportation - Lines (TRIM)**
- Airfield
- Airport
- Airstrip
- Airport.Abandoned
- Ferry Route
- Road (Gravel Undivided) - 1 Lane
- Road (Gravel Undivided) - 2 Lanes



Map center: 49° 46' 40" N, 116° 38' 36" W



Scale: 1:46,526

This map is a user generated static output from an Internet mapping site and is for general reference only. Data layers that appear on this map may or may not be accurate, current, or otherwise reliable. THIS MAP IS NOT TO BE USED FOR NAVIGATION.

Notes: Figure 3: Crawford Property



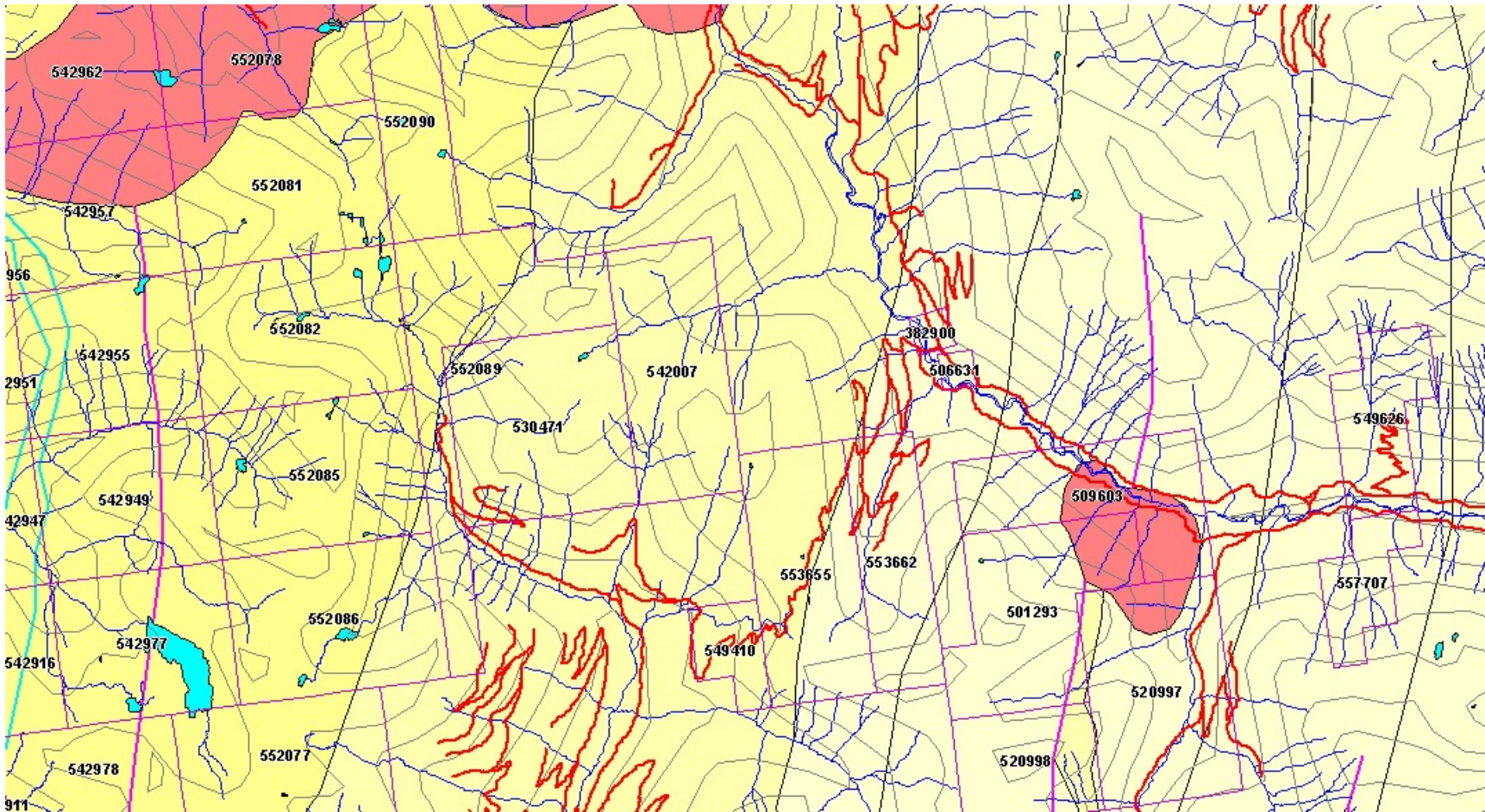


Figure 4: Geological map of the Crawford property and surrounding area. The Crawford property is underlain by clastic sediments correlated to the Horsethief Creek Group and is located approximately 5 km south of the Fry Creek Batholith (at top of figure) and 8 km west of the Sawyer Stock. (From MapPlace, approximate scale 1: 70,000)

## **LOCATION AND ACCESS**

The CRAWFORD property is located in the western Purcell Mountains (Latitude 49° 46' 56" N, Longitude 116° 39' 33" W), approximately 70 kilometres northwest of Cranbrook, B.C. on N.T.S. mapsheet 82 F/10E ( Fig. 1 and 2). The property consists of 2 Mineral Tenures acquired through Mineral Tenures Online (Fig. 3).

The property can be accessed by way of an old logging road up Crawford Creek about 15 kilometres northeast of the town of Crawford Bay. Elevation ranges from 1325 to 2320 metres.

All roads are negotiable using a 2WD vehicle although 4WD is recommended for better clearance.

Helicopter access is recommended for the northeastern?? portions of the property.

## **PHYSIOGRAPHY AND CLIMATE**

The CRAWFORD property is located slightly northwest of Rose Pass (Fig. 2), approximately 70 km northwest of Cranbrook, on the east side of Kootenay Lake (Fig. 1). Relief in the area varies from 1325 metres (4,350 feet) to approximately 2320 metres (7,611 feet).

The claims are generally characterized by moderately to very steep topography, with generally south and west facing slopes along east-west and north-south oriented valleys. Crawford Creek, along the western edge of the property is oriented roughly north-south.

Vegetation in the area consists predominantly coniferous, with deciduous trees preferentially located along the valley bottom. Undergrowth consists largely of small deciduous shrubs, with Devil's Club along watercourses and wet areas.

The claims are located east of Kootenay Lake along a regional topographic high, comprising the local drainage divide, and are therefore subject to heavier precipitation. As a result, the region is characterized by heavy snowfall during the winter months. The property is available for vehicle based, geological exploration from June to late October.

## CLAIM STATUS

The property consists of 2 Mineral Tenure On-line (MTO) mineral tenures (Fig. 3), acquired in accordance with existing government claim location regulations. Significant tenure information is summarized below:

<b>Tenure Name</b>	<b>Area (ha)</b>	<b>Tenure #</b>	<b>Expiry Date*</b>
Crawford	521.565	530471	Mar. 24, 2012
Crawford East	<u>438.0745</u>	542007	Sept. 27, 2007
<b>Total:</b>	<b>959.6395</b>		

\*After 2006 assessment credit applied.

## HISTORY

Prior to 1979 there is no recorded work for the immediate area. The Rose Pass tin occurrence, a quartz vein containing galena, sphalerite, chalcopyrite, and reportedly, stannite, is located about 4 km southeast of the property.

In 1979 two claims comprising 32 units were staked by Cominco Ltd to cover several molybdenite occurrences located by follow-up of regional stream silt anomalies.

In 1980 Cominco carried out a program of geological mapping and soil sampling on the Crawford property (on their Rose property) (Wright 1980). The work consisted of detailed geological mapping and prospecting of the property, and soil sampling on a grid. Sampling consisted of 617 soils and 8 stream silts. All samples were analyzed for Cu, Pb, Zn, Mn, Mo and W. Results showed scattered anomalous values for Cu, Pb, Zn, Mn and W which could not be related to known mineralization. Anomalous molybdenum values were found to correspond to a large quartz monzonite intrusion containing several molybdenite showings. Further work was recommended to determine the significance of the anomalies. No further work appears to have been filed by Cominco on the property so it is not known whether a follow-up program was undertaken.

## **REGIONAL GEOLOGY**

The only previous work undertaken pertaining to the general area of the Crawford claims was that of Reesor (1996, 1993) for the east side of Kootenay Lake. The stratigraphy of the Purcell Supergroup strata has been well described to the east by Höy (1993) and the Purcell and Windermere Supergroup to the north by Pope (1990).

### **Stratigraphy**

#### **Windermere Supergroup**

The Windermere Supergroup varies in thickness in the Toby Creek area, from 80 metres to over 3 kilometres and is in sharp contact with the underlying Belt-Purcell Supergroup across an unconformity with considerable topography, interpreted as a result of a local basement high, the "Windermere High" (Reesor 1973). The Windermere Supergroup was deposited above this unconformity and consists of a basal conglomeratic unit, the Toby Formation, and the overlying argillite and pebble conglomerate dominated Horsethief Creek Formation.

#### **Horsethief Creek Group**

The Horsethief Creek Group has been subdivided into five lithofacies. These lithofacies define a rudimentary stratigraphy of facies within the Horsethief Creek Formation as individual lithological units are inconsistent due to rapid lateral thickness and facies variations.

The lithofacies identified in the Horsethief Creek Formation are as follows:

- a) siltstone-argillite - dominant in the lower half of the Horsethief Creek Formation and separate the remaining lithofacies throughout the formation. This lithofacies consists of thick sequences of thin bedded (1 to 10 cm), graded siltstone and argillite and finely laminated (1 to 5 mm), black, green and grey argillite.
- b) black carbonate - an easily traced marker used to identify and map the base of the Horsethief Creek Formation consisting of thin bedded (5 to 20 cm), dark grey to black limestone, with variable quartz sand and silt in a calcitic matrix, and thin calcareous quartz-arenite beds.
- c) dolomite - buff weathering dolomite, up to 30 metres thick, dolomite pebble-conglomerate beds and dolomite supported quartzite occur throughout the Horsethief Creek Formation.
- d) quartz feldspar arenites and pebble conglomerates - consist of pebble conglomerates comprised of grain-supported, moderately sorted crystalline quartz and quartz feldspar clasts with variable red jasper, green to grey argillite, quartzite and dolomite clasts in a quartz, feldspar, carbonate, sericite and chlorite matrix. Clasts are generally 1 to 2 centimetres in diameter but may exceed 10 centimetres in length. Coarse arenite beds are similar to the pebble

conglomerates but have a greater proportion of matrix and are generally poorly sorted.

- e) red and varicoloured argillites - are present at the top of the Horsethief Creek Formation and consist of variably coloured argillites with interbedded pink carbonate, and varicoloured impure arenites.

## **Mesozoic**

### **Granitic Intrusions**

Cretaceous intrusives of broadly “granitic” composition are present in a belt extending from the westernmost Rocky Mountains to Kootenay Lake, northward to the Baldy Batholith. Intrusions range from small dykes and sills to larger intrusive complexes such as the Mt. Skelly Batholith and are collectively referred to as the Bayonne Magmatic Belt (or Suite).

“Intrusive rocks ... include a number of small post kinematic mesozonal quartz monzonite, monzonite and syenitic plutons, numerous small quartz monzonite to syenite dikes and sills probably related to these stocks, and late mafic dikes. The Kiakho and Reade Lake stocks, two of the larger of the mesozonal plutons, cut across and apparently seal two prominent east-trending faults that transect the eastern flank of the Purcell anticlinorium, and hence place constraints on the timing of latest movement on these faults.

The Kiakho stock is exposed on the heavily wooded slopes of Kiakho Creek approximately 10 kilometres (west-southwest) ... of Cranbrook ... Exposures consist mainly of large, fresh angular boulders of boulder fields. Although contacts with country rock were not observed, regional mapping indicates that it intrudes clastic rocks of the Aldridge and Creston formations. The distribution of outcrops and a pronounced aeromagnetic anomaly indicate that it cuts the east-trending Cranbrook normal fault with no apparent offset. ...

The Kiakho stock is similar to the Reade Lake stock with the dominant phase being a light grey, medium-grained quartz monzonite. It is generally equigranular but grades into a hypidiomorphic granular porphyritic phase with prominent plagioclase and light grey to flesh-coloured potassic feldspar phenocrysts; both are up to several centimetres in diameter in a granular groundmass of white subhedral plagioclase, light grey potassic feldspar, quartz and black hornblende” (Höy 1993).

The Bayonne Granitic Suite is a composite batholith comprised of a number of smaller Jurassic to Cretaceous age granitoid stocks and plutons which extends from near the International Boundary across Kootenay Lake. On the east side of the Kootenay Lake, the Bayonne Granitic Suite locally includes the Mount Skelly Pluton, a biotite (hornblende) monzogranite with megacrysts of potassium feldspar (Reesor 1996). Rice (1941) grouped these granitoids under the broad heading of the Bayonne Batholith, as described below.

“The Bayonne batholith varies in composition from a granite to a calcic granodiorite; the average composition is that of a fairly alkaline granodiorite. ... Much of the rock has an equigranular texture, but a porphyritic phase occurs in many places, at some of which phenocrysts of potash feldspar 2 or 3 inches long are present. The potash feldspar may be orthoclase or microcline and in some specimens both occur. The plagioclase is oligoclase, generally well twinned and frequently in zoned crystals. Dark brown biotite is the only ferromagnesian mineral abundant, but grains of hornblende occur in rare instances. The usual accessories are present. Sericite and epidote are the commonest secondary minerals, but neither occur in significant amounts except where the rock has been altered.

A marked feature of the Bayonne batholith is its highly variable nature. This is observable not only in the range of composition but in the appearance of the rock. Coarse-grained and fine-grained, porphyritic and non-porphyritic, pink and light or dark grey phases may occur in a single exposure, in some places in streaks and patches. Masses of pegmatite and dykes of pegmatite and aplite occur everywhere. Some of the pegmatite dykes are over 100 feet wide. A few large crystals of blue-green beryl, pink garnet, magnetite, and a little black tourmaline were seen in these pegmatites.

Large inclusions of granitized sediments are locally abundant. ... These inclusions vary in size from a foot to some hundreds of feet. Alteration is severe, but the sedimentary nature of the original rock is, in most cases, still recognizable and the boundary between the granite and the inclusion is generally fairly sharp. Other inclusions or xenoliths (sic.) from a few inches to a foot long also occur, which can readily be distinguished from the first type mentioned. They parallel one another, are darker coloured, their original texture and composition has been more or less completely altered, they are fairly uniform in size, and they usually grade imperceptibly into the granite. They are more widely distributed, indeed very few exposures of any size were examined that did not contain some of these xenoliths (sic.), and in places they are extremely abundant. The xenoliths (sic.) are often most common in the porphyritic phases and scarcer in the non-porphyritic phases of the granite ...“.

### **Structure**

Four major phases of deformation have been identified in the Toby Creek area, Helikian-Devonian extension (D1), Jurassic-Paleocene contraction (D2-D3) and Eocene extension (D4).

The first phase of deformation resulted in unconformities at the base of the Dutch Creek and Mount Nelson Formations (D1a) and the unconformity at the base of the Windermere Supergroup (D1b). Thinning of Paleozoic strata onto the Windermere High is interpreted to reflect the effects of D1c deformation together with the development of small fault-bounded sub-basins.

Contraction during the Columbian (D2) and Laramide (D3) orogenies resulted in a series of northeast vergent thrust faults and the development of a regional foliation (S1). Three major thrust sheets are evident in the Toby Creek area with one, the Mount Nelson thrust sheet, comprised of four smaller fault panels. The three major thrust sheets represent out-of-sequence faults, having propagated toward the hinterland, carried in the hanging wall of the Purcell Thrust.

Contraction during D2 and D3 produced east-vergent imbricate thrust faults and west vergent backthrusts. Many of these faults were subsequently reactivated during the fourth phase (D4) of deformation. High angle brittle faults are also a result of D4.

## **LOCAL GEOLOGY**

### **Stratigraphy**

The CRAWFORD property is underlain by clastic sediments of the Horsethief Creek and Hamill Groups of Upper Proterozoic age. The rocks, which appear to be younging westward have been regionally metamorphosed and altered to light-grey phyllites, muscovite-plagioclase+/-andalusite+/-chlorite schists, quartz pebble conglomerates and light-grey quartzites (Wright 1980). The majority of outcrops, foliation in schists and quartz veins in all rock types generally strike NNE and dip fairly steeply toward the east. These rocks have been intruded by a large elliptical quartz monzonite stock of Cretaceous(?) age.

Given the presence of the large Fry Creek Batholith nearby to the northwest, the felsic intrusive on the property may be a related satellite intrusion or apophyse. Alternatively, it may be a small unrelated Cretaceous intrusion, having been intruded during a regional Mesozoic intrusive event.

### **Structure**

The structure of the CRAWFORD area is dominated by its position on the western flank of the Purcell Anticlinorium, a north plunging fold of regional significance. The Purcell Anticlinorium is allochthonous with respect to North American cratonic basement, having been transported northeastward in the hanging wall of the Purcell Thrust. This major structure has been complicated slightly by a number of regional and local faults, discussed below with reference to the Kootenay Lake mapsheet of Reesor (1996). An early folding event has been proposed for early structures interpreted to have developed in the Late Proterozoic during the Goat River Orogeny (Höy 1993).

The prominent faults in the CRAWFORD area are interpreted to be predominantly the result of the Laramide orogeny, characterized by east-verging, west-dipping thrust faults. The major fault system of the area is the St. Mary / Hall Lake fault system, interpreted to be a long lived fault initiated in the Late Proterozoic as a growth fault and periodically active at least into the Laramide orogeny. Eastward directed movement across the St. Mary / Hall Lake fault resulted in steeply dipping strata on the western limb of the Purcell Anticlinorium being juxtaposed against relatively shallowly to moderately dipping strata closer to the hinge axis.

Significant dip displacement is indicated across the fault east of Sanca Creek where Proterozoic lower

Creston strata has been juxtaposed against early Paleozoic Cambrian Eager Formation strata. Later thrust faults are evident in the hanging wall of the St. Mary / Hall Lake fault. The Redding Creek fault is locally significant fault. It is a west dipping, east verging thrust fault that juxtaposes middle Creston strata against the lower member of the Coppery Creek group. A number of smaller, normal faults are indicated in the hanging wall of the Redding Creek Fault, all of which appear to have minor dip (and probably strike-slip) movement. All of the faults in the hanging wall of the St. Mary / Hall Lake fault are interpreted to be older than the Cretaceous Mount Skelly Pluton (Bayonne Magmatic Belt) as all are truncated at the contact of the pluton.

## **DETAILED/PROPERTY GEOLOGY**

The following has been taken from Wright (1980):

“In the NE corner of the property is a 300m wide unit of silvery-grey phyllite, consisting of 90% muscovite and 10% plagioclase, with a NNE strike and steep eastward dip. In the upper part of the unit, the phyllite is interbedded with fine to coarse quartz pebble conglomerate beds up to 50 cm thick. The quartz pebbles which range from 1 to 12 cm in length, averaging 2cm, show a fining westward sequence. The phyllites grade along strike into silvery-grey muscovite-plagioclase schists which are simply a coarser-grained version of the same rock with similar foliation and composition. Fine to coarse quartz pebble conglomerates, as above, are interbedded with the schists. Toward the intrusive contact, the rocks become coarser-grained with the muscovite-plagioclase schists grading into fine to medium-grained and andalusite-muscovite-plagioclase schists. These rocks are typically light to dark grey, weathering medium to dark grey, with 70-80% muscovite, 5-15% plagioclase, 5-7% andalusite, and less than 1% disseminated pyrite.

Adjacent to the quartz monzonite contact, the schists become chloritized, with an average composition of 60% muscovite, 10-20% chlorite, 5-15% plagioclase, 5-15% andalusite and 1% pyrite. These rocks are light to dark greenish-grey, weathering dark reddish-green to grey. Infrequent quartz veins up to 4 cm thick parallel foliation, averaging 022 /60 E.

Within the schists, unit 2a constitutes a 20-25 metre-wide band of medium quartz pebble conglomerate in a coarse-grained quartzite matrix. The milky white quartz pebbles, which range in size from 1-5cm and average 2cm, make up approximately 15-20% of the rock are well-rounded and poorly sorted. Also within the schists, in the eastern half of the property is a 25-50 metre-wide unit of pinkish-white to yellowish-grey, medium-grained quartzite, in places containing less than 1% disseminated pyrite.



Along the western edge of the property is a thick resistant unit of light grey, fine to medium-grained quartzite of the Hamill Group. Manganese and iron staining, and specular hematite are abundant on fracture surfaces. Near the contact with the quartz monzonite intrusion, coatings of pyrolusite and recrystallized quartz are abundant along fractures. In places, small dark red crystals of magnetite make up less than 2% of the rock.

The quartz monzonite, which forms an elliptical stock in the centre of the property is typically white to pinkish-grey, weathering medium to dark grey, fine to coarse-grained, and consists of 30-35% plagioclase, 30-35% K-feldspar, 30% quartz and 5-10% biotite. Aplite veins are common, ranging from 1 to 50 cm in width with an average attitude of 065 /80 S. Milky white quartz veins up to 20 cm thick are less abundant than the aplite veins, and exhibit sharp contacts with random orientations throughout most of the intrusion. Near the contact with the schists, especially along the southern contact, the percentage of biotite in the quartz monzonite rises sharply to approximately 30% giving the rock a dioritic appearance. The contact between the quartz monzonite and the Hamill quartzite is gradational, from unaltered quartz monzonite to kaolinized quartz monzonite, then pinkish quartzite and finally light-grey quartzite.

Alteration is most intense in the quartz monzonite within three hundred metres of the contact. The rock is pervasively sericitized and kaolinized, with silicification, iron and manganese staining along joints. The central portion of the intrusion, where exposed, is relatively fresh.

#### Mineralization

Molybdenite mineralization, as disseminated flakes and rosettes in quartz veins was noted in several localities within the altered margin of the intrusion. Trace amounts of powellite were also noted from scattered localities”.

## **2006 PROGRAM**

The 2006 program consisted of an airborne geophysical program undertaken by Aeroquest Limited. A total of 82.5 line km were flown with collection of electromagnetic, magnetic and radiometric data over the entirety of the property.

Electromagnetic (“EM”) data is expected to identify and delineate possible conductors, which may include faults and/or mineralized veins. Magnetics is expected to allow differentiation of intrusive phases from sedimentary strata hosting the intrusions and, therefore, allow possible identification of one possible control to mineralization. Finally, the radiometric portion of the survey detects the response of three radioactive elements, specifically, potassium, thorium and uranium. Again, radiometrics may allow the Company to differentiate separate intrusive phases.

A copy of the report is included in Appendix B.

## **RESULTS (see Appendix B)**

No geological mapping was undertaken on the property during the 2006 field season. As such, the author is not in a position to address possible stratigraphic correlations.

The magnetic data documents a large magnetic anomaly in the centre of the property likely corresponding to the felsic intrusive body mapped. Cretaceous intrusions correlated to the Bayonne Magmatic Suite are associated with both strong magnetic anomalies over the corresponding intrusions (i.e Fry Creek Batholith) and magnetic haloes surrounding the intrusion (i.e. White Creek Batholith).

“The airborne geophysical data document two approximately north-south electromagnetic trends, “A” and “B”, which appear to be off-set by complex faulting. Trend “A” consists of high amplitude features suggesting larger sources, some double peak and some deeper. The broad stacked zones suggest a low conductive, probable sedimentary source, of fairly consistently east-dipping conductive lithology(ies) rather than a discrete source. Trend “B” is less continuous characterized on L5060 as a thin source, with a westerly dip at surface and on L5081 as low conductance and thickening at depth” (J. Rudd, Aeroquest, pers. comm, 2007).

The radiometric data appears to document the intrusive lithologies, with correlation between potassium (K), thorium (Th), uranium (U) and Total Count (TC) data. The data appears to indicate north-northeast trending anomalies. The radiometric anomalies appear to correlate moderately well with the magnetic data

## **DISCUSSION**

The Aeroquest survey was flown in order to provide data suitable for an initial evaluation of the property. There has been no soil sampling, prospecting or mapping by Jasper personnel. The airborne survey was flown in an attempt to identify areas for subsequent follow-up. Ideally sub-surface anomalies identified from the airborne survey will aid in directing future surface surveys.

In general, the data documents a number of anomalies interpreted to be worthy of follow-up ground work. In particular two prominent linear anomalies are evident along the eastern property boundary where the felsic (Cretaceous) intrusive appears to be in contact with host sedimentary strata, quartzite and schists of the Horsethief Group.

The property covers a mapped exposure of felsic intrusive material interpreted to correlate to the Bayonne Magmatic Belt, comprised of Cretaceous age felsic intrusions extending from the Baldy Batholith north of Kamloops to the International Boundary with the United States south of Creston. The felsic intrusive may represent an apophyse of the Fry Creek Batholith, a large intrusive complex located nearby to the northwest. Alternatively, it may represent a separate intrusion similar to the Hall Lake Stock, located approximately 20 kilometres to the southeast.

Previous workers (Wright 1980) carried out a program of geological mapping and soil sampling. The work consisted of detailed geological mapping and prospecting of the property, and soil sampling on a grid. Sampling consisted of 617 soils and 8 stream silts with all samples analyzed for Cu, Pb, Zn, Mn, Mo and W. Results showed scattered anomalous values for Cu, Pb, Zn, Mn and W which could not be related to known mineralization. Anomalous molybdenum values were found to correspond to a large quartz monzonite intrusion containing several molybdenite showings. The molybdenite mineralization, as disseminated flakes and rosettes in quartz veins was noted in several localities within the altered margin of the intrusion. Trace amounts of powellite were also noted from scattered localities.

Further work was recommended to determine the significance of the anomalies. No further work appears to have been filed by Cominco on the property so it is not known whether a follow-up program was undertaken.

## **CONCLUSIONS**

Initial interpretation of the Aeroquest Limited airborne geophysical data, together with limited data from previous programs, strongly suggest further evaluation of the property is warranted.

In 1980 Cominco noted molybdenite mineralization, as disseminated flakes and rosettes in quartz veins in several localities within the altered margin of the intrusion. Trace amounts of powellite were also noted from scattered localities.

Further work was recommended to determine the significance of the anomalies. No further work appears to have been filed by Cominco on the property so it is not known whether a follow-up program was undertaken.

Further evaluation of the Crawford property is recommended particularly in light of the presence of molybdenite mineralization documented by Cominco which may not have been adequately followed-up.

## RECOMMENDATIONS

1. Compilation of results from previous programs should be undertaken to build an initial database of with which to continue evaluation of the property;
2. Undertake a soil sampling program. Detailed contour sampling should be undertaken throughout the property to provide better coverage, with smaller grids established to develop better resolution in areas of anomalous results;
3. Geological mapping should be undertaken to:
  - a) identify and/or re-establish mineralized horizons,
  - b) identify and/or confirm the stratigraphy present on the property,
  - c) provide better structural control for the property.
  - d) obtain rock and/or chip samples of mineralized horizons identified on the property;
4. Consider diamond drilling to test surface anomalies identified on the basis of additional soil and rock sampling and/or sub-surface anomalies identified from airborne and/or ground-based geophysical surveys.

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## **Appendix A**

### Statement of Qualifications

## STATEMENT OF QUALIFICATIONS

I, Richard T. Walker, of 656 Brookview Crescent, Cranbrook, B.C., hereby certify that:

- 1) I am a graduate of the University of Calgary of Calgary, Alberta, having obtained a Bachelors of Science in 1986,
- 2) I obtained a Masters of Geology at the University of Calgary of Calgary, Alberta in 1989;
- 3) I am a member in good standing with the Association of Professional Engineers and Geoscientists of the Province of British Columbia;
- 4) I am the Vice President of Exploration for Jasper Mining Corporation, with offices at 1020, 833 - 4<sup>th</sup> Ave South, Calgary, Alberta;
- 5) I am the author of this report which is based on an Aeroquest Limited airborne geophysical survey completed between June 30<sup>th</sup> and July 1<sup>st</sup>, 2006;
- 6) I have a direct interest in Jasper Mining Corporation; and
- 7) I hereby grant my permission to Jasper Mining Corporation to use this report, or any portion of it, for any legal purposes normal to the business of the firm, provided the excerpts used do not materially deviate from the intent of this report as set out in the whole.

Dated at Cranbrook, British Columbia this 26<sup>th</sup> day of June, 2007.



---

Richard T. Walker, P.Ge



**APPENDIX B**

**AEROQUEST LIMITED**  
**GEOPHYSICAL REPORT**

**Report on a Helicopter-Borne  
AeroTEM II Electromagnetic, Radiometric  
& Magnetometer Survey**



**Aeroquest Job # 07013  
Crawford, Sawyer, McFarlane, Storm King  
and Sanca Properties**

Nelson area, Southern British Columbia  
NTS 082F07,08,09,10,15

for

**Jasper Mining Corporation**

by

** *AEROQUEST LIMITED***

4-845 Main Street East  
Milton, Ontario, L9T 3Z3  
Tel: (905) 693-9129 Fax: (905) 693-9128  
[www.aeroquestsurveys.com](http://www.aeroquestsurveys.com)  
Report date: October, 2006

# Report on a Helicopter-Borne AeroTEM II Electromagnetic and Magnetic Survey

**Aeroquest Job # 07013**  
**Crawford, Sawyer, McFarlane, Storm King**  
**and Sanca Properties**  
Nelson area, Southern British Columbia  
NTS 082F07,08,09,10,15

for

**Jasper Mining Corporation**  
1020-833 4<sup>th</sup> Ave S. W.  
Calgary, Alberta  
T2P 3T5

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**1.2. Appendices**

- Appendix 1: Survey Block Co-ordinates
- Appendix 2: Claim Listing
- Appendix 3: Description of Database Fields
- Appendix 4: Technical Paper: "Mineral Exploration with the AeroTEM System"
- Appendix 5: Instrumentation Specification Sheet
- Appendix 6: AeroTEM EM Anomaly Listing

**1.3. List of Maps (1:10,000)**

- MAG Coloured Total Magnetic Intensity (TMI) with line contours and EM anomalies
- First Vertical Derivative of TMI with line contours and EM anomalies
- ZOFF AeroTEM Off-Time Z1 colour grid with line contours and EM anomalies
- Spectrometer – Potassium Percent
- Spectrometer – Thorium to Potassium Ratio

## **INTRODUCTION**

This report describes a helicopter-borne geophysical survey carried out on behalf of Jasper Mining Corporation on the Crawford, Sawyer, McFarlane, Storm King and Sanca Properties, near Nelson, Southern British Columbia.

There are two principal geophysical sensors. The first is Aeroquest's exclusive AeroTEM II time domain helicopter electromagnetic system which is employed in conjunction with a Gamma-Ray Spectrometer (GRS) system and high-sensitivity cesium vapour magnetometers. Ancillary equipment includes a real-time differential GPS navigation system, radar altimeter, video recorder, and a base station magnetometer. Full-waveform streaming EM data is recorded at 38,400 samples per second. The streaming data comprise the transmitted waveform, and the X component and Z component of the resultant field at the receivers.

The second principal sensor was the Aeroquest's Airborne Gamma Ray Spectrometer (AGRS) system, which utilizes as four downward looking NaI crystals used as the main gamma-ray sensors and one upward looking crystal for monitoring non-geologic sources.

A secondary acquisition system (RMS) records the ancillary data. A PicoDAS acquisition system records the GRS data set.

The total line kms presented in the maps and data totalled 1396.28. The survey flying described in this report took place on June 21<sup>st</sup> – July 15<sup>th</sup>, 2006.

## **2. SURVEY AREA**

The project area is lies 50km east of Nelson and and 65km west of Cranbrook, just east of Kootenay lake. It lies approximately 65km north of the US border. The terrain is rugged and mountainous with elevations ranging from approximately 3000-8000 ft. Access to the property is good with a number of smaller and larger roads in the general area. Highway 3A, adjacent to the project area, runs N-S along the eastern shore of Kootenay lake. Highway 3 runs generally E-W to the south of the area and a number of local roads transect the project area.

The surveying conducted consisted of five blocks, Crawford (7km<sup>2</sup>), Sawyer (17.3km<sup>2</sup>), McFarlane (40.2km<sup>2</sup>), Storm King (14.3km<sup>2</sup>) and Sanca (46.7km<sup>2</sup>). A number of mining claims fall either partly or wholly within this project area. They are outlined in Appendix 2.

The base of operations was at Gray Creek on Kootenay lake, adjacent to the McFarlane block.

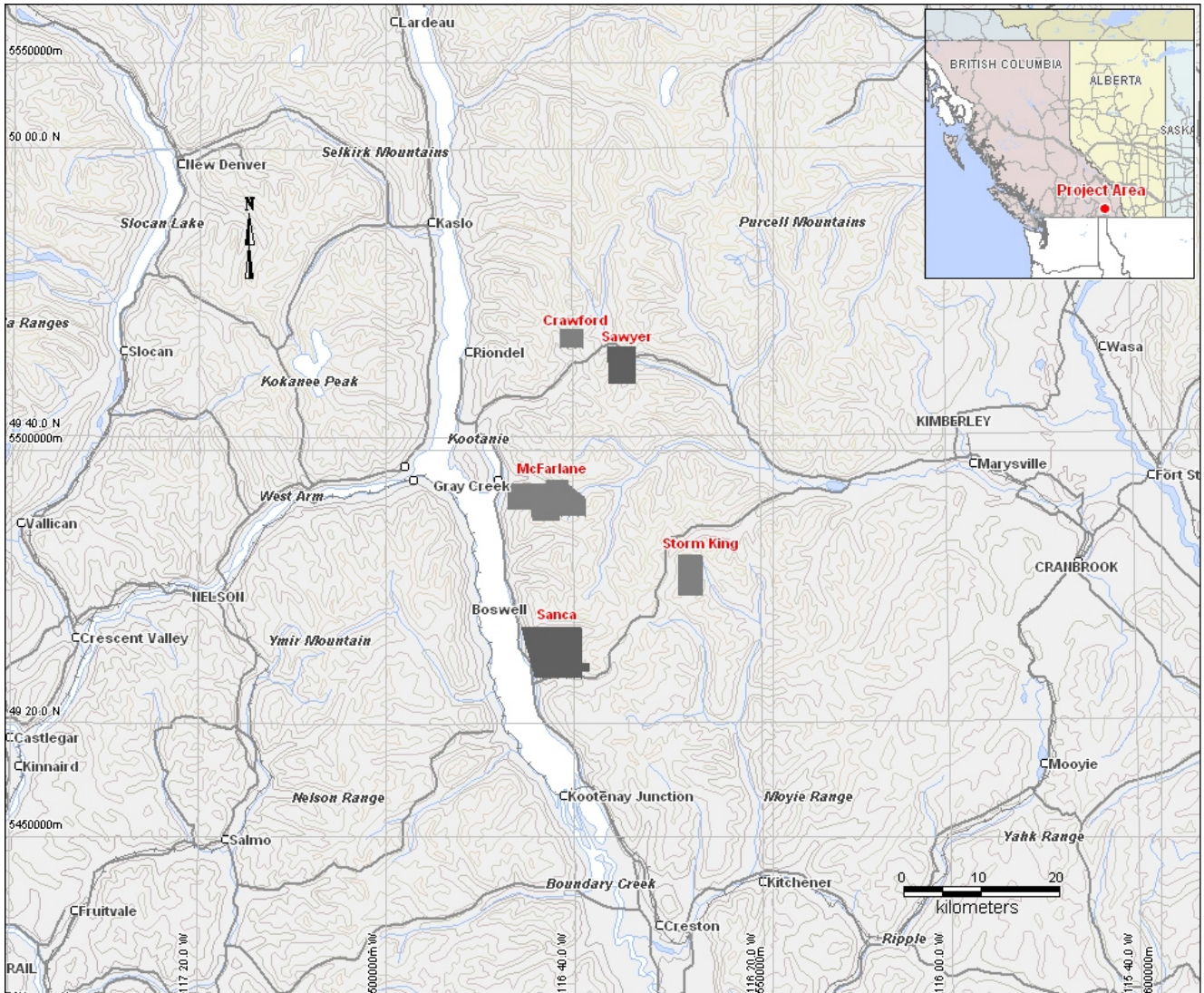


Figure 1. Regional location map of the project area.

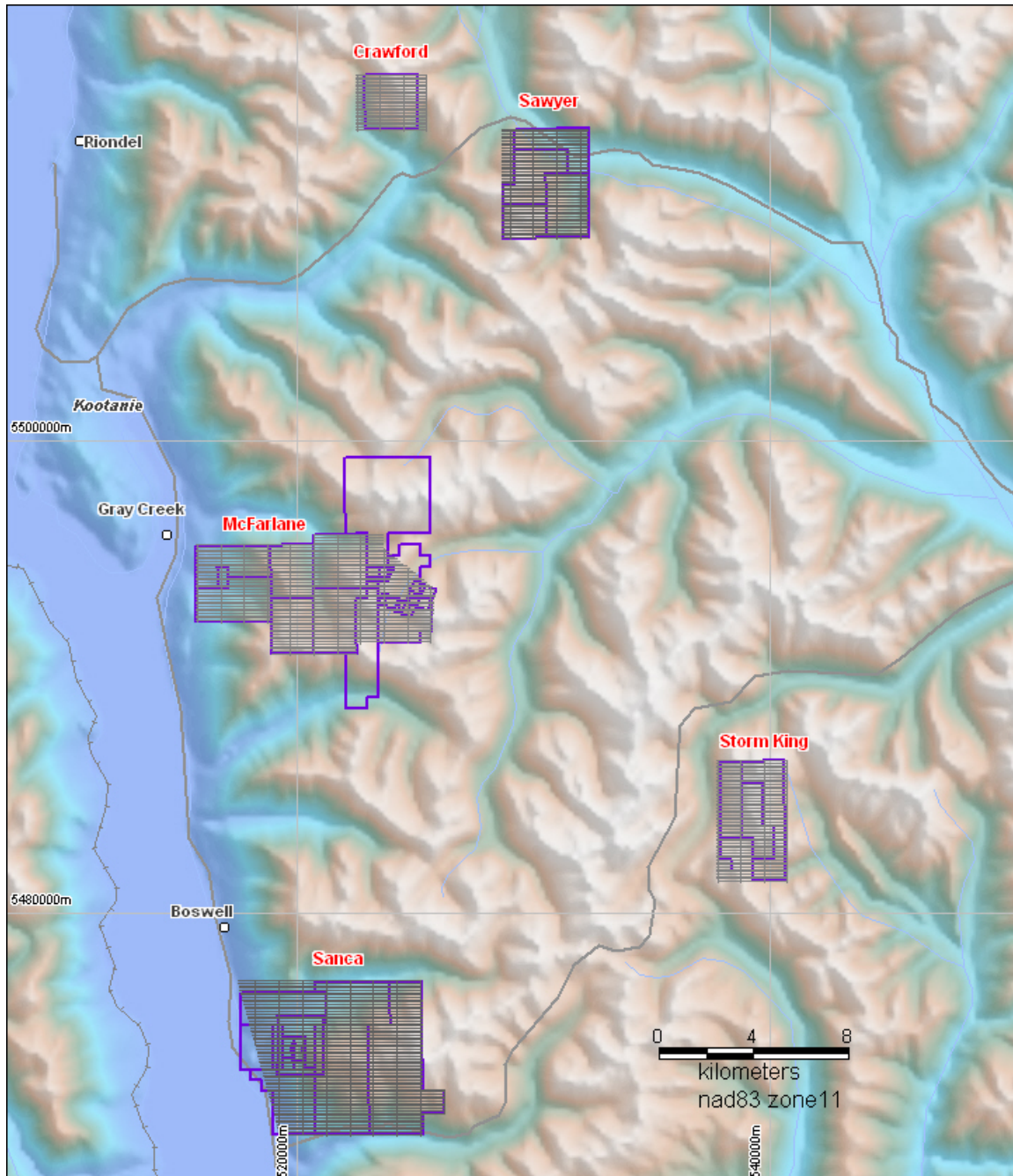


Figure 2. Project Flight Paths and mining claims



### 3. SURVEY SPECIFICATIONS AND PROCEDURES

The survey specifications are summarized in the following table:

Survey Block	Line Spacing (m)	Line direction	Survey Coverage (line-km)	Dates Flown
Crawford	100	E-W (90°)	82.5	June 30th July 1st, 2006
Mcfarlane	100	E-W (90°)	455.8	June 21st - 25th, 2006
Sanca	100	E-W (90°)	530.2	July 1st - 8th, 2006
Sawyer	100	E-W (90°)	204.3	June 26 <sup>th</sup> – 29 <sup>th</sup> , 2006
Storm King	100	E-W (90°)	96.2	July 10th - 14th, 2006

The survey coverage was calculated by adding up the along-line distance of the survey lines and control (tie) lines as presented in the final Geosoft database. The survey was flown with a line spacing of 100 m with the tie lines flown perpendicular to the survey lines with a spacing of 1 km.

The nominal EM bird terrain clearance is 30m, but can be higher in more rugged terrain due to safety considerations and the capabilities of the aircraft. Two magnetometer sensors are recording. One is attached to the tail of the EM bird and a second is mounted in a smaller bird connected to the tow rope 17 metres above the EM bird and 21 metres below the helicopter (Figure 4). Nominal survey speed over relatively flat terrain is 75 km/hr and is generally lower in rougher terrain. Scan rates for ancillary data acquisition is 0.1 second for the magnetometer and altimeter, and 0.2 second for the GPS determined position. The EM data is acquired as a data stream at a sampling rate of 38,400 samples per second and is processed to generate final data at 10 samples per second. The 10 samples per second translates to a geophysical reading about every 1.5 to 2.5 metres along the flight path.

#### 3.1. Navigation

Navigation is carried out using a GPS receiver, an AGNAV2 system for navigation control, and an RMS DGR-33 data acquisition system which records the GPS coordinates. The x-y-z position of the aircraft, as reported by the GPS, is recorded at 0.2 second intervals. The system has a published accuracy of under 3 metres. A recent static ground test of the Mid-Tech WAAS GPS yielded a standard deviation in x and y of under 0.6 metres and for z under 1.5 metres over a two-hour period.

#### 3.2. System Drift

Unlike frequency domain electromagnetic systems, the AeroTEM II system has negligible drift due to thermal expansion. The operator is responsible for ensuring the instrument is properly warmed up prior to departure and that the instruments are operated properly throughout the flight. The operator maintains a detailed flight log during the survey noting the times of the flight and any unusual

geophysical or topographic features. Each flight included at least two high elevation 'background' checks. During the high elevation checks, an internal 5 second wide calibration pulse in all EM channels was generated in order to ensure that the gain of the system remained constant and within specifications.

### **3.3. Field QA/QC Procedures**

On return of the pilot and operator to the base, usually after each flight, the AeroDAS streaming EM data and the RMS data are carried on removable hard drives and FlashCards, respectively and transferred to the data processing work station. At the end of each day, the base station magnetometer data on FlashCard is retrieved from the base station unit.

Data verification and quality control includes a comparison of the acquired GPS data with the flight plan; verification and conversion of the RMS data to an ASCII format XYZ data file; verification of the base station magnetometer data and conversion to ASCII format XYZ data; and loading, processing and conversion of the streaming EM data from the removable hard drive. All data is then merged to an ASCII XYZ format file which is then imported to an Oasis database for further QA/QC and for the production of preliminary maps.

Survey lines which show excessive deviation from the intended flight path are re-flown. Any line or portion of a line on which the data quality did not meet the contract specification was noted and reflown.

## **4. AIRCRAFT AND EQUIPMENT**

### **4.1. Aircraft**

A Eurocopter (Aerospatiale) AS350B2 "A-Star" helicopter - registration C- FBHK was used as survey platform (Figure 3). The helicopter was owned and operated by Bighorn Helicopters, Calgary, Alberta. The survey aircraft was flown at a nominal terrain clearance of 220 ft (70 m).



Figure 3. Helicopter of the type used for the survey.

#### **4.2. Magnetometer**

The Aeroquest airborne survey system employs the Geometrics G-823A cesium vapour magnetometer sensor installed in a two metre towed bird airfoil attached to the main tow line, 17 metres below the helicopter (Figure 4A). The sensitivity of the magnetometer is 0.001 nanoTesla at a 0.1 second sampling rate. The nominal ground clearance of the magnetometer bird is 51 metres (170 ft.). The magnetic data is recorded at 10Hz by the RMS DGR-33.

#### **4.3. Electromagnetic System**

The electromagnetic system is an AeroQuest AeroTEM II time domain towed-bird system (Figure 4B). The current AeroTEM transmitter dipole moment is 38.8 kNIA. The AeroTEM bird is towed 38 m (125 ft) below the helicopter. More technical details of the system may be found in Appendix 4.

The wave-form is triangular with a symmetric transmitter on-time pulse of 1.10 ms and a base frequency of 150 Hz (Figure 5). The current alternates polarity every on-time pulse. During every Tx on-off cycle (300 per second), 128 contiguous channels of raw x and z component (and a transmitter current monitor, itx) of the received waveform are measured. Each channel width is 26.04 microseconds starting at the beginning of the transmitter pulse. This 128 channel data is referred to as the raw streaming data. The AeroTEM system has two separate EM data recording streams, the conventional RMS DGR-33 and the AeroDAS system which records the full waveform.

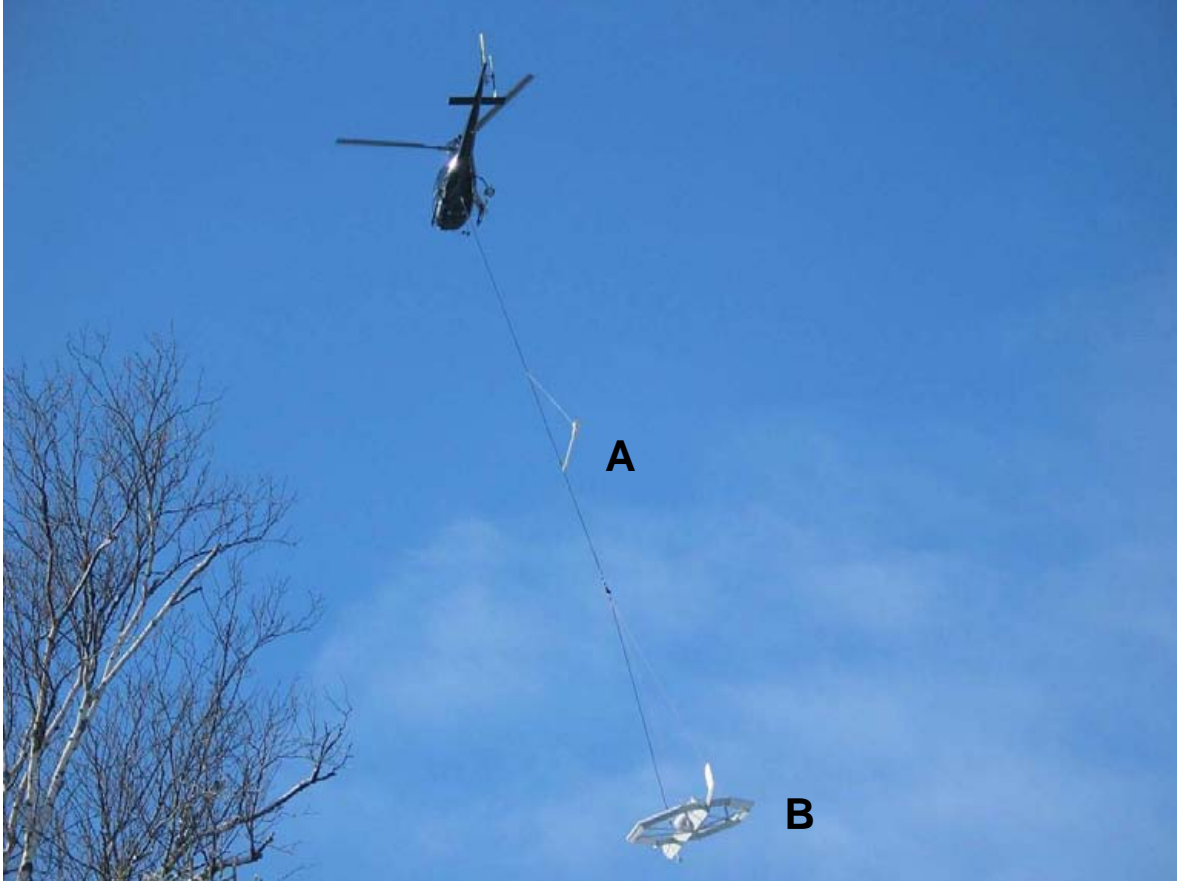


Figure 4. The magnetometer bird (A) and AeroTEM II EM bird (B)

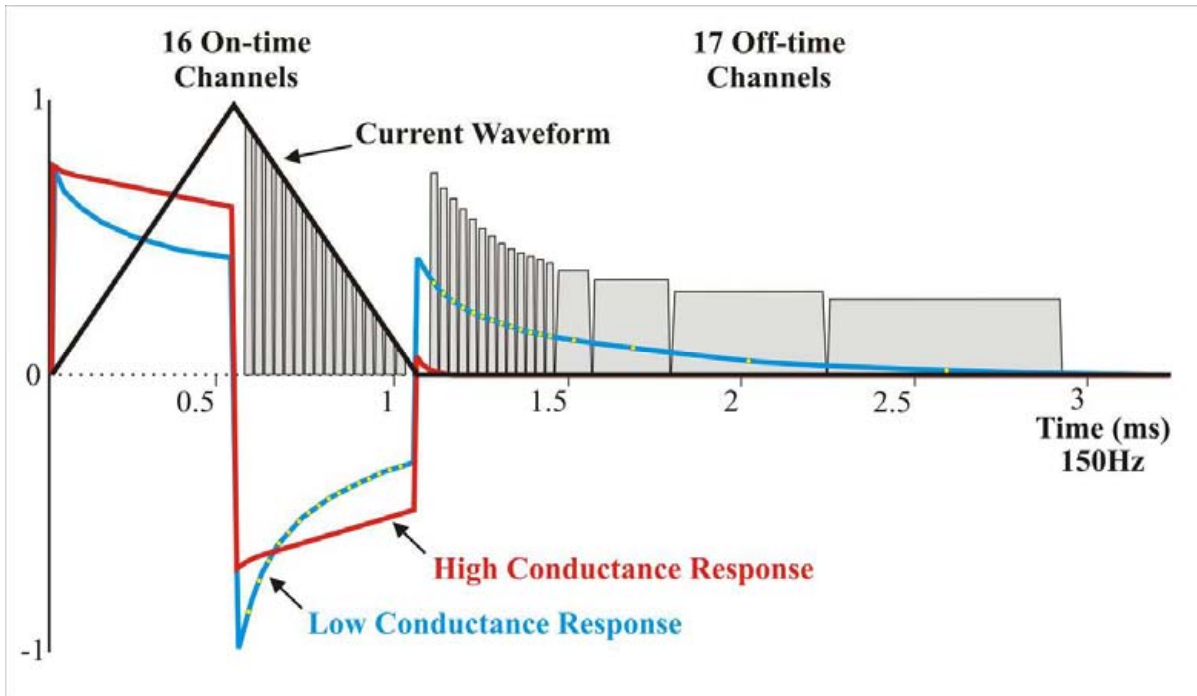


Figure 5. Schematic of Transmitter and Receiver waveforms

#### 4.4. Gamma Ray Spectrometer

A GRS10-5 Intelligent Gamma Ray Spectrometer system manufactured by Pico Envirotec Inc. was used to record radiometric data. The system employs NaI detectors with individual peak detection processors and unique software to help eliminate the problems of zero base shift and deadtime correction. A natural peak detection algorithm enables fast system stabilization and temperature calibration. Individual detector tracking enables linearity correction coefficients to be calculated real time. This linearity is then used to provide a better fit for the individual spectra, maximizing the resolution of the entire spectrum and increasing the sensitivity of lower energy windows.

Technical specifications:

- Downward looking crystal volume: 16.8 Litres (1024 cu. in)
- Upward looking crystal volume: 4 Litres (256 cu. in.)
- Sample interval: 1.0 seconds (0.5 optional)
- Channels: 256 (512 optional) – channel width: 11.71keV
- Sensor location: Left rear of helicopter cabin (nominal ground clearance – 70 metres)
- Total counts window: 295keV to 3000keV
- Potassium counts window: 1306keV to 1588keV
- Uranium counts window: 1588keV to 1841keV
- Upward looking Uranium counts window: 1588keV to 1841keV
- Thorium counts window. 2376keV to 2847keV
- Cosmic counts: 3000keV to 6000keV
- Barometric and temperature sensor type: Honeywell transducer model HPB100
- Barometric and temperature sensor location: aircraft landing skid
- AntiCoincidence: simultaneous pulses recorded on all sensors stored in channel 0
- Spectra Tracking: fully automatic
- Stabilization time: 30 sec. on ground, 3 minutes in air @ 100m altitude
- Spectra Correction: automatic, system to be calibrated once per year
- Data Acquisition System: PicoEnvirotec AGIS - with GPS synchronization

Digital data was recorded as 256 channel spectra of the downward and upward looking detectors at a 1 Hz interval and stored on a compact flash disk.

#### 4.5. AERODAS Acquisition System

The 128 channels of raw streaming data are recorded by the AeroDAS acquisition system (Figure 6) onto a removable hard drive. The streaming data are processed post-survey to yield 33 stacked and binned on-time and off-time channels at a 10 Hz sample rate. The timing of the final processed EM channels is described in the following table:

Channel:	Start Gate	End Gate	Start (us)	Stop (us)	Mid (us)	Width (us)
1 ON	25	25	651.0	677.0	664.0	26.0
2 ON	26	26	677.0	703.1	690.1	26.0
3 ON	27	27	703.1	729.1	716.1	26.0
4 ON	28	28	729.1	755.2	742.1	26.0

5 ON	29	29	755.2	781.2	768.2	26.0
6 ON	30	30	781.2	807.2	794.2	26.0
7 ON	31	31	807.2	833.3	820.3	26.0
8 ON	32	32	833.3	859.3	846.3	26.0
9 ON	33	33	859.3	885.4	872.3	26.0
10 ON	34	34	885.4	911.4	898.4	26.0
11 ON	35	35	911.4	937.4	924.4	26.0
12 ON	36	36	937.4	963.5	950.5	26.0
13 ON	37	37	963.5	989.5	976.5	26.0
14 ON	38	38	989.5	1015.6	1002.5	26.0
15 ON	39	39	1015.6	1041.6	1028.6	26.0
16 ON	40	40	1041.6	1067.6	1054.6	26.0
0 OFF	44	44	1145.8	1171.8	1158.8	26.0
1 OFF	45	45	1171.8	1197.8	1184.8	26.0
2 OFF	46	46	1197.8	1223.9	1210.9	26.0
3 OFF	47	47	1223.9	1249.9	1236.9	26.0
4 OFF	48	48	1249.9	1276.0	1262.9	26.0
5 OFF	49	49	1276.0	1302.0	1289.0	26.0
6 OFF	50	50	1302.0	1328.0	1315.0	26.0
7 OFF	51	51	1328.0	1354.1	1341.1	26.0
8 OFF	52	52	1354.1	1380.1	1367.1	26.0
9 OFF	53	53	1380.1	1406.2	1393.1	26.0
10 OFF	54	54	1406.2	1432.2	1419.2	26.0
11 OFF	55	55	1432.2	1458.2	1445.2	26.0
12 OFF	56	56	1458.2	1484.3	1471.3	26.0
13 OFF	57	60	1484.3	1588.4	1536.4	104.2
14 OFF	61	68	1588.4	1796.8	1692.6	208.3
15 OFF	69	84	1796.8	2213.4	2005.1	416.6
16 OFF	85	110	2213.4	2890.4	2551.9	677.0

#### 4.6. RMS DGR-33 Acquisition System

In addition to the magnetics, altimeter and position data, six channels of real time processed off-time EM decay in the Z direction and one in the X direction are recorded by the RMS DGR-33 acquisition system at 10 samples per second and plotted real-time on the analogue chart recorder. These channels are derived by a binning, stacking and filtering procedure on the raw streaming data. The primary use of the RMS EM data (Z1 to Z6, X1) is to provide for real-time QA/QC on board the aircraft.

The channel window timing of the RMS DGR-33 6 channel system is described in the table below.

RMS Channel	Start time (microsec)	End time (microsec)	Width (microsec)	Streaming Channels
Z1, X1	1269.8	1322.8	52.9	48-50
Z2	1322.8	1455.0	132.2	50-54
Z3	1428.6	1587.3	158.7	54-59
Z4	1587.3	1746.0	158.7	60-65
Z5	1746.0	2063.5	317.5	66-77
Z6	2063.5	2698.4	634.9	78-101



Figure 6. AeroTEM II Instrument Rack

#### 4.7. Magnetometer Base Station

The base magnetometer was a Geometrics G-858 cesium vapour magnetometer. Data logging and UTC time synchronisation was carried out within an external data logging computer, with an external GPS providing the timing signal. That data logging was configured to measure at 0.1 second intervals (10Hz). Digital recording resolution was 0.001 nT. The sensor was placed on a tripod in an area free of cultural noise sources. A continuously updated display of the base station values was available for viewing and regularly monitored to ensure acceptable data quality and diurnal levels.

#### **4.8. Radar Altimeter**

A Terra TRA 3500/TRI-30 radar altimeter is used to record terrain clearance. The antenna was mounted on the outside of the helicopter beneath the cockpit. The recorded data represents the height of the antenna, i.e. helicopter, above the ground. The Terra altimeter has an altitude accuracy of +/- 1.5 metres.

#### **4.9. Video Tracking and Recording System**

A high resolution colour digital video camera is used to record the helicopter ground flight path along the survey lines. The video is digitally annotated with GPS position and time and can be used to verify ground positioning information and cultural causes of anomalous geophysical responses.



Figure 7. Digital video camera typical mounting location.

#### **4.10. GPS Navigation System**

The navigation system consists of an Ag-Nav Incorporated AG-NAV2 GPS navigation system comprising a PC-based acquisition system, navigation software, a deviation indicator in front of the aircraft pilot to direct the flight, a full screen display with controls in front of the operator, a Mid-Tech RX400p WAAS-enabled GPS receiver mounted on the instrument rack and an antenna mounted on the magnetometer bird. WAAS (Wide Area Augmentation System) consists of approximately 25 ground reference stations positioned across the United States that monitor GPS satellite data. Two master stations, located on the east and west coasts, collect data from the reference stations and create a GPS correction message. This correction accounts for GPS satellite orbit and clock drift plus signal delays caused by the atmosphere and ionosphere. The corrected differential message is then broadcast through one of two geostationary satellites, or satellites with a fixed position over the equator. The corrected position has a published accuracy of under 3 metres. A recent static ground test of the Mid-Tech WAAS GPS yielded a standard deviation in x and y of under 0.6 metres and for z under 1.5 metres over a two-hour period.

Survey co-ordinates are set up prior to the survey and the information is fed into the airborne navigation system. The co-ordinate system employed in the survey design was WGS84 [World] using the UTM zone 11N projection. The real-time differentially corrected GPS positional data was recorded by the RMS DGR-33 in geodetic coordinates (latitude and longitude using WGS84) at 0.2 second intervals.



#### **4.11. Digital Acquisition System**

The AeroTEM received waveform sampled during on and off-time at 128 channels per decay, 300 times per second, was logged by the proprietary AeroDAS data acquisition system. The channel sampling commences at the start of the Tx cycle and the width of each channel is 26.04 microseconds. The streaming data was recorded on a removable hard-drive and was later backed-up onto DVD-ROM from the field-processing computer.

The RMS Instruments DGR33A data acquisition system was used to collect and record the analogue data stream, i.e. the positional and secondary geophysical data, including processed 6 channel EM, magnetics, radar altimeter, GPS position, and time. The data was recorded on 128Mb capacity FlashCard. The RMS output was also directed to a thermal chart recorder.

### **5. PERSONNEL**

The following AeroQuest personnel were involved in the project:

- Manager of Operations: Bert Simon
- Field Data Processors: Adam Smiarowski
- Field Operator: Tom Szumigaj
- Data Interpretation and Reporting: Jonathan Rudd, Marion Bishop

The survey pilots Clay Wilson, John Jess and Greg Goodison were employed directly by the helicopter operator – Bighorn Helicopters, Calgary, Alberta.

### **6. DELIVERABLES**

#### **6.1. Hardcopy Map Products**

The project area is divided into (4) 1:10,000 map sheets. Five (5) geophysical products are delivered as listed below:

- MAG Coloured Total Magnetic Intensity (TMI) with line contours and EM anomalies
- First Vertical Derivative of TMI with line contours and EM anomalies
- ZOFF AeroTEM Off-Time Z1 colour grid with line contours and EM anomalies
- Spectrometer – Potassium Percent
- Spectrometer – Thorium to Potassium Ratio

The coordinate/projection system for the maps is NAD83 Universal Transverse Mercator Zone 11 (for Canada; Central America; Mexico; USA (ex Hawaii Aleutian Islands)). For reference, the latitude and longitude in WGS84 are also noted on the maps. All the maps show flight path trace, skeletal topography, and conductor picks represented by an anomaly symbol classified according to calculated on-time conductance. The anomaly symbol is accompanied by postings denoting the calculated off-time conductance, a thick or thin classification and an anomaly identifier label. The anomaly symbol

legend is given in the margin of the maps. The magnetic field data is presented as superimposed line contours with a minimum contour interval of 10 nT. Bold contour lines are separated by 1000 nT.

## **6.2. Digital Deliverables**

### **Final Database of Survey Data**

The geophysical profile data is archived digitally in Geosoft GDB binary format database(s). The databases has also been exported into Geosoft XYZ format, which is text file format offering greater compatibility with other viewing software. A description of the contents of the individual channels in the database can be found in Appendix 3. A copy of this digital data is archived at the Aeroquest head office in Milton.

### **Geosoft Grid files (GRD)**

Leveled Grid products used to generate the geophysical map images. Cell size for all grid files is 25 meters.

- Total Magnetic Intensity (Mag)
- First Vertical Derivative of TMI (1VD)
- AeroTEM Z1 Off-Time (ZOFF)
- Radiometric Percent Potassium (Kcorr)
- Radiometric Ratio –Thorium to Potassium (ThKratio)

### **Digital Versions of Final Maps**

Map files in Geosoft .map and Adobe PDF format

### **Free Viewing Software**

Geosoft Oasis Montaj Viewing Software

Adobe Acrobat Reader

### **Digital Copy of this Document**

## **7. DATA PROCESSING AND PRESENTATION**

All in-field and post-field data processing was carried out using Aeroquest proprietary data processing software, and Geosoft Oasis montaj software. Maps were generated using 36-inch wide Hewlett Packard ink-jet plotters.

### **7.1. Base Map**

The geophysical maps accompanying this report are based on positioning in the datum of NAD83. The survey geodetic GPS positions have been projected using the Universal Transverse Mercator projection in Zone 11N. A summary of the map datum and projection specifications are as follows:

- Ellipse: GRS 1980
- Ellipse major axis: 6378137m eccentricity: 0.081819191
- Datum: North American 1983 - Canada Mean
- Datum Shifts (x,y,z) : 0, 0, 0 metres
- Map Projection: Universal Transverse Mercator Zone 11 (Central Meridian 117°W)
- Central Scale Factor: 0.9996
- False Easting, Northing: 500,000m, 0m

### **7.2. Flight Path & Terrain Clearance**

The position of the survey helicopter was directed by use of the Global Positioning System (GPS). Positions were updated five times per second (5Hz) and expressed as WGS84 latitude and longitude calculated from the raw pseudo range derived from the C/A code signal. The instantaneous GPS flight path, after conversion to UTM co-ordinates, is drawn using linear interpolation between the x/y positions. The terrain clearance was maintained with reference to the radar altimeter. The raw Digital Terrain Model (DTM) was derived by taking the GPS survey elevation and subtracting the radar altimeter terrain clearance values. The calculated topography elevation values are relative to WGS84 (GPS) altitude and are not tied in to surveyed geodetic heights.

Each flight included at least two high elevation 'background' checks. During the high elevation checks, an internal 5 second wide calibration pulse in all EM channels was generated in order to ensure that the gain of the system remained constant and within specifications.

### **7.3. Electromagnetic Data**

The raw streaming data, sampled at a rate of 38,400 Hz (128 channels, 300 times per second) was reprocessed using a proprietary software algorithm developed and owned by Aeroquest Limited. Processing involves the compensation of the X and Z component data for the primary field waveform. Coefficients for this compensation for the system transient are determined and applied to the stream data. The stream data are then pre-filtered, stacked, binned to the 33 on and off-time channels and checked for the effectiveness of the compensation and stacking processes. The stacked data is then filtered, leveled and split up into the individual line segments. Further base level adjustments may be carried out at this stage.

The final field processing step was to merge the processed EM data with the other data sets into a Geosoft GDB file. The EM fiducial is used to synchronize the two datasets. The processed channels are merged into 'array format; channels in the final Geosoft database as Zon, Zoff, Xon, and Xoff

The filtering of the stacked data is designed to remove or minimize high frequency noise that can not be sourced from the geology. Apparent bedrock EM anomalies were interpreted with the aid of an auto-pick from positive peaks and troughs in the on-time Z channel responses correlated with X channel responses. The auto-picked anomalies were reviewed and edited by a geophysicist on a line by line basis to discriminate between thin and thick conductor types. Anomaly picks locations were migrated and removed as required. This process ensures the optimal representation of the conductor centres on the maps.

At each conductor pick, estimates of the off-time conductance have been generated based on a horizontal plate source model for those data points along the line where the response amplitude is sufficient to yield an acceptable estimate. Some of the EM anomaly picks do not display a tau value; this is due to the inability to properly define the decay of the conductor usually because of low signal amplitudes. Each conductor pick was then classified according to a set of seven ranges of calculated off-time conductance values. For high conductance sources, the on-time conductance values may be used, since it provides a more accurate measure of high-conductance sources. Each symbol is also given an identification letter label, unique to each flight line. Conductor picks that did not yield an acceptable estimate of off-time conductance due to a low amplitude response were classified as a low conductance source. Please refer to the anomaly symbol legend located in the margin of the maps.

#### **7.4. Gamma-Ray Spectrometer Data**

All radiometric processing was completed using the International Atomic Energy Agency (IAEA - 1991) guidelines. The Individual detector processors in the GRS10-5 spectrometer and intelligent peak detection software has virtually eliminated the problem of system drift (and subsequent leveling) and the need for deadtime corrections.

##### *Data Quality Assurance and Control*

The spectrometer data are referenced to the other data sets using a GPS time stamp. Merging of the various recorded data sets is done post flight using proprietary Aeroquest software. Preliminary ROI channels are generated and profiles are then plotted from the digital data to check for any missing data, spikes or data corrupted by other noise sources. Where necessary, the data are corrected or flagged for re-flight depending on the severity or duration of the noise.

##### *Spectral Calibration*

When calibrated (with thorium source about once a year) linearity of the each detector is measured and linearity correction coefficients are calculated. When operating in real time (collecting data), the linearity of each detector is mathematically corrected for each measurement. Individual detector tracking (tuning) and linearity correction provide better fit of the individual spectra that are being summed and therefore a sharper (better resolution) spectrum is obtained.

### *Spectra Windowing*

The Gamma-Ray spectra were recorded in a 256 channel array at a sample rate of 1 Hz. The standard windows for the GRS10-5 detector are as follows:

- Total counts window: 295keV to 3000keV (channels 25 to 255)
- Potassium counts window: 1306keV to 1588keV (channels 111 to 135)
- Uranium counts window: 1588keV to 1841keV (channels 135 to 165)
- Thorium counts window. 2376keV to 2847keV (channels 202 to 242)
- Cosmic counts: 3000keV to 6000keV (channel 256 )

### *Data Pre-Filtering*

The following raw channels were low-pass filtered prior to further processing:

Filter widths:

- Total counts : 4 seconds
- Potassium counts : 5 seconds
- Uranium counts : 7 seconds
- Thorium counts : 7 seconds
- Cosmic counts : 35 seconds
- Radar altimeter : 3 seconds

### *Filtering to Prepare for Background Corrections*

The radar altimeter data are filtered in order to ensure that no noise sources from the altimeter data are introduced to the radiometric data processing. The upward looking data are also filtered to improve the count statistics. A typical filter width ranges from 10 to 20s. In order to establish radon background levels from the upward-looking detector data, temporary heavily filtered upward and downward looking uranium and downward looking thorium data are utilized. The original unfiltered data are, of course, retained.

### *Standard Pressure and Temperature corrections*

Radar altimeter data are used in adjusting the stripping ratios for altitude and to carry out the height attenuation corrections. They are then converted to effective height (he) at STP by the expression  $he = (h * 273.15)/(T + 273.15) * (P/1013)$ , where h is the observed radar altitude; T is the temperature in degrees C; and P is the barometric pressure in mbars.

### *LiveTime (DeadTime) corrections*

No LiveTime corrections were required for this survey. The GRS10-5 does not generally require corrections for system deadtime. This correction is only applied where the total count rates are extremely high. Dead-time correction is made to each window using the expression  $N=n/(1-T)$  where N is the corrected count; n is the raw recorded count; and T is the dead-time. It is estimated that the system deadtime is less than 10 microseconds per pulse.

### *Cosmic and Aircraft Background*

Cosmic and aircraft background expressions are determined for each spectral window as described in chapter 4 of the IAEA Technical Report 323. The general form of these expressions is  $N = a + bC$ , where  $N$  is the combined cosmic and aircraft background for each window;  $a$  is the aircraft background in the window;  $C$  is the cosmic channel count; and  $b$  is the cosmic stripping factor for the window. The expressions are evaluated for each ROI window for each sample and used as a subtractive correction for the data.

### *Radon Background*

Correction of the data for variations in background due to radon is a multi-step process. First, test flights at various elevations over water are carried out in the field to establish the contribution of atmospheric radon to the ROI windows. A least squares analysis of the data from these test flights yields the constants for equations 4.9 to 4.12 (IAEA Report 323). Second, the response of the upward looking detector to radiation from the ground is established. Here a departure from the IAEA Report has been recommended by Grasty and Hovgaard (1996). The expression for the radon component in the downward looking uranium window is given by  $U_r = (u - a_1U - a_2T + a_2b_T - b_u) / (a_u - a_1 - a_2a_T)$  (see Eq. 4.3 – IAEA 323) where,  $U_r$  is the radon background detected in the downward U window;  $u$  is the measured count in the upward uranium window;  $U$  is the measured count in the downward uranium window;  $T$  is the measured count in the downward thorium window;  $a_1$ ,  $a_2$ ,  $a_u$  and  $a_T$  are proportionality factors; and  $b_u$  and  $b_T$  are constants determined experimentally. Using  $a_1$  or  $a_2$  (see above) in this equation will result in a good estimate of  $U_r$  permitting correction of the other ROI windows.

Survey altitude test data were collected and used to establish atmospheric background and calibrate the upward and downward looking detector systems. Variations in count rates due to soil moisture content and altimeter variations can largely be overcome by a normalization procedure using the thorium count. The procedure correlates the thorium count to the uranium count assuming the contribution to each ROI from the ground is proportional.

### *Compton Stripping*

Readings from pure Uranium, Thorium and Potassium sources can be seen in other ROI's or Regions of Interest (windows). This spectral overlap must be corrected for. The stripping ratios  $a$ ,  $b$  and  $g$  are determined during tests over calibration pads. The principal ratios  $a$ ,  $\beta$  and  $g$  should be adjusted for temperature, pressure and altitude (above ground) before stripping is carried out. These stripping ratios are used to remove the contribution in each of the three ROI windows from higher energy sources, leaving only the contribution from potassium, uranium and thorium.

### *Altitude Attenuation Corrections*

The altitude attenuation correction corrects the data in each of the ROI windows for the effects of altitude. The count rates decrease exponentially with altitude and therefore the counts are corrected to a constant altimeter datum at the nominal survey height of 30m.

### *Apparent Radioelement Concentrations*

The corrected count rate data can be converted to estimate the ground concentrations of each of the three radioelements, potassium, uranium and thorium. The procedure assumes an infinite horizontal slab source geometry with a uniform radioelement concentration. The calculation assumes radioactive equilibrium in the U and Th decay series. Therefore the U and Th concentrations are assigned as equivalent concentrations using the nomenclature eU and eTh. An estimate of the air absorbed dose rate can be made from the apparent concentrations, K%, eU ppm and eTh ppm.

### *Computation of Radioelement Ratios*

Standard rationing of the three radioelements (eU/eTh, eU/K and eTh/K) can be carried out and presented in profile or plan map form. In order to ensure statistical confidence in generating these ratios, we generally take the following precautions:

- Reject all data point where the apparent potassium concentration is less than 0.25% as these measurements are likely taken over water.
- Carry out cumulative summing along the survey line of each radioelement, rejecting areas where the summation does not exceed a certain threshold value (no lower than 25 counts for both numerator and denominator).
- Compute the ratios using the cumulative sums.

## **7.5. Magnetic Data**

Prior to any leveling the magnetic data was subjected to a lag correction of -0.1 seconds and a spike removal filter. The filtered aeromagnetic data were then corrected for diurnal variations using the magnetic base station and the intersections of the tie lines. No corrections for the regional reference field (IGRF) were applied. The corrected profile data were interpolated on to a grid using a random grid technique with a grid cell size of 25 metres. The final leveled grid provided the basis for threading the presented contours which have a minimum contour interval of 10 nT.

In order to enhance subtle magnetic trends, the first vertical derivative grid was calculated from the total magnetic intensity (TMI) grid. The first vertical derivative (1VD) of the TMI enhances low amplitude and small wavelength magnetic features which define shallow geologic features that may represent potential mineral exploration targets or target environments.

## **8. General Comments**

The survey was successful in mapping the magnetic, conductive and radiometric properties of the geology throughout the survey area. For a detailed interpretation please contact Aeroquest Limited.

### **8.1. Magnetic Response**

The magnetic data provide a high resolution map of the distribution of the magnetic mineral content of the survey area. This data can be used to interpret the location of geological contacts and other

structural features such as faults and zones of magnetic alteration. The sources for anomalous magnetic responses are generally thought to be predominantly magnetite because of the relative abundance and strength of response (high magnetic susceptibility) of magnetite over other magnetic minerals such as pyrrhotite.

### 8.2. EM Anomalies

The EM anomalies on the maps are classified by conductance (as described earlier in the report) and also by the thickness of the source. A thin, vertically orientated source produces a double peak anomaly in the z-component response and a positive to negative crossover in the x-component response (Figure 8). For a vertically orientated thick source (say, greater than 10m), the response is a single peak in the z-component response and a negative to positive crossover in the x-component response. Because of these differing responses, the AeroTEM system provides discrimination of thin and thick sources and this distinction is indicated on the EM anomaly symbols (N = thin and K = thick). Where multiple, closely spaced conductive sources occur, or where the source has a shallow dip, it can be difficult to uniquely determine the type (thick vs. thin) of the source (Figure 10). In these cases both possible source types may be indicated by picking both thick and thin response styles. For shallow dipping conductors the 'thin' pick will be located over the edge of the source, whereas the 'thick' pick will fall over the downdip 'heart' of the anomaly.

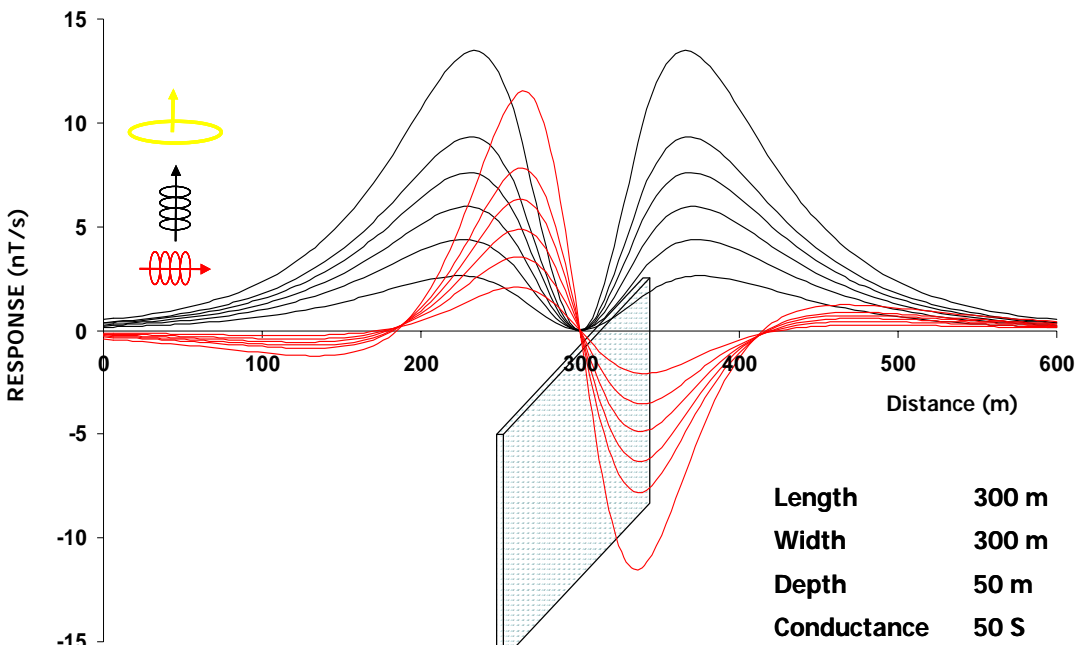


Figure 8. AeroTEM response to a 'thin' vertical conductor.



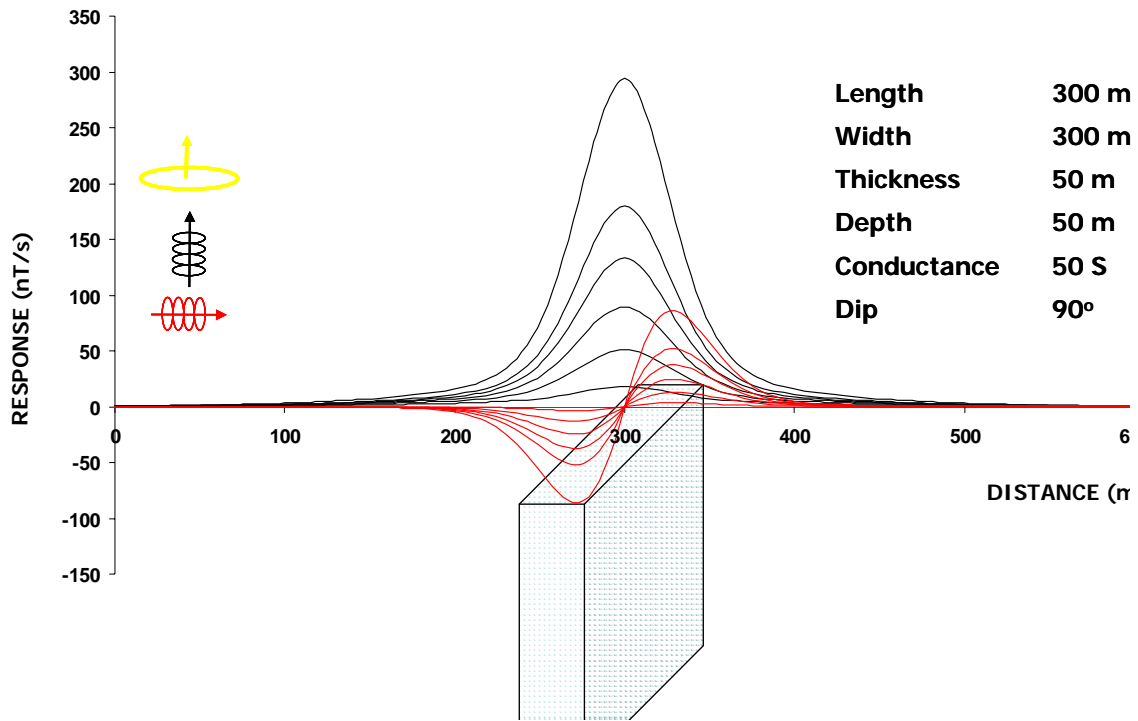


Figure 9. AeroTEM response for a 'thick' vertical conductor.

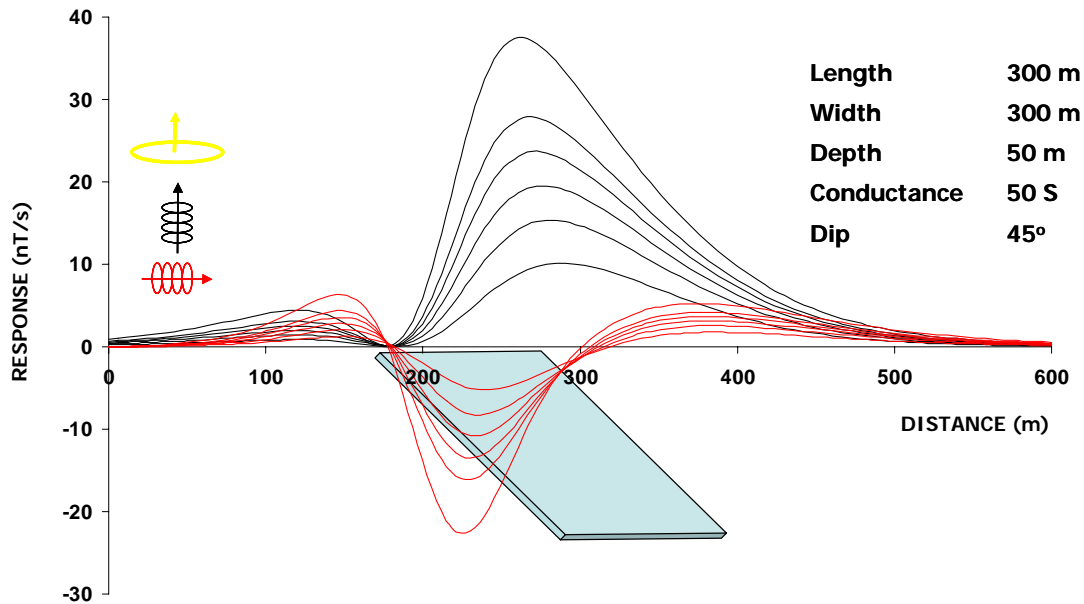


Figure 10. AeroTEM response over a 'thick' dipping conductor.

All cases should be considered when analyzing the interpreted picks and prioritizing for follow-up. Specific anomalous responses which remain as high priority should be subjected to numerical modeling prior to drill testing to determine the dip, depth and probable geometry of the source.

Respectfully submitted,

Jonathan Rudd, P.Eng

Aeroquest Limited  
October, 2006

## APPENDIX 1 – PROJECT CORNER COORDINATES

The Project consists of 5 blocks with boundaries as defined in the following tables. Positions are in UTM Zone 11 – NAD83.

### Crawford

X	Y
522491.0	5515525.0
525499.0	5515525.0
525509.0	5513163.0
522501.0	5513142.0

### Sawyer

X	Y
528670.0	5513220.0
532340.0	5513280.0
532360.0	5508560.0
528690.0	5508540.0

### McFarlane

X	Y
515710.0	5495595.0
520680.0	5495595.0
520690.0	5496065.0
523676.0	5496059.0
523659.0	5495497.0
525875.0	5493710.0
525675.0	5491440.0
522514.0	5491410.0
522525.0	5490950.0
518894.0	5490915.0
518870.0	5492300.0
515710.0	5492310.0

### Storm King

X	Y
537749.0	5486438.0
540756.0	5486487.0
540799.0	5481288.0
537790.0	5481291.0

### Sanca

X	Y
517470.0	5477105.0
525300.0	5477105.0
525350.0	5472540.0
526300.0	5472540.0
526250.0	5471450.0
525380.0	5471480.0
525360.0	5470500.0
519270.0	5470570.0

## APPENDIX 2 – Mining Claims

Block	Tenure Number	Claim Name	Owner	Good To Date	Mining Division	Area (Ha)
McFarlane	<u>524920</u>	MIR 1	CHRISTOPHER IAN WARREN	2007/JAN/09		523.81
McFarlane	<u>411445</u>	SPHINX 14	EAGLE PLAINS RESOURCES LTD.	2015/NOV/30	NELSON	25.0
McFarlane	<u>411447</u>	SPHINX 16	EAGLE PLAINS RESOURCES LTD.	2015/NOV/30	NELSON	25.0
McFarlane	<u>411449</u>	SPHINX 18	EAGLE PLAINS RESOURCES LTD.	2015/NOV/30	NELSON	25.0
McFarlane	<u>412989</u>	JODI NO 11	EAGLE PLAINS RESOURCES LTD.	2015/AUG/06	FORT STEELE	25.0
McFarlane	<u>503970</u>		EAGLE PLAINS RESOURCES LTD.	2015/AUG/06		377.026
McFarlane	<u>505368</u>		EAGLE PLAINS RESOURCES LTD.	2015/NOV/30		1339.734
McFarlane	<u>522989</u>	SPHINX SW	EAGLE PLAINS RESOURCES LTD.	2006/NOV/30		20.946
Sanca	<u>537407</u>	KT1	GORDON JAMES GOODBRAND	2007/JUL/19		63.047
Sanca	<u>537408</u>	KT2	GORDON JAMES GOODBRAND	2007/JUL/19		42.03
Sanca	<u>537409</u>	KT3	GORDON JAMES GOODBRAND	2007/JUL/19		84.06
Sanca	<u>393796</u>	SPARKY 16	MOUNTAIN STAR RESOURCES LTD	2006/OCT/13	NELSON	500
McFarlane	<u>413243</u>	LYDY 1	MOUNTAIN STAR RESOURCES LTD	2015/JUL/31	FORT STEELE	25
McFarlane	<u>413244</u>	LYDY 2	MOUNTAIN STAR RESOURCES LTD	2015/JUL/31	FORT STEELE	25
McFarlane	<u>413245</u>	LYDY 3	MOUNTAIN STAR RESOURCES LTD	2015/JUL/31	FORT STEELE	25
McFarlane	<u>413246</u>	LYDY 4	MOUNTAIN STAR RESOURCES LTD	2015/JUL/31	FORT STEELE	25
McFarlane	<u>413248</u>	LYDY 6	MOUNTAIN STAR RESOURCES LTD	2015/JUL/31	FORT STEELE	25
McFarlane	<u>413255</u>	LYDY 13	MOUNTAIN STAR RESOURCES LTD	2015/JUL/31	FORT STEELE	25
McFarlane	<u>413256</u>	LYDY 14	MOUNTAIN STAR RESOURCES LTD	2015/JUL/31	FORT STEELE	25
Sawyer	<u>501293</u>	Intrusive	MOUNTAIN STAR RESOURCES LTD	2007/JAN/12		438.339
Storm King	<u>501696</u>	Copper storm	MOUNTAIN STAR RESOURCES LTD	2007/JAN/12		314.681
Sanca	<u>503128</u>	Sparky 1	MOUNTAIN STAR RESOURCES LTD	2010/JUN/13		252.181
Sanca	<u>503131</u>	Sparky 2	MOUNTAIN STAR RESOURCES LTD	2010/JUN/13		504.6
Sawyer	<u>509603</u>	Sawyer North	MOUNTAIN STAR RESOURCES LTD	2007/MAR/24		375.644
McFarlane	<u>512490</u>		MOUNTAIN STAR RESOURCES LTD	2016/JUL/31		377.084
McFarlane	<u>513555</u>	MCFARLANE NORTH	MOUNTAIN STAR RESOURCES LTD	2016/DEC/31		460.637
McFarlane	<u>513556</u>	MCFARLANE SOUTH	MOUNTAIN STAR RESOURCES LTD	2016/DEC/31		523.627
Sanca	<u>516555</u>		MOUNTAIN STAR RESOURCES LTD	2006/OCT/13		504.216
Sanca	<u>516556</u>		MOUNTAIN STAR RESOURCES LTD	2006/OCT/13		567.61
Sanca	<u>516557</u>		MOUNTAIN STAR RESOURCES LTD	2006/OCT/13		420.497
Sanca	<u>516558</u>		MOUNTAIN STAR RESOURCES LTD	2007/OCT/13		630.484
Sanca	<u>516559</u>		MOUNTAIN STAR RESOURCES LTD	2007/OCT/13		630.491
Sanca	<u>516560</u>		MOUNTAIN STAR RESOURCES LTD	2007/OCT/13		525.184
McFarlane	<u>520326</u>	MCFARLANE 1	MOUNTAIN STAR RESOURCES LTD	2016/SEP/22		523.531
McFarlane	<u>520327</u>	MCFARLANE 2	MOUNTAIN STAR RESOURCES LTD	2016/SEP/22		418.847
McFarlane	<u>520328</u>	MCFARLANE 3	MOUNTAIN STAR RESOURCES LTD	2016/SEP/22		523.717
McFarlane	<u>520329</u>	MCFARLANE 4	MOUNTAIN STAR RESOURCES LTD	2016/SEP/22		418.986
Sawyer	<u>520997</u>	SAWYER EAST	MOUNTAIN STAR RESOURCES LTD	2006/OCT/12		501.055
Sawyer	<u>520998</u>	SAWYER WEST	MOUNTAIN STAR RESOURCES LTD	2006/OCT/12		250.551
Storm King	<u>527085</u>	STORM KING SOUTH	MOUNTAIN STAR RESOURCES LTD	2007/FEB/05		167.525
Storm King	<u>527086</u>	STORM KING NORTH	MOUNTAIN STAR RESOURCES LTD	2007/FEB/05		335.573
Storm King	<u>527274</u>	STORM KING EAST	MOUNTAIN STAR RESOURCES LTD	2007/FEB/08		188.865
Storm King	<u>527275</u>	STORM KING WEST	MOUNTAIN STAR RESOURCES LTD	2007/FEB/08		293.653
Crawford	<u>530471</u>	CRAWFORD	MOUNTAIN STAR RESOURCES LTD	2007/MAR/24		521.565
Sanca	<u>518704</u>	CONDOR	NIKOLAY ZHOVTYUK	2006/AUG/03		252.091
McFarlane	<u>513175</u>	BEN DERBY	TOM ELSON CHERRY	2008/MAY/22		41.88

### APPENDIX 3 - Description of Database Fields

The GDB file is a Geosoft binary database. In the database, the Survey lines and Tie Lines are prefixed with an "L" for "Line" and "T" for "Tie".

Database (Crawford.gdb, McFarlane.gdb, Sanca.gdb, Sawyer.gdb, StormKing.gdb):

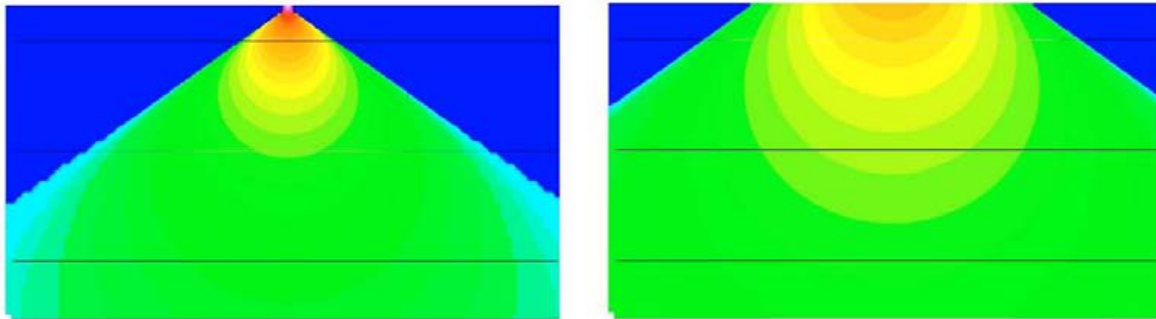
Column	Units	Description
Line		Line number
Flight		Flight #
emfid		AERODAS Fiducial
utctime	hh:mm:ss.ss	UTC time
x	m	UTM Easting (NAD83, zone 11N)
y	m	UTM Northing (NAD83, zone 11N)
bheight	m	Terrain clearance of EM bird
dtm	m	Digital Terrain Model
MOBf	nT	Total magnetic field – top sensor
Magf	nT	Total magnetic field from sensor on EM bird
Basemagf	nT	Base station total magnetic intensity
Zon	nT/s	Processed Streaming On-Time Z component Channels 1-16
Zoff	nT/s	Processed Streaming Off-Time Z component Channels 0-16
Xon	nT/s	Processed Streaming On-Time X component Channels 1-16
Xoff	nT/s	Processed Streaming Off-Time X component Channels 0-16
Anom_labels		Alphanumeric label of conductor pick
Off_Con	S	Off-time conductance at conductor pick
Off_Tau	S	Off-time decay constant at conductor pick
Anom_ID	S	Anomaly Character (K= thick, N = thin)
grade		Classification from 1-7 based on conductance of conductor pick
pwrline		powerline monitor data channel
Off_allcon	S	Off-time conductance
Off_AllTau	S	Off-time decay constant
TCcorr	CPS	Total Counts
Kcorr	%	Potassium
Ucorr	Ppm	Equivalent Uranium
Thcorr	Ppm	Equivalent Thorium
THKratio		Ratio – Thorium to Potassium
TCEXP	microR/h	Exposure Rate

## APPENDIX 4: AEROTEM DESIGN CONSIDERATIONS

Helicopter-borne EM systems offer an advantage that cannot be matched from a fixed-wing platform. The ability to fly at slower speed and collect data with high spatial resolution, and with great accuracy, means the helicopter EM systems provide more detail than any other EM configuration, airborne or ground-based. Spatial resolution is especially important in areas of complex geology and in the search for discrete conductors. With the advent of helicopter-borne high-moment time domain EM systems the fixed wing platforms are losing their *only* advantage – depth penetration.

### **Advantage 1 – Spatial Resolution**

The AeroTEM system is specifically designed to have a small footprint. This is accomplished through the use of concentric transmitter-receiver coils and a relatively small diameter transmitter coil (5 m). The result is a highly focused exploration footprint, which allows for more accurate “mapping” of discrete conductors. Consider the transmitter primary field images shown in Figure 1, for AeroTEM versus a fixed-wing transmitter.

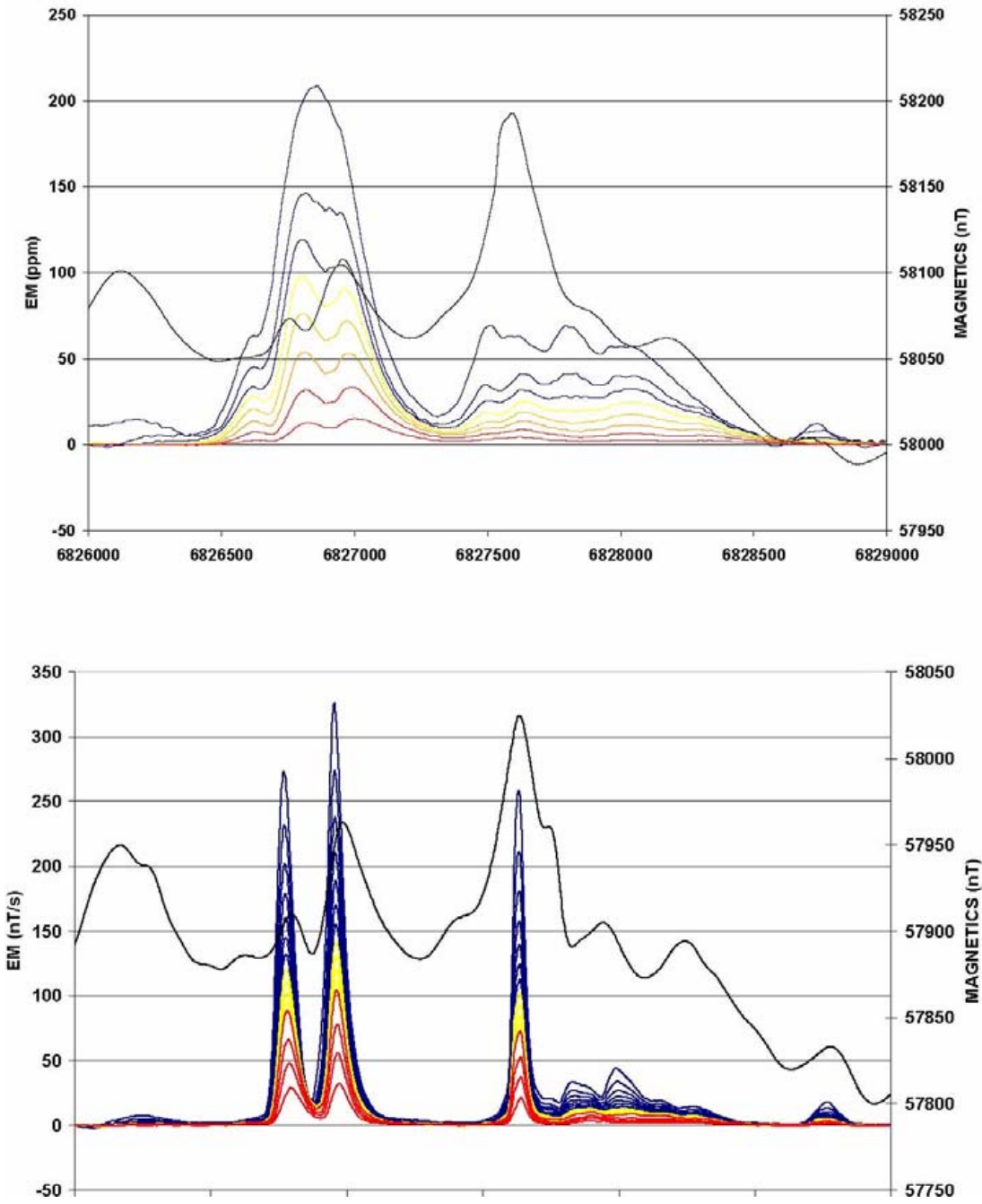


The footprint of AeroTEM at the earth's surface is roughly 50m on either side of transmitter

The footprint of a fixed-wing system is roughly 150 m on either side of the transmitter

**Figure 1. A comparison of the footprint between AeroTEM and a fixed-wing system, highlights the greater resolution that is achievable with a transmitter located closer to the earth's surface. The AeroTEM footprint is one third that of a fixed-wing system and is symmetric, while the fixed-wing system has even lower spatial resolution along the flight line because of the separated transmitter and receiver configuration.**

At first glance one may want to believe that a transmitter footprint that is distributed more evenly over a larger area is of benefit in mineral exploration. In fact, the opposite is true; by energizing a larger surface area, the ability to energize and detect discrete conductors is reduced. Consider, for example, a comparison between AeroTEM and a fixed-wing system over the Mesamax Deposit (1,450,000 tonnes of 2.1% Ni, 2.7% Cu, 5.2 g/t Pt/Pd). In a test survey over three flight lines spaced 100 m apart, AeroTEM detected the Deposit on all three flight lines. The fixed-wing system detected the Deposit only on two flight lines. In exploration programs that seek to expand the flight line spacing in an effort to reduce the cost of the airborne survey, discrete conductors such as the Mesamax Deposit can go undetected. The argument often put forward in favor of using fixed-wing systems is that because of their larger footprint, the flight line spacing can indeed be widened. Many fixed-wing surveys are flown at 200 m or 400 m. Much of the survey work performed by Aeroquest has been to survey in areas that were previously flown at these wider line spacings. One of the reasons for AeroTEM's impressive discovery record has been the strategy of flying closely spaced lines and finding all the discrete near-surface conductors. These higher resolution surveys are being flown within existing mining camps, areas that improve the chances of discovery.



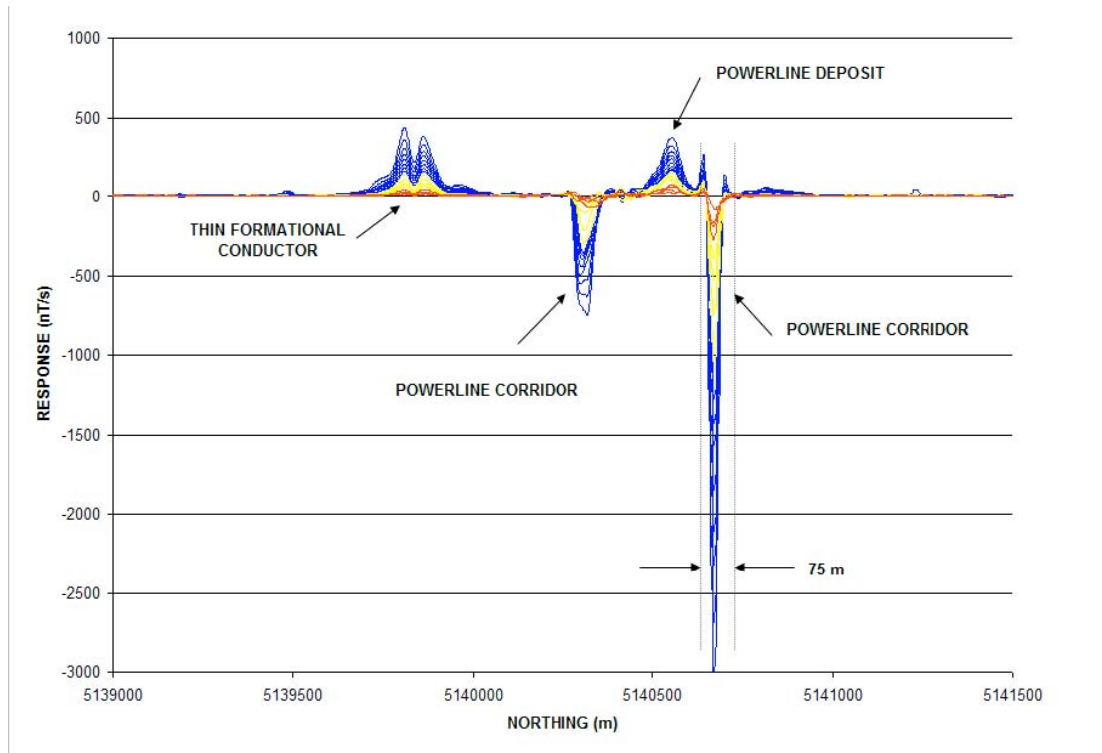
**Figure 2. Fixed-wing (upper) and AeroTEM (lower) comparison over the eastern limit of the Mesamax Deposit, a Ni-Cu-PGE zone located in the Raglan nickel belt and owned by Canadian Royalties. Both systems detected the Deposit further to the west where it is closer to surface.**

The small footprint of AeroTEM combined with the high signal to noise ratio (S/N) makes the system more suitable to surveying in areas where local infrastructure produces electromagnetic noise, such as power lines and railways. In 2002

Aeroquest flew four exploration properties in the Sudbury Basin that were under option by FNX Mining Company Inc. from Inco Limited. One such property, the Victoria Property, contained three major power line corridors.

The resulting AeroTEM survey identified all the known zones of Ni-Cu-PGE mineralization, and detected a response between two of the major power line corridors but in an area of favorable geology. Three boreholes were drilled to test the anomaly, and all three intersected sulphide. The third borehole encountered 1.3% Ni, 6.7% Cu, and 13.3 g/t TPMs over 42.3 ft. The mineralization was subsequently named the Powerline Deposit.

The success of AeroTEM in Sudbury highlights the advantage of having a system with a small footprint, but also one with a high S/N. This latter advantage is achieved through a combination of a high-moment (high signal) transmitter and a rigid geometry (low noise). Figure 3 shows the Powerline Deposit response and the response from the power line corridor at full scale. The width of power line response is less than 75 m.



**Figure 3. The Powerline Deposit is located between two major power line corridors, which make EM surveying problematic. Despite the strong response from the power line, the anomaly from the Deposit is clearly detected. Note the thin formational conductor located to the south. The only way to distinguish this response from that of two closely spaced conductors is by interpreting the X-axis coil response.**

**Advantage 2 – Conductance Discrimination**

The AeroTEM system features full waveform recording and as such is able to measure the on-time response due to high conductance targets. Due to the processing method (primary field removal), there is attenuation of the response with increasing conductance, but the AeroTEM on-time measurement is still superior to systems that rely on lower base frequencies to detect high conductance targets, but do not measure in the on-time.

The peak response of a conductive target to an EM system is a function of the target conductance and the EM system base frequency. For time domain EM systems that measure only in the off-time, there is a drop in the peak response of a target as the base frequency is lowered for all conductance values below the peak system response. For example, the AeroTEM peak response occurs for a 10 S conductor in the early off-time and 100 S in the late off-time for a 150 Hz base frequency. Because base frequency and conductance form a linear relationship when considering the peak response of any EM system, a drop in base frequency of 50% will double the conductance at which an EM system shows its peak response. If

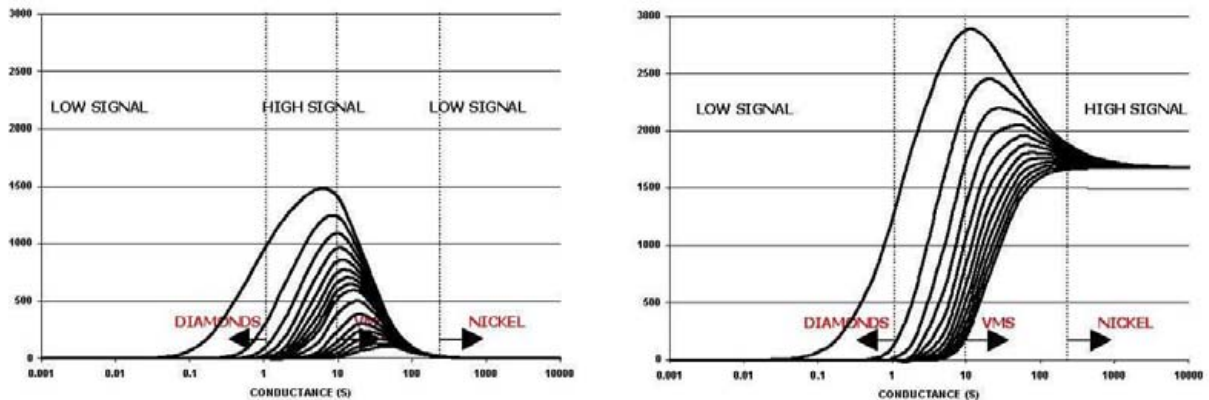


the base frequency were lowered from 150 Hz to 30 Hz there would be a fivefold increase in conductance at which the peak response of an EM occurred.

However, in the search for highly conductive targets, such as pyrrhotite-related Ni-Cu-PGM deposits, a fivefold increase in conductance range is a high price to pay because the signal level to lower conductance targets is reduced by the same factor of five. For this reason, EM systems that operate with low base frequencies are not suitable for general exploration unless the target conductance is more than 100 S, or the target is covered by conductive overburden.

Despite the excellent progress that has been made in modeling software over the past two decades, there has been little work done on determining the optimum form of an EM system for mineral exploration. For example, the optimum configuration in terms of geometry, base frequency and so remain unknown. Many geophysicists would argue that there is no single ideal configuration, and that each system has its advantages and disadvantages. We disagree.

When it comes to detecting and discriminating high-conductance targets, it is necessary to measure the pure inphase response of the target conductor. This measurement requires that the measured primary field from the transmitter be subtracted from the total measured response such that the secondary field from the target conductor can be determined. Because this secondary field is in-phase with the transmitter primary field, it must be made while the transmitter is turned on and the transmitter current is changing. The transmitted primary field is several orders of magnitude larger than the secondary field. AeroTEM uses a bucking coil to reduce the primary field at the receiver coils. The only practical way of removing the primary field is to maintain a rigid geometry between the transmitter, bucking and receiver coils. This is the main design consideration of the AeroTEM airframe and it is the only time domain airborne system to have this configuration.



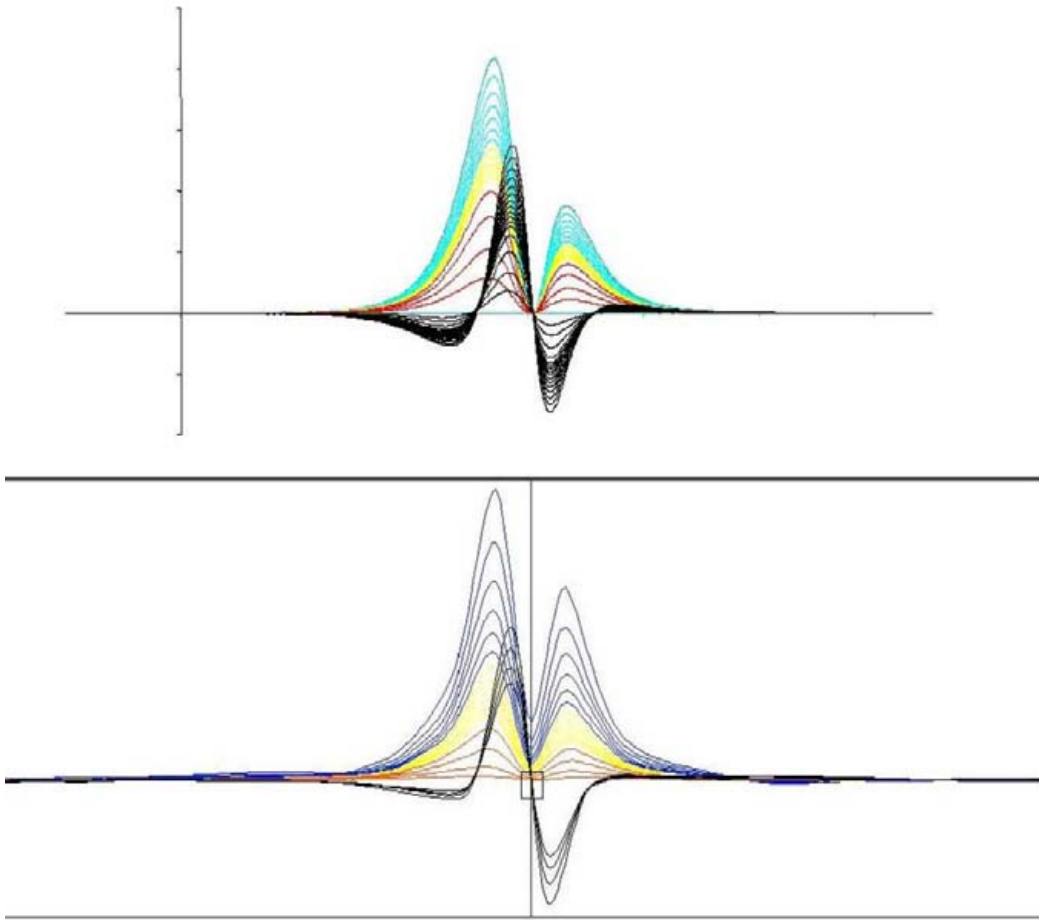
The off-time AeroTEM response for the 16 channel configuration.

The on-time response assuming 100% removal of the measured primary field.

**Figure 4. The off-time and on-time response nomogram of AeroTEM for a base frequency of 150 Hz. The on-time response is much stronger for higher conductance targets and this is why on-time measurements are more important than lower frequencies when considering high conductance targets in a resistive environment.**

### Advantage 3 – Multiple Receiver Coils

AeroTEM employs two receiver coil orientations. The Z-axis coil is oriented parallel to the transmitter coil and both are horizontal to the ground. This is known as a maximum coupled configuration and is optimal for detection. The X-axis coil is oriented at right angles to the transmitter coil and is oriented along the line-of-flight. This is known as a minimum coupled configuration, and provides information on conductor orientation and thickness. These two coil configurations combined provide important information on the position, orientation, depth, and thickness of a conductor that cannot be matched by the traditional geometries of the HEM or fixed-wing systems. The responses are free from a system geometric effect and can be easily compared to model type curves in most cases. In other words, AeroTEM data is very easy to interpret. Consider, for example, the following modeled profile:



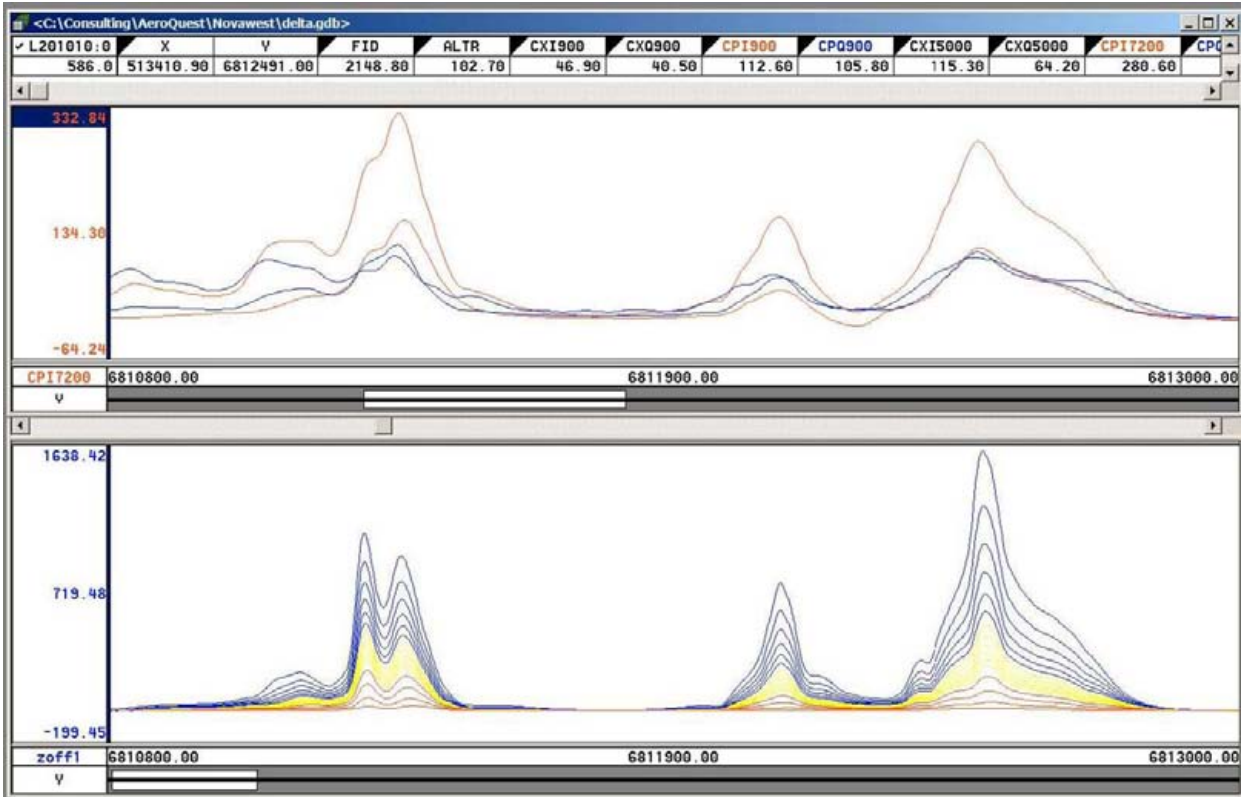
**Figure 5. Measured (lower) and modeled (upper) AeroTEM responses are compared for a thin steeply dipping conductor. The response is characterized by two peaks in the Z-axis coil, and a cross-over in the X-axis coil that is centered between the two Z-axis peaks. The conductor dips toward the higher amplitude Z-axis peak. Using the X-axis cross-over is the only way of differentiating the Z-axis response from being two closely spaced conductors.**

### **HEM versus AeroTEM**

Traditional helicopter EM systems operate in the frequency domain and benefit from the fact that they use narrowband as opposed to wide-band transmitters. Thus all of the energy from the transmitter is concentrated in a few discrete frequencies. This allows the systems to achieve excellent depth penetration (up to 100 m) from a transmitter of modest power. The Aeroquest Impulse system is one implementation of this technology.

The AeroTEM system uses a wide-band transmitter and delivers more power over a wide frequency range. This frequency range is then captured into 16 time channels, the early channels containing the high frequency information and the late time channels containing the low frequency information down to the system base frequency. Because frequency domain HEM systems employ two coil configurations (coplanar and coaxial) there are only a maximum of three comparable frequencies per configuration, compared to 16 AeroTEM off-time and 12 AeroTEM on-time channels.

Figure 6 shows a comparison between the Dighem HEM system (900 Hz and 7200 Hz coplanar) and AeroTEM (Zaxis) from surveys flown in Raglan, in search of highly conductive Ni-Cu-PGM sulphide. In general, the AeroTEM peaks are sharper and better defined, in part due to the greater S/N ratio of the AeroTEM system over HEM, and also due to the modestly filtered AeroTEM data compared to HEM. The base levels are also better defined in the AeroTEM data. AeroTEM filtering is limited to spike removal and a 5-point smoothing filter. Clients are also given copies of the raw, unfiltered data.



**Figure 6. Comparison between Dighem HEM (upper) and AeroTEM (lower) surveys flown in the Raglan area. The AeroTEM responses appear to be more discrete, suggesting that the data is not as heavily filtered as the HEM data. The S/N advantage of AeroTEM over HEM is about 5:1.**

Aeroquest Limited is grateful to the following companies for permission to publish some of the data from their respective surveys: Wolfden Resources, FNX Mining Company Inc, Canadian Royalties, Nova West Resources, Aurogin Resources, Spectrem Air. Permission does not imply an endorsement of the AeroTEM system by these companies.

## APPENDIX 5: AeroTEM Instrumentation Specification Sheet

# AEROTEM Helicopter Electromagnetic System

### System Characteristics

- Transmitter: Triangular Pulse Shape Base Frequency 150 Hz
- Tx On Time - 1,150 (150Hz)  $\mu$ s
- Tx Off Time - 2,183 (150Hz)  $\mu$ s
- Loop Diameter - 5 m
- Peak Current - 250 A
- Peak Moment - 38,800 NIA
- Typical Z Axis Noise at Survey Speed = 5 nT peak to peak
- Sling Weight: 270 Kg
- Length of Tow Cable: 40 m
- Bird Survey Height: 30 m nominal

### Receiver

- Two Axis Receiver Coils (x, z) positioned at centre of transmitter loop
- Selectable Time Delay to start of first channel 21.3 , 42.7, or 64.0 ms

### Display & Acquisition

- AERODAS Digital recording at 128 samples per decay curve at a maximum of 300 curves per second (26.455  $\mu$ s channel width)
- RMS Channel Widths: 52.9, 132.3, 158.7, 158.7, 317.5, 634.9  $\mu$ s
- Recording & Display Rate = 10 readings per second.
- On-board display - six channels Z-component and 1 X-component

### System Considerations

Comparing a fixed-wing time domain transmitter with a typical moment of 500,000 NIA flying at an altitude of 120 m with a Helicopter TDEM at 30 m, notwithstanding the substantial moment loss in the airframe of the fixed wing, the same penetration by the lower flying helicopter system would only require a sixty-fourth of the moment. Clearly the AeroTEM system with nearly 40,000 NIA has more than sufficient moment. The airframe of the fixed wing presents a response to the towed bird, which requires dynamic compensation. This problem is non-existent for AeroTEM since transmitter and receiver positions are fixed. The AeroTEM system is completely portable, and can be assembled at the survey site within half a day.

**Tel: +1 905 693-9129. Fax: +1 905 693-9128.**

**Email: [sales@aeroquestsurveys.com](mailto:sales@aeroquestsurveys.com)**

## APPENDIX 6: EM ANOMALY LISTING

### Crawford

easting	northing	line	Label	Type	bheight	dtm	flight	Grade	Cond	Tau	utctime
525251.2	5515521	5010	B	K	62.4	1917.8	44	7	59.43	771	17:15:31
525170	5515509	5010	C	K	71.5	1928.1	44	6	37.00	610	17:17:22
525195.9	5515422	5020	A	K	55.0	1911.6	43	6	49.89	706	4:43:02
525126.8	5515312	5030	A	K	94.8	1926.4	43	5	24.88	499	4:01:24
525161.6	5515216	5040	C	K	50.7	1990.0	43	4	16.20	403	23:31:50
525033.5	5515216	5040	D	K	58.2	2006.6	43	5	22.00	469	23:34:50
524733.5	5515187	5040	E	K	46.5	2032.1	43	1	0.45	67	23:43:12
523066.5	5515206	5040	F	K	76.6	1708.1	43	1	0.20	44	0:35:12
525035.7	5515118	5050	A	K	72.8	2052.2	43	5	27.94	529	22:48:55
525496.8	5515119	5050	B	K	75.1	1958.7	43	3	9.80	313	22:59:14
525034.1	5515033	5060	C	K	52.4	2069.5	43	5	31.35	560	18:02:26
524984	5515039	5060	D	N	47.1	2087.9	43	5	31.00	560	18:04:02
525473.6	5514896	5070	A	K	50.4	2005.1	42	3	9.00	305	5:24:34
524981.3	5514925	5070	A	K	52.4	2127.8	42	6	37.12	609	6:09:22
524845.1	5514817	5080	A	K	29.2	2244.6	42	3	7.70	277	4:37:48
524908.5	5514798	5080	B	K	38.6	2221.8	42	3	7.70	277	4:40:41
525374.3	5514804	5080	C	K	57.0	2071.3	42	2	4.80	220	4:55:07
525470.1	5514720	5090	A	K	29.3	2011.1	42	3	6.33	252	23:25:31
525442.5	5514716	5090	B	K	23.2	2034.6	42	3	5.30	230	23:30:19
525276	5514721	5090	C	K	46.6	2099.7	42	2	3.90	198	23:53:02
524961.5	5514716	5090	D	K	44.2	2184.9	42	4	12.90	359	0:08:38
524903.5	5514718	5090	E	K	32.8	2212.5	42	3	5.12	226	0:12:48
524770.9	5514613	5100	A	N	30.2	2197.6	42	3	9.88	314	22:31:53
524836.3	5514610	5100	B	K	26.7	2189.1	42	3	9.88	314	22:34:24
525273.2	5514642	5100	C	N	65.8	2080.4	42	2	2.83	168	22:48:19
525328.9	5514633	5100	D	K	60.3	2067.9	42	2	2.83	168	22:49:48
525428.5	5514632	5100	E	K	52.9	2020.2	42	2	4.62	215	22:53:34
525337	5514517	5110	A	K	32.4	2012.2	42	2	3.38	184	18:12:29
524935	5514532	5110	B	K	42.7	2120.6	42	4	16.00	407	18:34:43
524856.2	5514534	5110	C	K	30.8	2155.0	42	4	12.55	354	18:40:05
524757.5	5514529	5110	D	K	30.7	2188.0	42	4	13.00	365	18:49:50
525331.5	5514413	5120	A	K	46.1	1950.2	41	2	3.00	174	6:59:24
524867.5	5514427	5120	B	K	33.9	2094.7	41	2	4.35	209	7:18:07
524761.6	5514426	5120	C	K	30.1	2143.7	41	2	4.25	206	7:24:05
524839.8	5514311	5130	A	K	59.1	2049.2	41	4	17.75	421	6:04:58
525285.8	5514312	5130	B	K	51.8	1925.6	41	2	3.70	192	6:20:53
524818.7	5514213	5140	A	K	59.2	1987.8	41	5	31.11	558	2:06:53
524713.9	5514225	5140	B	K	47.7	2054.5	41	3	9.30	304	2:13:43
524811.2	5514116	5150	A	K	91.3	1935.1	41	5	23.00	482	0:40:46
525206.4	5514111	5150	B	K	56.3	1832.6	41	2	1.00	102	0:53:22
525330.4	5514119	5150	C	K	54.2	1798.7	41	4	11.67	342	0:57:10
525297.1	5514037	5160	B	K	78.7	1735.3	41	3	9.12	302	19:46:53
524765.2	5514016	5160	C		34.2	1904.5	41	4	18.14	426	20:10:41

Easting Northing Line Label Type Bheight DTM Flight Grade Cond Tau UTCTIME

525226.5	5513927	5170	B	K	52.8	1668.4	40	2	3.50	186	6:40:58
524755.7	5513913	5170	C	K	61.3	1860.3	40	4	10.40	322	7:13:26
524726.1	5513811	5180	A	K	93.8	1830.1	40	3	9.70	312	5:34:00
525439.5	5513832	5180	B	K	69.4	1686.9	40	4	10.30	320	5:54:29
525469.5	5513716	5190	B	K	103.0	1686.4	40	4	16.00	401	0:51:34
524635.5	5513710	5190	C	K	46.7	1834.1	40	4	11.00	331	1:41:02
522675.5	5513609	5200	A	K	56.8	1379.7	40	1	0.01	10	21:30:14
524544.1	5513616	5200	B	K	98.3	1825.9	40	3	7.40	272	23:27:43
524490.9	5513507	5210	B	K	45.7	1801.2	40	3	8.50	290	19:52:31
524453	5513435	5220	B	K	56.9	1783.6	39	3	5.50	235	6:49:50
524315.7	5513448	5220	C	K	52.6	1776.2	39	2	2.47	157	6:54:31
524201.5	5513322	5230	A	K	49.0	1716.7	38	1	0.75	87	19:00:38
525377	5513350	5230	B	K	61.1	1659.6	38	2	4.95	222	19:48:31
525431.3	5513343	5230	C	K	66.2	1693.4	38	2	2.98	173	19:53:42
525103.7	5513204	5240	B	K	126.5	1462.6	38	4	11.40	337	16:14:14
524486.1	5513539	5930	A	K	61.2	1812.2	39	3	6.72	259	1:18:05
525438.3	5515196	5940	A	K	42.7	1944.7	39	4	14.86	385	3:55:07
525449	5514750	5940	B	K	35.0	2028.3	39	3	7.64	276	4:20:53
525441.6	5514652	5940	C	K	38.9	2010.5	39	3	7.59	275	4:24:53

## McFarlane

Easting	Northing	line	Label	Type	bheight	dtm	flight	Grade	Cond	Tau	utctime
521632.2	5495988	2010	A	K	53.4	1371.5	1	2	3.92	198	1:28:38
521681.3	5495992	2010	B	N	47.0	1397.0	1	2	3.92	198	1:30:05
522359.2	5495991	2010	C	K	59.0	1576.1	1	1	0.01	10	1:48:10
522264.6	5495894	2020	A	N	66.7	1482.9	1	1	0.01	10	3:01:53
521740.3	5495905	2020	B	N	67.5	1374.7	1	1	0.25	50	3:12:29
521682.8	5495798	2030	A	N	71.1	1323.5	1	2	1.21	110	4:42:00
522256.1	5495791	2030	B	N	57.0	1443.1	1	1	0.01	10	4:59:02
523662	5495799	2030	C	K	46.1	1738.6	1	2	1.33	115	5:27:58
523720.5	5495719	2040	A	K	53.4	1729.9	1	2	1.24	111	5:39:05
521730.4	5495693	2040	B	N	54.2	1409.7	1	2	3.08	175	6:17:24
520760	5495692	2040	C	K	34.6	1319.1	1	1	0.01	10	6:54:46
523751.4	5495589	2050	A	K	61.3	1729.3	1	2	1.40	118	8:02:26
521721.8	5495600	2050	B	N	54.4	1470.3	1	2	1.05	102	8:48:02
520696	5495586	2050	C	K	40.0	1342.7	1	1	0.01	10	9:25:00
519327	5495594	2050	D	K	59.3	1506.9	1	3	8.30	287	10:06:41
519241.4	5495600	2050	E	K	59.8	1448.2	1	4	11.90	344	10:09:41
517933.1	5495602	2050	F	K	56.0	1479.3	1	1	0.69	83	10:50:46
519232.4	5495490	2060	A	K	52.1	1493.8	1	2	2.98	172	13:49:07
519257.2	5495502	2060	B	N	48.3	1506.0	1	2	2.98	173	13:50:53
519291.4	5495507	2060	C	K	47.3	1523.1	1	2	4.32	208	13:53:02
519411.1	5495504	2060	D	K	53.2	1593.7	1	2	2.90	170	14:00:14
521779.8	5495489	2060	E	K	56.9	1543.6	1	1	0.01	10	15:25:10
523738.9	5495497	2060	F	K	55.3	1759.6	1	1	0.40	63	16:15:17
523910.3	5495395	2070	A	N	63.5	1828.7	1	1	0.40	62	16:27:58

Easting      Northing    Line    Label    Type    Bheight    DTM    Flight    Grade    Cond    Tau    UTCTIME

523799.7	5495393	2070	B	K	51.0	1809.1	1	1	0.40	62	16:30:31
520715.1	5495395	2070	C	K	40.5	1324.7	1	2	2.10	144	17:46:00
519250.5	5495390	2070	D	K	73.0	1547.8	1	2	2.54	159	18:30:19
518661	5495381	2070	E	K	63.0	1640.4	1	1	0.01	10	18:49:14
517935	5495395	2070	F	K	67.3	1472.0	1	1	0.01	10	19:08:05
517869.3	5495295	2080	A	K	47.4	1422.3	1	1	0.01	10	21:16:38
519226.5	5495289	2080	B	K	64.9	1584.9	1	2	3.07	175	22:04:19
519321.1	5495299	2080	C	K	45.1	1643.1	1	2	3.80	195	22:09:41
520698.8	5495292	2080	D	K	59.3	1329.2	1	2	1.08	104	22:54:53
523874.8	5495294	2080	E	N	64.2	1863.0	1	2	1.30	114	0:37:48
523824.8	5495187	2090	A	K	53.7	1893.6	1	1	0.33	57	0:57:53
520745	5495197	2090	B	K	61.6	1311.0	1	1	0.97	98	2:16:34
519687	5495187	2090	C	K	46.8	1748.7	1	1	0.01	10	2:50:14
519227.1	5495199	2090	D	K	65.6	1625.3	1	4	11.20	334	3:04:58
517886.8	5495190	2090	E	K	76.5	1408.6	1	1	0.01	10	3:46:34
516470	5495198	2090	F	K	54.6	874.1	1	1	0.75	87	4:18:14
519069.4	5495072	2101	A	K	85.3	1695.1	2	1	0.51	71	17:59:53
519234.2	5495106	2101	B	K	88.0	1673.2	2	2	1.43	120	18:05:34
520693	5495092	2101	C	K	98.6	1340.4	2	2	1.69	130	19:15:26
523868.3	5495094	2101	D	N	68.1	1923.2	2	1	0.01	10	22:05:00
524364.9	5494991	2110	A	K	42.5	2133.4	2	1	0.83	91	22:39:34
523845.2	5494996	2110	B	K	61.9	1935.0	2	1	0.10	31	23:05:22
519163.5	5495002	2110	C	K	63.7	1740.3	2	1	0.60	77	1:54:19
519072.2	5495005	2111	B	K	62.0	1742.7	2	1	0.95	97	2:30:55
518931.7	5495000	2111	C	K	48.4	1781.9	2	1	0.01	10	2:36:00
517961.5	5495004	2111	D	K	78.9	1413.0	2	1	0.14	37	3:20:46
517128	5494983	2111	E	K	70.2	1090.7	2	1	0.25	50	3:40:00
517899.3	5494892	2120	A	K	62.5	1435.0	2	1	0.01	10	5:49:43
519170.9	5494897	2120	B	K	80.3	1792.4	2	2	1.07	104	7:03:58
520685.9	5494888	2120	C	K	85.4	1360.5	2	1	0.21	46	7:50:26
523865.6	5494876	2122	A	N	58.2	1948.1	2	1	0.07	20	10:47:43
524239	5494884	2122	B	K	44.8	2139.1	2	1	0.01	10	11:05:43
524459.6	5494811	2130	A	K	83.9	2040.2	2	2	1.43	120	11:36:55
524325.2	5494792	2130	B	K	31.9	2104.2	2	4	10.00	318	11:42:48
519227.6	5494808	2131	A	K	65.7	1838.9	2	2	1.81	134	14:52:02
519130.3	5494809	2131	B	K	56.2	1853.8	2	1	0.79	89	14:54:48
519024.9	5494798	2131	C	K	65.8	1843.2	2	1	0.79	89	14:57:50
519097.1	5494695	2141	A	K	51.4	1915.1	3	1	0.25	50	5:56:41
524349.1	5494687	2144	A	N	61.5	2052.8	3	2	3.20	179	11:43:26
524431.5	5494689	2144	B	K	72.8	2014.3	3	2	3.20	179	11:46:02
524414.5	5494606	2150	A	K	50.9	1990.0	3	3	6.49	255	12:26:24
524380.5	5494605	2150	B	N	49.5	2010.5	3	3	6.49	255	12:28:22
520693.9	5494602	2152	A	K	80.7	1413.7	3	1	0.25	50	15:06:29
520701.7	5494499	2160	A	K	82.8	1426.0	3	1	0.30	60	20:40:53
524357.5	5494495	2160	B	N	80.9	1968.7	3	2	2.11	145	23:38:58
524396.5	5494489	2160	C	K	58.2	1949.4	3	2	2.11	145	23:40:55
524885.8	5494487	2161	A	K	66.0	1736.4	3	1	0.29	54	0:22:14
518941.5	5494396	2170	A	K	54.3	1872.4	4	1	0.20	40	14:13:26

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520726	5494404	2170	B	K	83.0	1438.4	4	1	0.01	10	15:00:55
524411.4	5494386	2173	A	K	95.7	1907.5	4	1	0.54	73	19:22:34
524472.7	5494389	2173	B	K	83.1	1870.6	4	2	1.45	120	19:25:05
524749.3	5494380	2173	C	K	71.4	1759.5	4	2	1.56	125	19:32:50
524905.6	5494380	2173	D	K	68.5	1744.8	4	1	0.42	65	19:36:38
524901.4	5494295	2180	A	N	56.5	1754.4	4	2	2.45	156	19:59:50
524839.8	5494304	2180	B	K	46.2	1763.4	4	2	2.45	156	20:01:34
524438.4	5494312	2180	C	K	65.5	1882.9	4	1	0.92	96	20:17:05
518995.6	5494195	2190	A	K	55.2	1775.8	4	1	0.79	89	4:23:29
524389.3	5494197	2190	B	K	73.9	1877.8	4	1	0.24	49	8:36:29
524648.5	5494197	2190	C	K	67.6	1775.2	4	1	0.73	85	8:43:10
524775.8	5494182	2190	D	K	76.4	1767.7	4	2	1.93	139	8:45:58
524915.5	5494198	2190	E	K	69.4	1782.0	4	1	0.88	94	8:48:55
524728.6	5494097	2200	A	N	72.3	1766.7	4	2	1.52	123	10:28:41
520823.7	5494091	2200	B	K	72.5	1468.8	4	1	0.01	10	12:32:07
519109.8	5494098	2200	C	K	88.6	1833.1	4	1	0.01	10	13:30:36
519101.4	5494002	2211	A	K	38.1	1833.1	5	1	0.35	59	11:14:19
524370.8	5493984	2217	A	K	67.9	1821.5	5	1	0.13	36	18:56:12
524649.7	5493974	2217	B	K	58.6	1762.5	5	2	2.46	157	19:02:41
524711.3	5493970	2217	C	N	55.5	1768.8	5	2	3.08	175	19:03:48
524774.4	5493988	2217	D	K	57.5	1779.2	5	2	2.90	171	19:05:07
524831	5494008	2217	E	N	61.1	1792.3	5	2	3.08	175	19:06:36
515748.2	5493890	2220	A	K	53.1	835.7	8	1	0.01	10	14:23:34
519105	5493884	2221	A	K	37.2	1779.2	8	1	0.39	62	17:00:34
519163.1	5493892	2221	B	K	37.1	1815.9	8	1	0.78	88	17:05:10
525024.2	5493899	2223	A	K	61.6	1833.2	5	1	0.19	44	20:03:26
524846	5493907	2223	B	K	57.1	1801.5	5	2	1.51	123	20:07:34
524742.5	5493895	2223	C	K	61.0	1767.4	5	2	2.70	164	20:09:41
524442.4	5493901	2223	D	K	56.5	1797.2	5	1	0.01	10	20:15:19
515619.4	5493800	2230	A	K	52.2	820.2	6	1	0.04	21	19:46:34
520862.8	5493782	2231	A	K	111.0	1513.2	6	1	0.01	10	23:29:43
524425.5	5493800	2231	B	K	91.8	1784.1	6	1	0.37	61	3:11:19
524596.4	5493796	2231	C	K	70.0	1764.7	6	2	1.12	106	3:16:00
524861.1	5493804	2231	D	K	68.4	1811.3	6	1	0.61	78	3:23:17
524916.1	5493699	2240	A	K	59.6	1830.6	6	1	0.47	69	13:49:17
524838.9	5493695	2240	B	K	50.4	1816.6	6	2	2.80	167	13:51:12
524616.8	5493690	2240	C	K	69.9	1765.5	6	1	0.44	66	13:56:26
524473.9	5493711	2240	D	K	72.8	1778.4	6	1	0.01	10	13:59:46
522066.2	5493675	2241	A	K	90.7	1921.1	6	1	0.01	10	17:23:19
520966.7	5493700	2241	B	K	71.0	1547.1	6	1	0.12	35	17:44:55
519275.2	5493702	2241	C	K	69.0	1773.3	6	1	0.01	10	18:34:22
515631.3	5493700	2242	A	K	48.3	831.8	6	1	0.08	28	20:15:17
515708.7	5493604	2250	A	K	73.1	837.6	7	1	0.01	10	11:56:34
517429	5493592	2250	B	N	48.7	1062.0	7	3	5.22	228	12:36:48
519300.9	5493607	2250	C	K	51.7	1757.1	7	1	0.52	72	13:39:36
524031.7	5493587	2252	A	K	73.0	1942.5	7	1	0.01	10	17:55:58
524419.8	5493597	2252	B	K	50.4	1772.5	7	2	1.38	117	18:04:55
524763.9	5493588	2252	C	K	69.1	1809.9	7	1	0.25	50	18:12:14



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524915.9	5493497	2260	A	K	72.3	1880.6	7	1	0.47	68	20:53:43
524408.1	5493492	2260	B	N	52.1	1776.1	7	2	1.20	110	21:04:12
520931.7	5493493	2260	C	K	105.6	1567.3	7	1	0.01	10	23:42:24
519396.1	5493490	2260	D	K	62.4	1840.5	7	1	0.01	10	0:32:50
517478.4	5493503	2261	A	N	81.6	1095.0	7	3	7.03	265	2:14:58
517395.1	5493519	2261	B	K	65.7	1091.4	7	3	7.03	265	2:16:43
515667.5	5493386	2270	A	K	59.4	886.7	9	1	0.26	51	6:46:48
517425.8	5493385	2270	B	N	66.9	1159.5	9	2	4.93	222	7:35:24
518098.5	5493388	2270	C	K	59.8	1254.3	9	1	0.01	10	7:53:26
519435.1	5493381	2274	A	K	56.1	1839.5	9	1	0.01	10	9:14:38
520837.8	5493394	2275	A	K	85.9	1622.1	9	1	0.01	10	10:27:48
524355.6	5493396	2277	A	N	64.3	1774.5	9	2	1.41	119	13:35:26
524427.8	5493409	2277	B	K	57.7	1773.0	9	2	1.41	119	13:36:48
524831.1	5493410	2277	C	K	55.0	1877.5	9	1	0.01	10	13:53:38
515624.7	5493296	2280	B	K	41.4	874.2	10	1	0.32	57	22:57:05
517397.5	5493286	2280	C	N	57.3	1190.3	10	1	0.53	73	23:40:46
524401.5	5493292	2281	A	N	72.3	1753.8	10	2	1.29	113	5:37:58
525007.6	5493185	2290	A	K	51.5	2010.0	10	1	0.01	10	7:57:07
524480.7	5493176	2290	B	N	76.9	1769.7	10	1	0.98	99	8:08:26
520957.2	5493185	2291	A	K	85.8	1597.7	10	1	0.01	10	11:29:26
517548.4	5493196	2291	B	K	75.4	1227.7	10	2	1.00	100	13:26:00
517289.8	5493194	2291	C	K	45.5	1240.1	10	2	1.10	105	13:38:53
524048.6	5493072	2302	A	N	74.7	1853.5	11	1	0.69	83	8:39:24
524115.2	5493074	2302	B	K	69.2	1817.9	11	1	0.69	83	8:41:02
524460	5493078	2302	C	N	67.4	1779.0	11	1	0.59	77	8:48:07
524522.2	5493010	2310	A	N	65.4	1796.4	11	1	0.47	68	11:36:31
524438.5	5493004	2310	B	K	72.5	1777.8	11	1	0.47	68	11:38:31
524058.5	5492976	2310	C	N	65.7	1849.8	11	1	0.15	39	11:47:55
521050.1	5492985	2310	D	K	83.4	1622.2	11	1	0.04	20	14:22:36
520372.3	5493005	2310	E	K	30.0	1914.7	11	1	0.01	10	14:43:38
519425.7	5492999	2310	F	K	61.2	1812.5	11	1	0.25	50	15:11:05
518354	5492991	2310	G	K	94.8	1367.9	11	1	0.01	10	15:39:07
518083.1	5492996	2310	H	K	53.1	1400.8	11	1	0.03	18	15:45:41
517602.8	5493000	2310	I	K	70.1	1336.9	11	1	0.26	51	16:07:29
517419.8	5493000	2310	J	K	53.3	1323.8	11	1	0.06	25	16:12:17
515610.8	5492975	2310	K	K	44.4	874.5	11	2	2.14	146	16:59:46
517182.8	5492908	2320	A	K	43.7	1297.5	12	1	0.01	10	13:44:17
519542.9	5492901	2320	B	K	66.0	1845.6	12	1	0.01	10	15:53:07
521009.4	5492901	2320	C	K	79.7	1617.5	12	1	0.01	10	16:44:12
524046.3	5492882	2320	D	N	63.1	1844.9	12	1	0.61	78	18:55:46
524100.7	5492889	2320	E	K	66.0	1821.2	12	1	0.62	78	18:57:05
524414.6	5492886	2320	F	K	56.3	1790.5	12	1	0.57	76	19:03:17
524485.8	5492912	2320	G	N	58.3	1798.1	12	1	0.58	76	19:04:48
525038.5	5492805	2330	A	K	65.9	2048.4	12	1	0.01	10	21:35:02
524463.5	5492790	2330	B	K	81.3	1795.6	12	1	0.07	25	21:49:26
521042.4	5492801	2332	A	K	73.3	1641.1	12	1	0.16	39	0:32:26
519553.9	5492815	2332	B	K	60.3	1891.0	12	1	0.01	10	1:31:22
517138	5492809	2332	C	K	50.5	1295.1	12	1	0.01	10	2:51:14

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515666.4	5492805	2332	D	K	63.4	868.5	12	1	0.30	55	3:27:36
516534.4	5492697	2340	A	K	53.0	1027.9	13	1	0.07	25	14:39:46
519577	5492701	2340	B	K	58.0	1938.5	13	1	0.01	10	17:37:22
521211.1	5492690	2340	C	K	82.5	1656.3	13	1	0.01	10	18:37:41
524168	5492693	2340	D	K	96.6	1792.8	13	1	0.74	86	20:20:10
524116.7	5492600	2350	A	K	63.6	1824.0	13	2	1.10	105	23:30:50
524145.8	5492613	2351	A	K	84.2	1814.9	13	2	2.10	145	23:58:17
524085.5	5492606	2351	B	N	77.2	1838.0	13	2	2.10	145	23:59:31
516383.2	5492507	2360	A	K	35.2	997.8	16	1	0.60	77	17:54:02
516560.9	5492504	2360	B	K	53.0	1035.6	16	1	0.31	55	17:58:46
518596	5492491	2360	C	K	69.7	1611.0	16	1	0.01	10	19:42:00
519574.3	5492503	2361	A	K	65.7	1985.4	16	1	0.25	50	21:19:34
521314.2	5492503	2361	B	K	82.1	1694.6	16	1	0.25	50	22:10:24
524237.3	5492473	2361	C	K	83.2	1796.2	16	2	2.50	159	23:53:14
524189.5	5492415	2370	A	K	73.3	1816.6	16	1	0.25	50	5:08:10
518682.8	5492419	2371	A	K	78.9	1639.7	16	2	1.27	113	8:29:58
516547.2	5492402	2371	B	K	58.5	1044.7	16	2	1.24	111	9:20:48
524060.9	5492092	2403	A	K	68.6	1876.8	18	1	0.25	50	22:13:14
524458.6	5492079	2403	B	K	56.9	1902.8	18	1	0.40	85	22:19:17
524081.1	5492003	2410	A	K	65.6	1873.6	18	1	0.25	50	0:35:17
519711.4	5491992	2411	A	K	54.0	2008.3	18	1	0.29	54	2:59:02
519726.6	5491911	2422	A	K	82.3	2004.1	18	1	0.50	90	5:37:50
521283.7	5491879	2422	B	K	81.7	1862.7	18	1	0.01	10	6:16:05
524310.3	5491694	2441	A	N	59.4	2006.1	19	2	1.57	125	6:24:12
524363.8	5491694	2441	B	K	52.1	2028.0	19	2	1.57	125	6:27:17
524297	5491584	2451	A	K	60.6	2070.5	19	1	0.01	10	9:27:14
515754.9	5493705	29010	A	K	45.3	831.4	17	1	0.01	10	4:08:00
515752.3	5492942	29010	B	K	52.8	869.9	17	2	1.37	117	4:27:10
516735.9	5492348	29020	A	K	67.6	1102.4	17	1	0.01	10	5:37:31
517675.7	5493517	29030	A	K	72.2	1123.6	17	2	1.39	118	8:57:10
519724.8	5491963	29050	A	K	74.6	1988.8	15	1	0.50	85	17:59:29
523678.6	5495413	29090	A	K	66.7	1753.0	14	2	1.38	118	19:05:48
524660.6	5494066	29100	A	K	53.2	1746.4	14	2	2.60	161	22:56:17

## Sanca

Easting	Northing	line	Label	Type	bheight	dtm	flight	Grade	Cond	Tau	utctime
520327	5477000	1020	A	N	54.0	1158.6	48	2	1.93	139	12:51:17
518814.7	5476914	1030	A	K	60.7	1015.0	48	1	0.97	99	15:31:53
520138.8	5476900	1030	B	K	65.5	1204.9	48	2	1.12	106	16:39:55
520357.2	5476910	1030	C	K	66.9	1113.4	48	2	2.65	163	16:49:00
521219.9	5476794	1040	A	N	55.2	977.6	48	2	1.83	135	21:03:05
521150.7	5476806	1040	B	K	47.9	980.1	48	2	1.83	135	21:04:29
520221	5476795	1040	C	N	61.7	1124.6	48	4	19.00	436	21:30:41
518797.5	5476790	1040	D	K	74.5	989.6	48	2	1.47	121	22:39:46
518822.1	5476690	1053	A	K	51.1	998.0	48	1	0.43	65	0:02:38
520136.8	5476692	1053	B	N	78.2	1117.8	48	3	5.94	244	1:02:24
520877.3	5476710	1053	C	K	63.0	951.5	48	4	13.00	360	1:18:31

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521024.4	5476707	1053	D	K	58.8	959.3	48	2	1.08	104	1:21:41
521026	5476592	1060	A	N	79.6	955.0	49	2	2.32	152	16:01:00
520143.8	5476604	1060	B	K	63.2	1058.7	49	2	4.53	213	16:17:58
520086.8	5476606	1060	C	N	60.5	1081.9	49	2	4.53	213	16:19:17
519950	5476501	1070	A	N	81.2	1083.0	49	2	1.60	127	19:08:31
520768.6	5476500	1070	B	K	82.2	917.4	49	4	11.30	335	19:24:41
520945.6	5476507	1070	C	K	54.6	954.4	49	2	1.44	120	19:28:38
525210.1	5476482	1070	D	K	90.5	1736.9	49	1	0.01	10	21:47:17
520890.1	5476392	1080	A	K	63.5	966.5	49	5	29.32	541	0:02:05
519909.5	5476390	1080	B	N	64.4	1031.2	49	1	0.79	89	0:20:14
519157.1	5476420	1080	C	K	68.2	1151.3	49	1	0.29	54	0:42:05
518815.9	5476407	1080	D	K	68.2	1001.4	49	1	0.51	71	0:51:02
518814.6	5476298	1090	A	K	40.0	1009.6	50	1	0.47	69	10:06:53
519796.3	5476322	1090	B	N	61.0	1029.9	50	1	0.57	76	10:41:24
519855	5476316	1090	C	K	62.9	1005.0	50	1	0.57	76	10:42:55
520822.4	5476302	1090	D	K	67.3	973.8	50	4	11.20	334	11:03:00
521523.7	5476315	1090	E	K	92.1	1137.9	50	1	0.03	17	11:22:31
520816.8	5476185	1100	A	K	73.4	1017.4	50	3	8.89	298	16:46:24
520491	5476190	1100	B	K	87.5	912.1	50	2	1.05	102	16:51:19
519584.9	5476204	1100	C	K	64.6	1014.9	50	1	0.89	94	17:11:29
518790.6	5476210	1100	D	K	63.3	999.2	50	1	0.20	44	17:34:58
518723.5	5476108	1110	A	K	30.6	983.8	51	1	0.23	48	6:43:53
518774.4	5476106	1110	B	K	29.8	1009.1	51	1	0.08	27	6:46:05
519642.2	5476107	1110	C	N	70.5	958.2	51	2	1.35	116	7:18:38
520766.9	5476083	1110	D	K	60.7	1022.8	51	2	1.16	107	7:49:24
520737.9	5475998	1121	A	K	63.8	1051.9	51	1	0.20	45	16:46:48
519610.6	5475995	1121	B	N	51.6	918.1	51	3	8.77	296	17:13:14
519538.6	5475998	1121	C	K	53.2	928.7	51	3	8.77	296	17:16:17
518828.3	5476012	1121	D	N	52.4	1033.6	51	1	0.44	66	17:52:05
518733.2	5476021	1121	E	K	65.0	992.2	51	1	0.44	67	17:55:02
518617.4	5475900	1130	A	K	42.8	957.8	52	1	0.94	97	6:24:02
518709.3	5475891	1130	B	K	43.4	992.9	52	2	1.87	137	6:28:05
519490.9	5475903	1130	C	K	64.1	889.0	52	3	6.41	253	6:49:31
519550	5475907	1130	D	K	51.8	885.0	52	3	6.41	253	6:50:55
522135.5	5475896	1130	E	K	23.7	1429.3	52	1	0.01	10	8:08:00
519452	5475784	1140	A	N	74.8	835.5	52	2	1.10	105	15:52:12
519384.5	5475787	1140	B	K	73.4	840.6	52	2	1.10	105	15:53:50
518734.4	5475814	1140	C	N	40.4	993.5	52	1	0.47	68	16:15:05
518638.7	5475812	1140	D	K	52.1	963.9	52	1	0.47	68	16:18:26
518408.1	5475813	1140	E	K	76.6	853.3	52	1	0.28	53	16:25:58
518336.5	5475699	1150	A	K	47.2	825.5	52	1	0.22	46	17:07:48
522396	5475634	1161	A	K	64.9	1461.7	53	1	0.01	10	12:51:29
519555.7	5475566	1161	B	K	78.2	806.3	53	1	0.06	25	14:11:58
522123.1	5475409	1180	A	K	59.3	1536.9	53	1	0.01	10	23:09:55
520357.8	5475405	1181	A	K	59.1	1063.4	54	1	0.01	10	9:57:00
519578.4	5475399	1181	B	K	66.7	840.8	54	1	0.01	10	10:15:55
518167.7	5475408	1181	C	K	72.8	741.5	54	1	0.06	23	10:47:50
518096.6	5475311	1190	A	K	55.4	704.0	54	1	0.10	31	11:15:12

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522051.1	5475303	1191	A	K	84.0	1543.9	54	1	0.01	10	13:52:43
518108.6	5475207	1201	A	K	78.7	674.9	54	1	0.07	27	0:13:07
517924.7	5475112	1210	A	K	55.4	616.5	56	1	0.50	71	7:51:58
522584.8	5475071	1211	A	K	76.0	1628.6	56	1	0.14	38	11:28:12
522606.7	5474990	1221	A	K	60.2	1661.7	56	1	0.25	50	19:07:55
520828.4	5474890	1230	A	K	74.8	1350.7	56	1	0.01	10	22:43:10
521534.3	5474896	1230	B	K	58.3	1593.0	56	1	0.25	50	23:17:12
522137.9	5474894	1230	C	K	52.5	1730.8	56	1	0.07	25	23:48:34
525278.3	5474893	1232	B	K	45.8	2274.7	57	1	0.01	10	14:42:05
520286.4	5474692	1250	A	K	71.5	1303.0	57	1	0.01	10	23:26:14
525357.1	5474590	1260	A	K	65.8	2260.5	58	2	2.55	160	14:47:43
525269.6	5474501	1271	A	N	65.6	2264.6	58	2	2.89	170	1:31:34
525350.8	5474512	1271	B	K	57.6	2249.5	58	2	2.89	170	1:33:17
525417.7	5474419	1280	A	K	65.8	2228.3	58	2	1.88	137	1:49:00
518785	5474299	1294	A	K	72.1	696.1	65	1	0.16	40	14:57:12
518744.4	5474189	1302	A	K	81.8	685.1	67	1	0.24	49	6:36:34
518886.4	5474103	1311	A	N	73.2	741.2	68	1	0.22	47	20:39:58
518785.7	5474095	1311	B	K	65.5	702.6	68	1	0.22	47	20:42:46
518734.6	5473994	1320	A	K	63.8	702.2	68	1	0.35	59	22:16:53
525263	5474011	1321	A	K	19.5	2394.3	68	1	0.01	10	3:53:26
524974.4	5474001	1321	B		11.7	2463.6	68	4	17.31	416	4:20:53
518842.3	5473896	1330	A	N	77.7	729.1	69	1	0.27	52	19:24:34
518762.6	5473897	1330	B	K	61.2	708.4	69	1	0.27	52	19:26:48
518412.9	5473897	1330	C	K	89.0	593.5	69	1	0.29	54	19:35:29
518388.2	5473824	1340	A	K	92.9	580.3	69	1	0.92	96	20:01:12
518671.6	5473807	1340	B	K	63.5	669.2	69	1	0.45	67	20:18:29
518719.7	5473802	1340	C	K	52.1	700.4	69	1	0.59	77	20:22:17
518792.6	5473704	1350	A	N	56.1	709.9	69	1	0.10	31	6:50:34
518712.9	5473713	1350	B	K	50.3	699.1	69	1	0.10	31	6:52:41
519922.1	5473530	1370	A	K	27.0	1198.7	70	2	1.01	100	20:47:19
518503.9	5473322	1390	A	N	62.9	615.6	70	3	6.50	255	3:47:50
521169.7	5473320	1390	B	K	39.8	1763.2	70	1	0.01	10	5:32:10
518579.6	5473197	1400	A	N	67.6	597.2	71	3	5.50	234	1:34:26
518552.7	5473120	1410	A	N	75.3	580.0	71	2	1.00	102	1:51:29
523325.6	5472991	1421	A	K	29.9	1934.8	71	1	0.01	10	8:19:19
522054.8	5473000	1421	B	K	38.2	1805.9	71	1	0.01	10	8:52:26
521966.5	5472805	1440	A	K	42.3	1785.1	71	1	0.16	40	15:45:31
522079.4	5472671	1450	A	K	55.9	1788.1	72	1	0.01	10	5:46:07
522053.8	5472580	1460	A	K	64.0	1779.5	72	1	0.01	10	12:37:53
522043.6	5472483	1470	A	K	48.9	1764.6	73	1	0.01	10	6:56:50
521982	5472398	1480	A	K	45.0	1754.2	73	1	0.01	10	14:07:53
518778.5	5472148	1500	A	K	71.8	530.6	74	1	0.74	86	14:34:22
521994.2	5472118	1510	A	K	31.3	1710.9	74	1	0.01	10	17:42:02
521969.1	5472013	1520	A	K	70.2	1676.2	74	1	0.01	10	23:53:48
518816.2	5471995	1521	A	K	41.2	534.1	74	1	0.73	86	3:34:34
518839.2	5471908	1530	A	K	45.9	535.6	75	1	0.83	91	11:34:10
524613.3	5471797	1540	A	K	40.9	1717.1	66	2	3.48	186	14:02:29
521352.2	5471796	1540	B	K	78.6	1285.4	66	1	0.09	29	17:25:02

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518920.9	5471627	1560	A	K	38.5	536.1	63	2	2.02	142	21:40:00
519366.6	5470992	1620	A	N	75.3	585.0	59	1	0.31	56	14:57:55
519441.1	5470898	1630	A	N	82.8	580.3	55	2	2.87	170	18:26:43
518221.6	5475319	1910	A	K	31.6	765.0	63	1	0.07	27	23:04:53
520212.6	5476696	1931	A	K	93.0	1064.8	64	4	13.40	367	7:44:19
521211.2	5476479	1940	A	K	70.0	990.0	64	1	0.86	93	21:29:02
521212.1	5476802	1940	B	K	82.1	983.4	64	1	0.76	87	21:39:19
525192.4	5474548	1982	A	K	52.6	2295.1	63	1	0.73	86	12:20:24

## Sawyer

Easting	Northing	line	Label	Type	bheight	dtm	flight	Grade	Cond	Tau	utctime
532118.4	5513248	4010	A	K	41.0	1760.6	21	5	23.19	482	10:58:55
532200.8	5513249	4010	B	K	49.3	1734.2	21	5	27.88	528	11:02:26
532175.7	5513127	4020	A	K	61.3	1635.9	21	4	10.51	324	11:39:12
531943.2	5513143	4020	B	K	63.9	1651.1	21	3	7.36	271	11:47:29
531614.1	5513146	4020	C	K	64.5	1565.7	21	4	12.60	354	11:57:31
529856.7	5513021	4030	A	K	86.1	1553.1	21	2	2.56	160	15:16:05
531551.6	5513018	4030	B	K	39.5	1494.9	21	2	2.77	167	16:03:00
531913.2	5513013	4030	C	K	49.6	1571.2	21	2	2.76	166	16:23:10
532144.3	5513037	4030	D	K	54.9	1596.5	21	2	2.88	170	16:35:41
532259.2	5513035	4030	E	K	57.7	1567.4	21	2	4.30	207	16:38:50
531974.1	5512924	4040	A	K	61.4	1529.7	21	2	2.25	150	17:13:00
531958.2	5512929	4040	A	K	77.2	1524.7	21	2	1.99	141	18:13:22
531906	5512927	4040	B	K	76.5	1515.2	21	2	2.15	147	18:15:19
530053.4	5512918	4040	C	K	42.2	1501.8	21	3	7.60	275	19:12:31
529827.1	5512908	4040	D	K	36.7	1631.3	21	2	1.86	136	19:27:48
529740.8	5512820	4050	A	K	78.8	1688.4	22	1	0.40	65	9:06:26
531912.1	5512821	4050	B	K	49.8	1452.7	22	1	0.25	50	10:08:43
528806.2	5512109	4122	A	K	83.2	1981.8	23	1	0.07	25	16:58:00
529591.9	5512018	4131	A	K	68.2	2040.1	24	1	0.20	50	4:57:46
529579.9	5511901	4142	A	K	91.7	1994.9	24	1	0.23	48	8:57:22
529358.9	5511913	4142	B	K	76.2	2081.5	24	1	0.20	50	9:15:07
529035.3	5511803	4150	A	K	66.8	2076.2	24	1	0.23	48	10:10:00
529526.5	5511812	4150	B	K	88.3	2031.7	24	1	0.24	49	10:30:26
529643.5	5511820	4150	C	K	88.2	1972.2	24	1	0.30	55	10:35:26
529630.4	5511716	4161	A	K	80.5	2021.3	24	1	0.01	10	14:50:55
529473.1	5511727	4162	A	K	80.7	2087.4	24	1	0.25	50	15:28:34
529230.2	5511525	4184	A	K	76.4	2070.2	26	2	3.56	189	9:22:14
528978.6	5511517	4184	B	K	67.5	1976.2	26	2	4.96	227	9:28:24
528949.4	5511418	4190	A	K	64.0	1979.4	27	2	4.59	214	21:13:48
529180.3	5511417	4191	A	K	67.2	2062.7	27	2	1.85	136	21:45:22
529589.2	5511413	4193	A	K	87.7	2079.1	27	1	0.59	77	23:00:58
529584.1	5511333	4204	A	K	70.1	2102.6	27	1	0.01	10	5:30:34
529181.3	5511328	4204	B	K	64.1	2126.7	27	2	3.75	193	5:49:36
528740.6	5511213	4210	A	K	104.8	1935.4	28	2	3.67	192	14:46:55
528981.2	5511231	4213	A	K	86.4	2067.3	28	4	14.80	385	16:13:43
529285.6	5511244	4214	A	K	39.2	2225.2	28	2	2.48	157	17:05:41

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529176.4	5511223	4214	B	K	54.7	2184.5	28	3	8.20	285	17:10:24
529347.9	5511107	4224	A	K	48.5	2295.5	28	1	0.28	53	1:46:29
529209.3	5511118	4224	B	K	55.3	2239.3	28	2	3.82	195	1:51:26
528786.7	5511016	4230	B	K	78.0	2062.3	29	1	0.37	61	14:02:26
529133.4	5511026	4231	A	K	102.7	2247.9	29	2	1.03	102	14:40:58
529296.6	5511038	4231	B	K	88.1	2308.4	29	1	0.29	54	14:44:36
529071.9	5510929	4240	A	K	78.9	2260.7	29	1	0.20	120	22:04:53
528834.4	5510927	4240	B	K	121.1	2095.7	29	1	0.07	25	22:12:53
528666.7	5510941	4240	C	K	69.2	2047.8	29	1	0.78	88	22:18:46
529419.8	5510816	4250	A	K	71.0	2255.2	29	1	0.12	50	23:17:26
530481.1	5510822	4250	B	K	86.1	1974.3	29	1	0.08	27	23:43:31
530303.7	5510706	4260	A	K	60.4	1933.7	29	2	4.30	207	2:30:22
529346.6	5510732	4260	A	K	60.7	2223.7	30	1	0.17	41	14:17:36
529224.1	5510633	4270	A	K	95.7	2193.2	30	1	0.01	10	15:44:26
530313.5	5510633	4270	B	K	89.8	1890.1	30	1	0.07	27	16:05:12
530676.3	5510629	4270	C	K	71.6	1776.2	30	4	11.80	343	16:12:19
531766.9	5510607	4270	D	K	79.9	1407.5	30	2	4.37	209	16:42:48
531781.1	5510521	4280	A	K	105.5	1409.1	30	1	0.83	91	18:43:02
531131.5	5510507	4281	A	K	63.5	1668.1	30	2	2.00	141	19:30:38
530617.6	5510503	4281	B	K	62.5	1734.2	30	4	14.03	375	19:38:31
530252.6	5510512	4281	C	K	55.2	1844.2	30	3	9.48	308	19:45:53
530177.8	5510511	4281	D	N	52.1	1866.3	30	3	9.48	308	19:47:34
529078.4	5510425	4290	A	K	99.2	2130.8	30	2	1.60	126	21:29:38
530219.5	5510423	4290	B	K	87.7	1834.9	30	3	6.00	245	21:53:48
530617.5	5510428	4290	C	K	112.9	1712.8	30	5	30.00	549	22:00:24
531352.5	5510403	4290	D	K	70.1	1675.2	30	1	0.46	67	22:16:48
531743.4	5510393	4290	E	K	105.0	1445.0	30	2	2.80	167	22:37:26
531783.9	5510340	4300	A	K	74.9	1437.0	30	2	3.10	177	0:20:43
531521.1	5510335	4301	A	K	70.5	1622.6	30	2	2.40	154	0:58:24
531370.6	5510317	4302	A	K	104.2	1725.1	30	1	0.01	10	1:49:46
530212.5	5510315	4302	B	K	65.6	1804.3	30	4	17.50	418	2:11:07
530121.2	5510318	4302	C	N	62.6	1821.1	30	4	17.50	418	2:13:05
529028.9	5510334	4303	A	K	81.4	2107.7	30	2	3.60	189	3:07:43
528816.4	5510194	4310	A	K	74.1	2108.8	31	2	2.27	151	1:56:31
529045.9	5510232	4310	B	K	88.5	2049.7	31	2	2.74	166	2:01:05
530143.6	5510237	4310	C	K	59.9	1799.5	31	2	1.70	131	2:18:29
531461.5	5510197	4310	D	K	81.2	1671.9	31	2	2.48	157	2:49:14
531852.7	5510219	4310	E	K	129.1	1393.8	31	2	1.28	113	3:04:24
528924.5	5510120	4321	A	N	70.2	2096.7	31	2	2.78	167	8:24:00
530020.5	5510129	4321	B	N	57.4	1805.6	31	3	5.63	237	8:46:50
530100.3	5510128	4321	C	K	60.0	1794.9	31	3	5.63	237	8:48:14
528828.3	5510024	4331	A	K	99.2	2093.2	31	2	2.76	166	13:39:24
530115.2	5510019	4331	B	K	99.7	1822.1	31	2	3.95	198	14:06:10
530143.4	5509886	4341	A	K	108.3	1930.7	32	1	0.01	10	7:33:10
528843.1	5509823	4351	A	K	78.1	2060.5	32	2	4.07	201	12:23:53
529029.4	5509820	4351	A	K	82.2	2125.5	32	2	1.79	134	12:53:46
530143.2	5509818	4351	B	K	100.5	1985.3	32	1	0.26	51	13:19:50
531670.4	5509812	4351	C	K	74.8	1510.4	32	2	1.56	125	14:15:12

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530162.4	5509725	4361	A	K	108.2	2073.3	32	1	0.01	10	18:20:02
528895.9	5509615	4370	A	K	71.5	2066.9	34	2	4.60	215	21:19:17
529207.5	5509523	4381	A	K	56.6	2154.4	34	2	1.73	132	5:50:41
529095.4	5509515	4381	B	K	46.4	2137.4	34	3	6.78	260	5:53:22
528736.3	5509531	4381	C	K	77.1	2000.3	34	3	5.69	239	6:01:41
529237.2	5509417	4391	A	K	71.8	2144.4	34	2	2.06	143	12:21:41
529094.8	5509431	4391	B	K	56.3	2124.2	34	2	4.45	211	12:25:46
529092	5509431	4391	C	K	56.2	2123.6	34	2	4.47	211	12:25:50
529234.5	5509312	4401	A	K	74.4	2162.0	35	2	2.75	166	5:11:41
529086.6	5509314	4401	B	K	71.7	2110.4	35	3	5.47	234	5:15:34
528718.2	5509315	4401	C	K	70.3	1991.1	35	3	7.09	266	5:23:22
531348.4	5509223	4410	A	K	74.1	1515.5	35	4	13.80	371	8:35:14
528696.2	5509220	4411	A	K	70.0	1993.8	35	2	3.61	190	11:17:46
529060	5509244	4411	B	K	63.5	2095.6	35	2	4.16	204	11:25:38
531334.1	5509126	4420	A	K	67.6	1490.2	35	4	15.34	391	14:40:43
531275.3	5509123	4420	B	K	64.1	1517.0	35	5	26.20	512	14:42:55
529940.4	5509122	4421	A	N	77.7	2107.6	36	2	1.21	110	4:15:10
530019	5509120	4421	B	K	69.2	2091.9	36	2	1.20	110	4:16:50
531281.4	5509012	4430	A	K	79.3	1486.0	36	5	21.82	467	6:00:10
531198.1	5509014	4430	B	K	69.6	1516.6	36	5	27.35	523	6:02:29
529962.9	5509021	4431	A	N	53.1	2034.4	36	3	5.54	235	8:00:41
529905.7	5509022	4431	B	K	53.4	2045.4	36	3	5.54	235	8:02:00
529283.4	5509011	4431	C	N	48.2	2183.6	36	2	1.25	112	8:19:02
529201.4	5509022	4431	D	K	35.2	2207.9	36	2	1.25	111	8:21:31
529223.3	5508933	4440	A	N	44.8	2187.0	36	2	1.23	111	9:22:58
529795.3	5508910	4440	B	N	61.7	2030.5	36	4	12.57	355	9:37:43
529853.6	5508909	4440	C	K	67.0	2010.8	36	4	12.57	355	9:38:58
529926.1	5508911	4440	D	N	80.2	1981.7	36	4	12.57	355	9:40:26
531169.8	5508911	4440	E	K	82.4	1512.3	36	5	26.85	518	10:16:00
531357.3	5508822	4450	A	K	75.0	1549.8	36	2	3.96	199	11:37:26
531173.1	5508829	4450	B	K	81.0	1509.4	36	5	34.79	590	11:41:58
530004.6	5508833	4450	C	K	59.5	1919.1	36	2	3.58	189	12:41:22
529860	5508839	4450	D	K	52.3	1978.5	36	5	21.66	465	12:46:14
529540.1	5508822	4450	E	N	40.0	2095.0	36	1	0.84	92	12:57:24
529876.7	5508703	4460	A	N	75.8	1987.2	36	2	4.62	215	15:16:41
529928.4	5508705	4460	B	K	77.0	1960.5	36	2	4.62	215	15:18:05
531142.4	5508716	4460	C	K	97.6	1520.9	36	4	15.27	391	15:48:41
531357.2	5508738	4460	D	K	62.3	1587.0	36	1	0.91	95	15:55:22
529862.9	5508618	4471	A	N	79.8	2036.2	37	3	6.42	253	6:31:34
529935.5	5508612	4471	B	K	89.5	1996.9	37	3	6.40	253	6:33:29
531136.7	5508646	4471	C	K	79.5	1541.3	37	5	21.88	468	7:10:31

## Storm King

Easting	Northing	line	Label	Type	bheight	dtm	flight	Grade	Cond	Tau	utctime
540196.9	5484347	3221	A	N	52.0	2010.8	83	2	2.50	158	5:37:14
539722.5	5484338	3222	A	N	47.8	2163.1	83	2	1.50	122	6:16:53
540145.3	5484239	3230	A	K	59.5	2049.5	83	5	29.12	540	1:15:19
540093.9	5484238	3230	B	N	59.2	2057.6	83	5	29.12	540	1:16:14

Easting Northing Line Label Type Bheight DTM Flight Grade Cond Tau UTCTIME

539869.1	5484234	3230	C	K	68.5	2118.9	83	2	1.39	118	1:21:02
539817.8	5484228	3230	D	N	66.1	2138.5	83	2	1.39	118	1:22:12
540140.4	5484150	3241	A	N	38.7	2127.2	83	1	0.86	93	23:26:19
539695.7	5483698	3280	A	K	65.7	2276.1	82	1	0.32	56	3:48:41
539567.1	5483527	3300	A	K	11.2	2364.0	81	1	0.01	10	13:11:43
539679.9	5483130	3344	A	K	51.8	2216.0	81	1	0.01	10	1:43:36
540404.5	5483054	3350	A	K	12.6	2324.0	80	1	0.01	10	11:38:19
539750.3	5483025	3350	B	K	70.6	2195.2	80	1	0.01	10	12:06:17
539623.8	5482945	3361	A	K	64.8	2211.2	80	1	0.29	53	9:56:22
539671	5482836	3370	A	K	55.7	2193.3	80	1	0.39	63	7:01:46
539513.1	5482828	3370	B	K	42.6	2221.2	80	1	0.28	53	7:09:26
539567.5	5482718	3381	A	K	33.8	2174.4	80	1	0.17	41	4:28:22
539751.2	5482751	3382	A	K	49.7	2149.0	80	1	0.11	32	5:06:26
539830.1	5482623	3390	A	N	75.5	2104.1	80	1	0.71	84	1:11:50
539655.4	5482634	3390	B	K	70.3	2147.2	80	1	0.32	56	1:18:53
539654.5	5482527	3400	A	K	49.4	2100.7	80	3	5.00	224	23:19:07
539827.9	5482545	3400	B	N	64.3	2091.6	80	4	13.00	361	23:26:17
539829.8	5482436	3410	A	K	73.1	2066.2	79	5	21.80	467	11:53:26
539732.5	5482439	3410	B	K	73.9	2067.4	79	5	22.90	478	11:57:50
539070.3	5482330	3421	A	K	91.2	2025.3	79	2	1.83	135	9:44:14
539127.7	5482337	3421	B	N	74.4	2015.3	79	2	1.83	135	9:46:00
539743.8	5482334	3421	C	N	62.7	2037.5	79	5	23.00	477	10:02:34
539826.6	5482340	3421	D	K	71.1	2037.2	79	5	21.80	466	10:05:26
539859.9	5482246	3430	A	K	70.3	2000.4	79	5	23.50	485	6:12:22
539097.5	5482231	3430	B	K	79.3	2009.5	79	2	2.00	141	6:32:46
539110.5	5482116	3440	A	K	83.5	1999.4	79	1	0.46	68	4:06:34
539190	5482114	3440	B	N	85.0	1973.9	79	1	0.46	68	4:08:50
539862.3	5482136	3440	C	K	63.1	1954.9	79	3	6.50	255	4:28:19
539959.8	5482038	3450	A	N	56.6	1916.2	77	1	0.01	10	8:04:07
539891.3	5482031	3450	B	K	63.0	1914.6	77	1	0.01	10	8:05:17
539227.6	5482038	3450	C	N	85.7	1955.9	77	1	0.38	62	8:16:24
539133.7	5482034	3450	D	K	65.0	2002.0	77	1	0.38	62	8:18:29
539117.9	5481924	3460	A	K	67.3	2014.6	77	1	0.17	41	6:24:34
539180.8	5481936	3460	B	N	75.1	1988.7	77	1	0.17	41	6:26:12
539308.1	5481837	3470	A	N	54.0	1991.0	77	1	0.12	34	3:43:14
539189.8	5481839	3470	B	K	57.2	2009.9	77	1	0.12	34	3:45:34
539206.2	5481711	3480	A	K	65.3	1994.4	77	1	0.08	29	1:58:55
539304	5481712	3480	B	N	58.0	1987.0	77	1	0.08	29	2:01:19
539410.2	5481629	3490	A	N	69.7	1968.1	77	1	0.06	25	23:42:31
539275.9	5481625	3490	B	K	63.7	1993.6	77	1	0.06	25	23:45:22
539278.3	5481526	3500	A	K	66.0	2003.9	77	1	0.01	10	22:16:07
539392.2	5481509	3500	B	N	77.0	1960.8	77	1	0.01	10	22:19:02
539448.6	5481438	3510	A	N	58.7	1956.8	76	1	0.01	10	9:15:26
539348.5	5481445	3510	B	K	67.4	1980.8	76	1	0.01	10	9:18:34
539421.1	5481331	3520	A	N	65.2	1949.2	76	1	0.44	66	7:03:14
539490.2	5481336	3520	B	K	61.2	1927.4	76	1	0.44	66	7:04:46



**Appendix C**

**STATEMENT OF EXPENDITURES**

## STATEMENT OF EXPENDITURES

The following expenses were incurred on behalf of the Sanca project between June 30<sup>th</sup> and July 1<sup>st</sup>, 2006.

Aeroquest Limited airborne geophysical survey (as per Invoice 1158)	<b><u>\$12,835.50</u></b>
---	---------------------------

**Appendix D**

**PROGRAM RELATED DOCUMENTS**



Contact Us > Help ?

B.C. HOME

Mineral Titles

Mineral Claim Exploration and Development Work/Expiry Date Change

- Select Input Method
- Select/Input Tenures
- Input Lots
- Data Input Form
- Review Form Data
- Process Payment
- Confirmation

- [Main Menu](#)
- [Search for Mineral / Placer / Coal Titles](#)
- [View Mineral Tenures](#)
- [View Placer Tenures](#)
- [View Coal Tenures](#)

→ [MTO Help Tips](#)

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## Mineral Titles Online

### Mineral Claim Exploration and Development Work/Expiry Date Change

Confirmation

Recorder: MOUNTAIN STAR RESOURCES LTD (139398)      Submitter: MOUNTAIN STAR RESOURCES LTD (139398)  
 Recorded: 2007/MAR/22      Effective: 2007/MAR/22  
 D/E Date: 2007/MAR/22

**Your report is due in 90 days. Please attach a copy of this confirmation page to the front of your report.**

Event Number: 4139260

Work Start Date: 2006/JUN/29  
Work Stop Date: 2006/JUL/01

Total Value of Work: \$ 12835.50  
Mine Permit No:

Work Type: Technical Work  
Technical Items: Geophysical, PAC Withdrawal (up to 30% of technical work performed)

#### Summary of the work value:

Tenure #	Claim Name/Property	Issue Date	Good To Date	New Good To Date	# of Days Forward	Area in Ha	Work Value Due	Sub-mission Fee
530471	CRAWFORD	2006/mar/24	2007/mar/24	2012/mar/24	1827	521.57	\$ 14603.82	\$ 1044.27

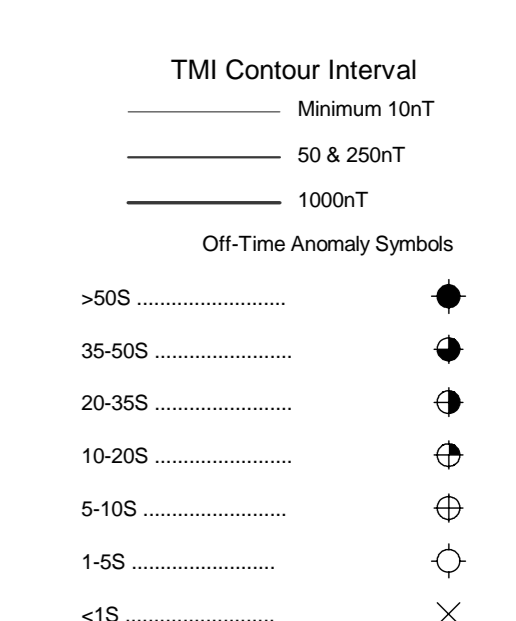
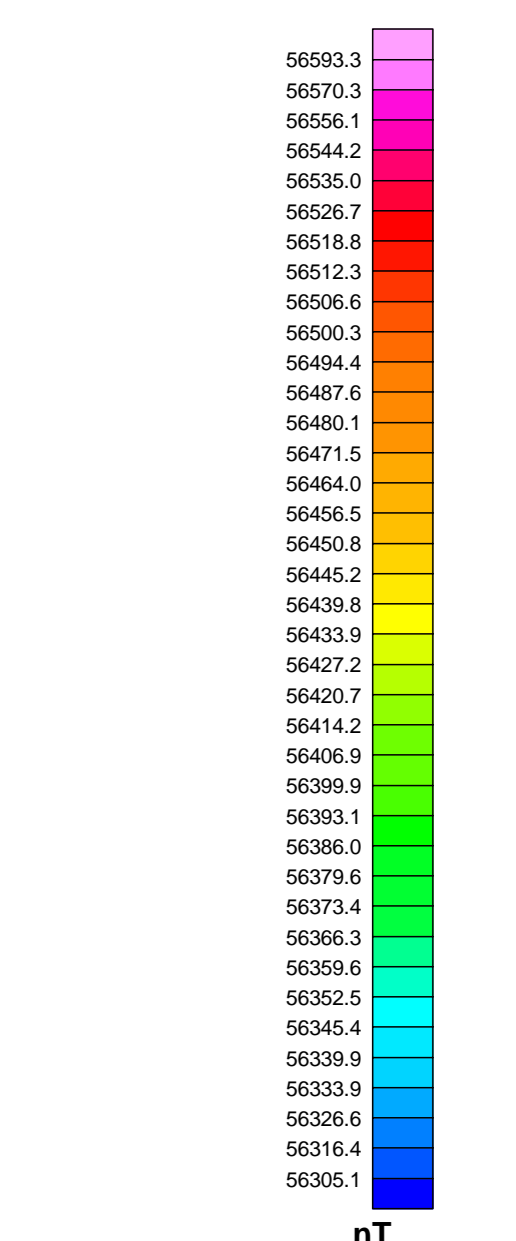
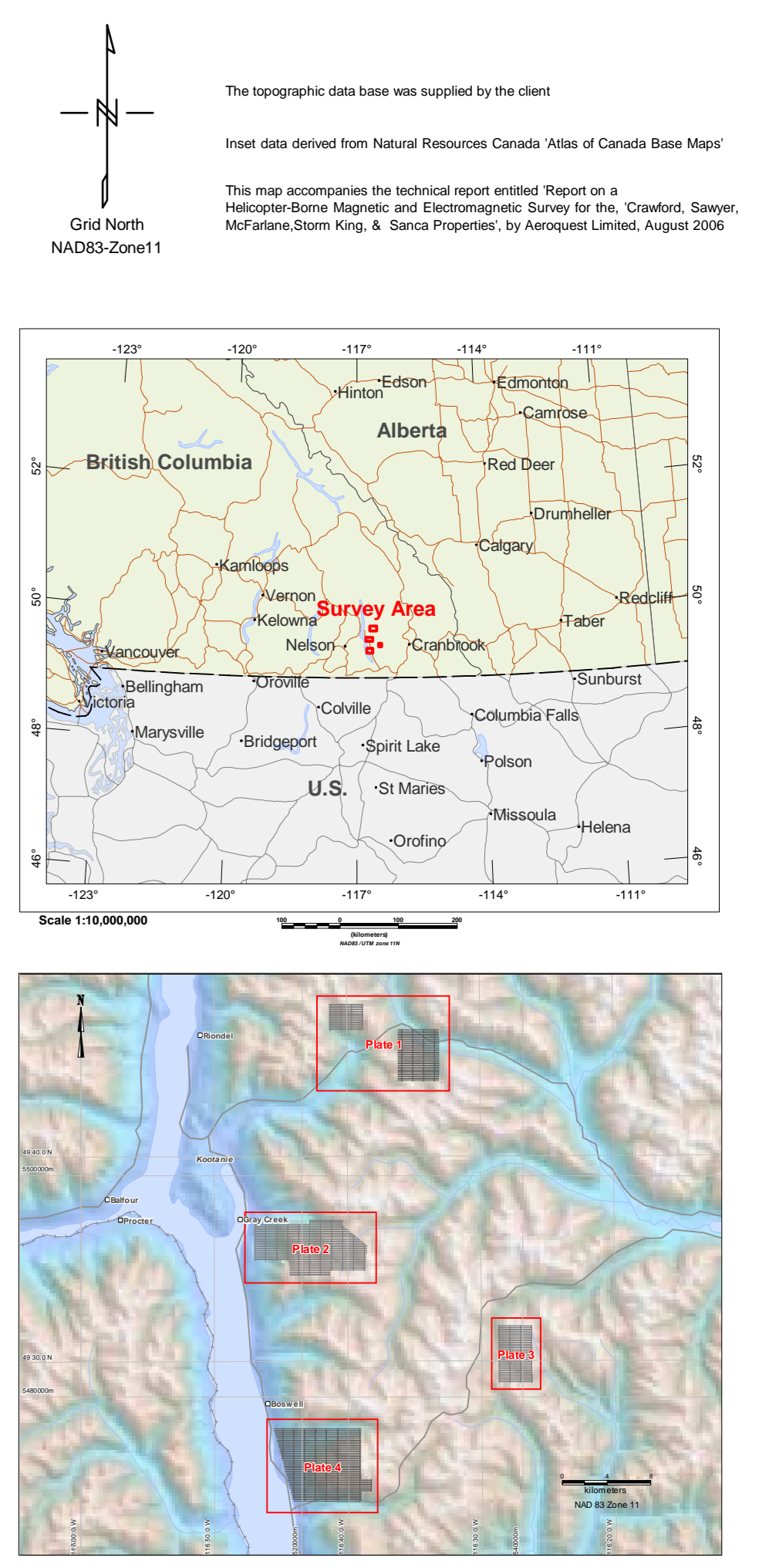
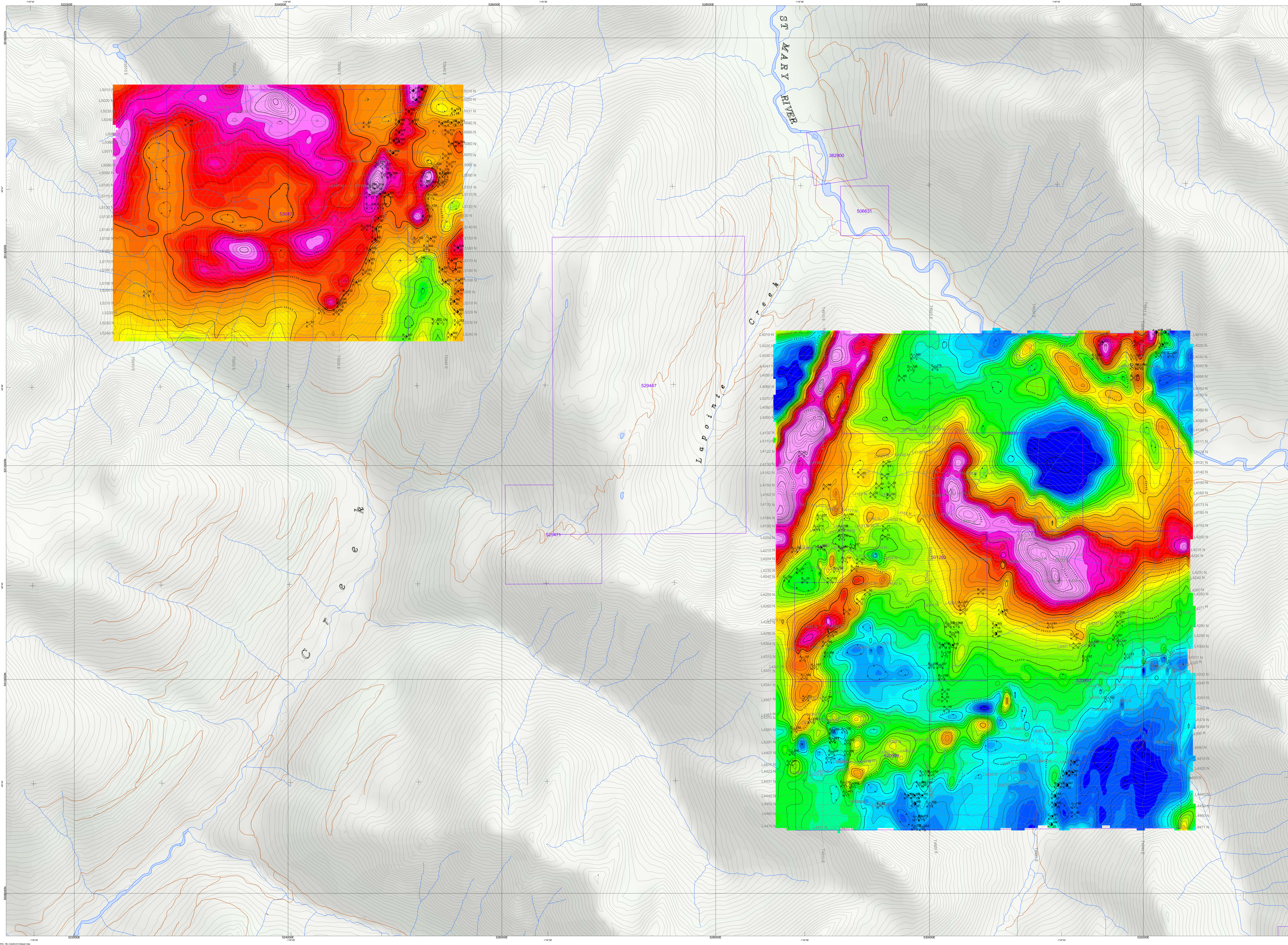
<b>Total required work value:</b>	\$	14603.82
<b>PAC name:</b>		mountain star resources ltd
<b>Debited PAC amount:</b>	\$	1768.32
<b>Credited PAC amount:</b>	\$	0.00
<b>Total Submission Fees:</b>	\$	1044.27
<b>Total Paid:</b>	\$	1044.27

The event was successfully saved.

Please use **Back** button to go back to event confirmation index.

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anomaly label  $\frac{1}{100}$  decay constant (m)  
 thick/thin source  $\frac{1}{30}$  off-line conductance (S)

**SURVEY SPECIFICATIONS:**  
 Survey from: June 28 to 29, 2006 & June 30 to July 1, 2006  
 Traverse line spacing: 100 metres  
 Traverse line direction: 90° Azimuth (E-W)  
 Nominal ERM height: 20 metres  
 Aircraft: Aeromaster A-Star 300B2 (C-FB9K)  
**INSTRUMENTATION:**  
 Data acquisition: ADAS & RMS DGR-33  
 Magnetometer: Geometrics G-823A vector output  
 Processor: Tower Ltd 17 m above EM and  
 Sensitivity: 0.01 nanotesla  
 Electromagnetic: GeoEM388 System (GDF)  
 Configuration: Tower Ltd  
 Camera Ray Geometrics Pro/Viewmax AGDS GRS 10-5  
 Downward looking crystal: vol - 16 BL (102kHz)  
 Ground looking crystal: vol - 4L (250kHz)  
 Sample interval: 1.0 seconds  
 Channels: 256

**NAVIGATION:**  
 Navigation: Differential Global Positioning System (DGPS)  
 Navigation equipment: uNAV with AGS TCM Backup receiver  
 Radar Altitude: Terra TRA3000TR3-30

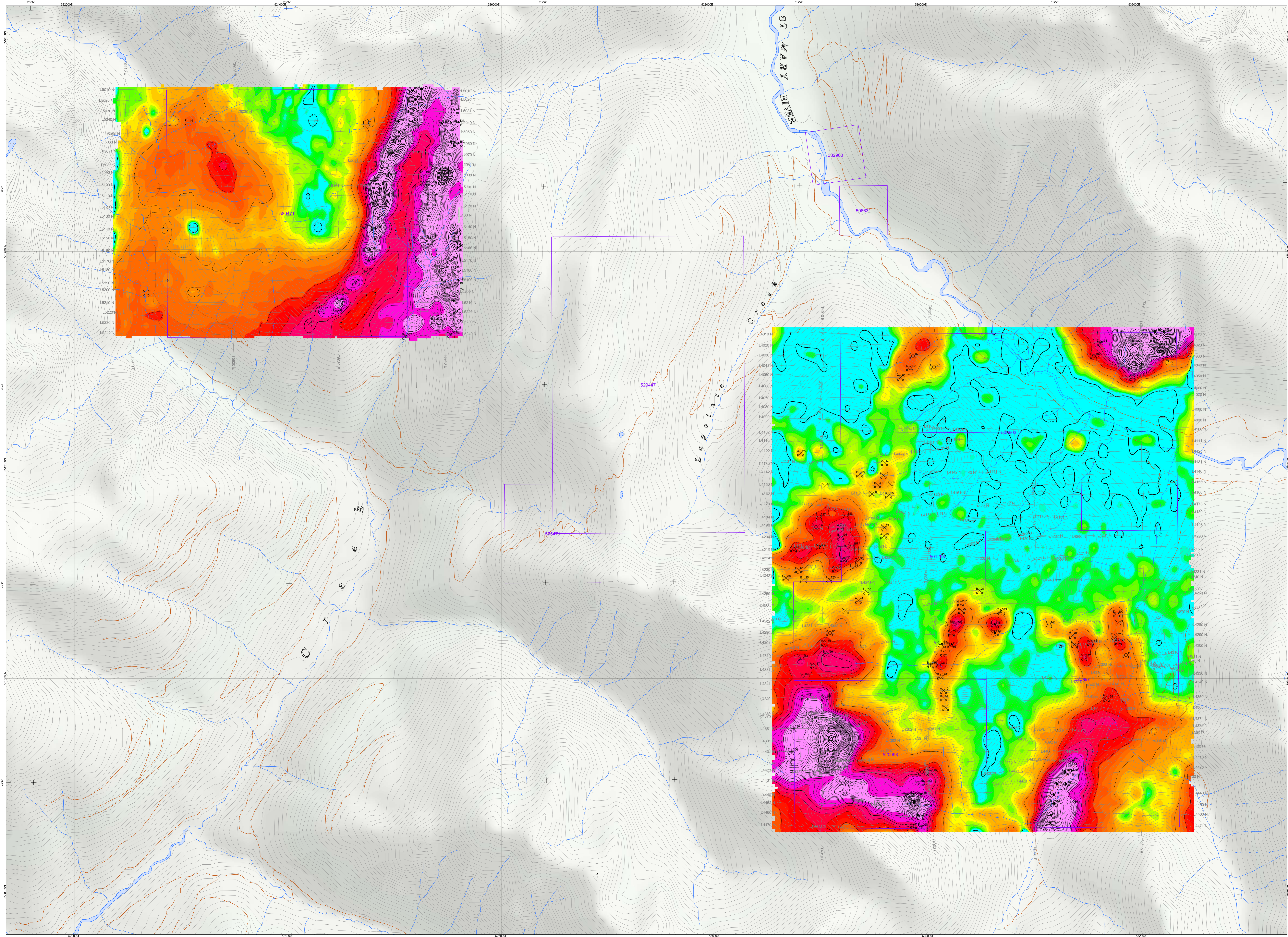
**DATA PROCESSING:**  
 Magnetos: manual, inline and microleveling corrections  
**POST-PROCESSING:**  
 Datum: NAD83  
 Map Axis: 6378137.000  
 Elevation: 5181819.000

**MAP PROJECTION:**  
 Projection: Universal Transverse Mercator  
 Central Meridian: 117°W (Zone 11)  
 Central Scale Factor: 0.9996  
 False Easting/Heighting: 500,000m/0m

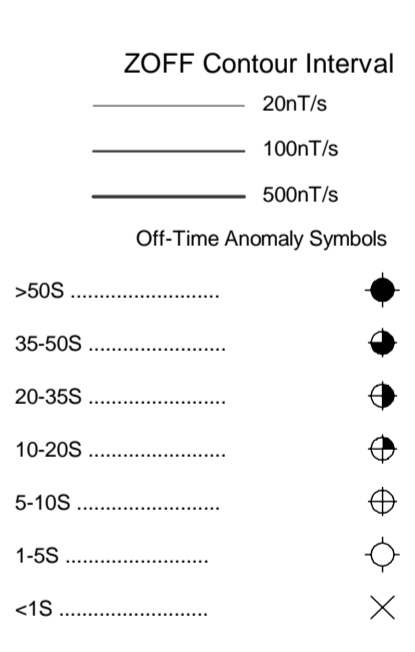
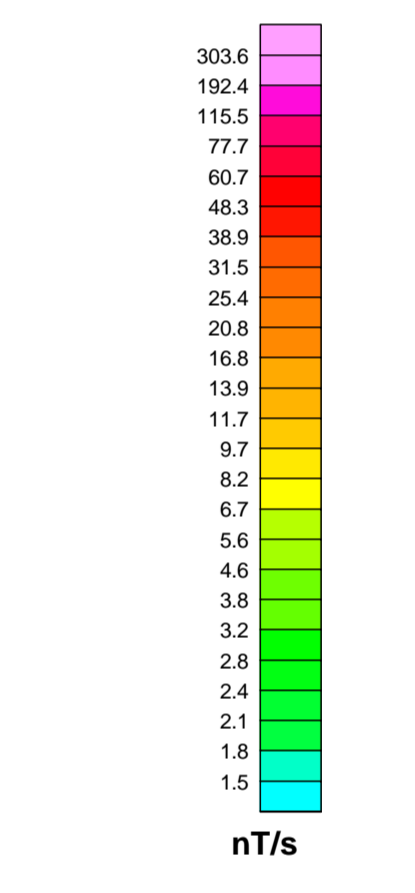
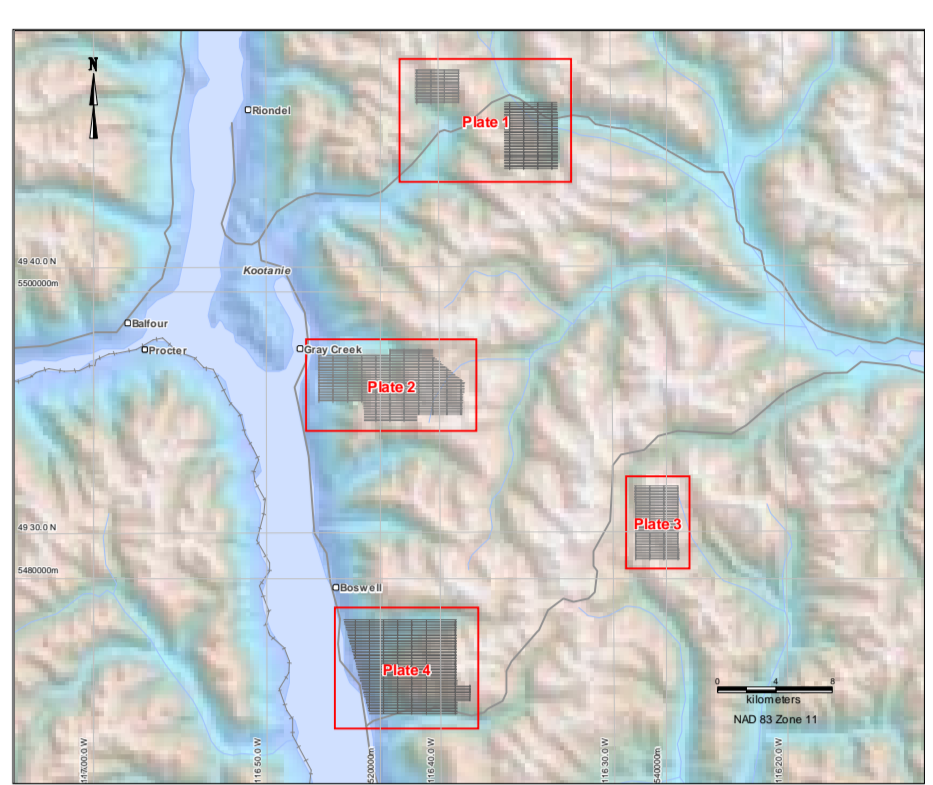
scale 1:10,000  
 0 100 200 300 400 500 600 700 800 900 1000 metres

Jasper Mining Corporation  
 Nelson Area, British Columbia  
**TOTAL MAGNETIC INTENSITY**  
**Crawford & Sawyer Block**  
 NTS 082F15, 082F10

**AEROQUEST LIMITED**  
 4045 Main St. East  
 Miss. BC, CANADA V2S 3C3  
 Tel: 250.873.8722 Fax: 250.873.8728  
 www.aeroquest.com  
 August 2006 **MAG Crawford & Sawyer**



The topographic data base was supplied by the client.  
 Data derived from Natural Resources Canada "Map of Canada Base Map".  
 This map accompanies the technical report entitled "Report on a Magnetotelluric and Electromagnetic Survey for the Crawford and Sawyer Blocks, Jasper Mining Corporation, British Columbia".  
 Prepared by: AEROQUEST LIMITED, 2008



**anomaly label** A 125 nTfs constant (µs)  
 B 30 nTfs constant (µs)  
 C 10 nTfs constant (µs)

**INSTRUMENTATION:**  
 Data acquisition: AGS & RMS DGR-33  
 Magnetometer: Geometrics G-823A cesium vapour  
 Insulation: Tower bar 17 m above EM base  
 Sensitivity: 300 nanoTesla  
 Electromagnetic: AEMTEK S System (GOLP)  
 Configuration: Tower bar  
 Control: Geometrics PicoLogview AGS GRS 10.0  
 Upward looking crystal: vs. -15.8 (102Kcs #)  
 Sample interval: 1.0 seconds  
 Channel: 256

**NAVIGATION:**  
 Navigation: Differential Global Positioning System (DGPS)  
 Navigation equipment: AGNAV with 160-TECH FR400 receiver  
 Radio Altimeter: Terra TRA3000TR3-30

**DATA PROCESSING:**  
 Magnetics: diurnal, saline and micro-leaking corrections

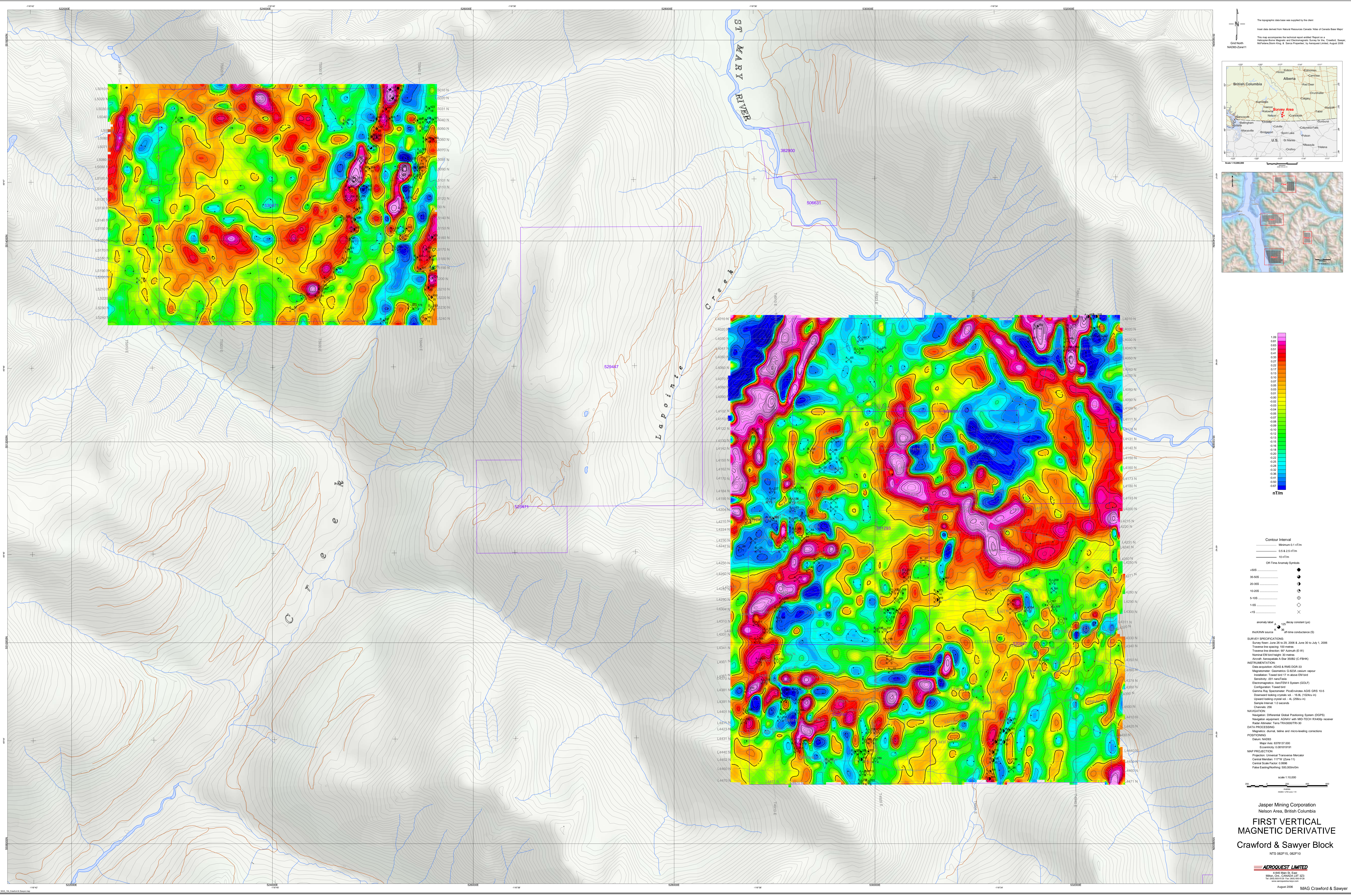
**POST-PROCESSING:**  
 Data: 1000 nTfs  
 Filter: 0.05 Hz  
 Map Projection: UTM  
 Central Meridian: 117°W (Zone 11)  
 Central Scale Factor: 0.9996  
 False Easting/Northing: 500,000m/0m

**Scale:** 1:10,000

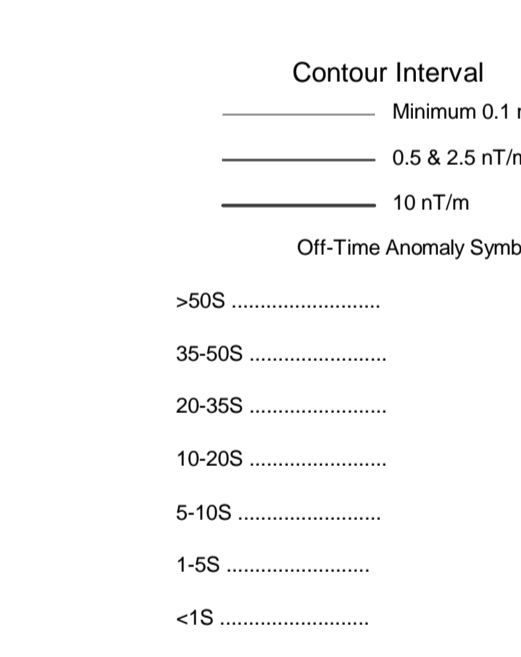
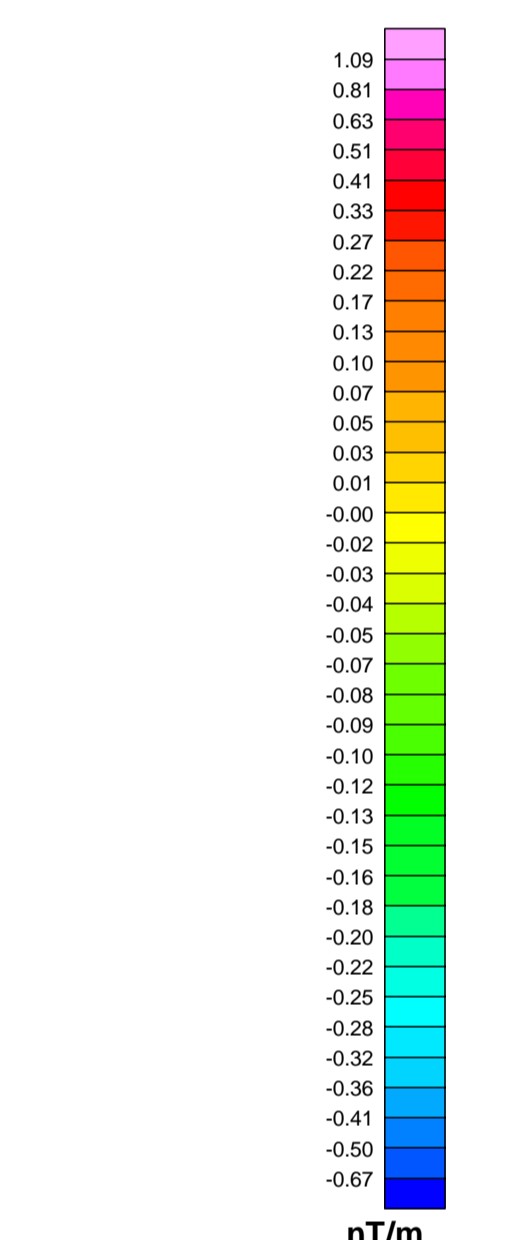
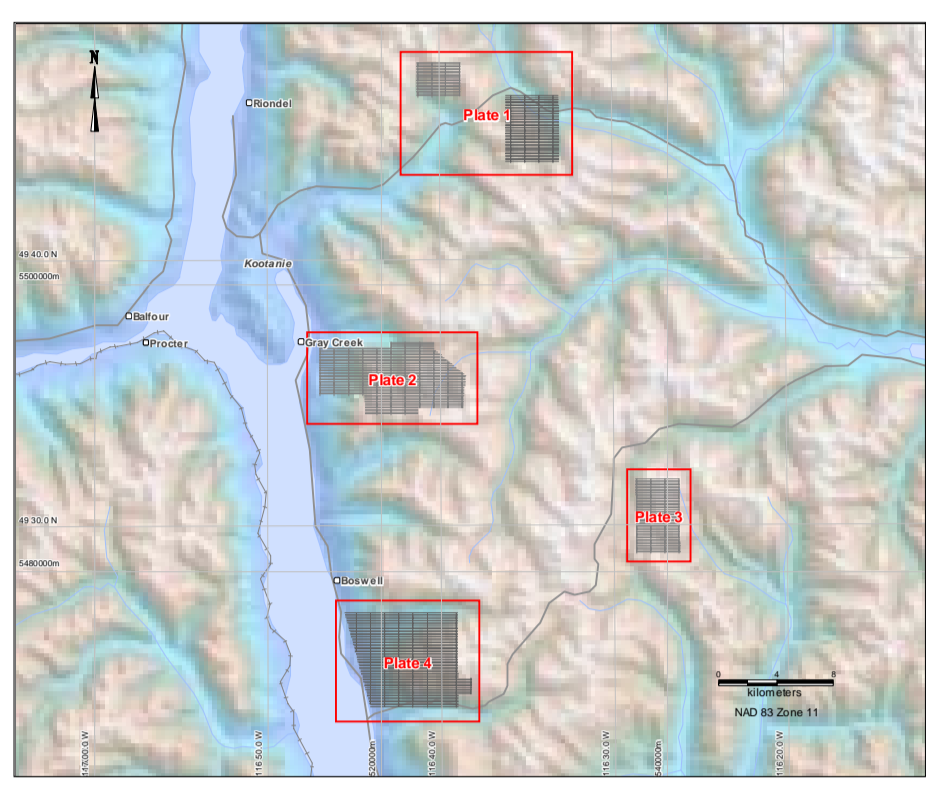
Jasper Mining Corporation  
 Nelson Area, British Columbia  
**AEROTEM Z1 OFF-TIME**

**Crawford & Sawyer Block**  
 NTS 082F15, 082F10

**AEROQUEST LIMITED**  
 4-602 Main St. E. Unit 101  
 Millip, BC, CANADA V1T 2T3  
 Tel: 250-363-1111  
 www.aeroquest.com  
 August 2008 ZOFF Crawford & Sawyer

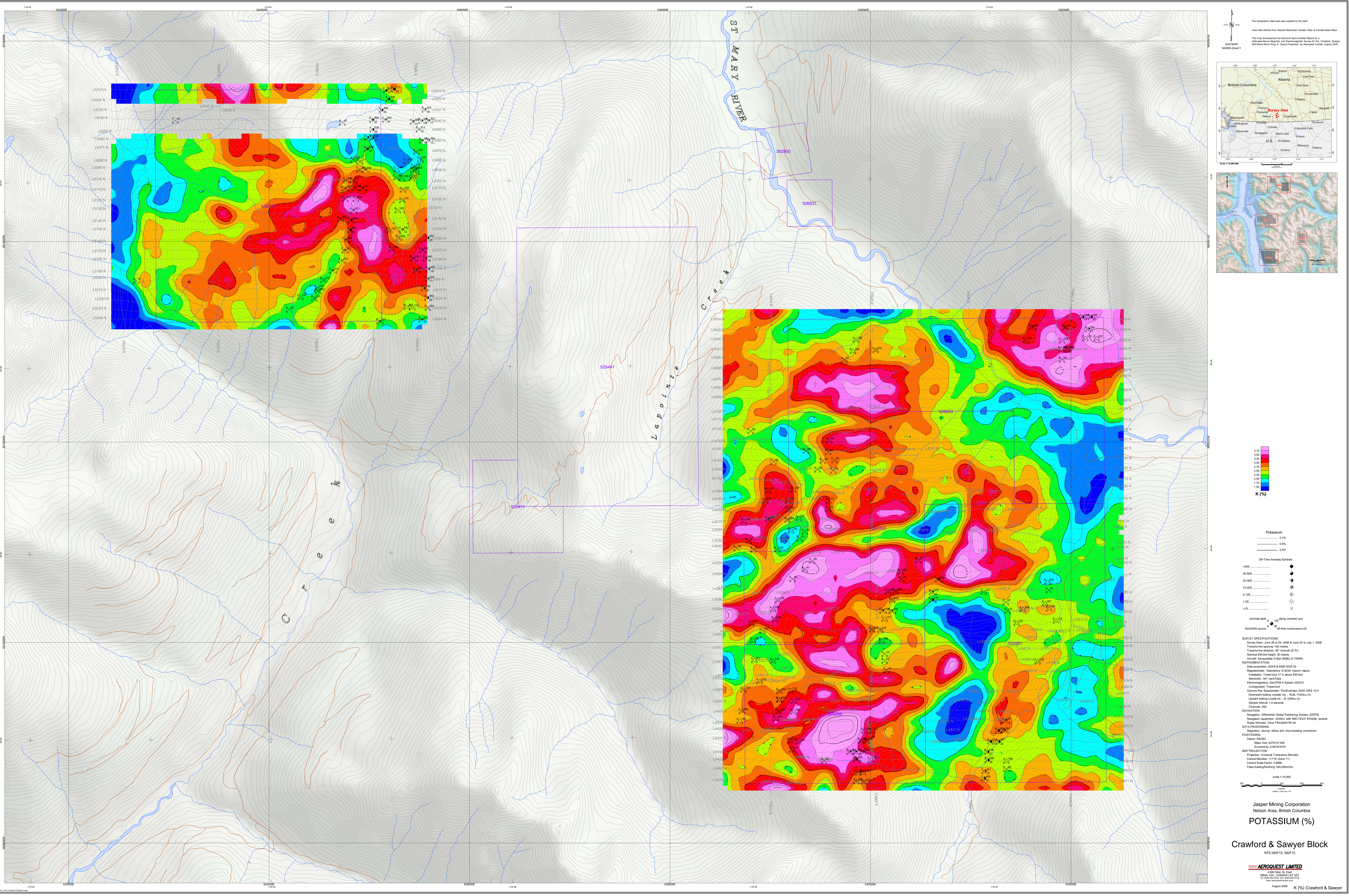


The topographic data was supplied by the client.  
Inset map derived from Natural Resources Canada Atlas of Canada Base Map  
This map incorporates the technical report entitled Report on a  
Magnetic Derivative Map and Electromagnetic Survey for the Capote Creek  
MAG Crawford & Sawyer Block, S. Survey Properties, by Aeroquest Limited, August 2006.  
Grid North  
NAD83 Zone 11

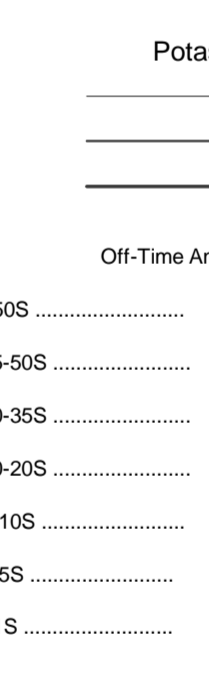
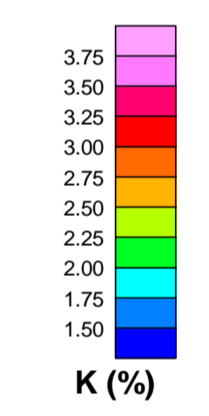
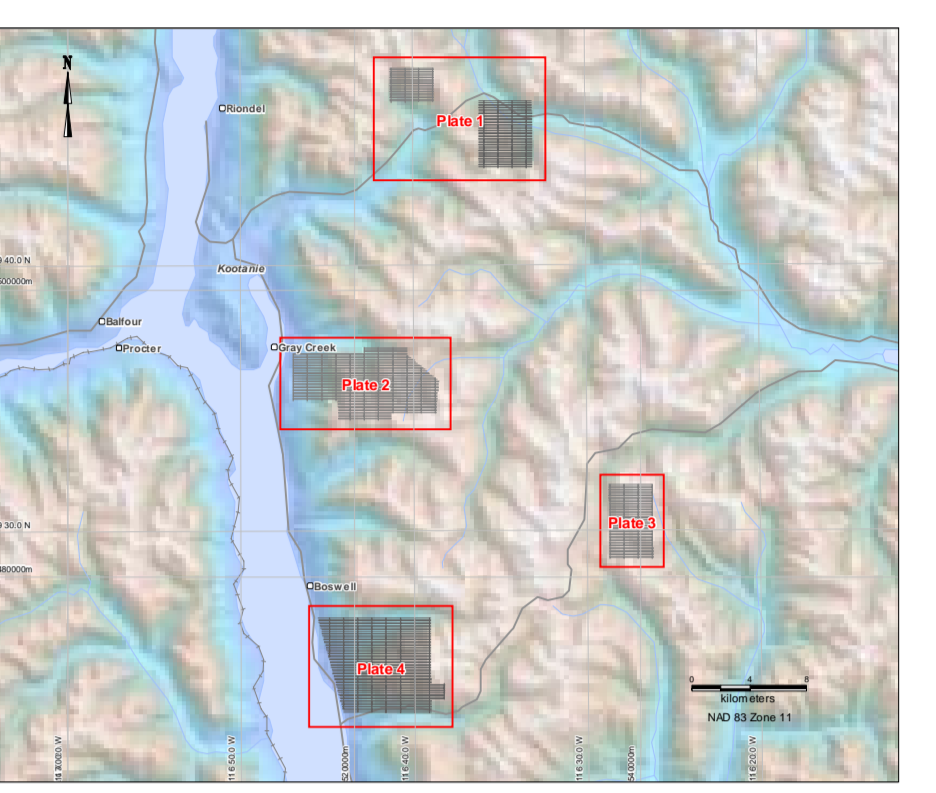


anomaly label A 150 decar constant (µs)  
ROCKWELL source K 30 90 time conductance (S)  
**SURVEY SPECIFICATIONS:**  
Survey from: June 26 to 29, 2006 & June 30 to July 1, 2006  
Traverse line spacing: 100 metres  
Traverse line direction: 90° Azimuth (E-W)  
Nominal EM package height: 30 metres  
Aircraft: Aerogeomatics A-Star 300R2 (C-184K)  
**INSTRUMENTATION:**  
Data acquisition: ADAS & RMS DGR-33  
Magnetometer: Geometrics G-823A cesium vapour  
Insulator: Towered 17 m above EM base  
Sensitivity: 0.1 nanoTesla  
Electromagnetic: AeroEM 8 System (SOPF)  
Configuration: Towered base  
Geomag Ray Spectrometer: FluxGonator AGS 10-5  
Downward looking crystal coil - 16.8L (1024µs)  
Shielded looking crystal coil - 4L (256µs)  
Sample Interval: 1.0 seconds  
Channel: 255  
**NAVIGATION:**  
Navigation: Differential Global Positioning System (DGPS)  
Navigation equipment: AGSNAV with HD-TDCH tracking receiver  
Radio Altimeter: Terra TRA3000TRF-3D  
**DATA PROCESSING:**  
Magnetics: manual, terrain and microleveling corrections  
**POSITIONING:**  
Datum: NAD83  
Map Axis: 6376137.000  
Elevation: 6381819.919  
**MAP PROJECTION:**  
Projection: Universal Transverse Mercator  
Central Meridian: 117°W (Zone 11)  
Central Scale Factor: 0.9998  
False Easting/Trueing: 500,000.00m  
Scale 1:10,000  
Jasper Mining Corporation  
Nelson Area, British Columbia  
**FIRST VERTICAL  
MAGNETIC DERIVATIVE**  
Crawford & Sawyer Block  
NTS 082F15, 082F10  
**AEROQUEST LIMITED**  
4845 Main St. East  
Mission, BC, CANADA V2T 2Z2  
Tel: (604) 855-2525 Fax: (604) 855-2526  
www.aeroquestlimited.com  
August 2006 MAG Crawford & Sawyer

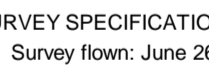




The topographic data base was supplied by the client.  
 Data derived from Natural Resources Canada Atlas of Canada Data Map.  
 This map accompanies the technical report entitled Report on a  
 Potassium Anomaly Map and Electromagnetic Survey for the Crawford, Sawyer  
 Mafic Intrusion Complex, British Columbia, by Aerquest Limited, August 2006.  
 Grid North  
 NAD83 Zone 11



Off-Time Anomaly Symbols



anomaly level A = decay constant (s)  
 the KHN source = off-time conductance (S)

**SURVEY SPECIFICATIONS:**

Survey from: June 26 to 28, 2006 & June 30 to July 1, 2006  
 Traverse line spacing: 500 metres  
 Traverse line direction: 90° Azimuth (E-W)  
 Nominal EM Induction height: 30 metres  
 Aircraft: Aerostar A-Star 300B2 (C-FBAK)  
**INSTRUMENTATION:**  
 Data acquisition: ADAS & RMS DGR-33  
 Magnetometer: Geometrics G-833A custom interior  
 Induction: Towed bird 17 m above EM bed  
 Sensitivity: 0.01 nT/mT/m  
 Electromagnetics: AerTEM 8 System (GOLF)  
 Configuration: Towed bird  
 Gamma Ray Spectrometer: RealTime ACIS GRS 10-6  
 Downward looking crystals: 4 - 16.4L (1024cu m)  
 Upward looking crystals: 4 - 4L (256cu m)  
 Sample Interval: 1.0 seconds  
 Channel: 256

**NAVIGATION:**

Navigation: Differential Global Positioning System (DGPS)  
 Navigation equipment: Axiom with MDT/ECR Kinect receiver  
 Base Aircraft: Terra TR4300/TH-30

**DATA PROCESSING:**

Magnetics: diurnal, tidal and micro-tide leveling corrections

**POSITIONING:**

Datum: NAD83  
 Map Axis: 6378137.000  
 Elevation: 0.000000000

**MAP PROJECTION:**

Projection: Universal Transverse Mercator  
 Central Meridian: 117°W (Zone 11)  
 Central Scale Factor: 0.9996  
 False Easting/Northing: 500,000.000m

Scale: 1:10,000



Jasper Mining Corporation  
 Nelson Area, British Columbia

**POTASSIUM (%)**

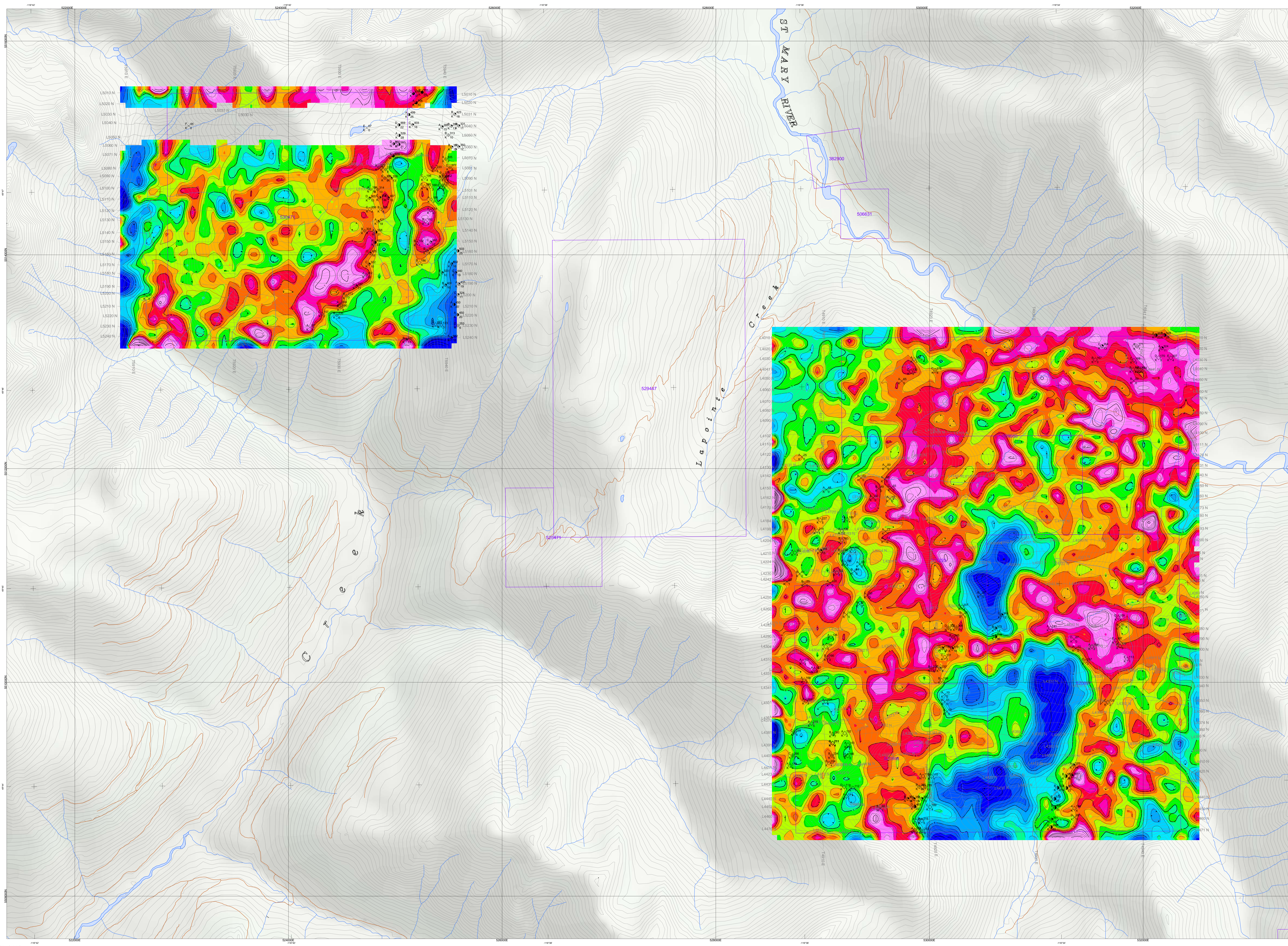
**Crawford & Sawyer Block**

NTS 082F15, 082F10

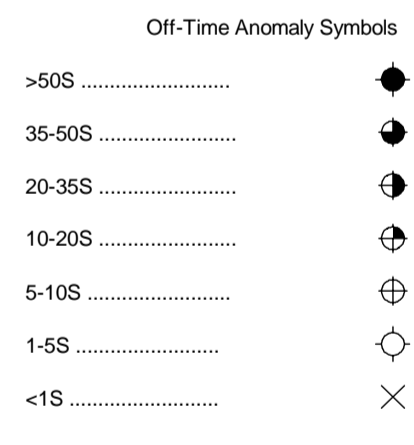
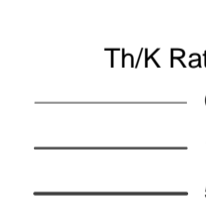
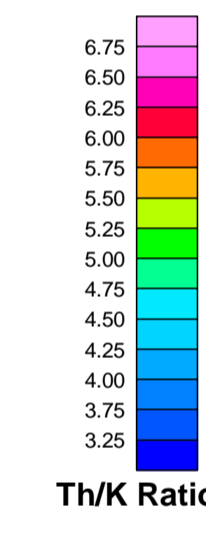
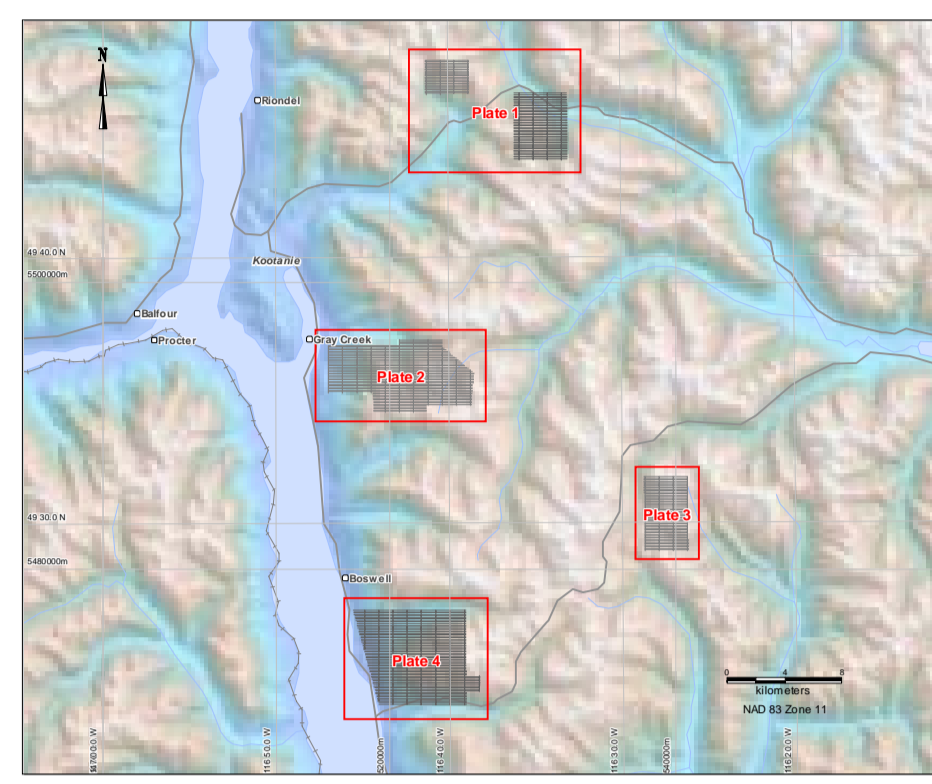


445 Main St. East  
 Nelson, BC, CANADA V1L 3Z3  
 Tel: 250-493-0722 Fax: 250-493-0723  
 www.aerquest.com

August 2006 K (%) Crawford & Sawyer



The geographic data base was supplied by the client.  
 Foot data derived from Natural Resources Canada "Map of Canada Base Map".  
 This map incorporates the technical report entitled "Report on a Hyperspectral Image and Electromagnetic Survey for the Crawford, Sower, McPherson, Stone Hill & Sarda Properties, by Aeroquest Limited, Report 2006".



**anomaly label**     $\lambda$     decay constant (s)  
**RK/Km source**     $\lambda$     90 min. conductance (S)

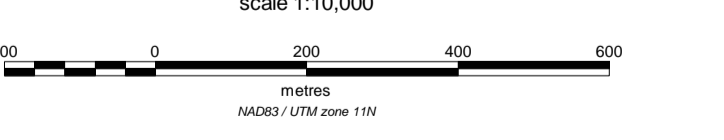
**SURVEY SPECIFICATIONS:**  
 Survey from: June 26 to 29, 2006 & June 30 to July 1, 2006  
 Traverse spacing: 100 metres  
 Traverse direction: 90° Azimuth (E-W)  
 Nominal EM dip height: 30 metres  
 Aircraft: Aerocapture A-Star 350B2 (C-FB4K)

**INSTRUMENTATION:**  
 Data acquisition: ADAS & RMS DGR-33  
 Magnetometer: Geometrics G-823A cesium vapour  
 Installation: Tower 12 m above EM field  
 Sensitivity: 0.01 nanoTesla  
 Electromagnetic: AeroTEM II System (SQUID)  
 Configuration: Tower base  
 Gamma Ray Spectrometer: Pro-Electronics AGS2 GR2 10.5  
 Downward looking crystal: NaI - 16.8L (192Kc #)  
 Shield: lead crystal coll. - 4L (250cu #)  
 Sample Interval: 1.5 seconds  
 Channels: 256

**NAVIGATION:**  
 Navigation: Differential Global Positioning System (DGPS)  
 Navigation equipment: AGNAV with HD-TCH FLARCO receiver  
 Radio Altimeter: Terra TRA3000TR-30

**DATA PROCESSING:**  
 Magnetics: diurnal, tidal and micro-tide corrections  
 POST-PROCESSING  
 Data: MARS  
 Map Area: 6278137.000  
 Elevation: 6208181.000

**MAP PROJECTION:**  
 Projection: Universal Transverse Mercator  
 Central Meridian: 117°W (Zone 11)  
 Central Scale Factor: 0.9996  
 False Easting/Northing: 500,000m/0m



Jasper Mining Corporation  
 Nelson Area, British Columbia  
**Th/K RATIO**

**Crawford & Sawyer Block**  
 NTS 082F15, 082F10