



REPORT ON
COMBINED HELICOPTER BORNE
ELECTROMAGNETIC, MAGNETIC, AND VLF-EM
SURVEY
BONANZA CREEK PROJECT
DAWSON, YUKON

NTS: 116B/3
Latitude: 64° 1.5'N; Longitude: 139° 24'W

09 17 58

for
EASTERN MINES LIMITED
by

AERODAT LIMITED

August 5, 1987



CLAIMS SURVEYED

CLAIMS	GRANTS	ANNIVERSARY
CRAZY 1-27	YA79611-637	FEBRUARY 17
LADY 1-22	YA88034-055	JUNE 11

OWNER: W.T. DAWSON
OPERATOR: EASTERN MINES LTD.

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09 17 58

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(Scale 1:10,000)

MAPS: (As listed under Appendix "B" of the Agreement)

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prepared from an uncontrolled photo laydown, showing registration crosses corresponding to NTS co-ordinates on survey maps.
- II. FLIGHT LINE MAP;
showing all flight lines and fiducials.
- III. AIRBORNE ELECTROMAGNETIC SURVEY INTERPRETATION MAP;
showing flight lines, fiducials conductor axes and anomaly peaks along with inphase amplitudes and conductivity thickness ranges for the 4600 Hz coaxial coil system.
- IV. TOTAL FIELD MAGNETIC CONTOURS;
showing magnetic values contoured at 5 nanoTesla intervals, flight lines and fiducials.
- V. VERTICAL MAGNETIC GRADIENT CONTOURS;
showing magnetic gradient values contoured at 0.5 nanoTeslas per metre.
- VI. APPARENT RESISTIVITY CONTOURS;
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showing 950 Hz coaxial and quadrature profiles,
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showing 4600 Hz coaxial inphase and quadrature
profiles, flight lines and fiducials.
- VIII(c) ELECTROMAGNETIC PROFILES;
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showing 32000 Hz coplanar inphase and quadrature
profiles, flight lines and fiducials.

1. INTRODUCTION

This report describes an airborne geophysical survey carried out on behalf of Eastern Mines Limited by Aerodat Limited. Equipment operated included a four frequency electromagnetic system, a high sensitivity cesium vapour magnetometer, a two frequency VLF-EM system, a film tracking camera, and an altimeter. Electromagnetic, magnetic and altimeter data were recorded both in digital and analog form.

The survey area, comprising a block of ground in the Bonanza Creek area, is located approximately 4 kilometres south of Dawson, Yukon. It is an area which has seen active placer mining over the last century. Elevation of the terrain within the survey block is in the order of 1700 feet. Two flights, which were flown on January 16, 1987, were required to complete the survey with flight lines oriented at an Azimuth of 015-195 degrees and flown at a nominal spacing of 100 metres. Coverage and data quality were considered to be well within the specifications described in the contract.

The survey objective is the detection and location of mineralized zones which can be directly or indirectly related to precious metal exploration targets. Of importance, therefore, are poorly mineralized conductors which may represent structural features

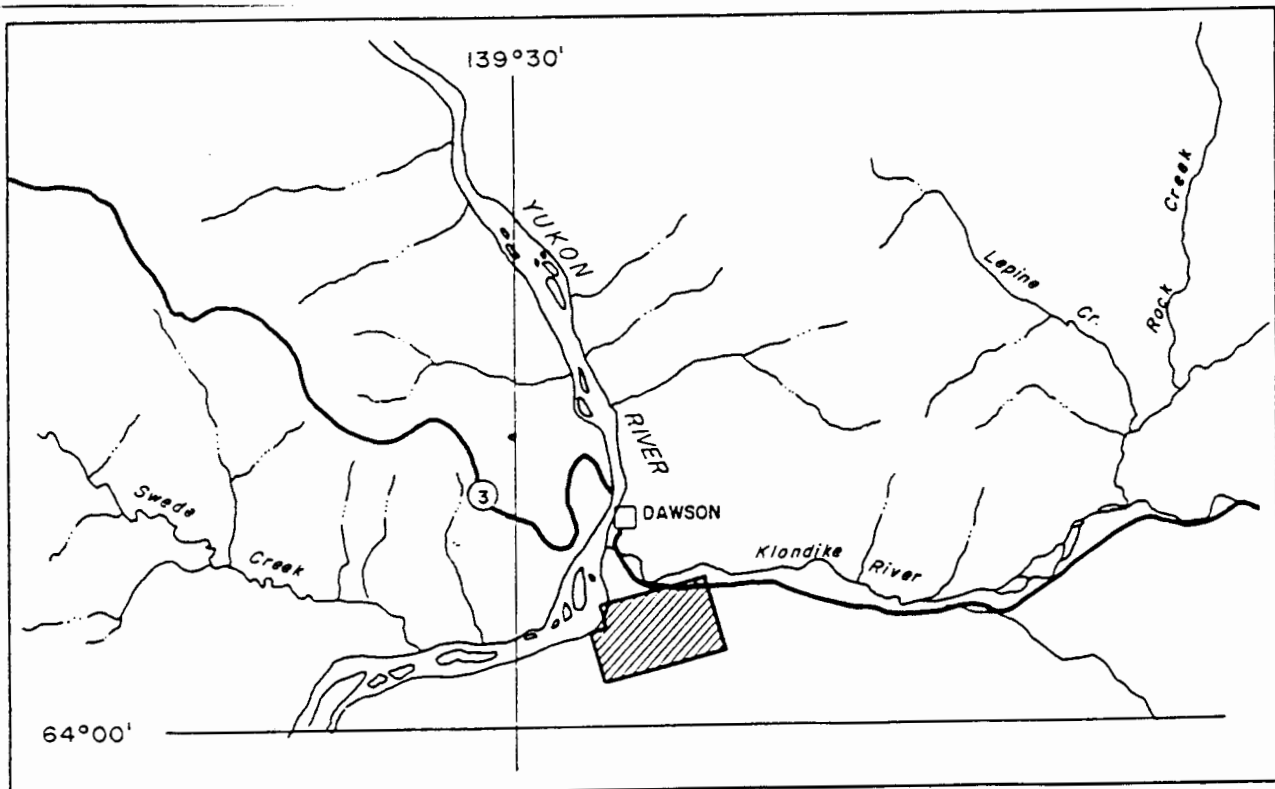
which can sometimes play an essential role in the eventual location of primary minerals.

A total of 139 kilometres of the recorded data were compiled in map form and are presented as part of this report according to specifications outlined by Eastern Mines Limited.

2. SURVEY AREA LOCATION

The survey area is depicted on the index map shown below. It is centred at Latitude 64 degrees 1.5 minutes North, Longitude 139 degrees 24 minutes West, approximately 4 kilometres south of Dawson, Yukon (NTS Reference Map No. 116 B/3). The area is accessible from the Stewart Crossing Dawson Road which traverses across the northeast corner of the survey block. From there, a few secondary or poor trails can be used to enter the survey block.

The terrain is rough and hilly with a terrain elevation of 1000 feet along Klondike River to the north, and in the area of the mountain peak located along the south central boundary of the survey, it is 2700 feet.



3. AIRCRAFT AND EQUIPMENT

3.1 Aircraft

A Bell Long Ranger 206-L helicopter, (C-GLGF), owned and operated by Maple Leaf Helicopters Limited, was used for the survey. Installation of the geophysical and ancillary equipment was carried out by Aerodat. The survey aircraft was flown at a mean terrain clearance of 60 metres.

3.2 Equipment

3.2.1 Electromagnetic System

The electromagnetic system was an Aerodat 4-frequency system. Two vertical coaxial coil pairs were operated at 950 Hz and 4600 Hz and two horizontal coplanar coil pairs at 4270 Hz and 32 kHz. The transmitter-receiver separation was 7 metres. Inphase and quadrature signals were measured simultaneously for the 4 frequencies with a time constant of 0.1 seconds. The electromagnetic bird was towed 30 metres below the helicopter.

3.2.2 VLF-EM System

The VLF-EM System was a Herz Totem 2A. This instrument measures the total field and quadrature components of two selected transmitters, preferably oriented at right angles to one another. The sensor was

towed in a bird 12 metres below the helicopter. The transmitters monitored were Jim Creek, Washington at 24.8 kHz for the Line station and Cutler, Maine at 24.0 kHz for the Orthogonal station.

3.2.3 Magnetometer

The magnetometer employed a Scintrex Model VIW-2321 H8 cesium, optically pumped magnetometer sensor. The sensitivity of this instrument was 0.1 nanoTeslas at a 0.25 second sampling rate. The sensor was towed in a bird 12 metres below the helicopter.

3.2.4 Magnetic Base Station

An IFG-2 proton precession magnetometer was operated at the base of operations to record diurnal variations of the earth's magnetic field. The clock of the base station was synchronized with that of the airborne system to facilitate later correlation.

3.2.5 Radar Altimeter

A Hoffman HRA-100 radar altimeter was used to record terrain clearance. The output from the instrument is a linear function of altitude for maximum accuracy.

3.2.6 Tracking Camera

A Panasonic video tracking camera was used to record flight path on VHS video tape. The camera was operated in continuous mode and the fiducial numbers and time marks for cross reference to the analog and digital data were encoded on the video tape.

3.2.7 Analog Recorder

An RMS dot-matrix recorder was used to display the data during the survey. In addition to manual and time fiducials, the following data were recorded:

Channel	Input	Scale
CXI1	Low Frequency Coaxial Inphase	2.5 ppm/mm
CXQ1	Low Frequency Coaxial Quadrature	2.5 ppm/mm
CXI2	High Frequency Coaxial Inphase	2.5 ppm/mm
CXQ2	High Frequency Coaxial Quadrature	2.5 ppm/mm
CPI1	Low Frequency Coplanar Inphase	10 ppm/mm
CPI1	Low Frequency Coplanar Quadrature	10 ppm/mm
CPI2	High Frequency Coplanar Inphase	20 ppm/mm
CPQ2	High Frequency Coplanar Quadrature	20 ppm/mm
PWRL	Power Line	60 Hz
VLT	VLF-EM Total Field, Line	2.5 %/mm

Channel	Input	Scale
VLQ	VLF-EM Quadrature, Line	2.5 %/mm
VOT	VLF-EM Total Field, Ortho	2.5 %/mm
VOQ	VLF-EM Quadrature, Ortho	2.5 %/mm
ALT	Altimeter	10 ft/mm
MAGF	Magnetometer, Fine	1.0 nT/mm
MAGC	Magnetometer, Coarse	10 nT/mm

3.2.8 Digital Recorder

A DGR 33 data system recorded the survey on magnetic tape. Information recorded was as follows:

<u>Equipment</u>	<u>Recording Interval</u>
EM system	0.1 seconds
VLF-EM	0.5 seconds
Magnetometer	0.25 seconds
Altimeter	0.5 seconds

4. DATA PRESENTATION

4.1 Base Map

A photomosaic base at a scale of 1:10,000 was prepared from a photo lay down map, supplied by Aerodat, on a screened mylar base.

4.2 Flight Path Map

The flight path was manually recovered onto the photomosaic base using the VHS video tape. The recovered points were then digitized, transformed to a local metric grid and merged with the data base. The flight path map showing all flight lines, is presented on a Cronaflex copy of the base map, with camera frame and navigator's manual fiducials for cross reference to both the analog and digital data.

4.3 Airborne Electromagnetic Survey Interpretation Map

The electromagnetic data were recorded digitally at a sample rate of 10 per second with a time constant of 0.1 seconds. A two stage digital filtering process was carried out to reject major spheric events and to reduce system noise.

Local spheric activity can produce sharp, large amplitude events that cannot be removed by conventional filtering procedures. Smoothing or stacking will reduce their amplitude but leave a broader residual response that can be confused with geological phenomena. To avoid this possibility, a computer algorithm searches out and rejects the major spheric events.

The signal to noise ratio was further enhanced by the application of a low pass digital filter. It has zero phase shift which prevents any lag or peak displacement from occurring, and it suppresses only variations with a wavelength less than about 0.25 seconds. This low effective time constant permits maximum profile shape resolution.

Following the filtering process, a base level correction was made. The correction applied is a linear function of time that ensures the corrected amplitude of the various inphase and quadrature components is zero when no conductive or permeable source is present. The filtered and levelled data were used in the interpretation of the electromagnetics.

An interpretation map was prepared showing peak locations of anomalies and conductivity thickness ranges along with the

Inphase amplitudes (computed from the 4600 Hz coaxial response) and conductor axes. The anomalous responses of the four coil configurations along with the interpreted conductor axes were plotted as a photocombination with the photomosaic base map.

4.4 Total Field Magnetic Contours

The aeromagnetic data were corrected for diurnal variations by adjustment with the digitally recorded base station magnetic values. No correction for regional variation was applied. The corrected profile data were interpolated onto a regular grid at a 20 metre true scale interval using a cubic spline technique. The grid provided the basis for threading the presented contours at a 5 nanoTesla interval.

The contoured aeromagnetic data have been presented on a Cronaflex copy of the photomosaic base map.

4.5 Vertical Magnetic Gradient Contours

The vertical magnetic gradient was calculated from the gridded total field magnetic data. Contoured at a 0.5 nT/m interval, the gradient data were presented as a photocombination with the photomosaic base map.

4.6 Apparent Resistivity Contours

The electromagnetic information was processed to yield a map of the apparent resistivity of the ground.

The approach taken in computing apparent resistivity was to assume a model of a 200 metre thick conductive layer (i.e., effectively a half space) over a resistive bedrock. The computer then generated, from nomograms for this model, the resistivity that would be consistent with the bird elevation and recorded amplitude for the 32 kHz coplanar frequency coil pair used. The apparent resistivity profile data were interpolated onto a regular grid at a 20 metres true scale interval using a cubic spline technique.

The contoured apparent resistivity data were presented as a photocombination with the photomosaic base map.

4.7 VLF-EM Total Field Contours

The VLF-EM signals from NAA, Cutler, Maine and NLK, Jim Creek, Washington, broadcasting at 24.0 and 24.8 kHz respectively, were compiled in contour map form and presented as a photocombination with the photomosaic base map.

5. INTERPRETATION5.1 Geology

The writer did not have any geology maps available so that any geological-geophysical deliberations on the survey area was impossible. However, a limited amount of interesting background was obtained from a paper by D.A. Barr, of Dupont of Canada Exploration Limited, titled 'Gold in the Canadian Cordillera', and taken from the Adams Club 8th Annual Special Symposium, 1979.

'The Cordillera in Canada is divided longitudinally into five tectonic divisions. From east to west these are the Eastern, Monieca, Intermontaine, Coast Crystalline and Insular Belts.'

Although lode gold deposits occur in all the belts, most of the lode and placer gold production has been derived from mines and placers in the Intermontaine and Monieca Belts. The preferred host environment contains altered Upper Paleozoic to Upper Jurassic eugeosynclinal or arc-type sedimentary and volcanic rocks adjacent to plutonic complexes of varying size and composition. Auriferous quartz lodes have been emplaced in fissures and shear zones which are commonly subsidiary to strong fault zones.

The Klondike River area is believed to be part of the Omineca Belt. Bedrock in the Klondike district is mainly the Klondike schist of sedimentary origin and uncertain age, but most probably early Paleozoic. Numerous small quartz veins occur in the Klondike schist which contain pyrite, minor chalcopyrite, galena and free gold. The Klondike schist was the source of gold deposited in the pre-Pleistocene White Channel Gravel member at the base of the White Channel Formation. The White Channel Gravel member comprises a discontinuous blanket of alluvium deposited in broad bars, channels and flood plains in the Klondike River area. Deep weathering of rocks under moderate to semi-tropical conditions occurred in early Tertiary and was followed by rapid aggragation in acute "V" shaped valleys with redistribution of the gold downstream in new bars which are as much as 300 feet vertically below the present position of the White Channel Gravels. Other minerals concentrated with the gold included magnetite, pyrite, platinum, osmiridium, cassiterite, scheelite, rutile and monazite.

5.2 Magnetics

The survey area is in a magnetically inactive area with only two areas within the survey block displaying any intensity at all. Both areas are located just to the south of the Klondike River, one on either side of the junction of the Bonanza Creek

tributary. As mentioned, the intensities are quite weak, seemingly in the order of 150 - 200 nanoTeslas.

Not having access to any geology maps, it is not known what the correlating rock types are with these two magnetic features. They both appear to be deep seated so it is possible that pluton rocks are the source.

Note the coincidence between the Creeks, Gulches etc. with magnetic lows. It is perhaps a relationship with fault zones or highly sheared zones.

5.3 Vertical Magnetic Gradient

This presentation has clearly defined those areas mentioned previously, as well as delineating a somewhat north-south lithology.

There is no question that a number of faults exist within the survey area. A few prominent north-south magnetic lows traverse through the block, in particular, toward the western third portion of the block. These areas may be interpreted as fault zones.

The few subtle magnetic features that exist within the survey area, may be related to Klondike schist rocks. However, the magnetic features towards the junction of Bonanza Creek are thought to be related to intrusive rocks.

5.4 Electromagnetics

The electromagnetic data was first checked by a line-by-line examination of the analog records. Record quality was good with minor noise levels on the low frequency coaxial trace. This was readily removed by an appropriate smoothing filter. Instrument noise was well within specifications. Geologic noise, in the form of surficial conductors, is present on the higher frequency responses and to a minor extent, on both the low frequency inphase and quadrature response.

Anomalies were picked off the analog traces of the low and high frequency coaxial responses and then validated on the coplanar profile data. These selections were then checked with a proprietary computerized selection program which can be adjusted for ambient and instrumental noise. The data were then edited and re-plotted on a copy of the profile map. This procedure ensured that every anomalous response spotted on the analog data was plotted on the final map and allowed for

the rejection - or inclusion if warranted - of obvious surficial conductors. Each conductor or group of conductors was evaluated on the bases of magnetic (and lithologic, where applicable) correlations apparent on the analog data and man made or surficial features not obvious on the analog charts.

RESULTS

As a result of this airborne survey being carried out, it is very clear that the entire area, with few exceptions, is overlain by a thin layer of conductive overburden. If one assumes a constant level of conductivity, throughout the survey area, then changes in amplitude, especially with the high frequency coplanar data, can be related to a thickening or thinning of the overburden cover.

The high amplitude responses correlating with the Yukon River, Klondike River and Bonanza Creek are believed to be caused by the White Channel Gravel alluvium member. It comprises a discontinuous blanket of alluvium deposited in broad bars, channel and flood plains. The actual source of the conductivity is not known but may be related to clay material within the alluvium.

Areas in close proximity to Examiner Gulch, California Gulch as well as the conductive horizon traversing east-west through the west-central portion of the survey block are all thought to be related to the Klondike schist rock formation. If this was to be the case, then this particular package of rocks should be investigated further. The frequency EM system may be strictly detecting the wide conductive horizon as a total package and may not be delineating individual conductors within this horizon. There are known to be sulphides such as pyrite, minor chalcopyrite and galena in the area, however, they are not believed to be in abundance.

There does not seem to be any correlation between the electromagnetic responses and the aeromagnetic data. The latter, for the most part, is striking roughly in a north-south direction. The EM results, however, seem to be coinciding with the White Channel Gravel member.

The conductive area between the Yukon River and Bonanza Creek displays a few sharp EM responses which may be a reflection of bedrock sources. It is for this reason that a reconnaissance survey should be carried out, concentrating on the few selected targets as outlined on the EM anomaly map. Further work in the form of till sampling and prospecting should be carried out in

the vicinity of all five (5) targets. There may also be areas of interest within the wide conductive belt which is located to the north of the selected targets.

5.5 Apparent Resistivity

The apparent resistivity data has clearly defined the conductive horizon within the Yukon River, Klondike River as well as tracing Examiner Gulch, California Gulch and a few other tributaries. Anywhere where there is evidence of alluvium, the computation of the apparent resistivity has outlined the area quite well.

This data presentation, perhaps, has outlined or depicted what may be the bedrock geology. Resistivity lows may reflect what are considered to be conductive Klondike schists while resistive areas may be associated with other rock types not known to the writer. In any event, areas of low resistivity should be investigated further.

5.6 VLF-EM Total Field

The VLF-EM data show only faint correlation with the frequency EM data and no apparent correlation with the aeromagnetic data. This would suggest a relationship with a near surface source as opposed to a deep bedrock source. Zones

1 to 5 have been detected by the VLF system and, in some instances, give better strike information.

Trends tend to be oriented northwest-southeast and one should note that areas of alluvium deposits coincide, for the most part, with VLF lows. The relationship is not known at the moment.

It is possible, after further investigation, that the VLF data may reveal structural fault zones. These horizons may be of extreme importance in the eventual discovery of primary minerals.

5.7 Recommendations

Further work in the form of till sampling and prospecting is recommended for areas in the vicinity of ZONES 1 to 5. As well, the 500-600 metre wide conductive belt should be investigated as to its source.

Both the VLF and Apparent Resistivity data may be of some assistance in extending or perhaps revealing new areas of interest. Zones of weakness are critical areas because of the unusual migration of primary minerals along these horizons. Resultant

quartz veins along with pyrite and free gold has usually occurred.

Ground VLF-EM may be a useful geophysical system to utilize for the detection of these conductive packages. As well, induced polarization may give better end results. However, the higher costs to run this system may be a critical factor. It is suggested that a high frequency ground EM system be considered as well. Perhaps a Genie or a Max Min II EM System. It is felt that any conductors that one pursues in this area will be relatively weak, therefore, the high frequencies are needed.

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APPENDIX I

GENERAL INTERPRETIVE CONSIDERATIONS

Electromagnetic

The Aerodat four frequency system utilizes two different transmitter-receiver coil geometries. The traditional coaxial coil configuration is operated at two widely separated frequencies and the lower frequency horizontal coplanar coil pair is operated at a frequency approximately aligned with one of the coaxial frequencies.

The electromagnetic response measured by the helicopter system is a function of the "electrical" and "geometrical" properties of the conductor. The "electrical" property of a conductor is determined largely by its electrical conductivity, magnetic susceptibility and its size and shape; the "geometrical" property of the response is largely a function of the conductor's shape and orientation with respect to the measuring transmitter and receiver.

Electrical Considerations

For a given conductive body the measure of its conductivity or conductance is closely related to the measured phase shift between the received and transmitted electromagnetic field. A small phase shift indicates a relatively high conductance, a large phase shift lower conductance. A small phase shift results

in a large inphase to quadrature ratio and a large phase shift a low ratio. This relationship is shown quantitatively for a non-magnetic vertical half-plane model on the accompanying phasor diagram. Other physical models will show the same trend but different quantitative relationships.

The phasor diagram for the vertical half-plane model, as presented, is for the coaxial coil configuration with the amplitudes in parts per million (ppm) of the primary field as measured at the response peak over the conductor. To assist the interpretation of the survey results the computer is used to identify the apparent conductance and depth at selected anomalies. The results of this calculation are presented in table form in Appendix II and the conductance and inphase amplitude are presented in symbolized form on the map presentation.

The conductance and depth values as presented are correct only as far as the model approximates the real geological situation. The actual geological source may be of limited length, have significant dip, may be strongly magnetic, its conductivity and thickness may vary with depth and/or strike and adjacent bodies and overburden may have modified the response. In general the conductance estimate is less affected by these limitations than is the

depth estimate, but both should be considered as relative rather than absolute guides to the anomaly's properties.

Conductance in mhos is the reciprocal of resistance in ohms and in the case of narrow slab-like bodies is the product of electrical conductivity and thickness.

Most overburden will have an indicated conductance of less than 2 mhos; however, more conductive clays may have an apparent conductance of say 2 to 4 mhos. Also in the low conductance range will be electrolytic conductors in faults and shears.

The higher ranges of conductance, greater than 4 mhos, indicate that a significant fraction of the electrical conduction is electronic rather than electrolytic in nature. Materials that conduct electronically are limited to certain metallic sulphides and to graphite. High conductance anomalies, roughly 10 mhos or greater, are generally limited to sulphide or graphite bearing rocks.

Sulphide minerals, with the exception of such ore minerals as sphalerite, cinnabar and stibnite, are good conductors; sulphides may occur in a disseminated manner that inhibits electrical

conduction through the rock mass. In this case the apparent conductance can seriously underrate the quality of the conductor in geological terms. In a similar sense the relatively non-conducting sulphide minerals noted above may be present in significant consideration in association with minor conductive sulphides, and the electromagnetic response only relate to the minor associated mineralization. Indicated conductance is also of little direct significance for the identification of gold mineralization. Although gold is highly conductive, it would not be expected to exist in sufficient quantity to create a recognizable anomaly, but minor accessory sulphide mineralization could provide a useful indirect indication.

In summary, the estimated conductance of a conductor can provide a relatively positive identification of significant sulphide or graphite mineralization; however, a moderate to low conductance value does not rule out the possibility of significant economic mineralization.

Geometrical Considerations

Geometrical information about the geologic conductor can often be interpreted from the profile shape of the anomaly. The change in shape is primarily related to the change in inductive coupling among the transmitter, the target, and the receiver.

In the case of a thin, steeply dipping, sheet-like conductor, the coaxial coil pair will yield a near symmetric peak over the conductor. On the other hand, the coplanar coil pair will pass through a null couple relationship and yield a minimum over the conductor, flanked by positive side lobes. As the dip of the conductor decreased from vertical, the coaxial anomaly shape changes only slightly, but in the case of the coplanar coil pair the side lobe on the down dip side strengthens relative to that on the up dip side.

As the thickness of the conductor increases, induced current flow across the thickness of the conductor becomes relatively significant and complete null coupling with the coplanar coils is no longer possible. As a result, the apparent minimum of the coplanar response over the conductor diminishes with increasing thickness, and in the limiting case of a fully 3 dimensional body or a horizontal layer or half-space, the minimum disappears completely.

A horizontal conducting layer such as overburden will produce a response in the coaxial and coplanar coils that is a function of altitude (and conductivity if not uniform). The profile shape will be similar in both coil configurations with an amplitude ratio (coplanar:coaxial) of about 4:1*.

In the case of a spherical conductor, the induced currents are confined to the volume of the sphere, but not relatively restricted to any arbitrary plane as in the case of a sheet-like form. The response of the coplanar coil pair directly over the sphere may be up to 8* times greater than that of the coaxial pair.

In summary, a steeply dipping, sheet-like conductor will display a decrease in the coplanar response coincident with the peak of the coaxial response. The relative strength of this coplanar null is related inversely to the thickness of the conductor; a pronounced null indicates a relatively thin conductor. The dip of such a conductor can be inferred from the relative amplitudes of the side-lobes.

Massive conductors that could be approximated by a conducting sphere will display a simple single peak profile form on both coaxial and coplanar coils, with a ratio between the coplanar to coaxial response amplitudes as high as 8*.

Overburden anomalies often produce broad poorly defined anomaly profiles. In most cases, the response of the coplanar coils closely follows that of the coaxial coils with a relative amplitude ratio of 4*.

Occasionally, if the edge of an overburden zone is sharply defined with some significant depth extent, an edge effect will occur in the coaxial coils. In the case of a horizontal conductive ring or ribbon, the coaxial response will consist of two peaks, one over each edge; whereas the coplanar coil will yield a single peak.

* It should be noted at this point that Aerodat's definition of the measured ppm unit is related to the primary field sensed in the receiving coil without normalization to the maximum coupled (coaxial configuration). If such normalization were applied to the Aerodat units, the amplitude of the coplanar coil pair would be halved.

Magnetics

The Total Field Magnetic Map shows contours of the total magnetic field, uncorrected for regional variation. Whether an EM anomaly with a magnetic correlation is more likely to be caused by a sulphide deposit than one without depends on the type of mineralization. An apparent coincidence between an EM and a magnetic anomaly may be caused by a conductor which is also magnetic, or by a conductor which lies in close proximity to a magnetic body. The majority of conductors which are also magnetic are sulphides containing pyrrhotite and/or magnetite. Conductive and magnetic

bodies in close association can be, and often are, graphite and magnetite. It is often very difficult to distinguish between these cases. If the conductor is also magnetic, it will usually produce an EM anomaly whose general pattern resembles that of the magnetics. Depending on the magnetic permeability of the conducting body, the amplitude of the inphase EM anomaly will be weakened, and if the conductivity is also weak, the inphase EM anomaly may even be reversed in sign.

VLF Electromagnetics

The VLF-EM method employs the radiation from powerful military radio transmitters as the primary signals. The magnetic field associated with the primary field is elliptically polarized in the vicinity of electrical conductors. The Herz Totem uses three coils in the X, Y, Z configuration to measure the total field and vertical quadrature component of the polarization ellipse.

The relatively high frequency of VLF (15-25) kHz provides high response factors for bodies of low conductance. Relatively "disconnected" sulphide ores have been found to produce measureable VLF signals. For the same reason, poor conductors such as sheared contacts, breccia zones, narrow faults, alteration zones and porous flow tops normally produce VLF anomalies. The method can therefore be used effectively for geological mapping. The only

relative disadvantage of the method lies in its sensitivity to conductive overburden. In conductive ground the depth of exploration is severely limited.

The effect of strike direction is important in the sense of the relation of the conductor axis relative to the energizing electromagnetic field. A conductor aligned along a radius drawn from a transmitting station will be in a maximum coupled orientation and thereby produce a stronger response than a similar conductor at a different strike angle. Theoretically, it would be possible for a conductor, oriented tangentially to the transmitter to produce no signal. The most obvious effect of the strike angle consideration is that conductors favourably oriented with respect to the transmitter location and also near perpendicular to the flight direction are most clearly rendered and usually dominate the map presentation.

The total field response is an indicator of the existence and position of a conductivity anomaly. The response will be a maximum over the conductor, without any special filtering, and strongly favour the upper edge of the conductor even in the case of a relatively shallow dip.

The vertical quadrature component over steeply dipping sheet-like

conductor will be a cross-over type response with the cross-over closely associated with the upper edge of the conductor.

The response is a cross-over type due to the fact that it is the vertical rather than total field quadrature component that is measured. The response shape is due largely to geometrical rather than conductivity considerations and the distance between the maximum and minimum on either side of the cross-over is related to target depth. For a given target geometry, the larger this distance the greater the depth.

The amplitude of the quadrature response, as opposed to shape is function of target conductance and depth as well as the conductivity of the overburden and host rock. As the primary field travels down to the conductor through conductive material it is both attenuated and phase shifted in a negative sense. The secondary field produced by this altered field at the target also has an associated phase shift. This phase shift is positive and is larger for relatively poor conductors. This secondary field is attenuated and phase shifted in a negative sense during return travel to the surface. The net effect of these 3 phase shifts determine the phase of the secondary field sensed at the receiver.

A relatively poor conductor in resistive ground will yield a net positive phase shift. A relatively good conductor in more conductive ground will yield a net negative phase shift. A combination is possible whereby the net phase shift is zero and the response is purely in-phase with no quadrature component.

A net positive phase shift combined with the geometrical crossover shape will lead to a positive quadrature response on the side of approach and a negative on the side of departure. A net negative phase shift would produce the reverse. A further sign reversal occurs with a 180 degree change in instrument orientation as occurs on reciprocal line headings. During digital processing of the quadrature data for map presentation this is corrected for by normalizing the sign to one of the flight line headings.

APPENDIX II

ANOMALY LIST

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FLIGHT	LINE	ANOMALY	CATEGORY	AMPLITUDE (PPM)		CONDUCTOR		BIRD HEIGHT MTRS
				INPHASE	QUAD.	CTP MHOS	DEPTH MTRS	
2	1070	A	1	19.4	16.8	1.5	0	33
2	1080	A	1	21.9	24.7	1.1	0	34
2	1090	A	2	42.2	32.9	2.3	0	35
2	1090	B	2	24.2	18.4	2.0	0	37
2	1100	A	2	34.1	19.0	3.4	0	36
2	1100	B	2	30.0	18.2	2.9	0	39
2	1110	A	3	78.1	32.9	6.3	0	35
2	1110	B	3	85.6	35.4	6.6	0	36
2	1110	C	3	73.5	30.8	6.2	0	32
2	1110	D	3	75.9	38.8	4.8	0	30
2	1110	E	3	21.6	8.3	4.8	0	58
2	1120	A	1	13.8	13.1	1.2	0	53
2	1120	B	2	37.0	19.4	3.7	0	44
2	1120	C	2	36.9	25.3	2.6	0	35
2	1120	D	3	77.5	34.4	5.8	0	36
2	1120	E	3	83.4	30.9	7.6	0	38
2	1120	F	3	67.8	27.4	6.3	0	38
2	1120	G	3	68.7	23.5	7.9	0	40
2	1120	H	3	78.1	27.5	7.9	0	37
2	1130	A	3	114.4	53.5	6.1	0	27
2	1130	B	3	85.1	45.4	4.7	0	31
2	1130	C	3	94.5	40.3	6.5	0	32
2	1130	D	4	102.0	36.8	8.3	0	31
2	1130	E	3	80.7	39.4	5.2	0	32
2	1130	F	2	48.2	42.4	2.1	0	35
2	1130	G	2	26.2	17.8	2.4	0	51
2	1130	H	1	14.7	10.7	1.7	0	42
2	1140	A	1	38.1	42.8	1.4	0	34
2	1140	B	2	41.1	36.0	2.0	0	36
2	1140	C	2	54.8	47.4	2.2	0	33
2	1140	D	3	79.7	38.4	5.3	0	36
2	1140	E	3	83.0	35.1	6.4	0	34
2	1140	F	3	84.7	34.2	6.8	0	35
2	1140	G	4	76.6	21.8	10.4	0	37
2	1140	H	4	81.1	17.9	14.7	0	44
2	1151	A	4	103.3	27.9	12.1	0	37

Estimated depth may be unreliable because the stronger part of the conductor may be deeper or to one side of the flight line, or because of a shallow dip or overburden effects.

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FLIGHT	LINE	ANOMALY	CATEGORY	AMPLITUDE (PPM)		CONDUCTOR		BIRD
				INPHASE	QUAD.	CTP DEPTH	DEPTH	HEIGHT
-----	-----	-----	-----	-----	-----	MHOS	MTRS	MTRS
2	1151	B	4	101.3	29.5	10.9	0	38
2	1151	C	4	91.6	32.2	8.3	0	41
2	1151	D	3	79.9	32.7	6.6	0	37
2	1151	E	3	57.3	28.2	4.7	0	38
2	1151	F	2	46.9	26.0	3.7	0	38
2	1151	G	1	38.5	34.1	1.9	0	33
4	1161	A	5	111.1	20.3	20.6	0	37
4	1161	B	5	96.3	20.4	16.3	0	37
4	1161	C	3	38.0	13.2	6.5	0	43
4	1161	D	3	24.5	8.6	5.6	0	59
4	1161	E	2	25.3	15.5	2.7	0	37
1	1160	A	2	32.6	26.0	2.1	0	30
1	1160	B	1	25.7	23.7	1.6	0	39
1	1160	C	1	16.7	14.1	1.5	0	47
1	1160	D	2	16.3	9.7	2.4	0	45
1	1160	E	4	80.3	21.8	11.2	0	39
1	1160	F	4	133.1	31.9	15.2	0	33
1	1160	G	5	166.1	36.8	17.9	0	35
1	1170	A	4	78.5	17.1	14.9	0	42
1	1170	B	5	81.4	11.6	26.3	0	40
1	1170	C	5	78.0	11.8	24.0	0	37
1	1170	D	5	78.2	13.3	20.6	0	44
1	1170	E	2	26.3	12.2	3.9	0	51
1	1170	F	2	34.1	27.2	2.1	0	38
1	1170	G	2	97.1	69.6	3.4	0	28
4	1171	A	2	105.6	85.5	3.0	0	21
4	1171	B	1	39.8	40.9	1.6	0	29
4	1171	C	1	32.3	31.8	1.5	0	32
4	1171	D	2	31.0	16.7	3.4	0	56
1	1180	A	3	39.7	17.0	5.0	0	34
1	1180	B	3	73.2	30.5	6.2	0	38
1	1180	C	3	51.4	17.7	7.2	0	39
1	1180	D	3	70.3	24.7	7.7	0	39
1	1180	E	4	99.2	23.7	14.1	0	41
1	1180	F	5	102.9	16.2	24.6	0	41
1	1180	G	5	102.9	20.6	17.9	0	39
1	1190	A	4	106.4	27.3	13.1	0	37
1	1190	B	5	108.1	22.2	17.6	0	38
1	1190	C	5	103.1	19.7	19.1	0	37

Estimated depth may be unreliable because the stronger part of the conductor may be deeper or to one side of the flight line, or because of a shallow dip or overburden effects.

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FLIGHT	LINE	ANOMALY	CATEGORY	AMPLITUDE (PPM)		CONDUCTOR		BIRD
				INPHASE	QUAD.	CTP MHOS	DEPTH MTRS	HEIGHT MTRS
1	1190	D	5	103.1	22.2	16.3	0	35
1	1190	E	4	76.7	23.5	9.4	0	36
1	1190	F	5	79.1	11.7	24.9	0	43
1	1190	G	5	57.2	10.2	17.7	0	50
1	1190	H	4	28.5	6.7	10.0	0	38
1	1190	J	1	20.9	25.1	1.0	0	30
1	1190	K	1	19.4	20.7	1.1	0	29
1	1200	A	0	16.0	20.1	0.8	0	34
1	1200	B	3	32.5	14.9	4.3	0	27
1	1200	C	3	67.4	32.5	5.0	0	31
1	1200	D	5	68.4	12.5	18.0	0	44
1	1200	E	5	90.4	18.7	16.5	0	42
1	1200	F	5	127.2	18.3	29.4	0	39
1	1200	G	5	128.3	18.9	28.5	0	37
1	1200	H	5	127.5	27.2	17.5	0	35
1	1200	J	5	175.0	38.0	18.6	0	33
1	1200	K	5	176.9	38.3	18.8	0	33
1	1200	M	4	141.4	50.1	9.3	0	29
1	1200	N	4	178.4	54.6	12.0	0	29
1	1200	O	4	152.6	52.6	9.9	0	29
1	1200	P	4	86.1	19.3	14.7	0	33
1	1210	A	6	73.1	5.0	68.8	0	42
1	1210	B	6	70.5	5.8	53.0	0	44
1	1210	C	6	92.4	9.1	44.7	0	37
1	1210	D	5	86.4	15.3	20.1	0	36
1	1210	E	5	67.8	10.7	21.9	0	33
1	1210	F	4	173.6	49.2	13.2	0	30
1	1210	G	6	194.3	26.9	34.7	0	32
1	1210	H	6	179.9	20.7	43.5	0	34
1	1210	J	5	80.7	10.3	30.4	0	39
1	1210	K	3	66.1	28.0	5.9	0	33
1	1210	M	3	53.1	22.8	5.4	0	36
1	1210	N	2	33.2	18.8	3.3	0	29
1	1210	O	1	37.1	33.2	1.8	0	20
1	1210	P	1	28.2	28.8	1.4	0	17
1	1220	A	3	53.2	27.4	4.3	0	37
1	1220	B	5	38.2	5.1	23.3	0	51
1	1220	C	4	72.2	16.1	14.1	0	39
1	1220	D	3	70.4	25.3	7.5	0	38
1	1220	E	3	34.6	16.6	4.1	0	39
1	1220	F	4	66.8	22.3	8.1	0	40
1	1230	A	4	127.9	35.2	12.6	0	32

Estimated depth may be unreliable because the stronger part of the conductor may be deeper or to one side of the flight line, or because of a shallow dip or overburden effects.

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FLIGHT	LINE	ANOMALY	CATEGORY	AMPLITUDE (PPM)		CONDUCTOR		BIRD
				INPHASE	QUAD.	CTP DEPTH MHOS	MTRS	HEIGHT MTRS
1	1230	B	5	145.9	23.9	25.7	0	28
1	1230	C	6	173.6	24.3	33.1	0	27
1	1230	D	5	204.2	47.1	18.0	0	28
1	1230	E	2	22.9	16.9	2.0	0	26
1	1230	F	2	62.1	46.6	2.8	0	29
1	1230	G	3	129.3	53.7	7.4	0	34
1	1230	H	4	95.9	33.5	8.5	0	40
1	1230	J	3	72.3	27.1	7.1	0	33
1	1230	K	5	67.9	9.2	26.8	0	40
1	1230	M	3	46.9	21.5	4.8	0	30
1	1230	N	3	42.8	19.4	4.7	0	35
1	1230	O	2	25.6	13.2	3.4	0	42
1	1230	P	1	27.8	27.6	1.4	0	27
1	1230	Q	2	54.2	44.7	2.3	0	20
1	1240	A	2	15.7	7.8	3.0	0	44
1	1240	B	2	41.3	23.9	3.4	0	36
1	1240	C	2	40.3	32.8	2.2	0	36
1	1240	D	5	38.2	6.0	18.7	0	55
1	1240	E	5	67.5	12.3	18.0	0	38
1	1240	F	5	123.6	16.6	31.9	0	35
1	1240	G	5	120.9	19.7	24.6	0	33
1	1240	H	4	84.3	28.5	8.5	0	36
1	1240	J	4	58.7	19.0	8.1	0	33
1	1250	A	4	56.5	15.2	10.2	0	35
1	1250	B	5	126.0	27.5	16.9	0	30
1	1250	C	5	146.4	26.0	23.1	0	30
1	1250	D	6	133.8	17.3	34.3	0	30
1	1250	E	5	40.9	6.7	18.1	0	53
1	1250	F	3	86.0	50.0	4.3	0	28
1	1250	G	2	26.0	18.2	2.3	0	26
1	1250	H	2	33.5	21.1	2.8	0	34
1	1250	J	2	39.9	29.6	2.4	0	25
1	1260	A	1	31.1	31.9	1.4	0	35
1	1260	B	0	21.7	29.2	0.9	0	32
1	1260	C	3	42.9	20.0	4.6	0	45
1	1260	D	3	45.4	22.1	4.4	0	48
1	1260	E	2	31.4	18.5	3.0	0	42
1	1260	F	2	34.6	17.5	3.8	0	45
1	1260	G	5	10.6	1.1	22.9	0	45
1	1260	H	4	24.7	5.4	10.6	0	55
1	1270	A	3	41.8	15.7	6.0	0	48

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FLIGHT	LINE	ANOMALY	CATEGORY	AMPLITUDE (PPM)		CONDUCTOR		BIRD
				INPHASE	QUAD.	CTP DEPTH	DEPTH	HEIGHT
-----	-----	-----	-----	-----	-----	MHOS	MTRS	MTRS
1	1270	B	3	23.9	9.1	5.0	0	32
1	1270	C	3	56.1	19.7	7.2	0	44
1	1270	D	3	54.3	24.8	5.1	0	31
1	1270	E	3	42.5	21.0	4.2	0	34
1	1270	F	1	16.7	14.5	1.4	0	34
1	1280	A	2	26.4	19.8	2.1	0	39
1	1280	B	2	15.8	8.9	2.6	0	51
1	1280	C	3	22.9	8.8	4.9	0	52
1	1290	A	3	39.1	13.7	6.5	0	48
1	1290	B	3	61.6	34.3	4.1	0	32
1	1290	C	2	51.4	32.4	3.3	0	29
1	1290	D	1	18.7	15.2	1.6	0	33
1	1290	E	1	22.1	25.9	1.1	0	33
1	1290	F	0	25.0	36.8	0.8	0	27
1	1300	A	0	10.6	19.4	0.4	0	49
1	1300	B	2	14.9	9.8	2.0	0	45
1	1300	C	2	28.1	16.0	3.1	0	45
1	1300	D	2	28.3	14.0	3.7	0	60
1	1300	E	2	20.9	10.9	3.1	0	42
1	1310	A	3	33.1	11.2	6.5	0	43
1	1310	B	3	85.4	40.9	5.5	0	33
1	1310	C	3	137.4	68.3	6.0	0	30
1	1310	D	2	41.4	28.0	2.8	0	27
1	1310	E	2	52.2	30.9	3.6	0	20
1	1310	F	1	19.9	18.3	1.4	0	29
1	1320	A	3	17.6	5.3	6.2	0	45
1	1320	B	3	24.2	9.8	4.6	0	46
1	1330	A	3	40.9	17.7	5.0	0	37
1	1330	B	2	25.0	16.6	2.4	0	27
1	1330	C	1	24.6	20.4	1.8	0	21
1	1340	A	1	13.3	11.4	1.3	0	42
1	1340	B	2	20.1	13.5	2.2	0	62
1	1340	C	1	22.3	17.4	1.9	0	43
1	1350	A	2	39.4	31.0	2.2	0	26
1	1350	B	2	48.8	28.0	3.6	0	29
1	1350	C	2	33.9	20.2	3.1	0	29
1	1350	D	2	30.6	22.7	2.2	0	28

Estimated depth may be unreliable because the stronger part of the conductor may be deeper or to one side of the flight line, or because of a shallow dip or overburden effects.

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FLIGHT	LINE	ANOMALY	CATEGORY	AMPLITUDE (PPM)		CONDUCTOR		BIRD
				INPHASE	QUAD.	CTP MHOS	DEPTH MTRS	HEIGHT MTRS
1	1360	A	2	23.2	15.1	2.4	0	40
1	1360	B	2	32.3	18.1	3.3	0	36
1	1360	C	1	27.3	34.6	1.0	0	32
1	1370	A	0	24.4	40.1	0.7	0	26
1	1370	B	1	26.7	25.7	1.5	0	29
1	1370	C	2	50.5	33.5	3.0	0	30
1	1370	D	2	67.9	55.4	2.6	0	25
1	1370	E	2	36.6	28.0	2.3	0	31
1	1380	A	2	47.1	35.6	2.5	0	35
1	1380	B	2	62.2	43.4	3.0	0	33
1	1380	C	1	25.5	29.8	1.1	0	30
1	1390	A	2	27.8	19.4	2.3	0	28
1	1390	B	3	40.9	20.6	4.1	0	39
1	1390	C	2	35.7	18.2	3.8	0	39
1	1390	D	2	27.9	18.4	2.5	0	35
1	1401	A	2	21.7	14.9	2.2	0	45
1	1401	B	2	10.5	4.7	3.0	0	59
1	1401	C	0	24.4	35.5	0.8	0	29
1	1410	A	1	10.6	10.1	1.1	0	29
1	1410	B	2	23.9	15.0	2.5	0	38
1	1410	C	2	21.5	12.9	2.6	0	39
1	1420	A	2	22.7	13.0	2.8	0	34
1	1420	B	3	25.3	11.1	4.2	0	40
1	1420	C	3	25.5	10.8	4.4	0	48
1	1420	D	2	36.9	25.4	2.6	0	24
1	1430	A	3	23.6	10.0	4.3	0	43
1	1430	B	3	23.9	10.2	4.3	0	52
1	1440	A	5	15.1	1.8	20.9	0	39
1	1440	B	2	12.5	5.1	3.7	0	36
1	1440	C	2	39.8	20.6	3.9	0	36
1	1450	A	3	16.2	6.2	4.4	0	45
1	1450	B	2	18.3	8.6	3.4	0	52
1	1450	C	2	24.1	16.7	2.2	0	44
1	1450	D	3	28.4	11.6	4.8	0	45
1	1460	A	2	38.6	25.7	2.8	0	33

Estimated depth may be unreliable because the stronger part of the conductor may be deeper or to one side of the flight line, or because of a shallow dip or overburden effects.

J8646

FLIGHT	LINE	ANOMALY	CATEGORY	AMPLITUDE (PPM)		CONDUCTOR		BIRD
				INPHASE	QUAD.	CTP MHOS	DEPTH MTRS	HEIGHT MTRS
1	1460	B	4	41.0	12.2	8.2	0	49
1	1460	C	4	72.5	23.4	8.7	0	38
1	1460	D	2	59.7	34.1	3.9	0	32
1	1460	E	3	54.5	27.4	4.5	0	34
1	1460	F	4	44.6	12.1	9.5	0	50
1	1460	G	3	35.0	12.1	6.4	0	45
1	1470	A	3	47.3	18.3	6.0	0	45
1	1470	B	4	69.6	19.8	10.1	0	47
1	1470	C	5	91.8	18.8	16.8	0	41
1	1470	D	3	107.1	63.9	4.4	0	33
1	1470	E	3	96.0	55.6	4.4	0	30
1	1470	F	4	128.9	46.5	8.9	0	30
1	1470	G	3	99.4	42.0	6.7	0	34
1	1470	H	3	95.9	38.4	7.1	0	35
1	1480	A	3	52.8	18.4	7.1	0	38
1	1480	B	3	69.0	32.8	5.2	0	31
1	1480	C	3	42.0	20.2	4.4	0	35

Estimated depth may be unreliable because the stronger part of the conductor may be deeper or to one side of the flight line, or because of a shallow dip or overburden effects.

APPENDIX III

CERTIFICATE OF QUALIFICATIONS

I, ROBERT J. DE CARLE, certify that: -

1. I hold a B. A. Sc. in Applied Geophysics with a minor in geology from Michigan Technological University, having graduated in 1970.
2. I reside at 28 Westview Crescent in the town of Palgrave, Ontario.
3. I have been continuously engaged in both professional and managerial roles in the minerals industry in Canada and abroad for the past eighteen years.
4. I have been an active member of the Society of Exploration Geophysicists since 1967 and hold memberships on other professional societies involved in the minerals extraction and exploration industry.
5. The accompanying report was prepared from information published by government agencies, materials supplied by Eastern Mines Limited and from a review of the proprietary airborne geophysical survey flown by Aerodat Limited for Eastern Mines Limited. I have not personally visited the property.
6. I have no interest, direct or indirect, in the property described nor do I hold securities in Eastern Mines Limited.

Signed,

Robert J. de Carle

Robert J. de Carle

Consulting Geophysicist

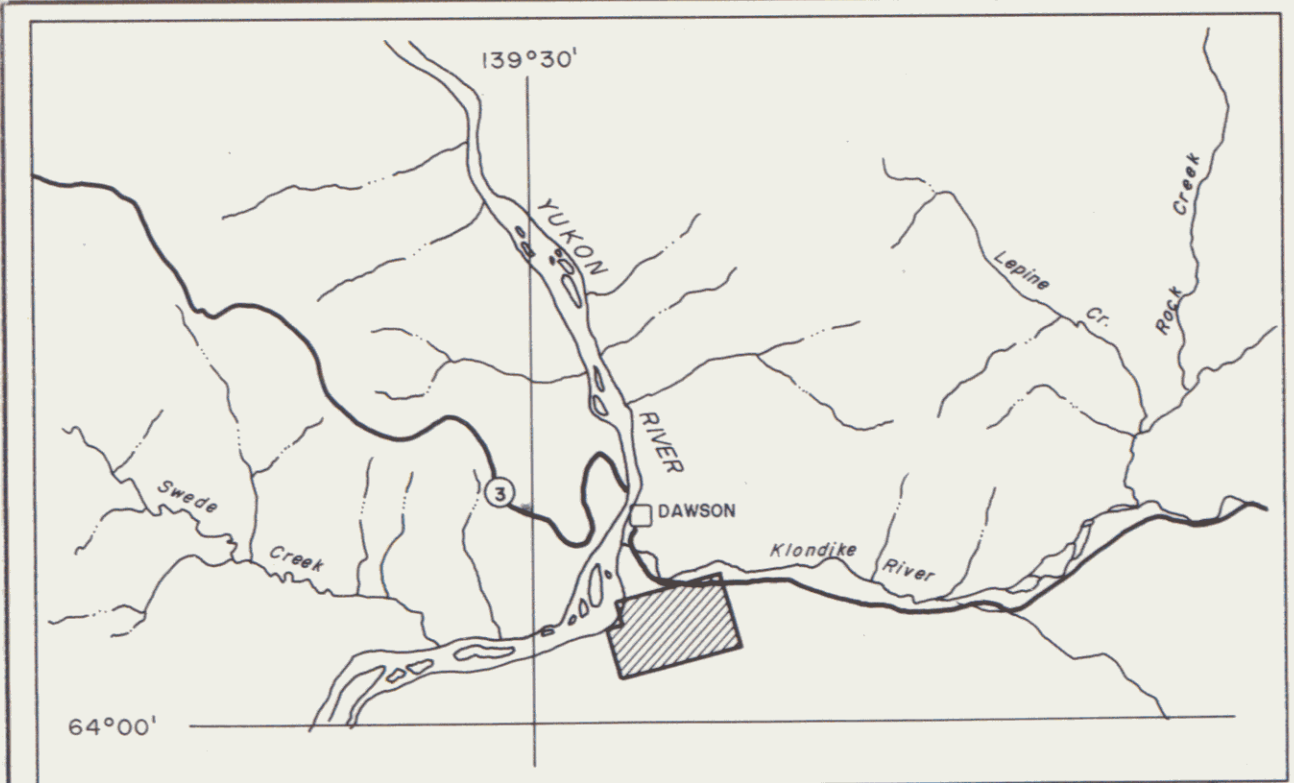
Palgrave, Ontario

August 05, 1987

COST STATEMENT

AIRBORNE GEOPHYSICAL SURVEY

Aerodat Limited - 139 Line Km @ \$75.00	\$10,425.00
Mark Management - Planning, Supervision, Reporting	1,563.75
TOTAL COST	<u>\$11,988.75</u> <u>=====</u>



EASTERN MINES LTD.

BASEMAP

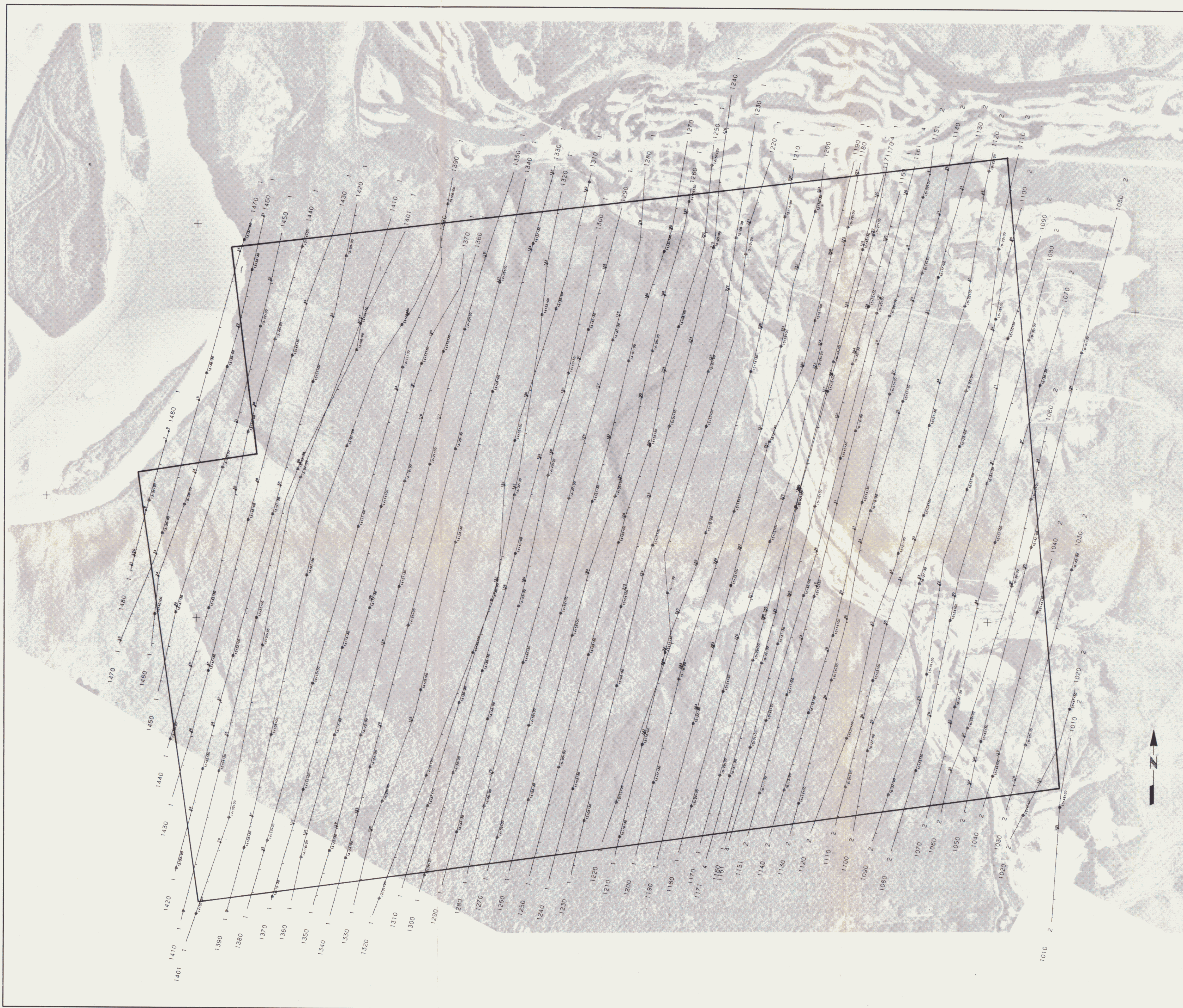
DAWSON
YUKON

SCALE 1:10,000

0 330 660 1320 1/2 MILE
0 100 200 500 1 KILOMETRE

AERODAT LIMITED	DATE: AUGUST 1987
	No: 116 B 3
	MAP No: 1 J8646

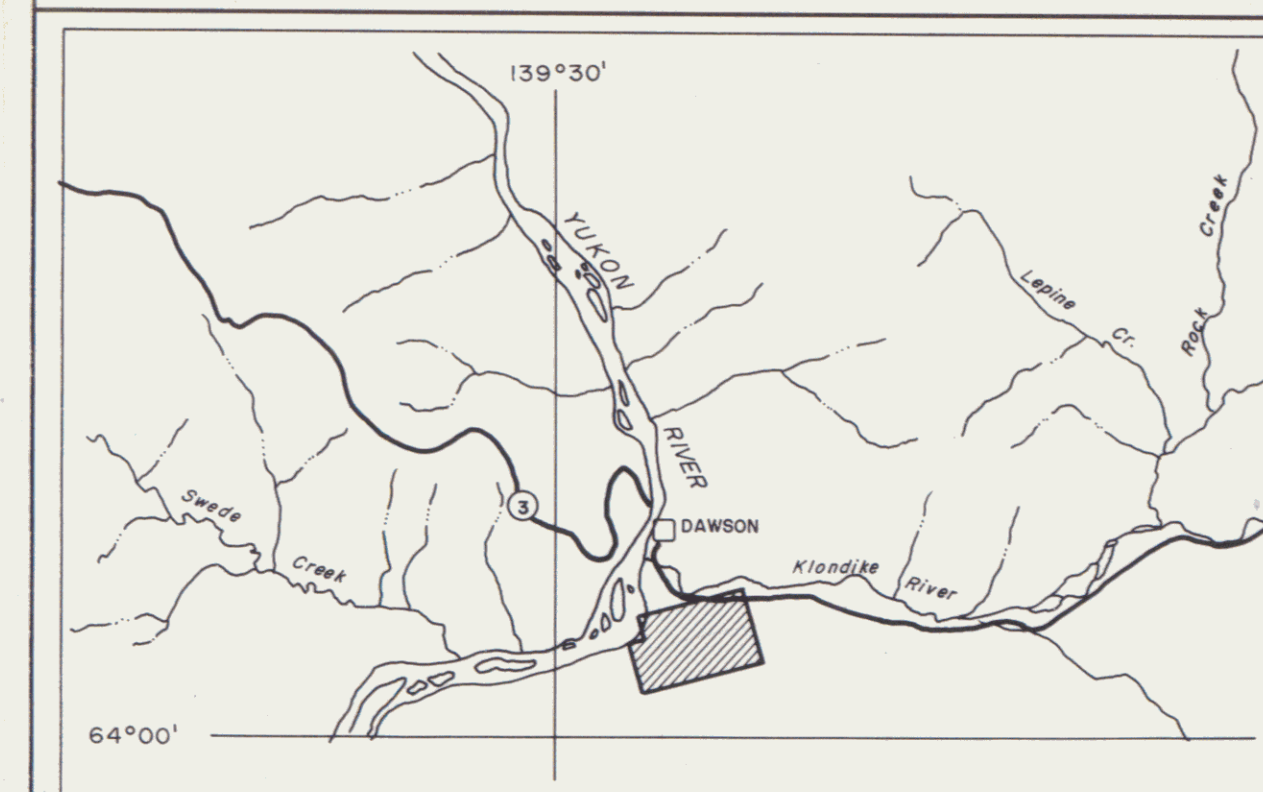
091758



Flight Path

Flight path derived from VHS video tape.

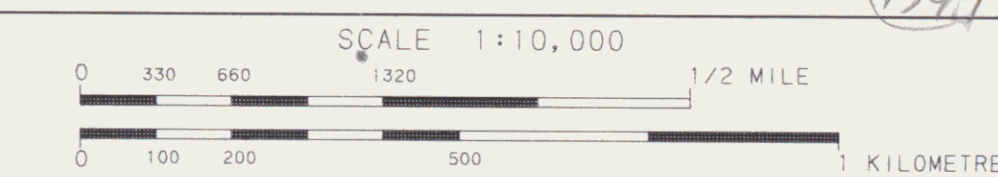
Average terrain clearance 80m
Line spacing = 100m



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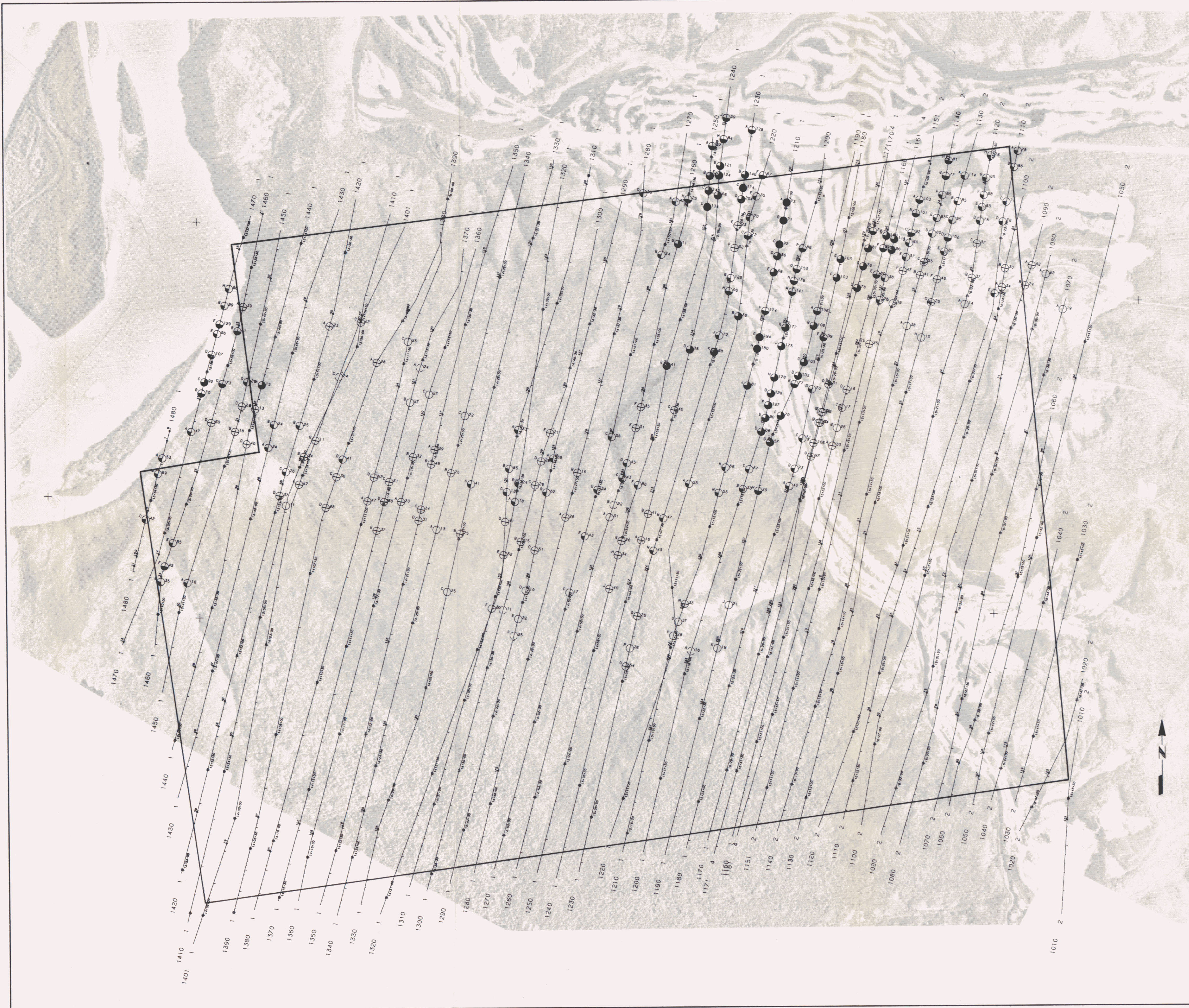
FLIGHT PATH

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YUKON**



AERODAT LIMITED

DATE: AUGUST 1987
NTS No: 116 B 3
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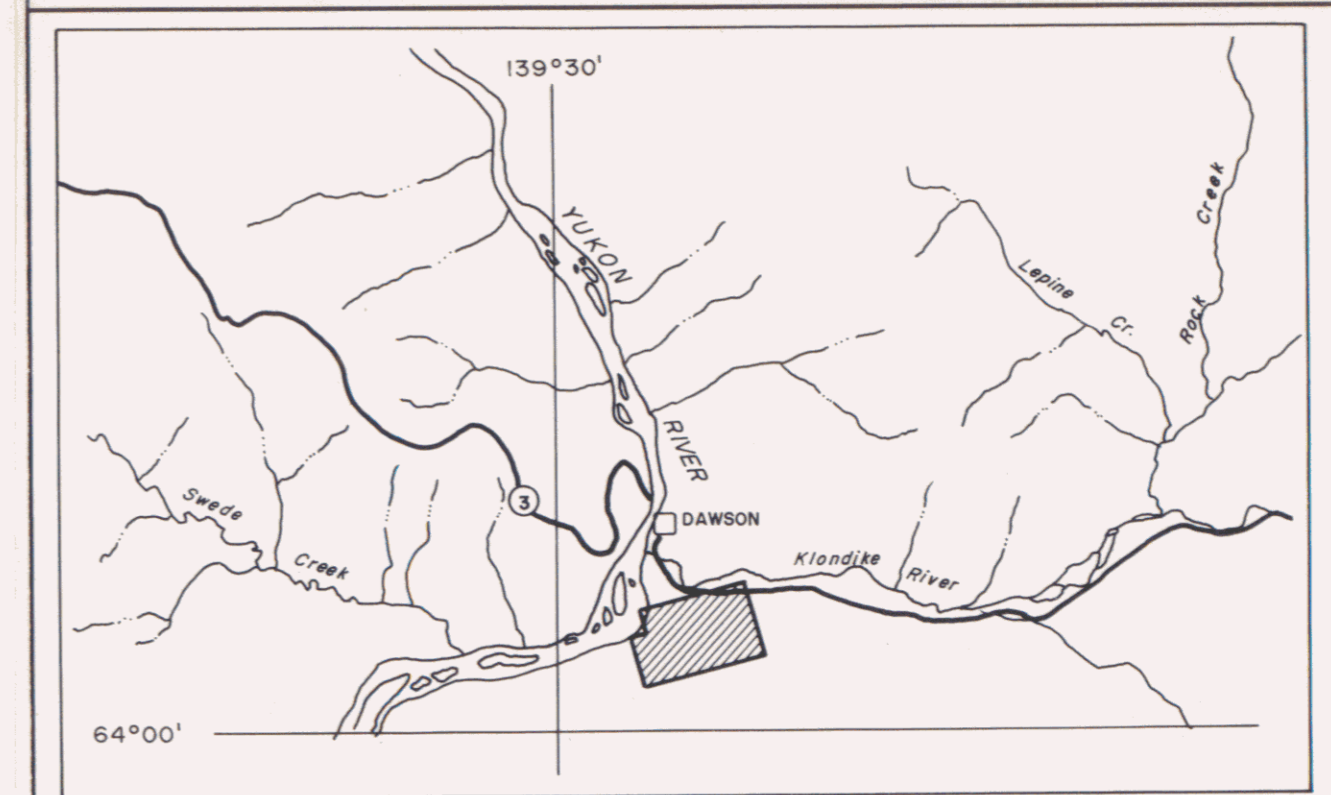
Flight Path

Flight path derived from VHS video tape.

Average terrain clearance 80m
Line spacing = 100m

Anomalies

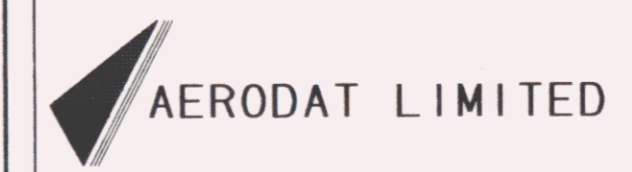
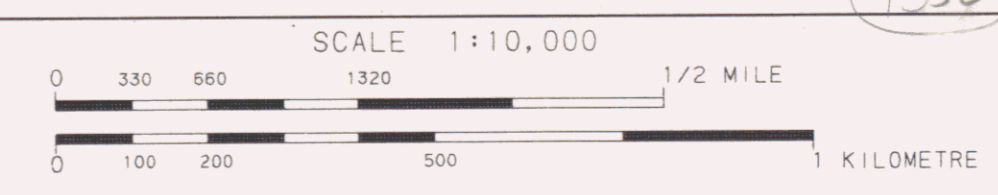
Calculated from the 4600hz co-ax channel
Sensor elevation 50m



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EM-ANOMALIES • 4600HZ
INTERPRETATION MAP

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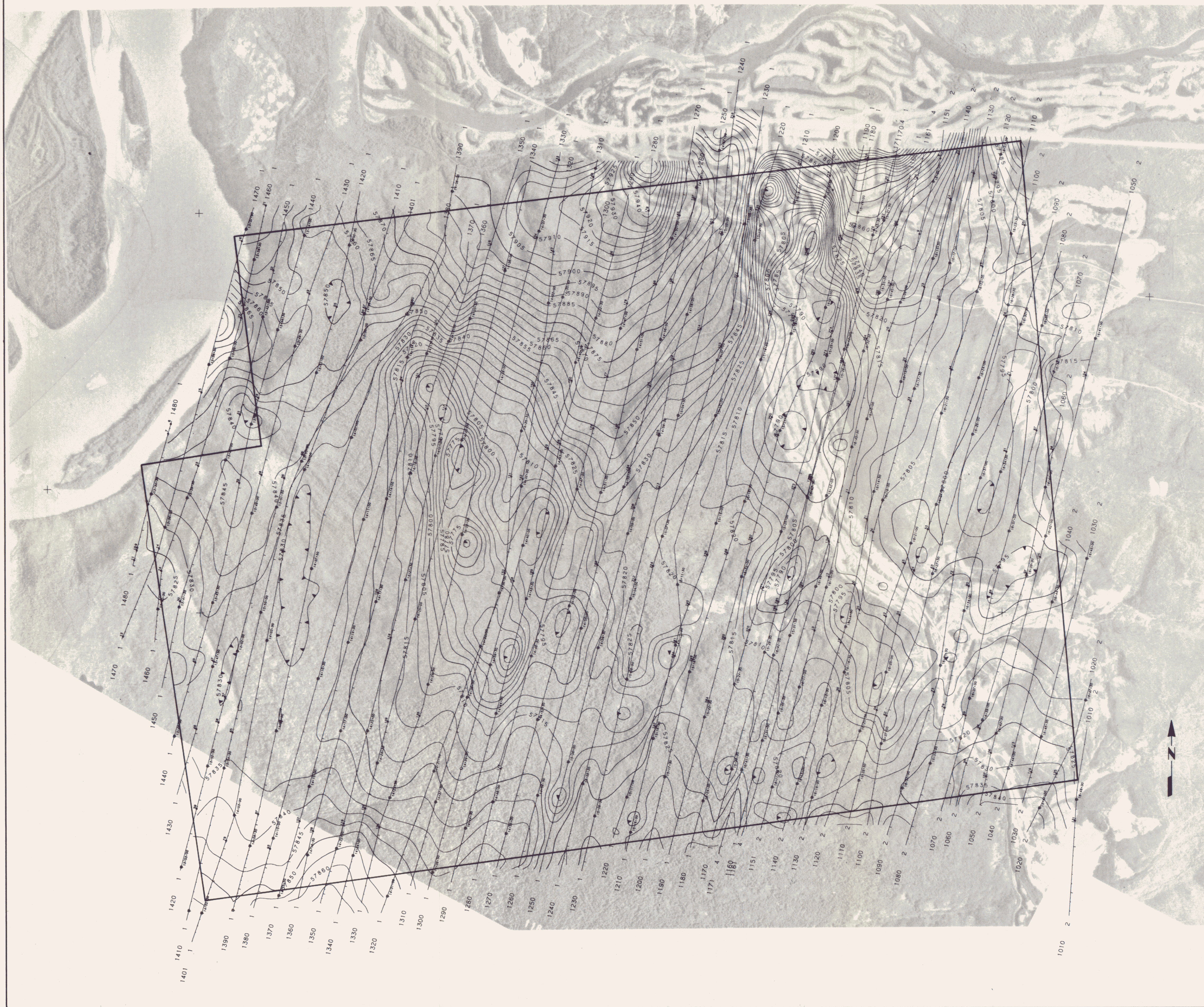


DATE:	AUGUST 1987
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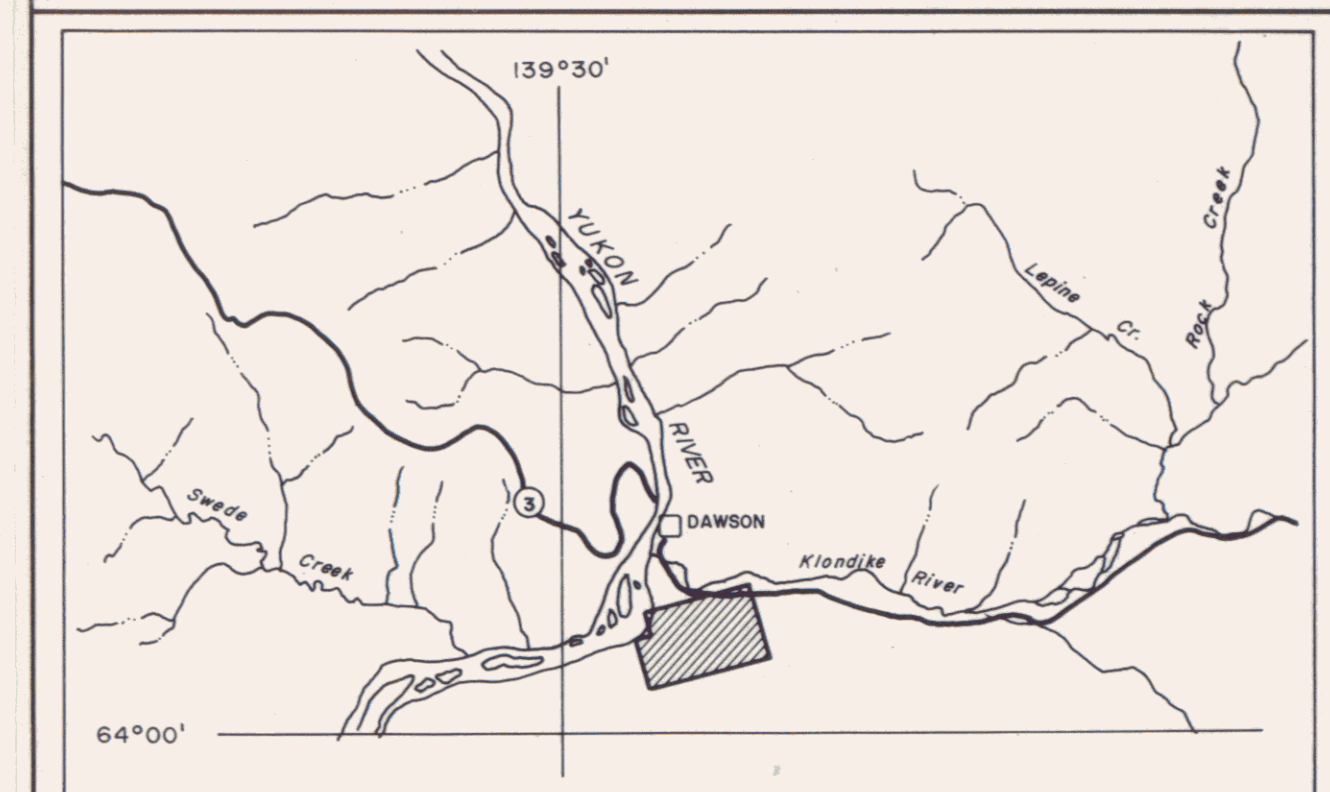
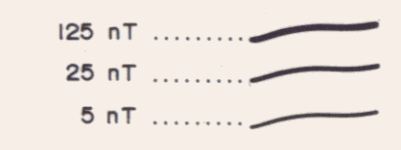


Flight Path

Flight path derived from VHS video tape.
 Average terrain clearance 80m
 Line spacing = 100m

Magnetics

Cesium high sensitivity magnetometer
 Sensor elevation 50m
 Total Field Magnetic Intensity
 Contours in nT



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TOTAL FIELD MAGNETIC CONTOURS
 Minimum Contour Interval 5nT

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(1551)

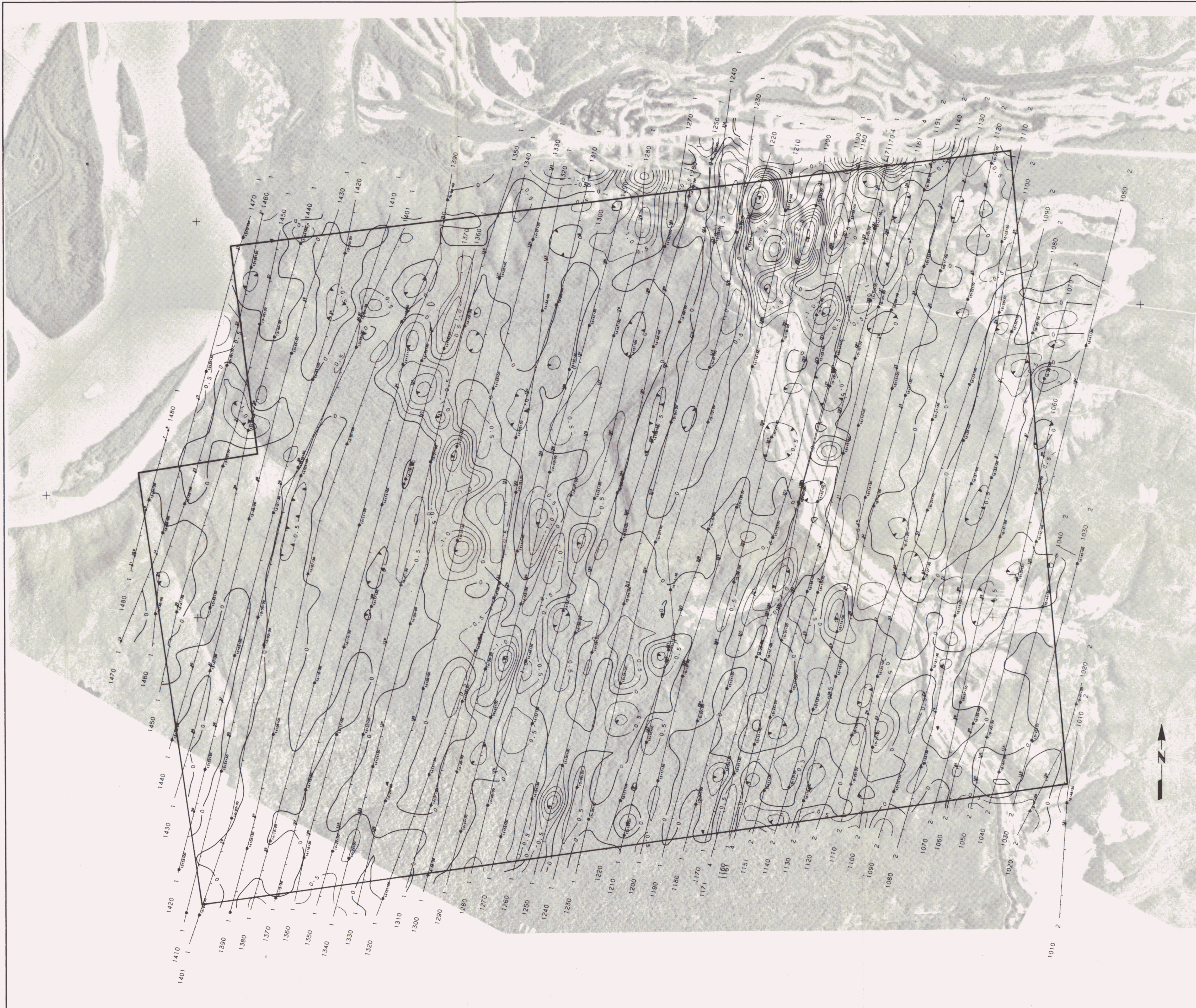
SCALE 1:10,000

0 330 660 1320 2640 feet
 0 100 200 500 1 kilometre

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	MAP No: 4

J8646

091758



Flight Path

Flight path derived from VHS video tape.

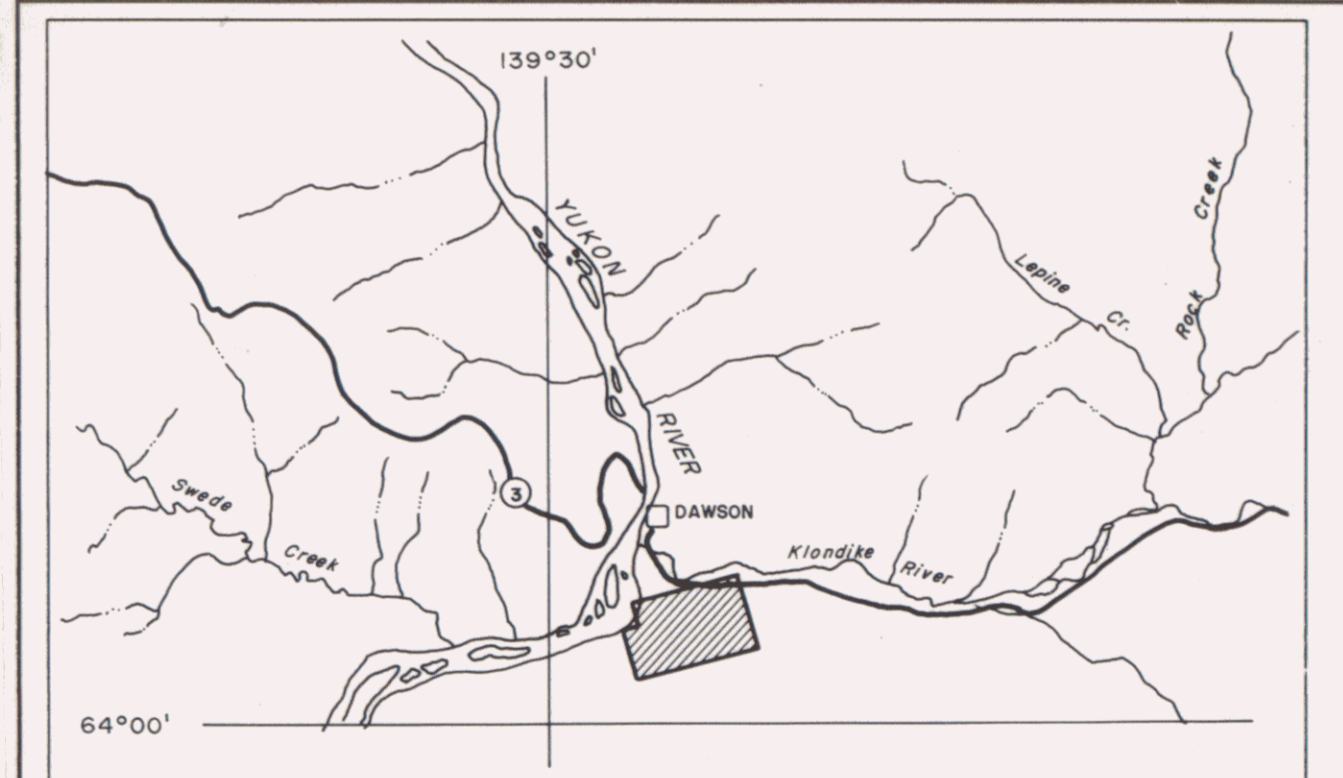
Average terrain clearance 80m
Line spacing = 100m

Vertical Gradient

Vertical magnetic gradient calculated from the total field magnetic intensity

Contours in nT/m

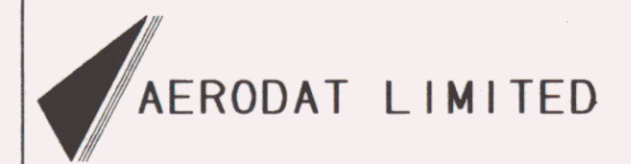
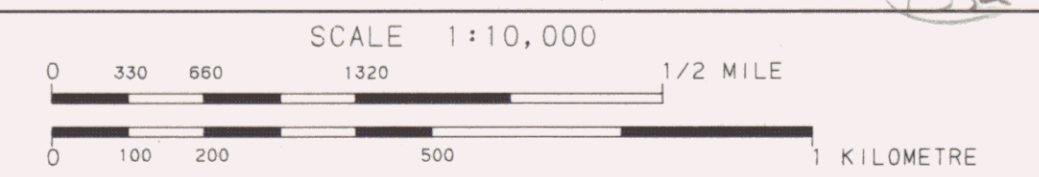
Cesium high sensitivity magnetometer
Sensor elevation 45m



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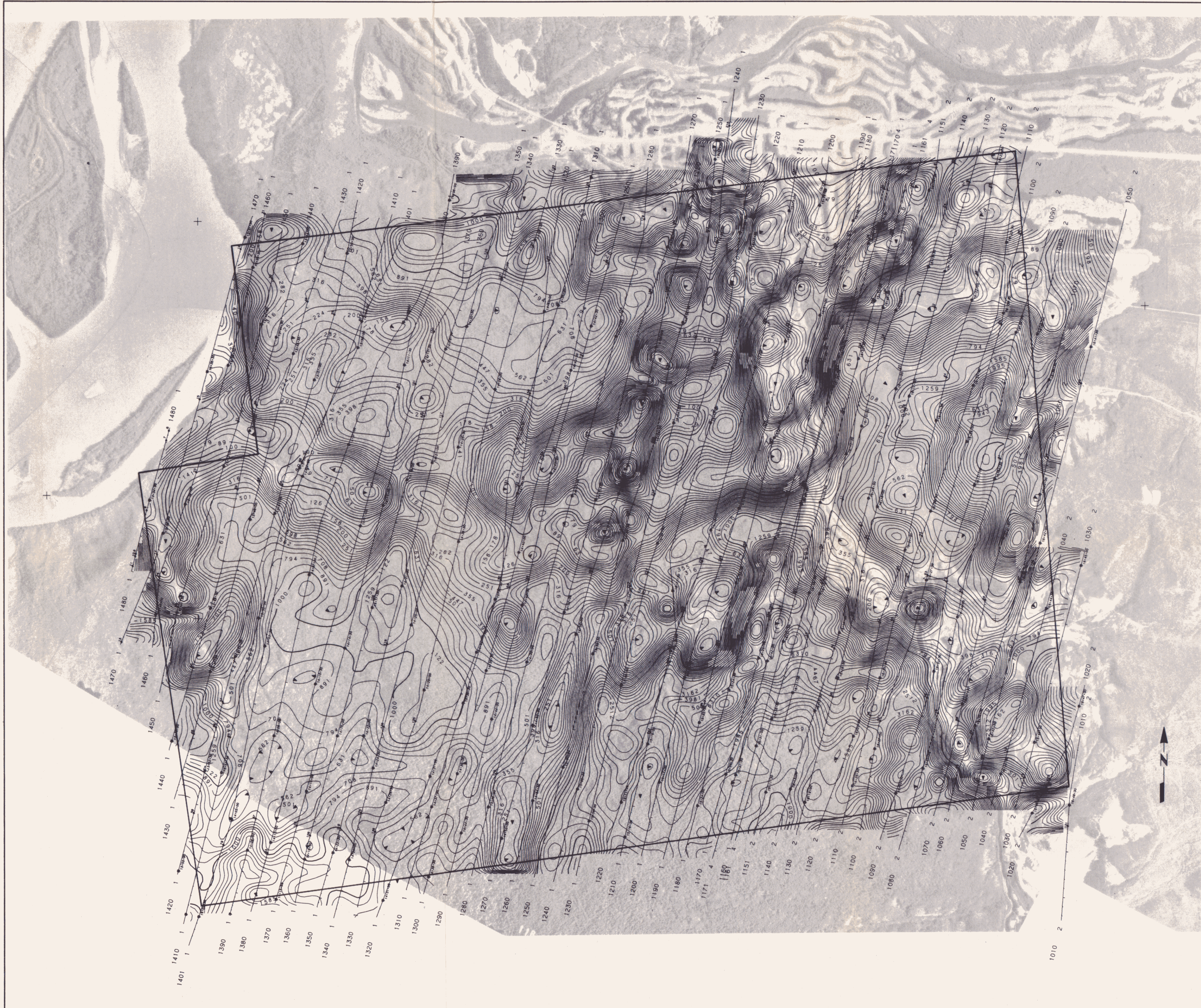
CALCULATED VERTICAL MAGNETIC GRADIENT
Minimum Contour Interval 0.5 nT/m

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DATE: AUGUST 1987
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MAP No: 5 J8646

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Flight Path

Flight path derived from VHS video tape.

Average terrain clearance 80m
Line spacing = 100m

Apparent Resistivity

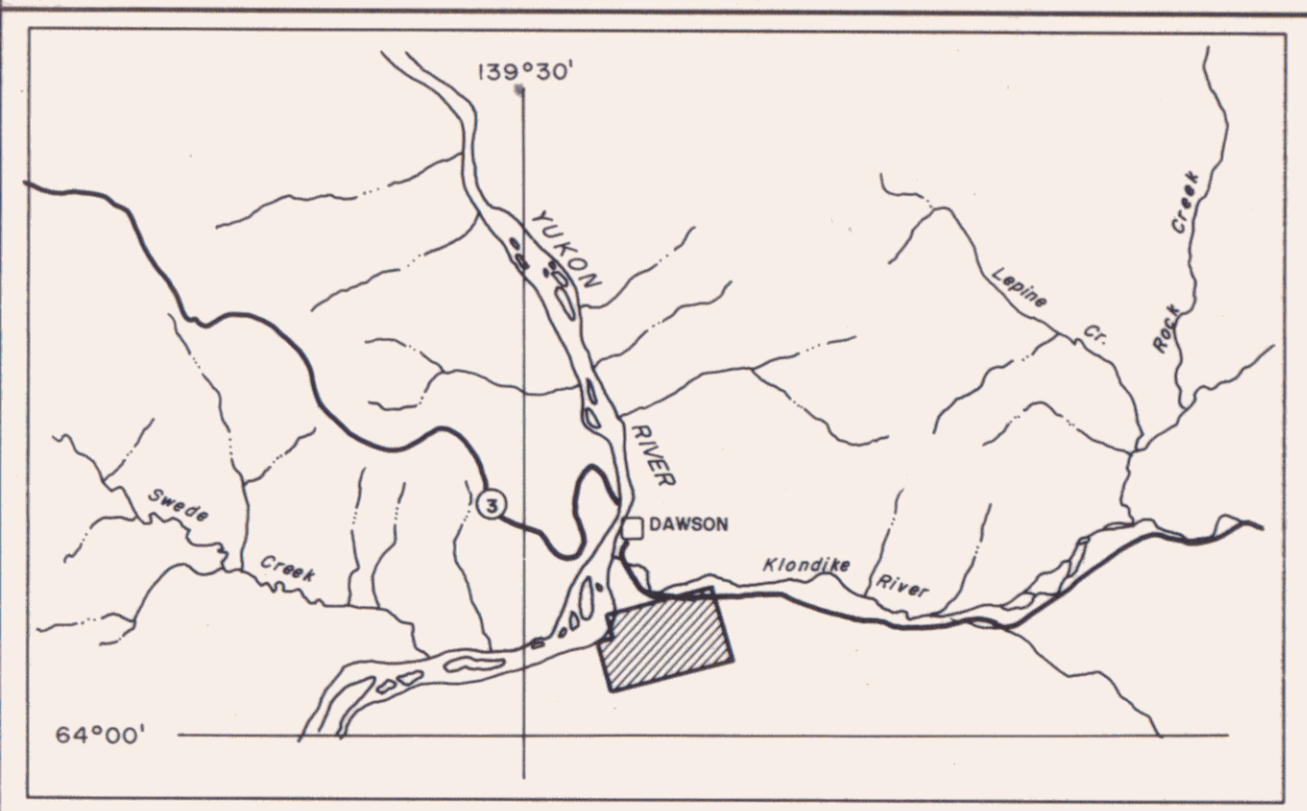
Contours - in ohm-m

Colours - distributed on an equal area basis

Calculated from 34000 Hz coplanar response using a 200 m model

Sensor elevation 30m

10^{NO} OHM-M N-123...9
10^{MM} OHM-M M-123...9



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APPARENT RESISTIVITY CONTOURS

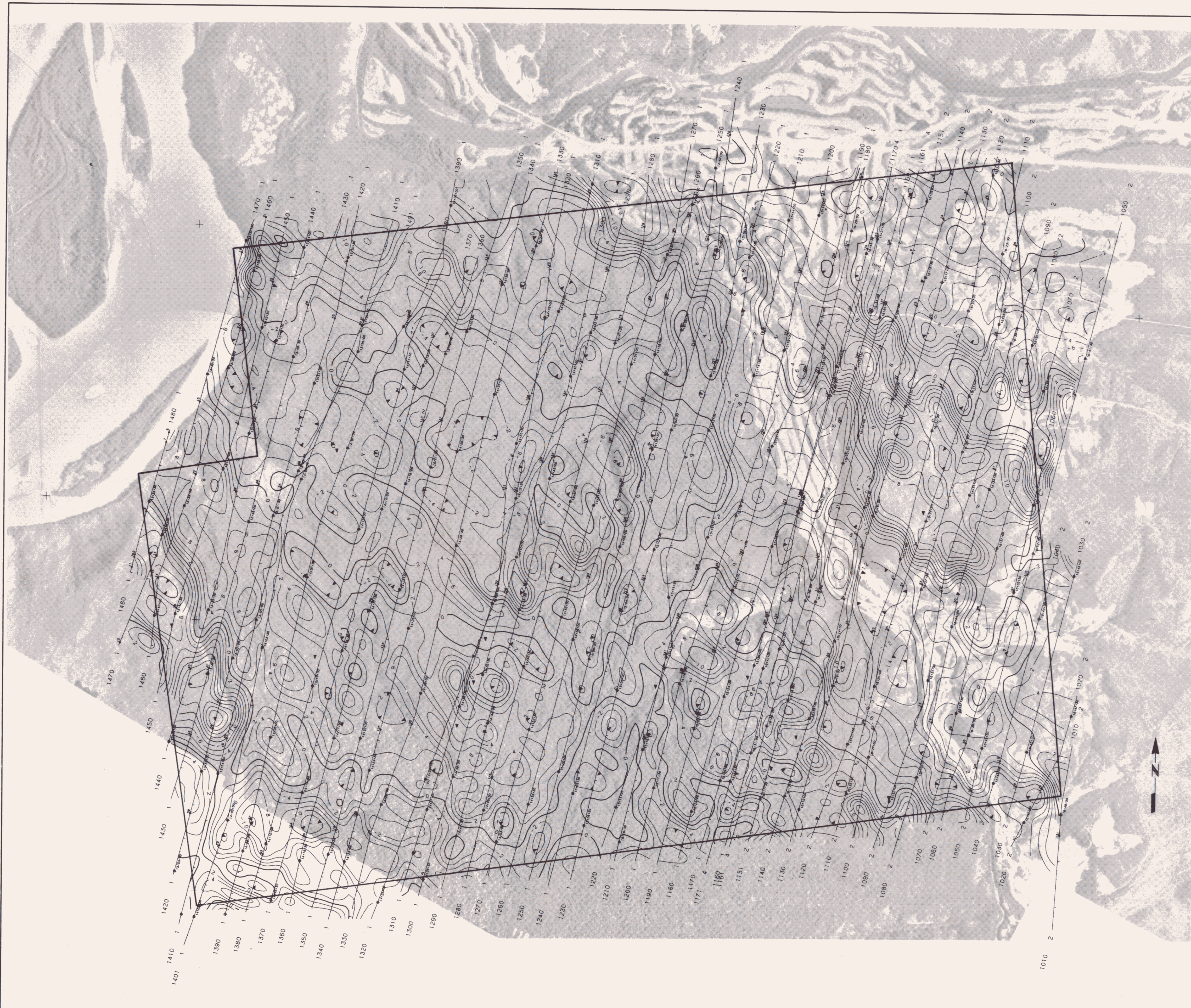
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SCALE 1:10,000

0 330 660 1320 1/2 MILE
0 100 200 500 1 KILOMETRE

AERODAT LIMITED	DATE: AURUST 1987
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	J8646

09175H
PT 160



Flight Path

Flight path derived from VHS video tape.

Average terrain clearance 80m
Line spacing = 100m

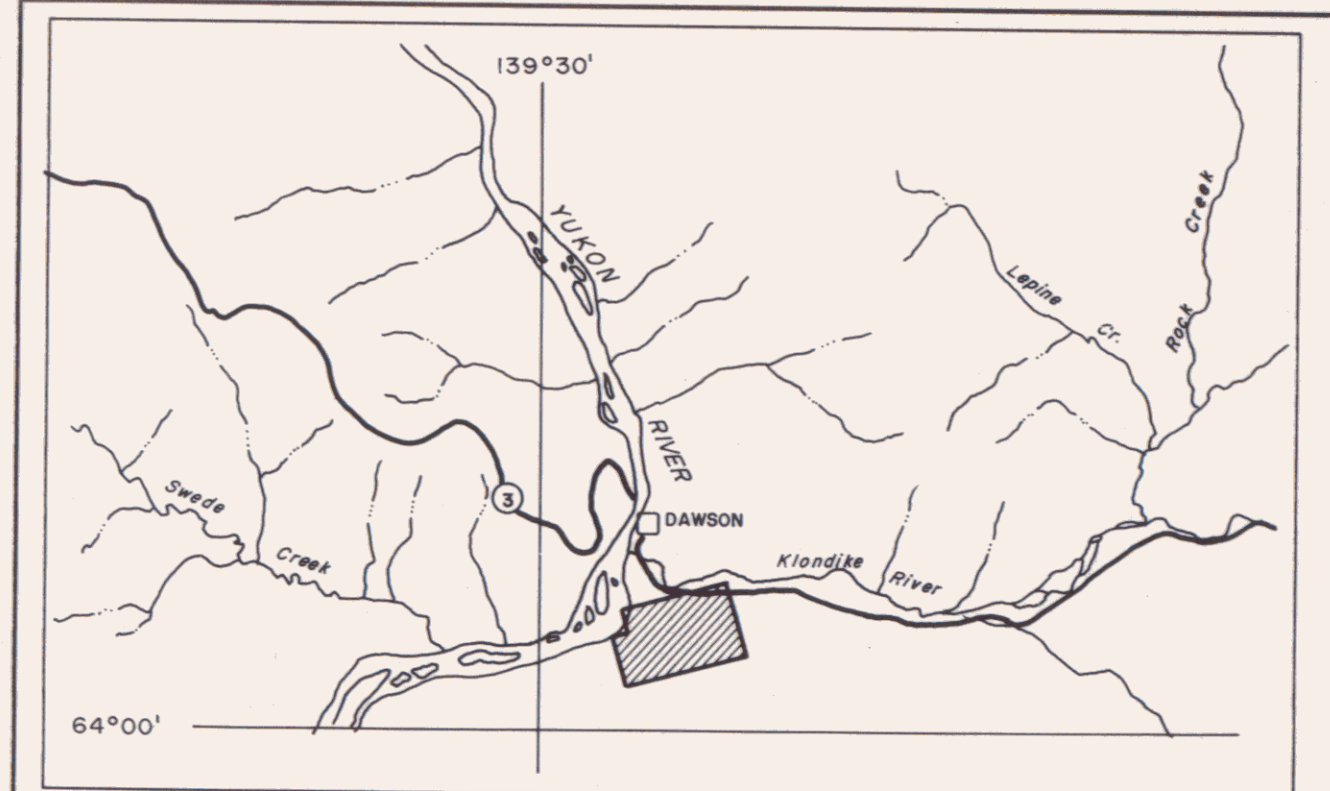
VLF-EM

VLF-EM Total Field Intensity in percent

Station: NLK (Jim Creek, Wash.)
24.8 kHz

Sensor elevation 45m

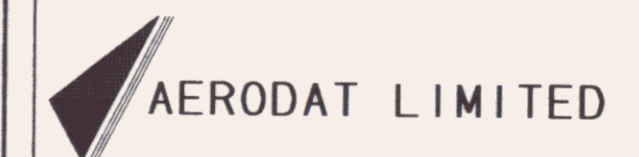
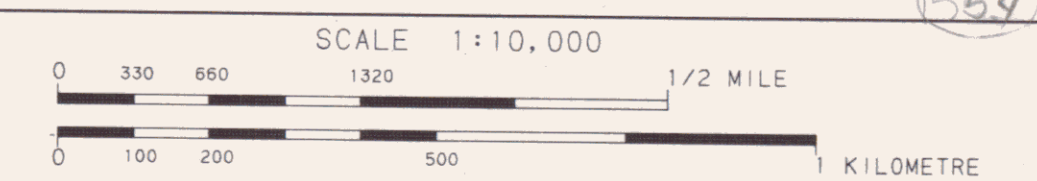
CONTOUR INTERVAL:
50%
10%
2%



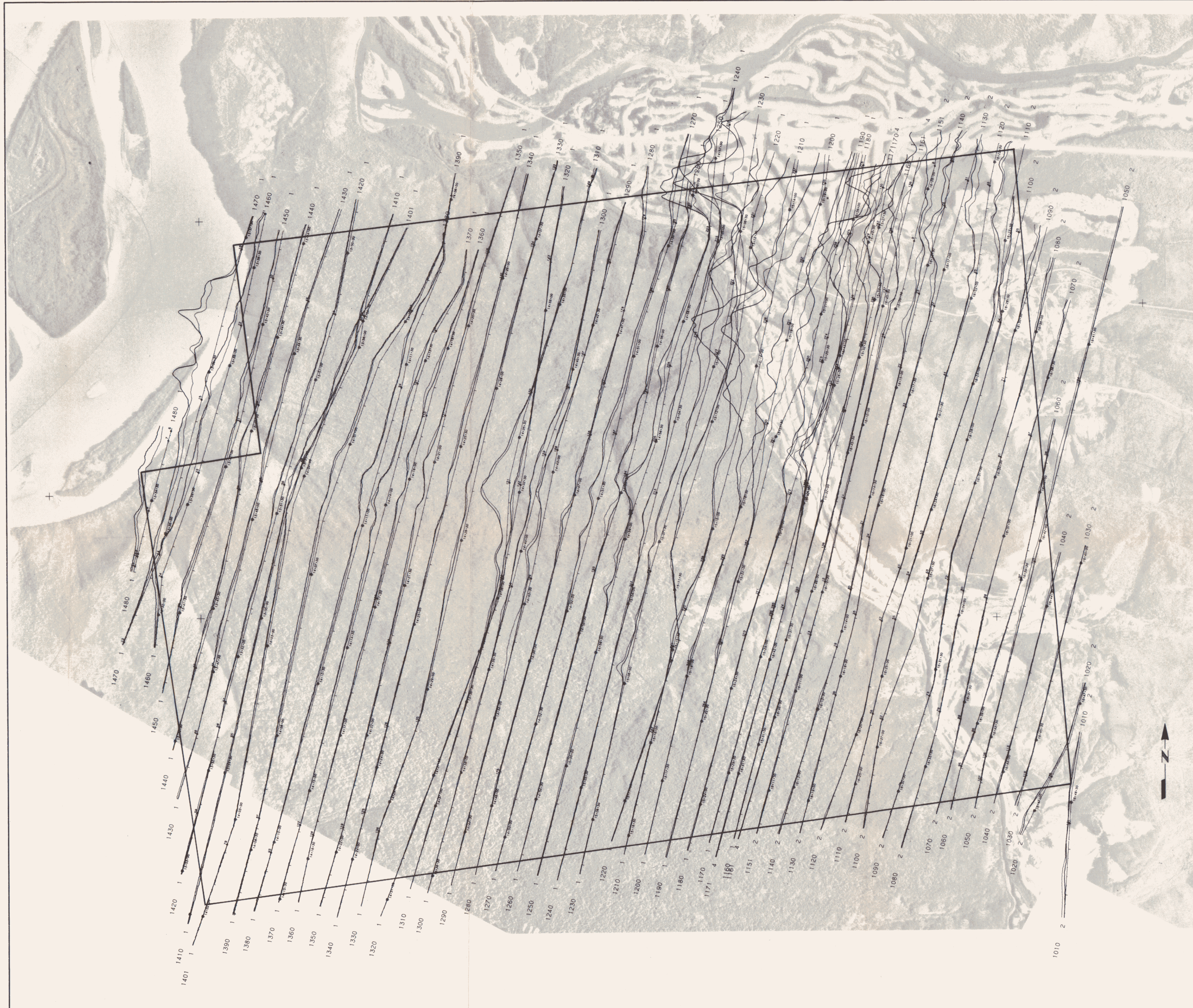
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TOTAL FIELD EM-VLF CONTOURS
Minimum Contour Interval 2%

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DATE: AUGUST 1987
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MAP No: 7 J8646



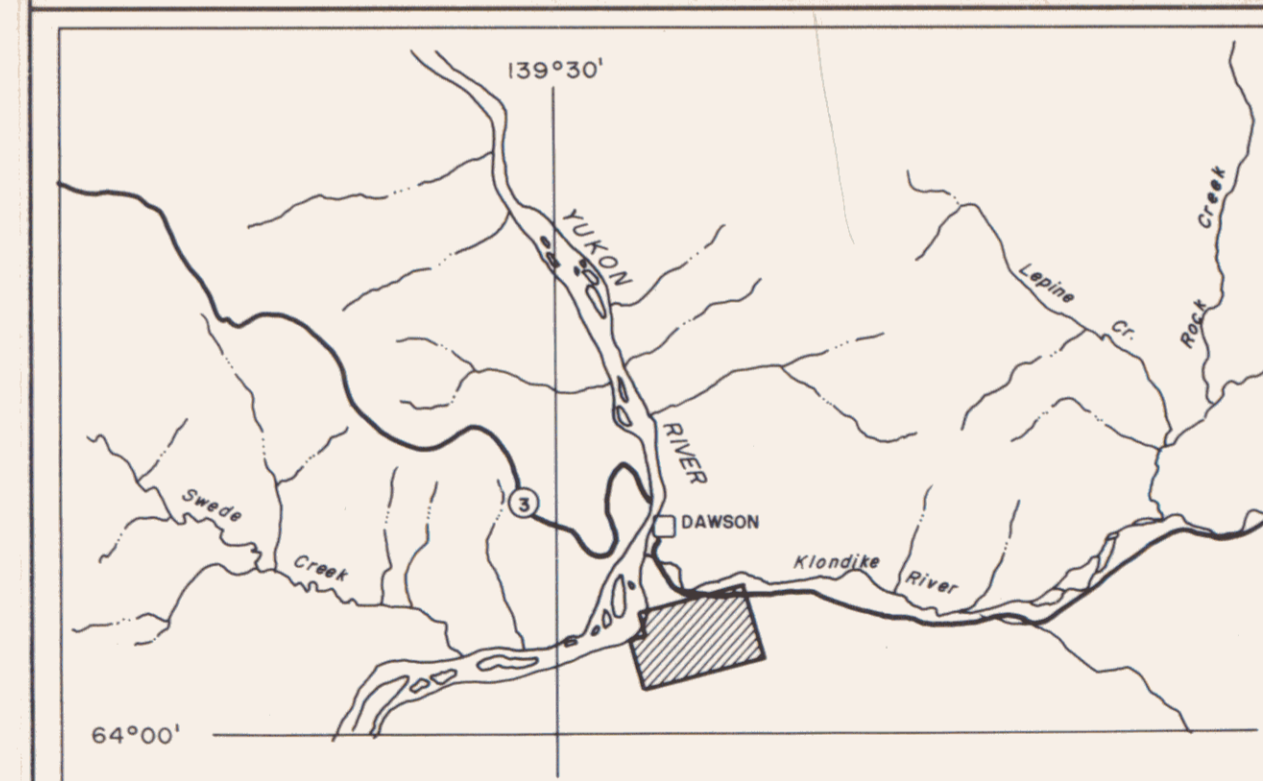
Flight Path

Flight path derived from VHS video tape.

Average terrain clearance 80m
Line spacing = 100m

EM Profiles

Coaxial 4 ppm/mm
950 Hz inphase
950 Hz quadrature
Sensor elevation.....30m
Coil separation.....7m



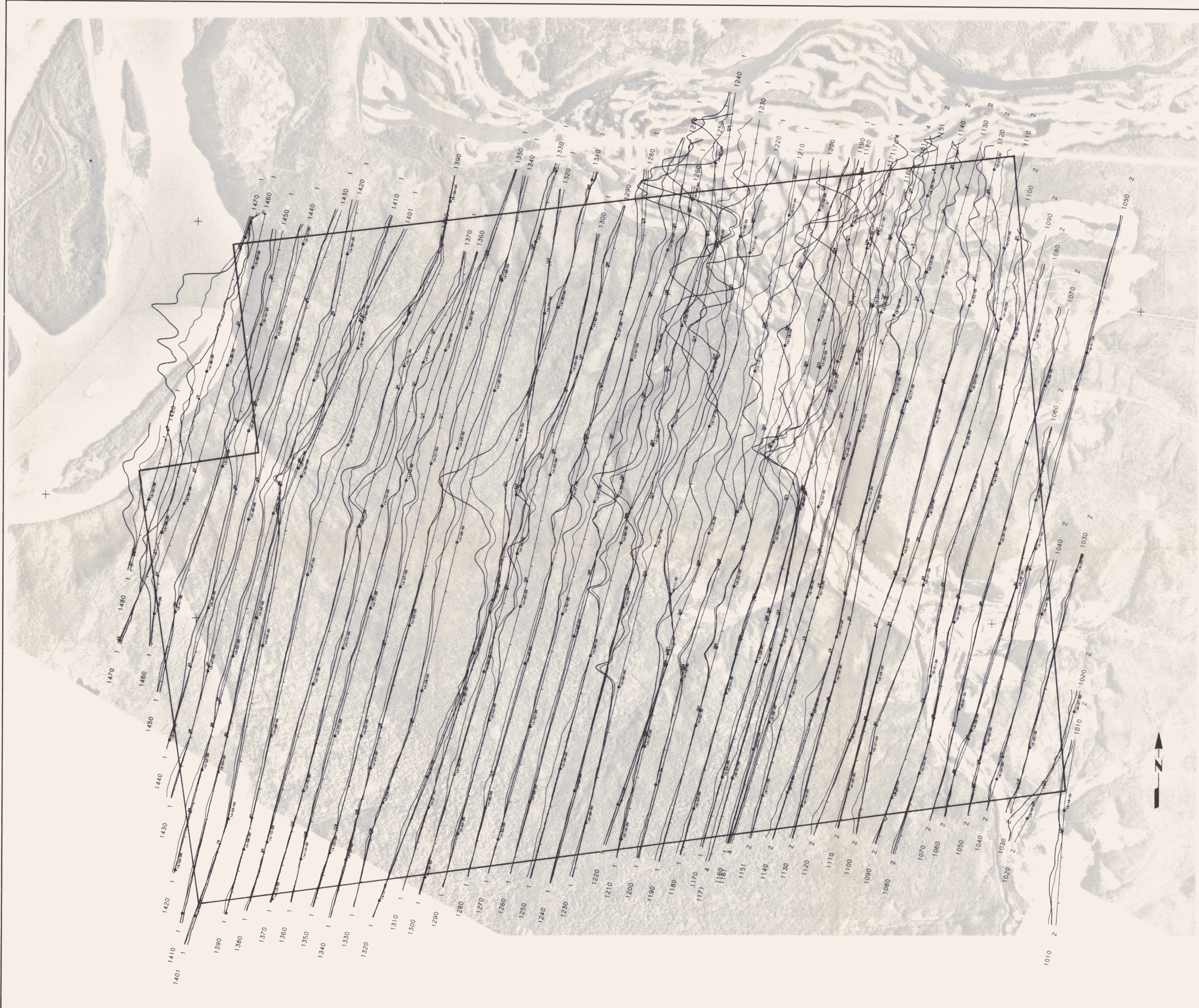
EASTERN MINES LTD.
ELECTROMAGNETIC PROFILES
950 Hz - coaxial configuration

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SCALE 1:10,000
0 330 660 1320 1/2 MILE
0 100 200 500 KILOMETRE

AERODAT LIMITED	DATE: AUGUST 1987
	NTS No: 116 B 3
	MAP No: 8a J8646

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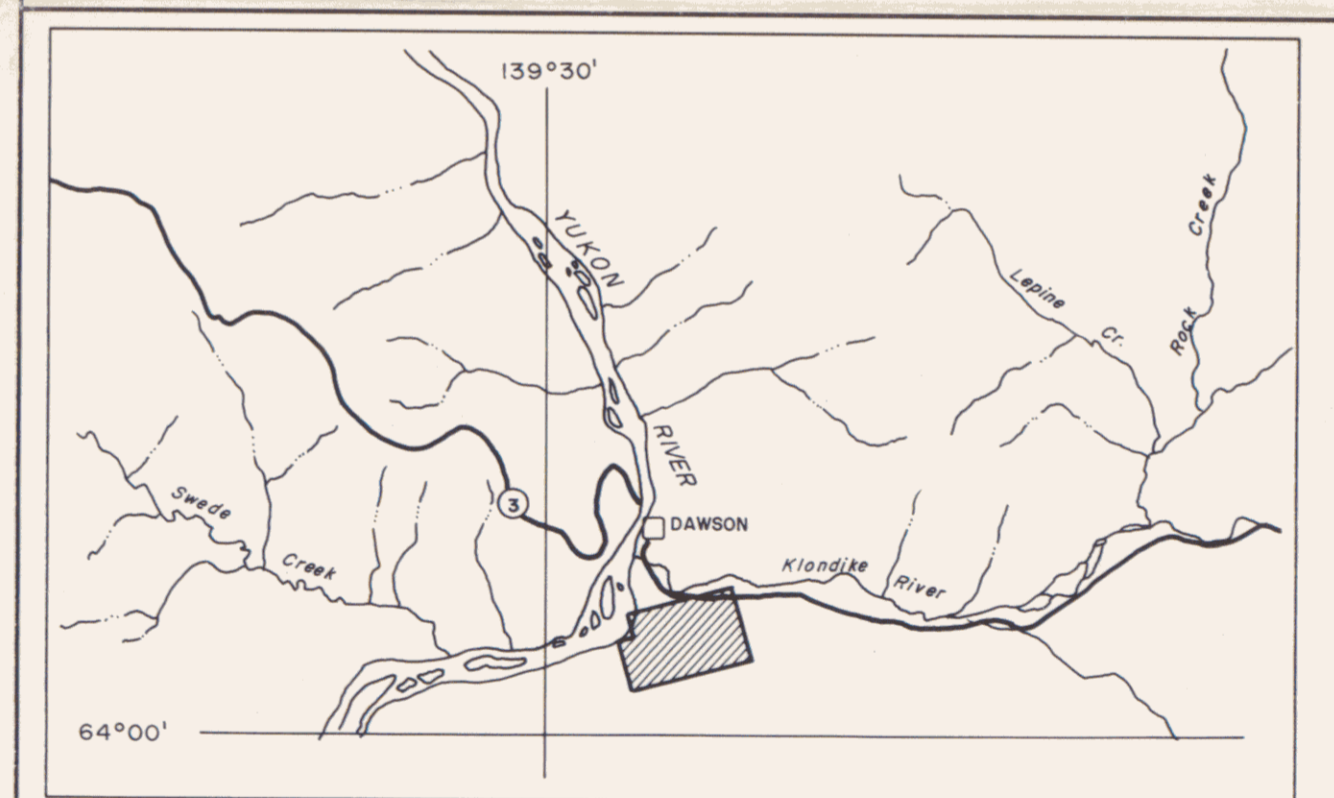


Flight Path

Flight path derived from VHS video tape.
 Average terrain clearance 80m
 Line spacing = 100m

EM Profiles

Coaxial 4 ppm/mm
 4600 Hz inphase
 4600 Hz quadrature
 Sensor elevation.....30m
 Coil separation.....7m



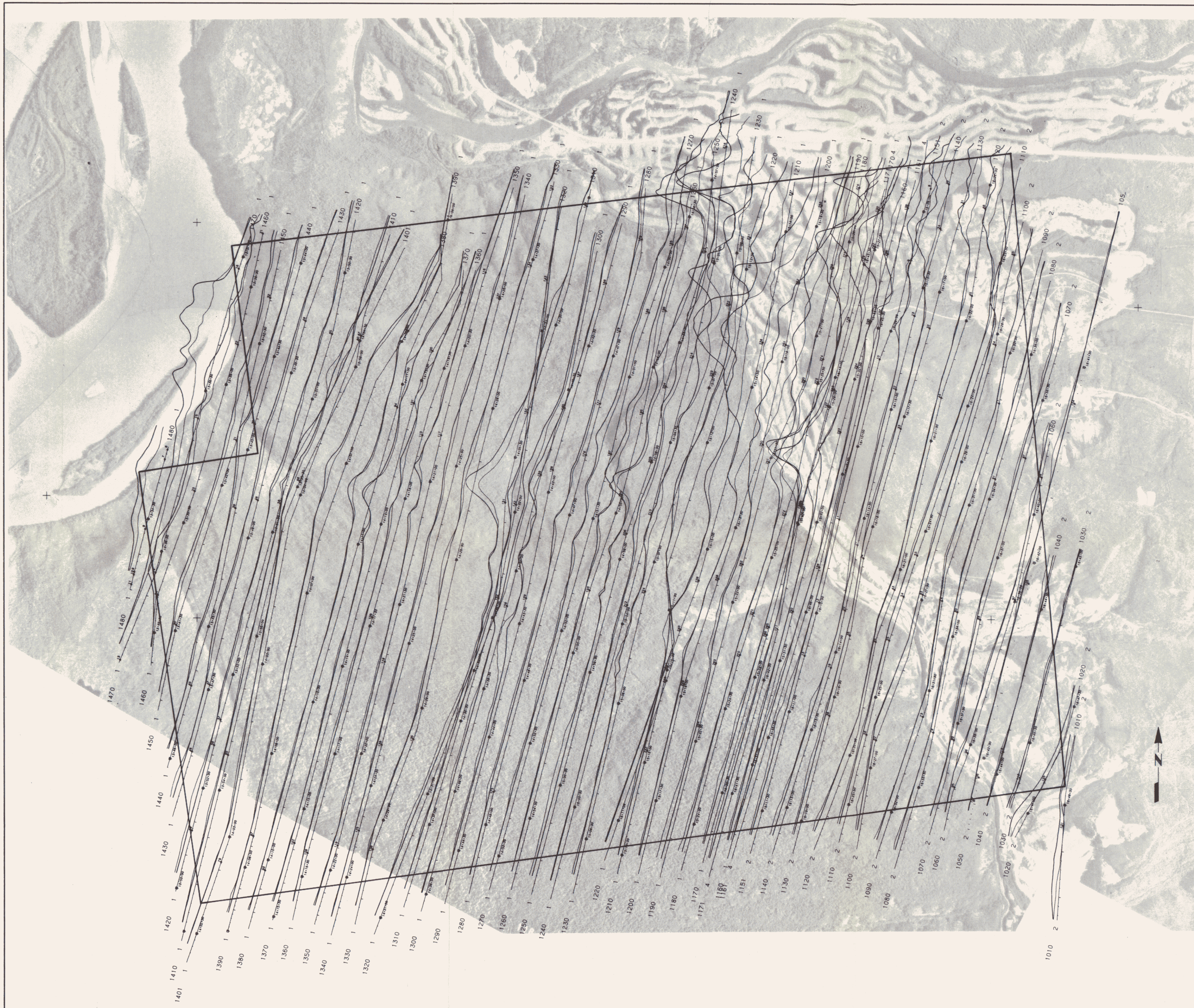
EASTERN MINES LTD.
ELECTROMAGNETIC PROFILES
 4600 Hz - coaxial configuration

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SCALE 1:10,000
 0 330 660 1320 1/2 MILE
 0 100 200 500 1 KILOMETRE

DATE: AUGUST 1987
 NTS No: 116 B 3
 MAP No: 8b J8646

091758

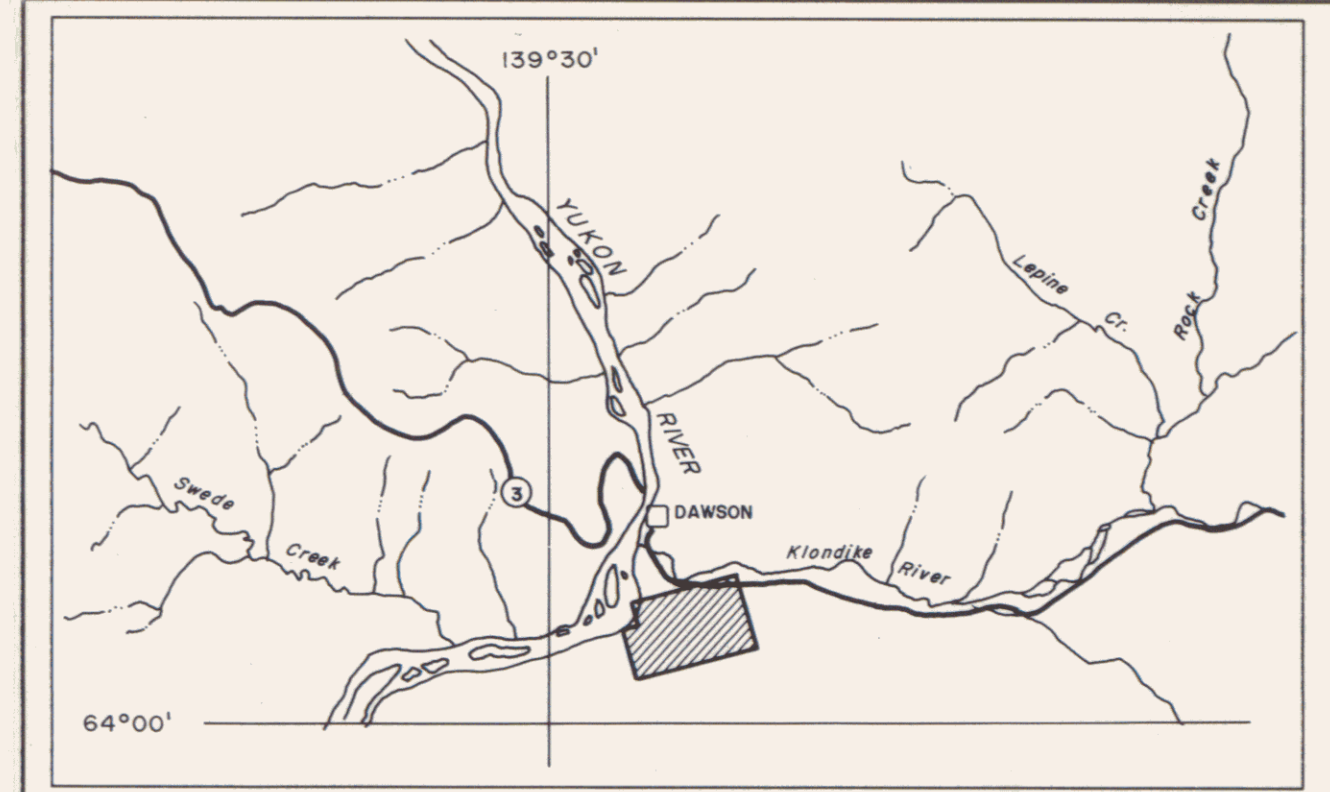


Flight Path

Flight path derived from VHS video tape.
 Average terrain clearance 80m
 Line spacing = 100m

EM Profiles

Coplanar 16 ppm/mm
 4270 Hz inphase
 4270 Hz quadrature
 Sensor elevation.....30m
 Coil separation.....7m



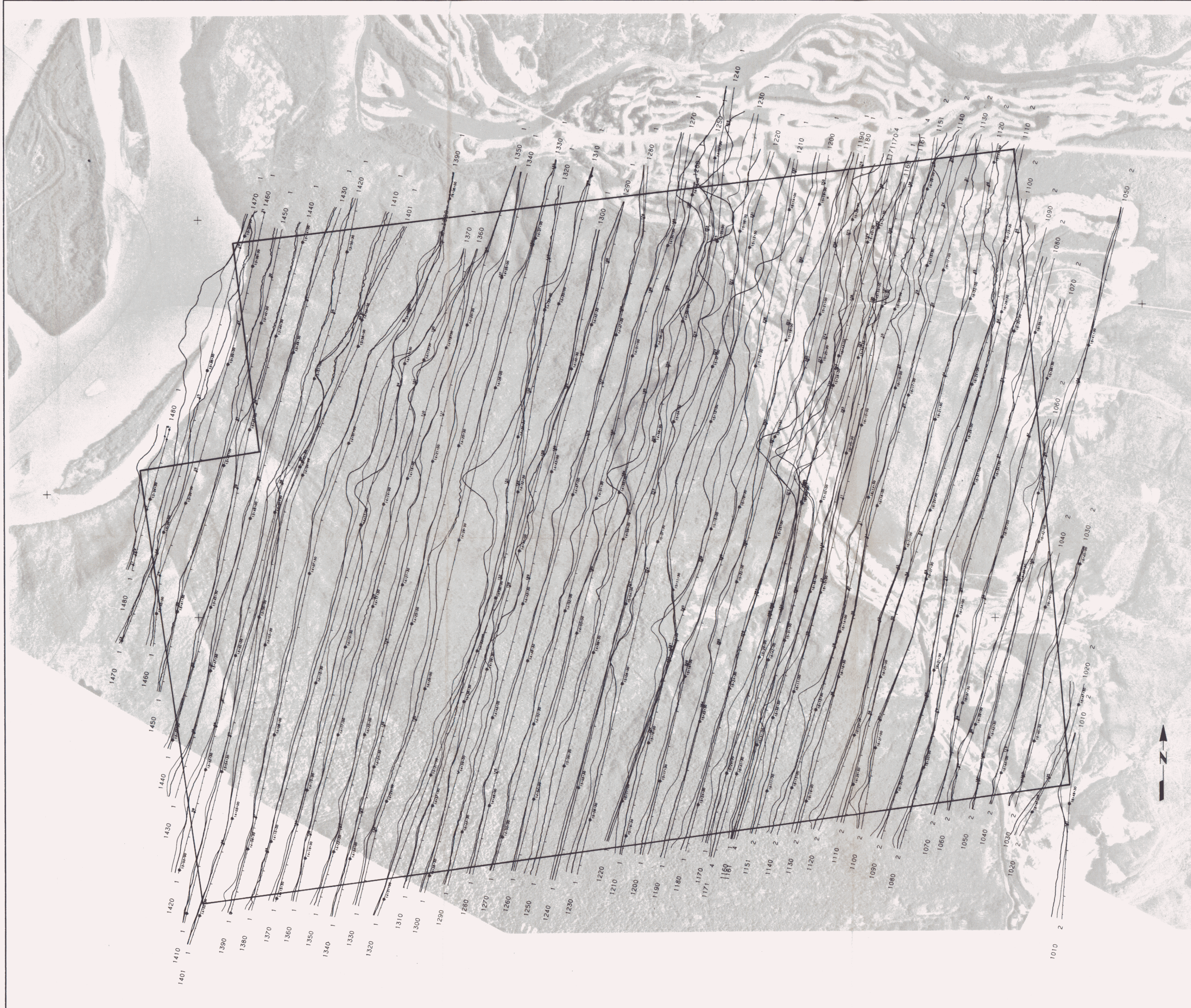
EASTERN MINES LTD.
ELECTROMAGNETIC PROFILES
4270 Hz - coplanar configuration

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YUKON

SCALE 1:10,000
 0 330 660 1320 1/2 MILE
 0 100 200 500 1 KILOMETRE

DATE: AUGUST 1987
 NTS No: 116 B 3
 MAP No: 8C J8646

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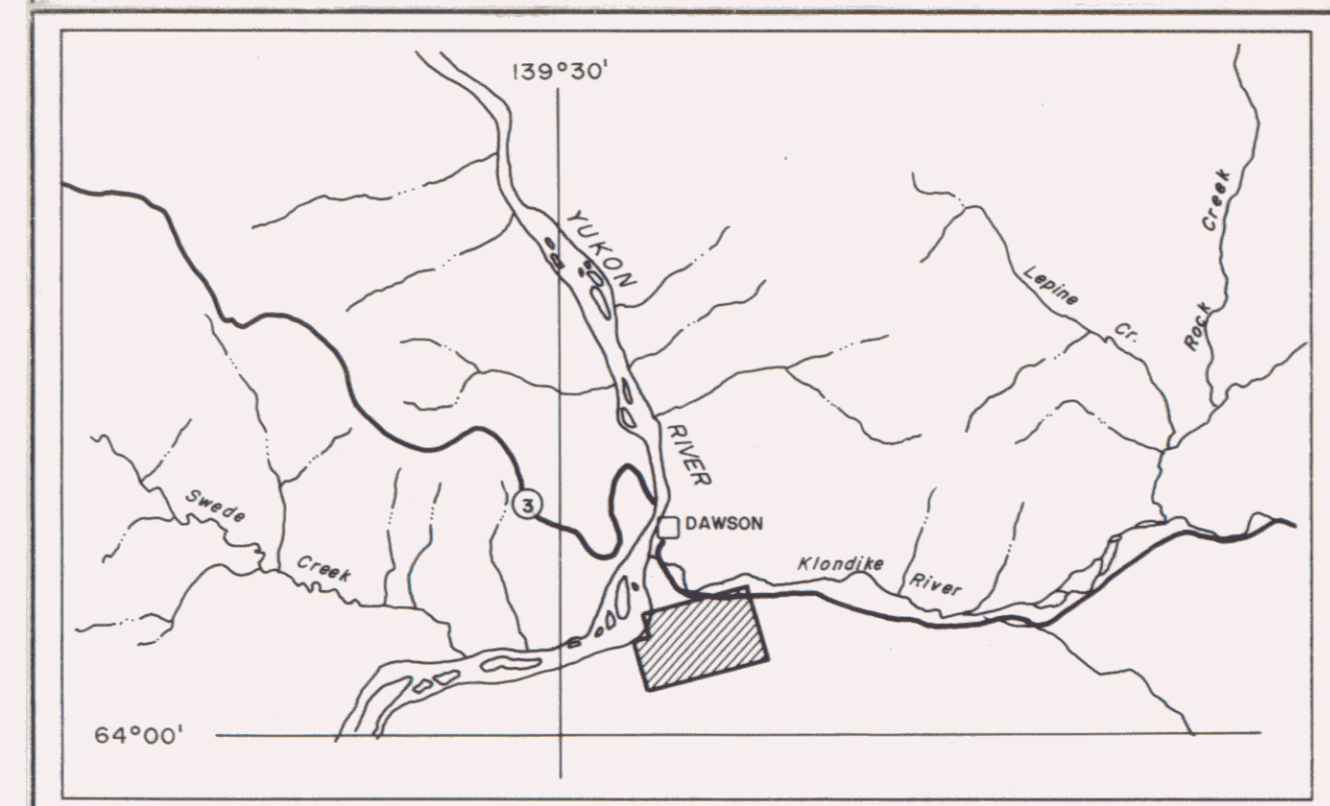


Flight Path

Flight path derived from VHS video tape.
 Average terrain clearance 80m
 Line spacing = 100m

EM Profiles

Coplanar 32 ppm/mm
 32000 Hz inphase
 32000 Hz quadrature
 Sensor elevation.....30m
 Coll separation.....7m



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ELECTROMAGNETIC PROFILES
 32000 Hz - coplanar configuration

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1555

SCALE 1:10,000

0 330 660 1320 1/2 MILE
 0 100 200 500 KILOMETRE

	DATE: AUGUST 1987
	NTS No: 116 B 3
	MAP No: 8d J8646

091758