81- #938 ~ 9740.

GEOPHYSICAL REPORT

ON A

MAXMIN II E.M. SURVEY

ON THE

WINGDAM CLAIMS

CARIBOO MINING DIVISION

BRITISH COLUMBIA

WINGDAM CLAIMS	: Wingdam Lake Area
	: 53° 02' N; 121° 58' W
	: N.T.S. 93H/4W
WRITTEN FOR	: TANACANA MINES LTD. c/o 50 Granville Square 200 Granville Street Vancouver, B.C. V6C 1S4
BY	: Reinhold R. Fassler, Geophysicist GEOTRONICS SURVEYS LTD. 403-750 West Pender Street Vancouver, B.C. V6C 2T7
DATED	: September 9, 1981

GEOTRONICS SURVEYS LTD.
Engineering & Mining Geophysicists
VANCOUVER, CANADA

9740

TABLE OF CONTENTS

LIST OF ILLUSTRATIONS

SUMMARY

A MaxMin II EM survey was carried out over the Wingdam #4, 6 and 7 Claims during June, 1981. The purpose of the survey was to detail anomalous areas found in an Airborne H.E.M. survey done in April, 1980 by Aerodat.

The claims are located approximately 15 km east of Cottonwood on Highway 26 in fairly mountainous terrain. The good conductors found in the area are believed to be due to graphitic material and/or sulphide mineralization.

The MaxMin survey was carried out with a two-man portable unit. Dip angle, direction, depth to top and the conductivity-thickness product of the conductor were calculated when possible using type curves and the ratios of the in-phase to quadrature response.

CONCLUSIONS

The MaxMin II EM survey located the following;

(a) Wingdam #7
Two good conductors.

(b) Wingdam #4
A broad conductive zone between 3E and 9E on lines 2S, 0 and 2N. Within this zone we have localized areas with

higher conductivity-thickness products, than the rest of the conductive zone.

After the MaxMin II survey was completed, a backhoe was used on lines 2N and 0+00 to expose bedrock. At around 7+00E quartz veins with massive pyrite were found. On either side of the quartz veins there is some graphitic schist. The MaxMin II responded to the graphitic schist but did not resolve the quartz veins with pyrite. This is due to the following limitations in the H.E.M. method.

The response of the MaxMin depends in part on the conductivity-thickness product and not just the conductivity of the conductor. As a result the conductivity of the massive pyrite may be high but the conductivity-thickness product could be low because of the relatively small amount of pyrite compared to the amount of graphitic schist. On lines 2N and 0+00 the MaxMin response is due to the graphitic schist and not the massive pyrite.

(c) The depths given in the Discussion of Results section should be considered as maximum depths. The error in the depth estimate is due to the presence of the slightly conductive bedrock encountered on most of the lines. When a good conductor is contained in a slightly conductive host rock the MaxMin response is altered in a manner that makes the conductor appear to be deeper than it actually is. There is no way to estimate the amount of error produced by the presence of a slightly conductive host rock.

RECOMMENDATIONS

The conductive zones mentioned in the Discussion of Results section should be examined in the field to determine the following:

(a) The most effective method of getting bedrock samples from the conductive zones.

(b) The degree of correlation that exists between the conductive zones found by the MaxMin and the mineralization in these zones.

GEOPHYSICAL REPORT

ON A

MAXMIN II E.M. SURVEY

ON THE

WINGDAM CLAIMS

CARIBOO MINING DIVISION, B.C.

INTRODUCTION AND GENERAL REMARKS

This report discusses the survey procedure, compilation of data and the interpretation of the MaxMin II E.M. survey carried out on the Wingdam Claims during June, 1981.

The survey was done under the supervision of Howard Myer, P.Eng., by Paul Laframboise (a geophysical technician) with the aid of an assistant. A total of 5.4 line km of MaxMin II surveying was done.

The primary purpose of the MaxMin II E.M. survey was to provide detailed information on the conductive zones found by the airborne H.E.M. survey done during April, 1980. In this locality the good conductors are believed to be due to graphitic material formed by local metamorphism. Often associated with this graphitic material is sulphide mineralization. Lode gold

mineralization in this area is in gold bearing quartz veins and gold bearing pyritic replacements in limestones.

This E.M. system allow the delineation between conductive clay zones and the good conductors associated with massive sulphide mineralization and/or graphitic material.

PROPERTY AND OWNERSHIP

The Wingdam Claims (1-8) are owned by TanaCana Mines Ltd. of Vancouver, British Columbia.

On June 23, 1981 the Wingdam Claims where grouped into the Wing Claim Group and the Dam Claim Group as follows:

Claim Name	Record No.	No. of Units	Expiry Date
WING GROUP			
Wingdam #1	770(8)	20	Aug. 8, 1982
Wingdam #2	771(8)	20	Aug. 8, 1982
Wingdam #4	772(8)	20	Aug. 8, 1982
Wingdam #8	1805(8)	9	Aug. 11, 1982
DAM GROUP			
Wingdam #3	759(8)	20	June 23, 1982
Wingdam #5	1802(8)	16	Aug. 11, 1982
Wingdam #6	1803(8)	16	Aug. 11, 1982
Wingdam #7	1804(8)	18	Aug. 11, 1982

LOCATION AND ACCESS

The Wingdam Claims are located approximately 15 km east of Cottonwood on Highway 26.

The geographical coordinates of the center of the claims are

53° 03' N latitude and 121° 58' W longitude.

PHYSIOGRAPHY

The Wingdam Claims lie in the region known as the Quesnel Highland. The terrain is mountainous with elevations ranging on the property from 1,000 m to 1,500 m. Most of the claims area is covered with timber of commercial value.

Lightning Creek is the major creek cutting through the property.

HISTORY OF PREVIOUS WORK

Some exploratory VLF-EM was done in conjunction with geological mapping. The most recent work was an Airborne H.E.M. done by Aerodat in April, 1980. Several conductive zones where located by the Aerodat survey.

GEOLOGY

The following information is quoted from Geological-Geophysical Report on Reconnaissance Geological Mapping and Electromag (VLF-EM16) Survey of Mineral Claims, Wingdam 1, 2 and 4, by Howard Myers, P.Eng., (B.C.), P.Geol. (Alta.) dated November, 1979.

"Bedrock, though concealed over a large portion of the claims area by rock debris and vegetation, outcrops on the ridges on steeper slopes and at various places along the stream bed. The rock debris consists mainly of morainal material and as glacial drift, landslide material on the steeper slopes of Lightning Creek. The overburden in the valley of Lightning Creek is very thick and masks completely the bedrock. Both boulder clay and hardpan together with slum are reported in the drilling on Lightning Creek. The slopes of the present

valley also contain boulder clay, blue clay and hardpan indicating the entire valley of Lightning Creek was filled with glacial deposits. There is good evidence and it has been postulated that Lightning Creek flowed north into the Beaver Pass area and on to the Willow River in past geological times. The large amount of placer gold indicated in the drilling and exploration of the deep channel of Lightning Creek would have its source in the surrounding or nearby quartz veins with pyrite and gold mineralization.

"Rock in the northeastern portion of the claim block are composed of quartzite, sericite schist, argillite slate and limestone of the Cariboo Series of Precambrian Age. In the southwestern portion of the area Hanson (Map 335A) maps the rocks as the Quesnel River Group consisting of shale, argillite and greenstone. The contact between the two formations could not be defined in the field by the writer. In the extreme western portion of the claim block argillites with quartz veins and limestone were mapped by the writer. The rocks are very similar to those in the Barkerville area mapped as the Basal Member of the Richfield Formation of Precambrian Age. In the extreme southwestern portion of the mapped area immediately southwest of Wingdam Lake, numerous quartz veins outcrop on the ridge. The quartz veins vary in width from an inch or fraction of an inch to over three feet. The quartz veins had a strike of north-northwest to northwest and were very abundant. There was no evidence of any gold or pyrite mineralization associated with the quartz veins. Rocks in the immediate area of the veins consisted of quartzite and sericite schist. Immediately east of the quartz veins there was evidence of faulting as shown on the enclosed map. This faulting was also indicated on the VLF-EM profile run across the area.

"The rocks of the Cariboo Series lie in the southwest limb of a broad anticlinal structure whose axis lies approximately three miles northeast of the claim block. The axis in general plunges to the northwest from 20 to 40 degrees. The strata of the Cariboo Series have a prevailing strike of north 30 to 40 degrees west and dips southwest, however, the beds are distorted in places by minor folding and faulting. Bedding planes are often distorted or obscured by shearing. In addition to the strike faults and northwest strike of the bedding there is a distinct northerly trend of faulting and topographic relief in the immediate area of the claim block. This northerly trend or line of weakness and is shown on the enclosed map is parallel to major faulting in the Barkerville Area mapped on the surface and underground. Among the well known northerly trending faults in the Barkerville area are the Lowhee Fault, Richfield Fault, Black Jack Gulch Fault, Waoming Fault and Grouse Creek Fault. Most all of these northerly trending faults were mapped by G. Hanson in Memoir 181, Canada Department of Mines 1935. In the Stanley area Stuart S. Holland mapped three of these northerly trending faults as reported in Bulletin No. 26, (B.C. Department of Mines 1948). These northerly trending fault zones of lines of weakness are very significant and have a definite relationship to gold mineralization in the general Cariboo area. The VLF-EM 16 appears to be able to map these fault zones or structures.

"Gold mineralization in the Wells Area east of the claim block occurs in two general types or forms namely with quartz veins and pyrite and as replacement type orebody in limestone. Mineralization occurs in fractures at or near the intersection of major structural trends in the area.

INSTRUMENTATION AND THEORY

A MaxMin II portable 2-man electromagnetometer, manufactured by Apex Parametrics Ltd. of Toronto, Ontario was used for

this survey. This instrument is designed for measuring tne electromagnetic field which results from a conductive body; that is a structure which conducts electricity better than barren rock-types do. This particular instrument has the advantage of flexibility over most other E.M. units in that it can operate with different modes and frequencies as well as having a variety of distances between transmitter and receiver. Five frequencies can be used (222, 444, 888, 1777 and 3555 Hertz) and six different coil separations (25, 50, 100, 150, 200 and 250 meters).

In all electromagnetic prospecting, a transmitter induces an alternating magnetic field (called the primary field) by having a strong alternating current move through a coil of wire. This primary field travels through any medium and if a conductive mass such as a sulphide body is present, the primary field induces a secondary alternating current in the conductor and this current in turn induces a secondary magnetic field. The receiver picks up the primary field and, if a conductor is present, the secondary field. The fields are expressed as a vector which has two components, the in-phase (or real) component and the out-of-phase (or quadrature) component. The results are expressed as the percent deviation of each component from what the values would be if no secondary field (and therefore no conductor) was present. Since the fields lose strength proportionally with the distance they travel, a distant conductor has less of an effect than a close conductor. Also the lower frequency of the primary field, the further the field can travel so the greater the depth penetration. This unit can vary the strength of the primary field and so use different separations between transmitter and receiver coils, change the frequency of the primary field

for varying depth penetrations, and use three different ways of orienting the coils to duplicate the survey in three styles so that more accuracy is possible in the interpretation of the data.

The use of the MaxMin II electromagnetometer allows for better discrimination between low conductive structures such as clay beds and barren shear zones and more conductive bodies like massive sulphide mineralization. It also gives several different types of data over a given area so that statistical analysis can result in less error in the interpretation.

SURVEY PROCEDURE

The survey was carried out on Wingdam #6, 4 and 7. The coil separation used was 50 m and/or 100 m at frequencies of 888 Hz and 222 Hz. Readings were taken every 25 m. The receiver operator read and recorded the in-phase and out-of-phase responses. The slope was recorded for use later in the data reduction. Stations on the ground are chained in, using horizontal distances.

Calibration and phase mixing tests were conducted three times a day and the appropriate corrections made when necessary.

COMPILATION OF DATA

The in-phase and quadrature responses were first corrected for the effect of slope by using the correction tables supplied by the manufacturer of the MaxMin equipment.

The corrected data was then plotted in profile form on a plan of the area at a scale of 1:2,500. This data is plotted at

the midpoint between where the transmitter and receiver coils were when the readings were taken. The anomalous profiles were type-curved for comparison with published type-curves. Type-curves are produced either by computer models or actual scale models tested under laboratory conditions. Type-curves can give information on dip of conductor, depth to top and indirectly the conductivity-thickness product of the conductor.

DISCUSSION OF RESULTS

Wingdam #4

Line 4N (N45E) - Poor conductor (conductivity-thickness approximately 8), at 9+50E. The dip is steep to the east. Conductive overburden or conductive bedrock close to surface (2 m) from 8E to 4E.

Line 0+00 (N45E) - Possible individual conductor at 3+50E. No dip or depth estimate. Conductive zone between 5E and 10E close to surface.

Line 2N (N45E) - A wide conductive zone from 3E to 9E. Higher conductivity-thickness product at the eastern and western edge of the conductive zone.

Wingdam #6

Line 2N - Slightly conductive bedrock along the line. Nothing of interest.

Line 0N - Nothing of interest.

Line 1 (N45E) - The profile indicates that this line comes close to a conductor at about 1+50W. A line to the south and one to the north is needed to obtain any more information on this conductor.

Wingdam #7

GROUP 1

Line 1N - On this line we have two good conductors.

#1 The conductor (#1) at 3+70W was modelled as a thick conductor of 25 m width. The calculated maximum depth to top is 20 to 30 m, dip is 60° to 80°E.

#2 The conductor (#2) at 2+50W has a width approximately 25 m. The maximum depth to top is 15 to 25 m. The dip cannot be calculated but is probably very steep (75°W to 75°E).

Line 0+00

#1 A good conductor (width approximately 25 m) at 3+50W. The estimated maximum depth to top is 20 to 30 m with a dip 75° to 90°E.

#2 A good conductor (width approximately 25 m) at 2+20W. The estimated depth to top is 15 to 25 m. Dip is probably steep to the east.

Line 1S

#1 A good conductor (conductivity-thickness product approximately 100) at 3+50W. Dip is calculated to be 75° to 90°E with a maximum depth to top of 20 to 30 m.

#2 This conductor (conductivity-thickness product approximately 110) is located at 2+00W. The maximum depth to top of conductor is 20 to 30 m. No estimate of dip possible.

Line 2S - Nothing interesting.

GROUP 2

Line 1S - Nothing interesting.

Line 2S - Nothing interesting.

Respectfully submitted,
GEOTRONICS SURVEYS LTD.

R. Fassler

Reinhold R. Fassler,
Geophysicist

September 9, 1981

SELECTED BIBLIOGRAPHY

Betz, J.E., Consideration Behind the Design of a Well Rounded Electromagnetic Prospecting System (Review).

Ketala, M. & Puranen, M., Type Curve for the Interpretation of Slingram (horizontal loop) Anomalies over Tabular Bodies Geological Survey of Finland, 1967.

Myers, H., Geological - Geophysical Report on Reconnaissance Geological Mapping and Electromag (VLF-EMIC) Survey of Mineral Claims Wingdam 1, 2 and 4 done for TanaCana Mines Ltd., November 1979.

GEOPHYSICIST'S CERTIFICATE

I, REINHOLD R. FASSLER, of the City of Vancouver, in the Province of British Columbia, do hereby certify:

That I am a Consulting Geophysicist of Geotronics Surveys Ltd. with offices at #403-750 West Pender Street, Vancouver, British Columbia.

I further certify:

1. I am a graduate of the University of British Columbia (1981) and hold a B.Sc. degree in Geophysics.

2. I have been active in the mining industry for the past twelve years including four years as a geophysical technician.

3. I am an active member of the Society of Exploration Geophysicists.

4. I do not holf any interest in TanaCana Mines Ltd. nor in the Wingdam Property, and I do not expect to receive any interest as a result of writing this report.

R. Fassler

Reinhold R. Fassler
Geophysicist

September 9, 1981

AFFIDAVIT OF EXPENSES

The MaxMin II EM survey was carried out on the Dam Claim Group (Wingdam 3, 5, 6 and 7 claims), Wells area, Cariboo M.D., British Columbia from June 17th to 23rd, 1981, to the value of the following:

FIELD:		
Geophysical technician and helper, 40 hours at $40/hour		$ 1,600
Vehicle rental, 4-wheel drive		320
Room and board		320
Instrument rental		250
Survey supplies		110
		$ 2,600
REPORT: (Proportionate)		
Geophysicist, 30 hours at $40/hour	$ 1,200	
Geophysical technician, 20 hours at $22.50/hour	450	
Drafting and printing	450	
Typing, photocopying and compilation	200	
	$ 2,300	
Dam Claim Group share of report		1,150
TOTAL		$ 3,750

Respectfully submitted,
GEOTRONICS SURVEYS LTD.

David G. Mark,
Manager

AFFIDAVIT OF EXPENSES

The MaxMin II EM survey was carried out on the Wing Claim Group (Wingdam 1, 2, 4 and 8 claims), Wells area, Cariboo M.D., British Columbia, from June 17th to 23rd, 1981, to the value of the following:

FIELD:

Geophysical technician and helper, 34 hours at $40/hour		$ 1,360
Vehicle rental, 4-wheel drive		310
Room and board		300
Instrument rental		200
Survey supplies		80
		$ 2,250

REPORT: (Proportionate)

Geophysicist, 30 hours at $40/hour	$ 1,200	
Geophysical technician, 20 hours at $22.50/hour	450	
Drafting and printing	450	
Typing, photocopying and compilation	200	
	$ 2,300	
Wing Claim Group share of report		1,150
TOTAL		$ 3,400

Respectfully submitted,
GEOTRONICS SURVEYS LTD.

David G. Mark,
Manager

FIG. 1

GEOTRONICS SURVEYS LTD.

TANACANA MINES LTD.

WINGDAM CLAIMS
WINGDAM LAKE, B.C.
CARIBOO, M.D.

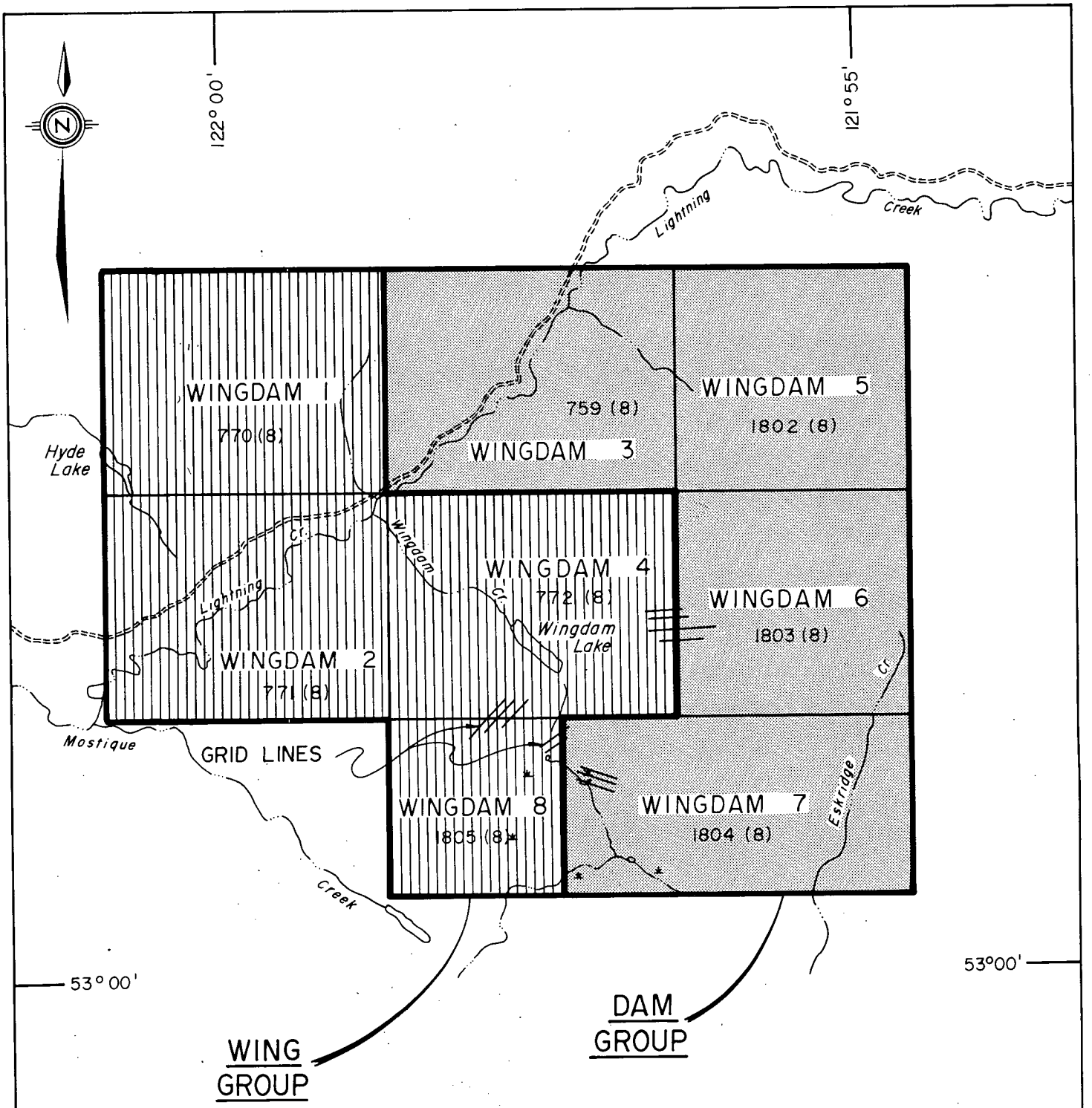
LOCATION MAP

SCALE

Km. 100 50 0 100 200 300 400 Km.

Miles 100 50 0 100 200 Miles

ALTAIR drafting services ltd.



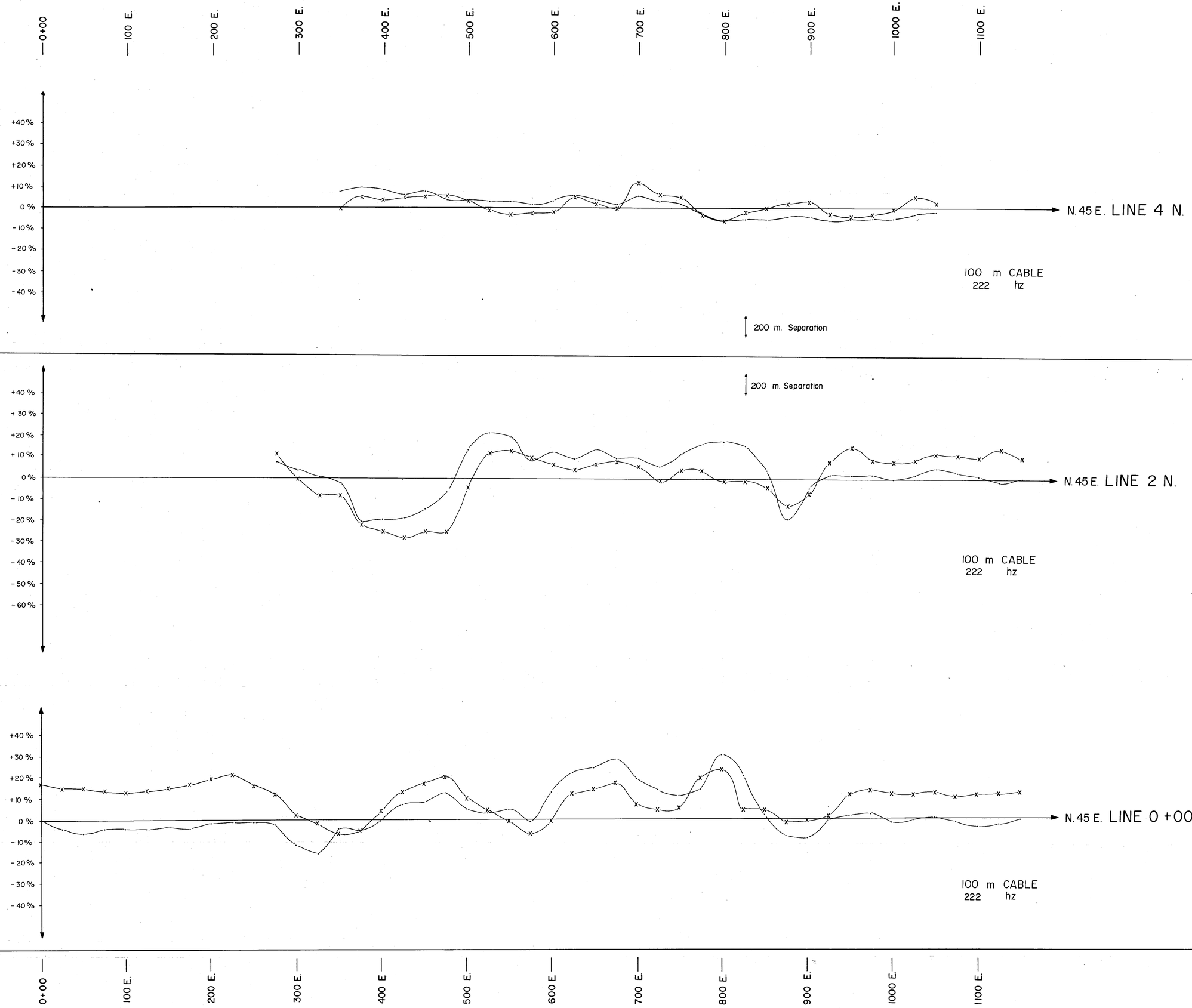
GEOTRONICS SURVEYS LTD.

TANACANA MINES LTD.

WINGDAM CLAIMS
WINGDAM LAKE, B.C.
CARIBOO, M.D.

CLAIM MAP

DATE:	SCALE:	JOB NO:	FIG NO:
JULY, 1981	1: 50,000	81 - 33	2



LEGEND

IN - PHASE RESPONSE

OUT - OF - PHASE RESPONSE

INSTRUMENTATION : APEX MAX - MIN II E.M.

GEOTRONICS SURVEYS LTD.

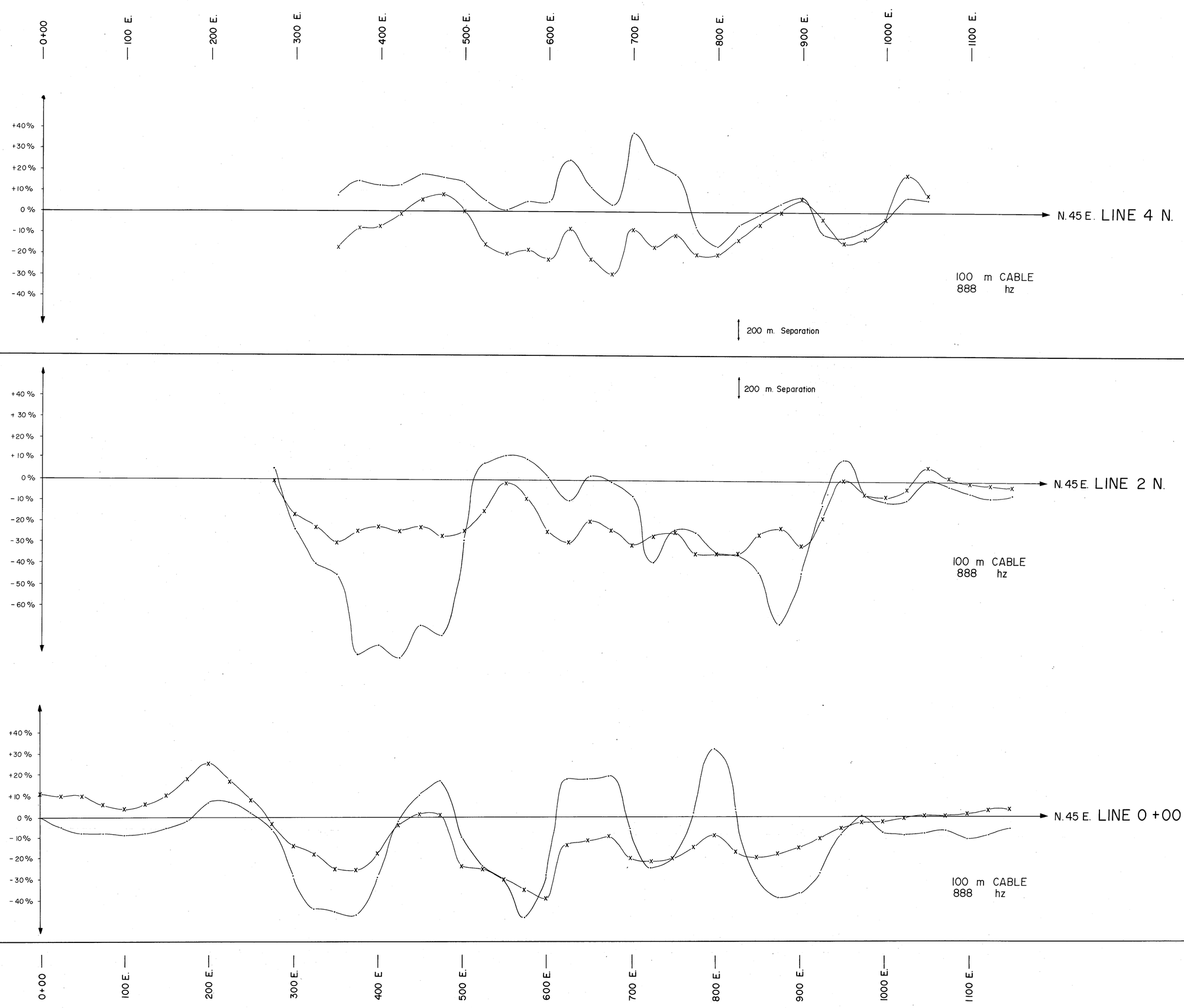
TANACANA MINES LTD.

WINGDAM #4

WINGDAM LAKE , B.C. CARIBOO MINING DIVISION

MAX. MIN. II
ELECTROMAGNETIC SURVEY
PROFILES

DRAWN BY:	JOB NO:	DATE:	SCALE:	SHEET NO:
P.L.	81-33	JULY, 1981	1: 2500	W#4-2



LEGEND

—·—·—·— IN - PHASE RESPONSE

x—x—x—x OUT - OF - PHASE RESPONSE

INSTRUMENTATION : APEX MAX - MIN II E.M.

MINERAL [illegible]
ASSESSMENT REPORT
9740
NO.

GEOTRONICS SURVEYS LTD.

TANACANA MINES LTD.

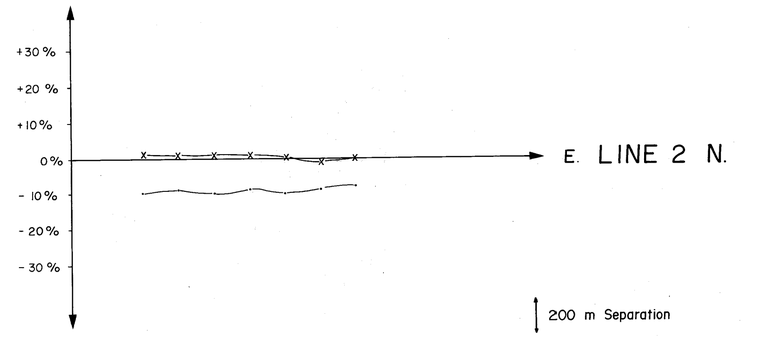
WINGDAM # 4

WINGDAM LAKE, B.C. CARIBOO MINING DIVISION

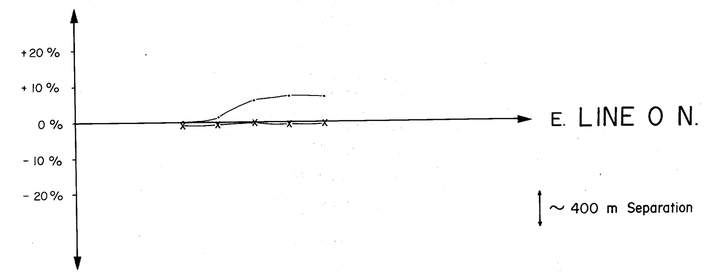
MAX. MIN. II
ELECTROMAGNETIC SURVEY
PROFILES

DRAWN BY:	JOB NO:	DATE:	SCALE:	SHEET NO:
P. L.	81-33	JULY, 1981	1: 2500	W # 4 - 1

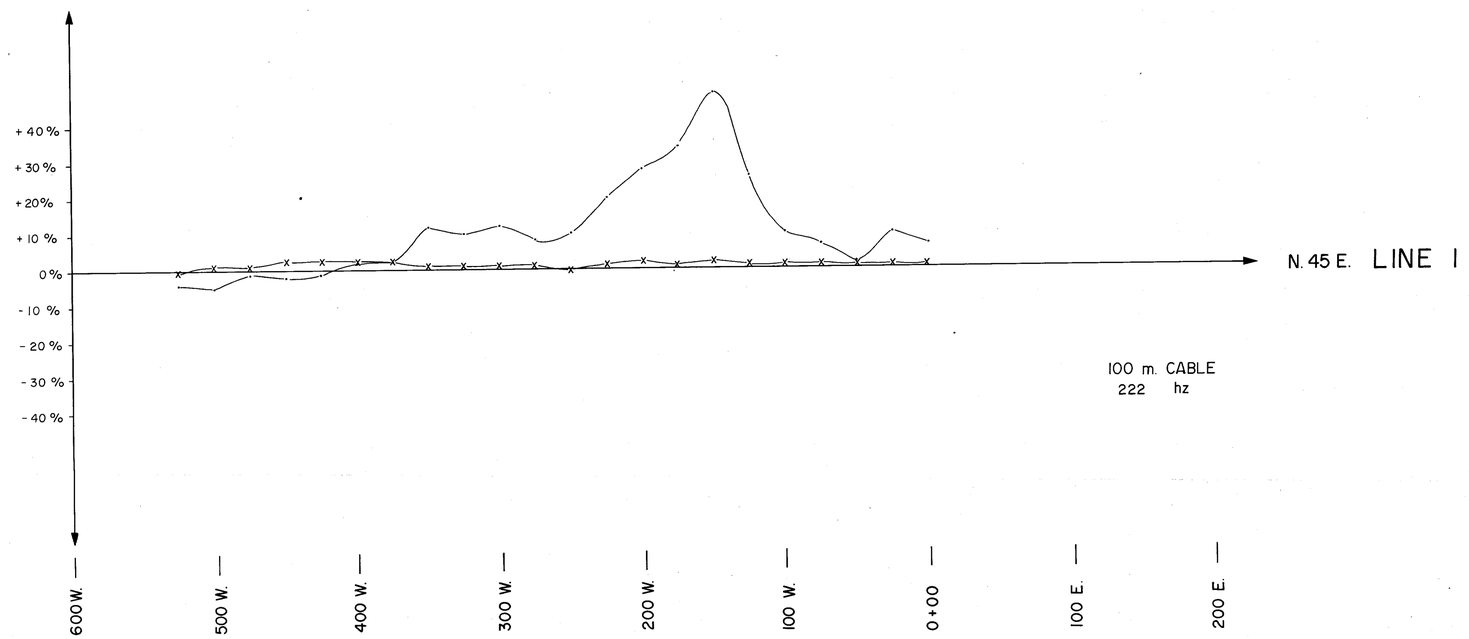
— 600 W. — 500 W. — 400 W. — 300 W. — 200 W. — 100 W. — 0+00 — 100 E. — 200 E.



100 m. CABLE
222 hz



100 m. CABLE
222 hz



100 m. CABLE
222 hz

600 W. — 500 W. — 400 W. — 300 W. — 200 W. — 100 W. — 0+00 — 100 E. — 200 E.

LEGEND

——·——·—— IN - PHASE RESPONSE

x—x—x—x OUT - OF - PHASE RESPONSE

INSTRUMENTATION : APEX MAX - MIN II E.M.

GEOTRONICS SURVEYS LTD.

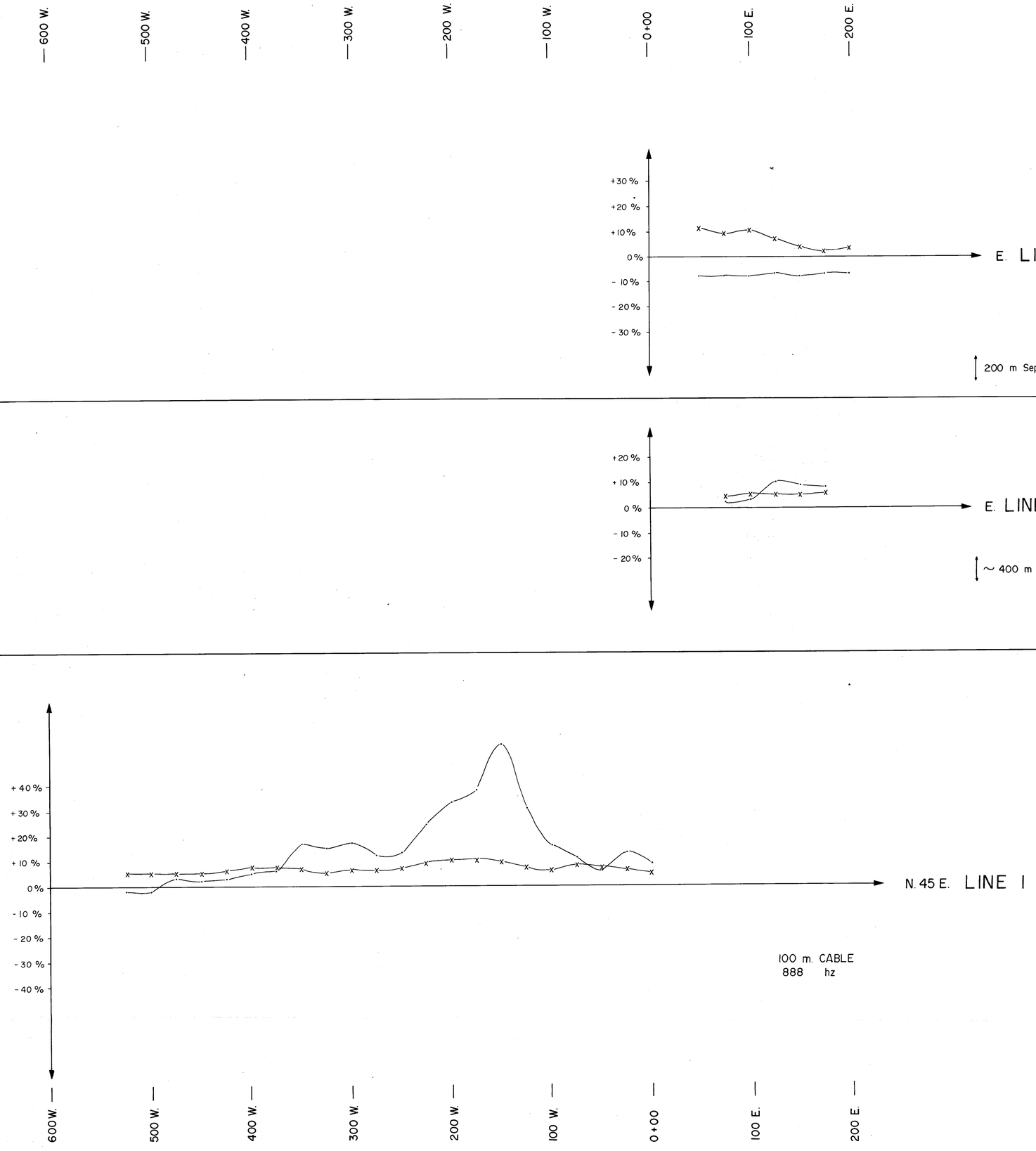
TANACANA MINES LTD.

WINGDAM #6

WINGDAM LAKE , B.C. CARIBOO MINING DIVISION

MAX. MIN. II
ELECTROMAGNETIC SURVEY
PROFILES

DRAWN BY:	JOB NO:	DATE:	SCALE:	SHEET NO:
P.L.	81-33	JULY, 1981	1: 2500	W#6 - 1



LEGEND

IN - PHASE RESPONSE

OUT - OF - PHASE RESPONSE

INSTRUMENTATION : APEX MAX - MIN II E.M.

GEOTRONICS SURVEYS LTD.

TANACANA MINES LTD.

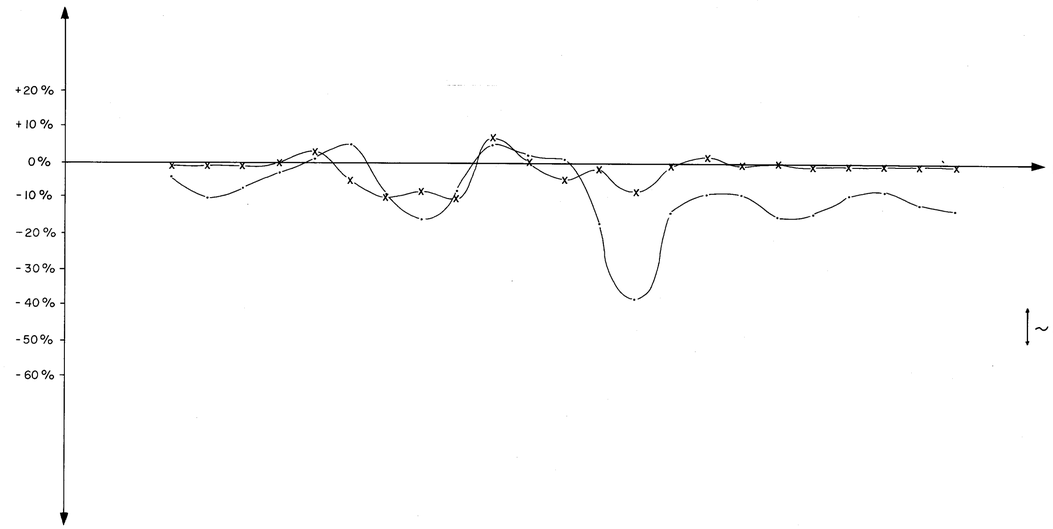
WINGDAM #6

WINGDAM LAKE, B.C. CARIBOO MINING DIVISION

MAX. MIN. II
ELECTROMAGNETIC SURVEY
PROFILES

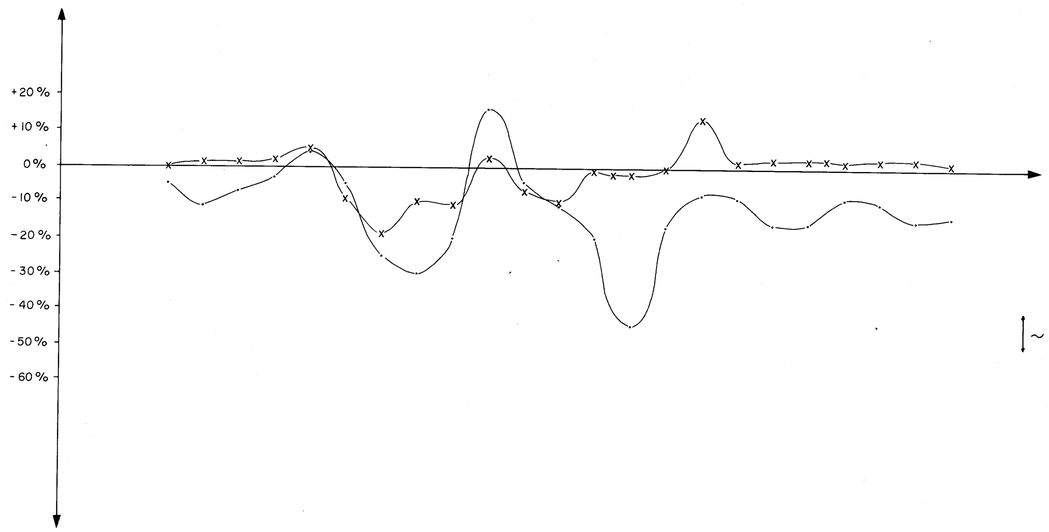
DRAWN BY:	JOB NO:	DATE:	SCALE:	SHEET NO:
P.L.	81-33	JULY, 1981	1: 2500	W#6-2

600 W. — 500 W. — 400 W. — 300 W. — 200 W. — 100 W. — 0 +00



~ 200 m Separation to line I S.

50 m CABLE
222 hz



~ 200 m Separation to line I S.

50 m CABLE
888 hz

600 W. — 500 W. — 400 W. — 300 W. — 200 W. — 100 W. — 0 +00

LEGEND

——·——·—— IN - PHASE RESPONSE

x—x—x—x OUT - OF - PHASE RESPONSE

INSTRUMENTATION : APEX MAX - MIN II E.M.

GEOTRONICS SURVEYS LTD.

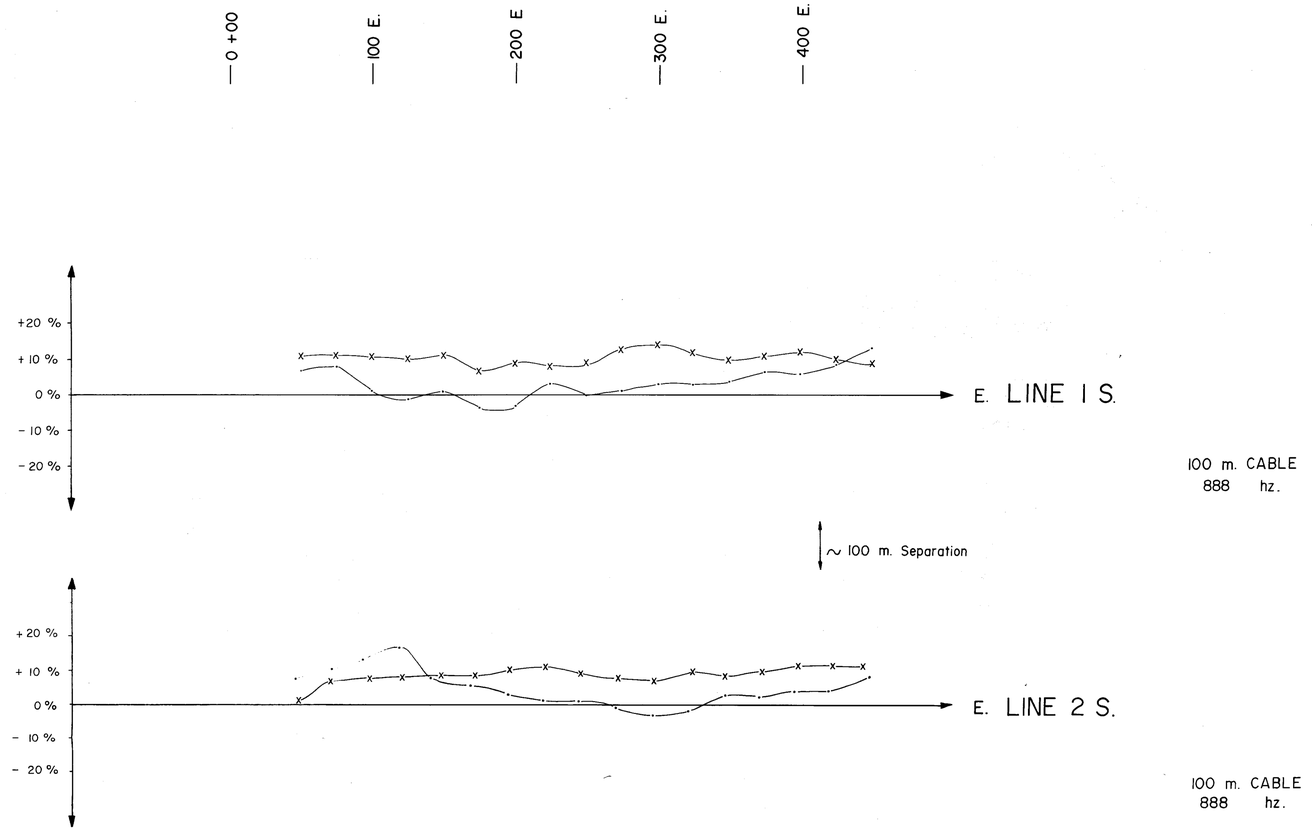
TANACANA MINES LTD.

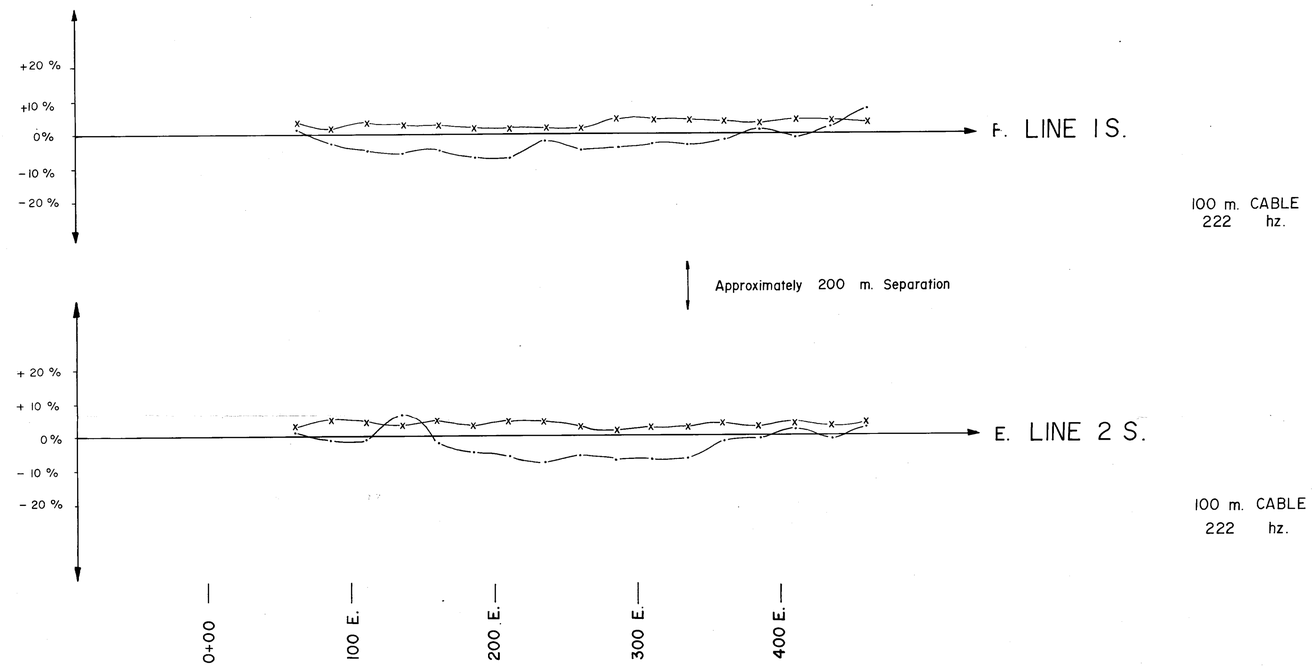
WINGDAM # 7

WINGDAM LAKE , B.C. CARIBOO MINING DIVISION

MAX. MIN. II
ELECTROMAGNETIC SURVEY
PROFILES

DRAWN BY:	JOB NO:	DATE:	SCALE:	SHEET NO:
P.L.	81-33	JULY, 1981	1: 2500	W#7 - 1





LEGEND

—·—·— IN - PHASE RESPONSE

x—x—x—x OUT - OF - PHASE RESPONSE

INSTRUMENTATION : APEX MAX - MIN II E.M.

GEOTRONICS SURVEYS LTD.

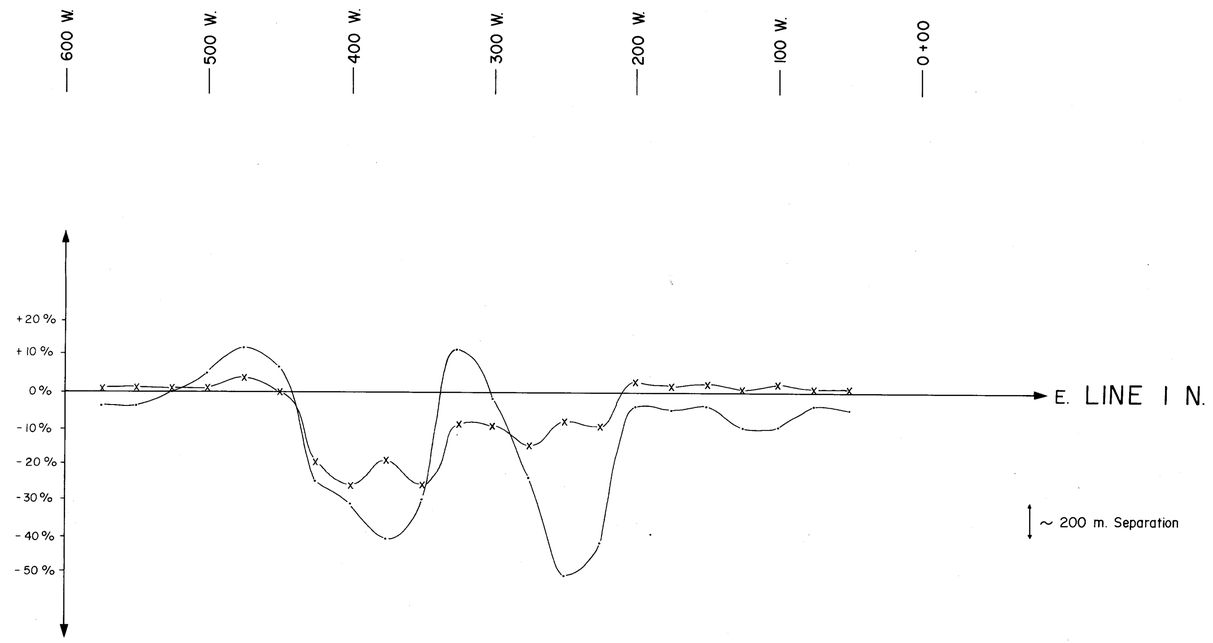
TANACANA MINES LTD

WINGDAM # 7

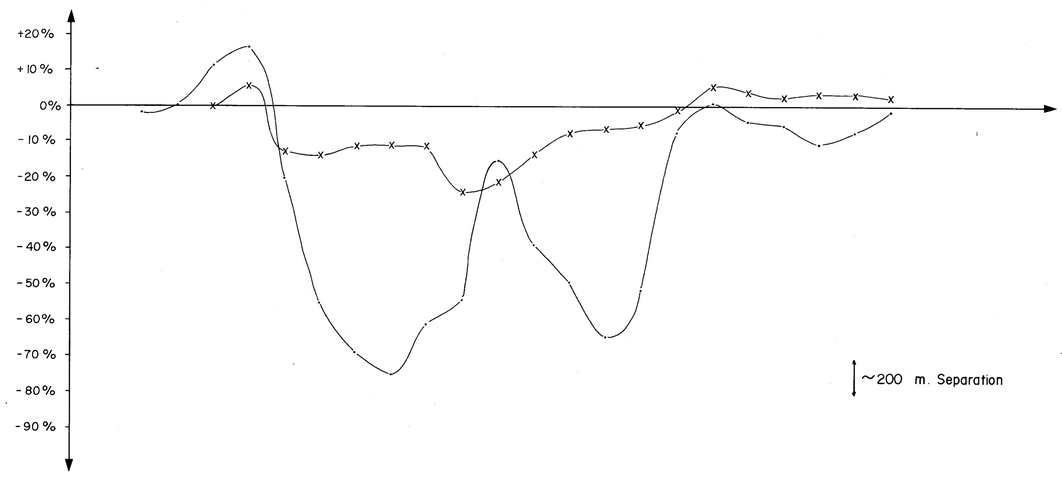
WINGDAM LAKE , B.C. CARIBOO MINING DIVISION

MAX. MIN. II ELECTROMAGNETIC SURVEY PROFILES

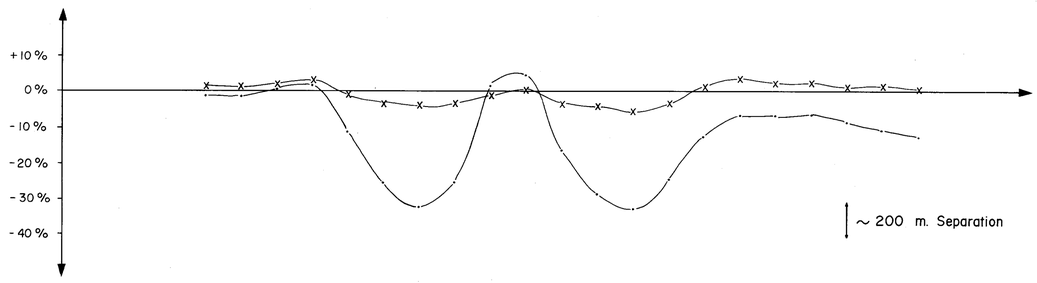
DRAWN BY:	JOB NO :	DATE:	SCALE :	SHEET NO:
P.L.	81-33	JULY, 1981	1: 2500	W# 7 - 2



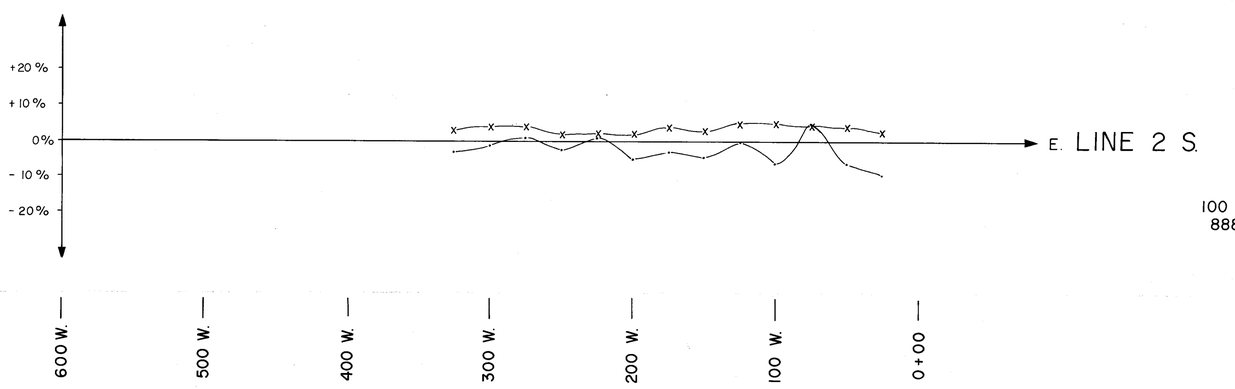
50 m. CABLE
888 hz



100 m. CABLE
888 hz



100 m. CABLE
888 hz



100 m. CABLE
888 hz

LEGEND

—·—·—·— IN - PHASE RESPONSE

x—x—x—x OUT - OF - PHASE RESPONSE

INSTRUMENTATION : APEX MAX - MIN II E.M.

GEOTRONICS SURVEYS LTD.

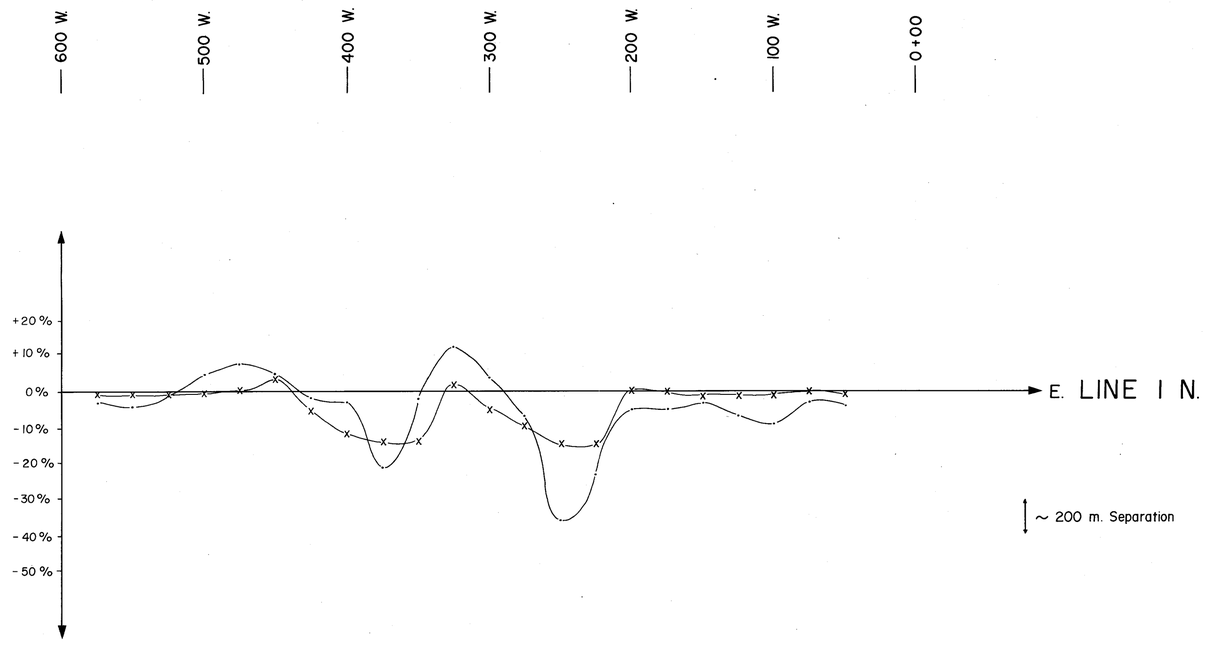
TANACANA MINES LTD.

WINGDAM # 7

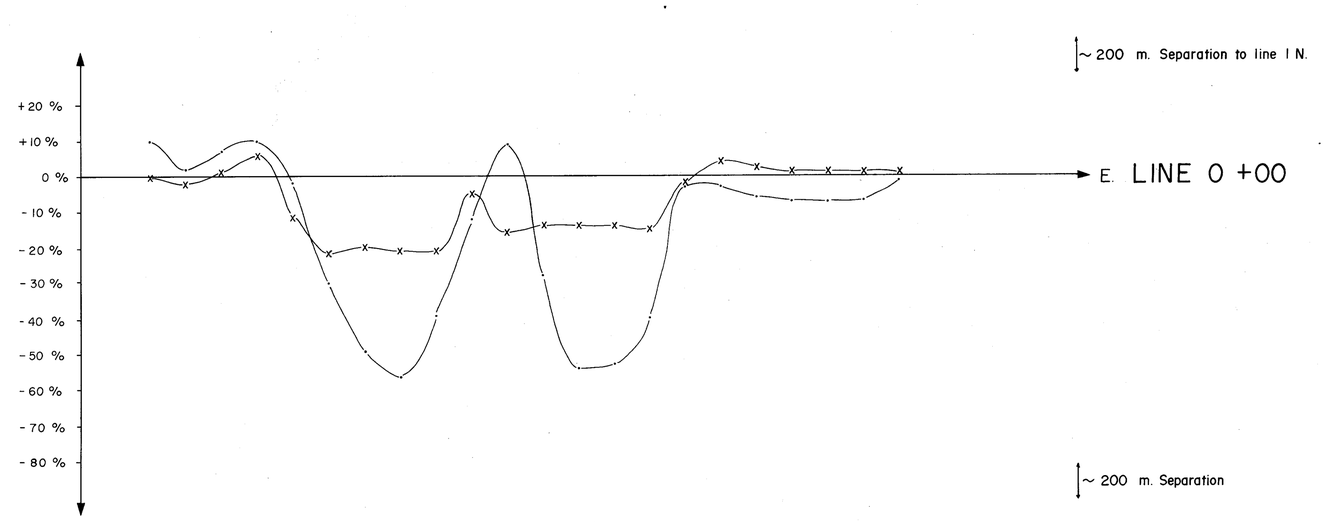
WINGDAM LAKE , B.C. CARIBOO MINING DIVISION

MAX. MIN. II
ELECTROMAGNETIC SURVEY
PROFILES

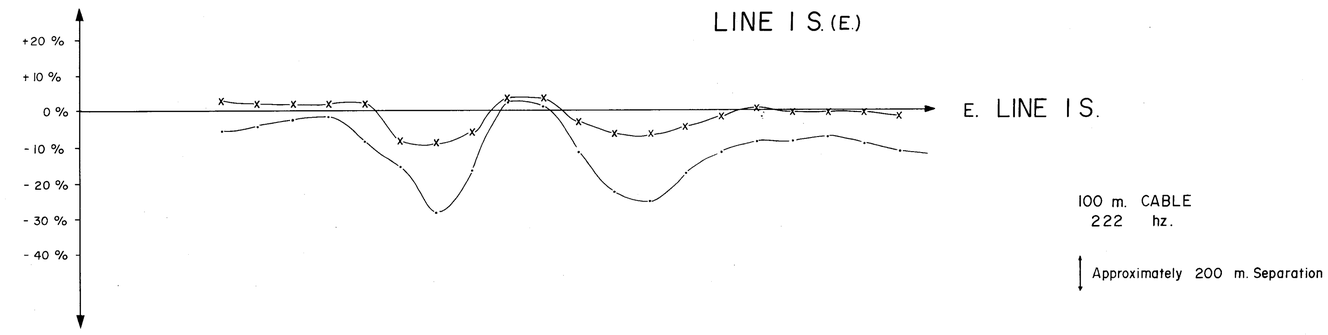
DRAWN BY:	JOB NO :	DATE:	SCALE :	SHEET NO:
P. L.	81-33	JULY, 1981	1: 2500	W# 7 - 3



50 m. CABLE
222 hz

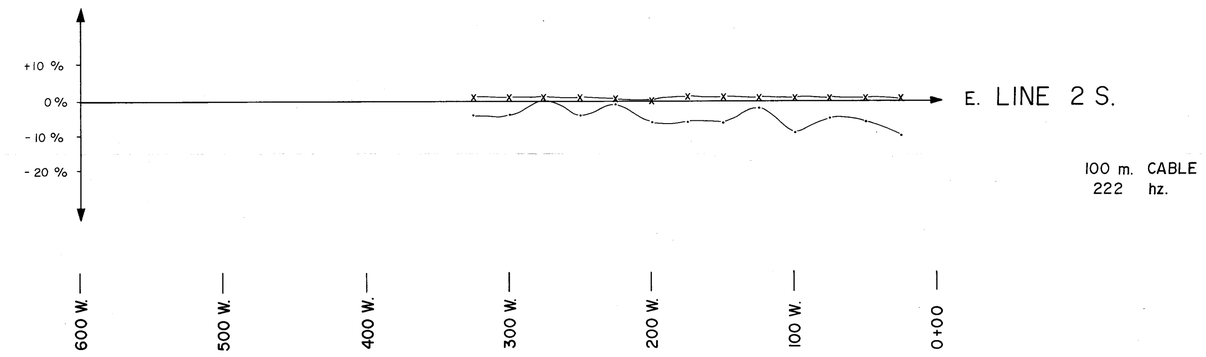


100 m. CABLE
222 hz



100 m. CABLE
222 hz.

Approximately 200 m. Separation



100 m. CABLE
222 hz.

LEGEND

IN-PHASE RESPONSE

OUT-OF-PHASE RESPONSE

INSTRUMENTATION : APEX MAX-MIN II E.M.

GEOTRONICS SURVEYS LTD.

TANACANA MINES LTD.

WINGDAM # 7

WINGDAM LAKE, B.C. CARIBOO MINING DIVISION

MAX. MIN. II
ELECTROMAGNETIC SURVEY
PROFILES

DRAWN BY:	JOB NO:	DATE:	SCALE:	SHEET NO:
P.L.	81-33	JULY, 1981	1: 2500	W# 7 - 4