Geophysical Report on

Ground Magnetometer Survey of

X-AT-Hobo-Matt Group of Mineral Claims

for

Canadian Johns-Manville Co. Ltd.

Box 1500, Asbestos, Que.

Covering: X claims 1,2-8, Record Nos. 11554(0),11556(0)-11561(0)

X claims 13-18, Record Nos. 11566(0), 11571(0)

AT claims 7-8, Record Nos. 14613(0)-14614(0)

AT claims 10-18(Fr.) Record Nos. 14615(0)-14623(0)

Hobo claims 91,93,95,105-106,108,218, Record Nos. 8969,

8971,8972,8973, 8983,8984, 8986,10486B.

Matt claims 1-8, Record Nos. 2441M-2448M.

Located: 1) 59° 42'N, 133° 26'W

- 2) N.T.S. Map 104N, Atlin
- 3) On Boulder Creek, 12 miles N.E. of Atlin, B.C.

Work Done: December, 1972

Report: February, 1973

Submitted by:

L.J. Schoen

4253

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Department of

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ASSESSMENT REPORT

NO 4253 MAP

Leon Schoen

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INTRODUCTION

During the period December 5-13, 1973 a ground magnetometer survey was carried out over the Boulder Creek grid on the X-AT-Hobo-Matt mineral claims owned by Canadian Johns-Manville Co. Ltd. These claims lie $1\frac{1}{2}$ miles southwest of the Adanac Ruby Creek Molybdenum body and are of interest for their possible mineralization potential and land use value.

Geochemical surveys in 1970 and 1971 (Conn& Lin, 71, Schoen 72) have indicated minor anomalies in a number of elements. The present survey was done to investigate possible correlations between magnetic response (susceptibility variations) and mineralization, geology and/or structure.

Location and Access

These claims are located at the headwaters of Boulder Creek in the Atlin Mining Division, British Columbia about 12 miles northeast of Atlin and 3 miles upstream from Surprise Lake. The property can be reached in summer by 4 wheel drive vehicle and winter by snowmobile or snowshoes along a secondary road to Surprise Lake thence a rough road up the west side of Boulder Creek. The geographical coordinates of the X-At-Hobo-Matt claim group are 39° 42'N. 133°22'W on the N.T.S. sheet 104N, Atlin.

Physiography and Vegetation

The elevation of the claim group ranges from 4500 feet at the south end to 5,600 feet at the northeast corner with local relief of about 1100 feet (Flate 25). Boulder Creek Valley strikes north-south and slopes gradually up to Mt. Leonard, and peaks along the Ruby-Boulder Creek divide to the north. The southern slopes of these

and the

peaks are generally steep but rounded in form.

The valley floor and slopes are covered with a semi-continuous layer of glacial till. A carpet of alpine vegetation extends up to approximately 4700 feet where outcrop and talus screes commence.

The development of soils under these conditions is very slow with some organic A-horizon and negligible B-horizon, followed by an intermixture of grey glacial till and broken bedrock forming the C-horizon.

Climate

Climatologically the area is in a semi-arid continental zone. Summer temperatures may reach more than $+80^{\circ}\text{F}$. Brisk southerly winds are fairly constant with sudden rain showers occuring frequently. Winter conditions prevail from November to April with continuous snow cover in excess of 3 feet with much drifting and surface wind packing. Winter lows may reach -60°F with strong frequent winds.

General Geology

The main part of the claim group is underlain by Ruby Creek Alaskite which froms a small outlier of the Cretaceous Surprise Lake Batholith. The extreme southern area of the claim group is underlain by greenstones, volcanic greywacke, and derived amphibolite (Aitken 1959) of the Fermian Cache Creek group which is intruded by 2 small Permian ultrabasic bodies. An outcrop of steatized ultramafic rock containing small amounts of short asbestos in shear zones and a few pods of banded limestone occurs on the ridge immediately south of Aidt Peak. The postulated outline of the ultramafic body (Aspinall 1970) lies to the east of line 36 north.

Within the area of Alaskite there occurs mostly coarse and

fine grained "laskite with numerous float occurrances of quartz and quartz-feldspar porphyry (Aspinall, 1970).

a 20 foot wide aplitic dike trending northeast-southwest with high Fe staining. The NE section of the survey area contains occasional quartz veins to 2 inches thick with (Fe, Mn) Wo₄. About 3000' east of 40N-36E is the abandoned adit of the Black Diamond Tungsten Mine which has W bearing quartz veins striking on the average N45°E (Little 1959).

Magnetometer Survey

A. Grid Control

In December 1972 the previously established Boulder Creek geochem grid (1971) was resurveyed and extended by Brunton and chain methods. A total of 23 line miles of grid was surveyed over the claim group. A Northeast-southwest baseline was established along the location line of the X1-8 claims. Northwest-southeast offset lines were established at 400' intervals and extended by flaged and marked pickets at 200' intervals to 1200 NW and 3600 to 5200 feet SE. A tieline was established for control at 2600 feet East parallel to the baseline.

B. Instrumentation & Method

Two McPhar M-700 battery operated fluxgate magnetometers were used for the survey. This instrument is light (84 pounds), easy to read, quite temperature stable and of rugged construction. The variation in strength of the vertical component of the earth total magnetic field was measured relative to an established base station. Readings were taken at 100 foot intervals along most lines for a total of over 1200 readings. Readings were taken facing either east or west to eliminate as much as possible reading variations, from slight

movement of the instrument due to the horizontal component of the field. Both east and west facing readings were taken at a number of stations to determine the orientation error of each instrument. Two main bases were established during the survey. The operators read a main base station at least twice a day, at the beginning and end of traverses or an auxillary base as often as time, terrain and weather would permit for construction of each days durinal curve. The instruments were allowed to become cold saturated before use. One instrument used a battery pack carried beneath the operators coat and the other its regular internal battery supply. While both instruments gave similar and consistant readings, it was found that the useful life of the batteries carried within the instrument in the cold weather was much shorter than that of the batteries in the bally pack. The magnetometers were used on their most sensitive scale readable to +- 5 gammas.

C. Corrections:

After compilation of an orientation error for each machine the data was corrected to all east facing readings. Durinal curves were made from base station data and corrections applied. Data was then reduced to the two main base stations and then to the main base at O NS and O EW. A baseline correction was then applied to bring the data into agreement with the baseline values. Any suspicious linear magnetic trends parallel to the survey lines can be ascribed to imprecision in the durinal curves andthe relatively narrow range of magnetic values making the data very sensitive to small uncorrected differences between lines. This problem could be substantially reduced in future surveys by a similar magnetometer with a chart recorder set up each day at a base station to give a precise durinal curve.

Data Presentation

The raw magnetic data was plotted as individual line cross sections (plates 3-24) to make preliminary interpretation of the survey. The reduced data was plotted as a composite cross section map (Plate 2) and as a vertical field strength contour map (Plate 1.) A contour interval of 25 gammas was selected.

d. Discussion and Interpretation of Results:

There are a number of inherent errors possible in ground magnetic data. The vector angle of the earths field in the survey area is assumed to be constant over so small an area as the Boulder Creek grid and therevore of no effect on the survey if the field is assumed constant. Long period changes in total field vector angle could also affect the results as well as durinal variations. durinal variations are corrected out and long period variations are assumed not to have been effective over the time span of the survey. Remanent magnetism in the rocks could have a large affect on the overall data or just in areas of rocks with strong remanent magnetism. Unless otherwise stated it is assumed that any remanent magnetism is parallel to and in the direction of the present day earth field. Another possible error source is due to increased overburden thickness in some areas of a grid and subsequent attenuation of inductive effects. Boulder Creek area this is not felt to be a problem of any significance. A final error source previously mentioned is bias due to the rectangular grid used in the survey.

The magnetic contour map reveals a number of lineations and small areas of anomalously high or low values. As previously stated mag. lineation parallel to the crosslines are for the most part disregarded as grid error. However, a number of lineations cut the grid lines.



A linear of relative magnetic lows occurs from 325-14 E toward 20S-6E. A trend subparallel to this goes from 28S18E northerly to 8N-0+0. These trends crosscut the common vein trends in the area (normally northeast). This may represent a change in phase in the Alaskite or possibly a fault crosscutting the area.

The entire survey area exhibits a tendency to higher values in the northeast half and lower values in the southwest half. This is probably due to different phases of Alaskite. Aspinall's map indicates that the northern half of the survey area is underlain mostly by coarse Alaskite with less fine Alaskite and porphyry than the southern half (Aspinall 1970). Such rock distribution could be responsible for the magnetic pattern.

Around 36 E from lines 24N to 36N are 2 linear highs trendings NE-Sw. These are very narrow and contain the highest values of the survey and possibly represent a thin near surface continuation of veins of similar strike from the northeast around the Black Diamond Tungsten Mine. These highs are symetrical in crossection and suggest a causative source dipping to the southeast. The form of the curves can be vaguely traced along their trend to the southwest (Plate 2) where they again become strongly evident around 22 to 34E on lines 45 to 85 and around 22-29E on lines 245 to 325. This may be a continuation of the vein or a structural trend.

In as much as greenstone occurs just to the south of the survey area the magnetic high and associated low area to its northeast occuring at the southeast end of the tieline may instead be caused by subcrop of this rock or the ultrabasic plug intruded into the greenstone. Simmlarly if one discounts the northeast-southwest continuing trend previously described, the area of high and low around lines

85 to 4 N-22 to 36E may well be due to a small ultrabasic plug or greenstone mega inclusion. The form of these anomalies suggest a shallow near vertical magnetic source. Unfortunately the nature of the data prevents clearer determinations of depth to or shape of causative sources

Two linear highs centered at 20N 48E and 12N 56E with assocriated lows to the southwest suggest magnetite bearing veins dipping southeasterly.

A small trend around 20N-4E may be due to similar sources. The high centered around 7S-10W suggests an irregular dike-like source dipping also to the southeast.

Magnetic-Geochemical Correlation

On the whole, comparison of the 1971 Boulder Creek Geochemical results (Schoen 1972) and this magnetometer survey indicate at best scattered irregular and weak correlations. Both positive and inverse correlations are sought in an attempt to determine mag-mineral and/or mag-rock relationships. The northern third of the magnetometer survey extends beyond the area of the geochem survey.

Cu: The most well defined anomaly in the 1971 geochem survey is one of Probable to High Cu values around 0 to 125, 0 to 12E. This and a small Cu anomaly around 0+0-16 to 20 E appear to correlate moderately well with small areas of low magnetic values. Some scattered anomalous Cu values appear to occur generally in a northwest-southeast trend of low magnetic values. The magnetic highs associated with these lows do not coincide with any anomalous Cu values. The pattern is suggestive of a one sided halo of copper around the magnetic highs.

Ph: The Cu and Pb anomalies are for the most part mutually exchasive with a band of scattered, erratic lead anomalies runing east west just south of the copper anomalies. This band of Pb anomaly doesn't appear to have any magnetic correlation.

Zn. Ag: An area of Probable to highly anomalous Zn values lies over an Ag anomaly in the western corner of the 1971 geochemical grid also overlies an area of magnetic low on the east ends of lines 20 to 32S. Scattered anomalous Zn and Ag values occur in the area of gentle magnetic relief between the baseline and tie line.

Mo: An area of Probably anomalous Mo values west of the baseline from 4N to 12S lies just east of a magnetic high on the east ends of lines 8S-4S. Scattered high Mo values occur in the area of gentle magnetic relief between the baseline and tieline.

<u>W</u>: Possible and Probable W values are scattered over most of the survey area but do not appear to exhibit any correlation with magnetic patterns.

Conclusions and Recommendations:

Magnetic response is higher in the north end of the survey area possibly due to phase changes in the underlying Alaskite. A number of magnetic lineations trending northeast-southwest may be due to narrow, near surface magnetite bearing veins and/or small irregular ultrabasic bodies or greenstone mega-inclusions. One magnetic low lineation trending north-south may represent a fault.

There is mostly poor correlation between 1971 geochemical results and magnetic pattern both being for the most part weak and amorphous. An area of anomalous Cu values does appear to correlate with some areas of magnetic lows.

Recommendations:

This survey does not on the whole indicate major structure or mineralization worth holding most of the ground. Magnetic lineations on mineral claims AT 14,15,16 should be checked geologically for possible surface expression and mineralization.

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- 1) Aspinall, N.C. 1968, Report on Geological Mapping Thor and Hobo Claims, Ruby Creek-Boulder Creek, Atlin, M.D., B.C. Assessment Report.
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- 3) Conn, H.K., Lin, C.P.; 1971 Geochemical Report on the X group of claims. Atlin, M.D. B.C. Assessment Report.
- 4) Schoen, L.J. 1972, Geochemical Report on the X Group of Mineral Claims for Canadian Johns-Manville Co. Ltd. Assessment Report.
- 5) Little, H.W., Tungsten Deposits of Canada. G.S.C. Economic Geology Series #17, 1959.

STATEMENT OF QUALIFICATIONS

- I, Leon J. Schoen do hereby certify that:
- 1. I am a geologist employed by Canadian Johns-Manville Co. Ltd. Box 1500, Asbestos, Quebec and Box 69 Atlin, B.C.
- 2. I am a graduate of the University of Montana at Missoula, Montana B.A. geology, 1969.
- 3. I have studied geophysics at the undergraduate and graduate level at the University of Montana and the University of Michigan with The Foundation for Glacier and Environmental Research on the Juneau Icefield, Alaska-B.C.
- 4. I am a member of the following professional organizations:
 - a) The American Geophysical Union
 - b) The International Glaciological Society
 - c) The Foundation for Flacier and Environmental Research.
- 5. I do not have nor do I expect to receive any financial interest either direct or indirect in the X-AT-Hobo-Matt Group of Claims.
- 6. This report is based on the study of published and unpublished data and on field information collected by Canadian Johns-Manville Co. Ltd. personnel.

Leon S. Schoen, Geologist

Boulder Creek Magnetometer Survey

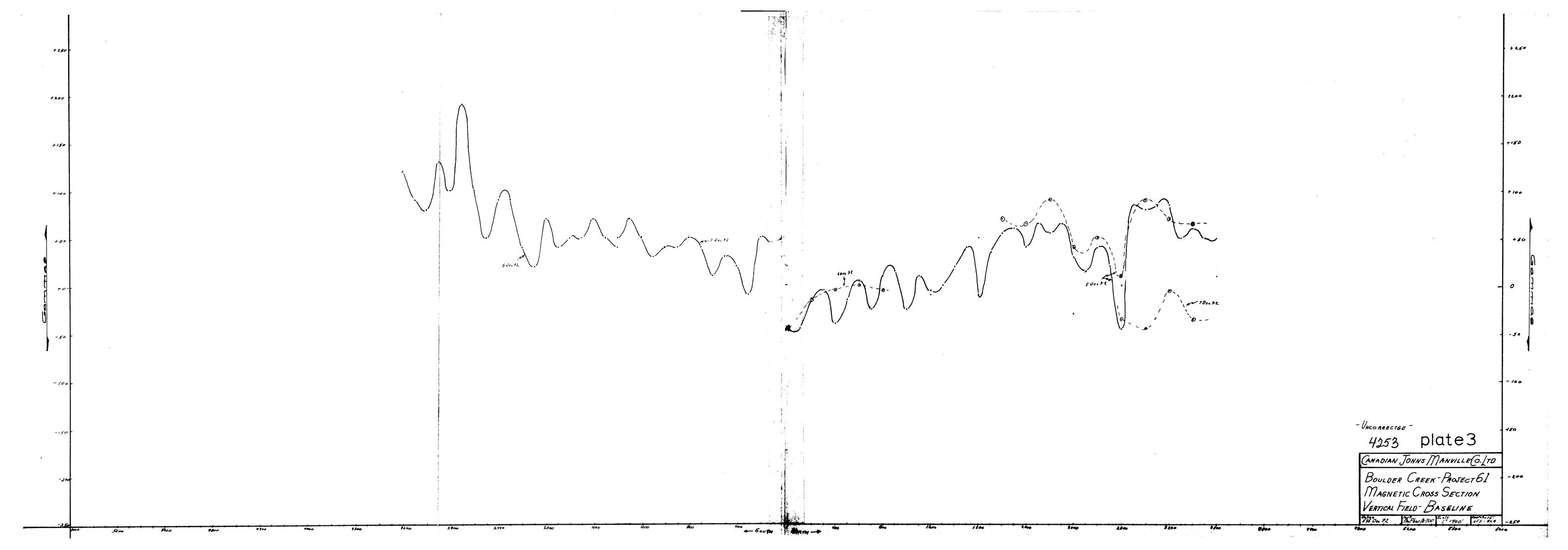
Total

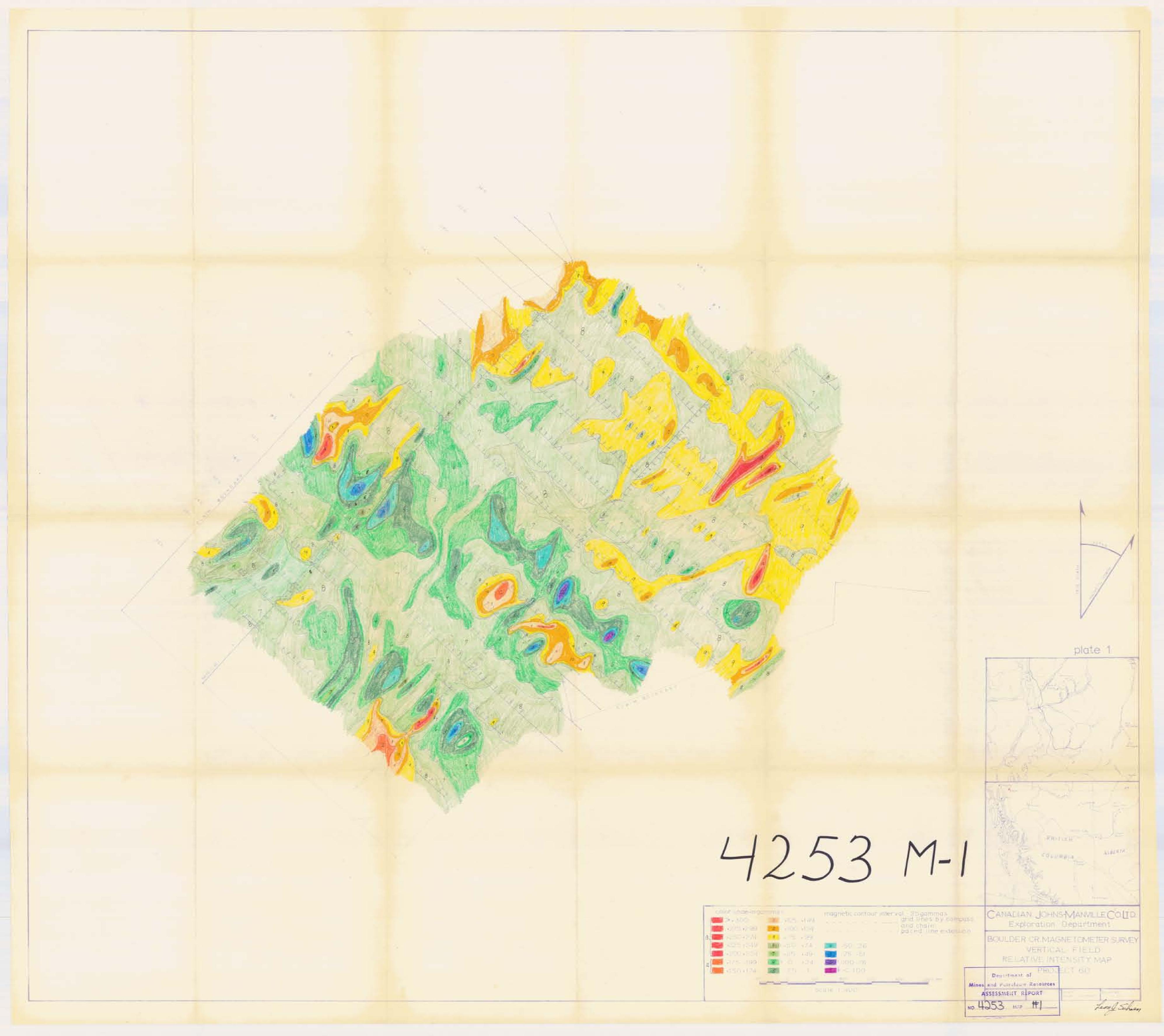
Statement of Costs: December 1972-January 1973

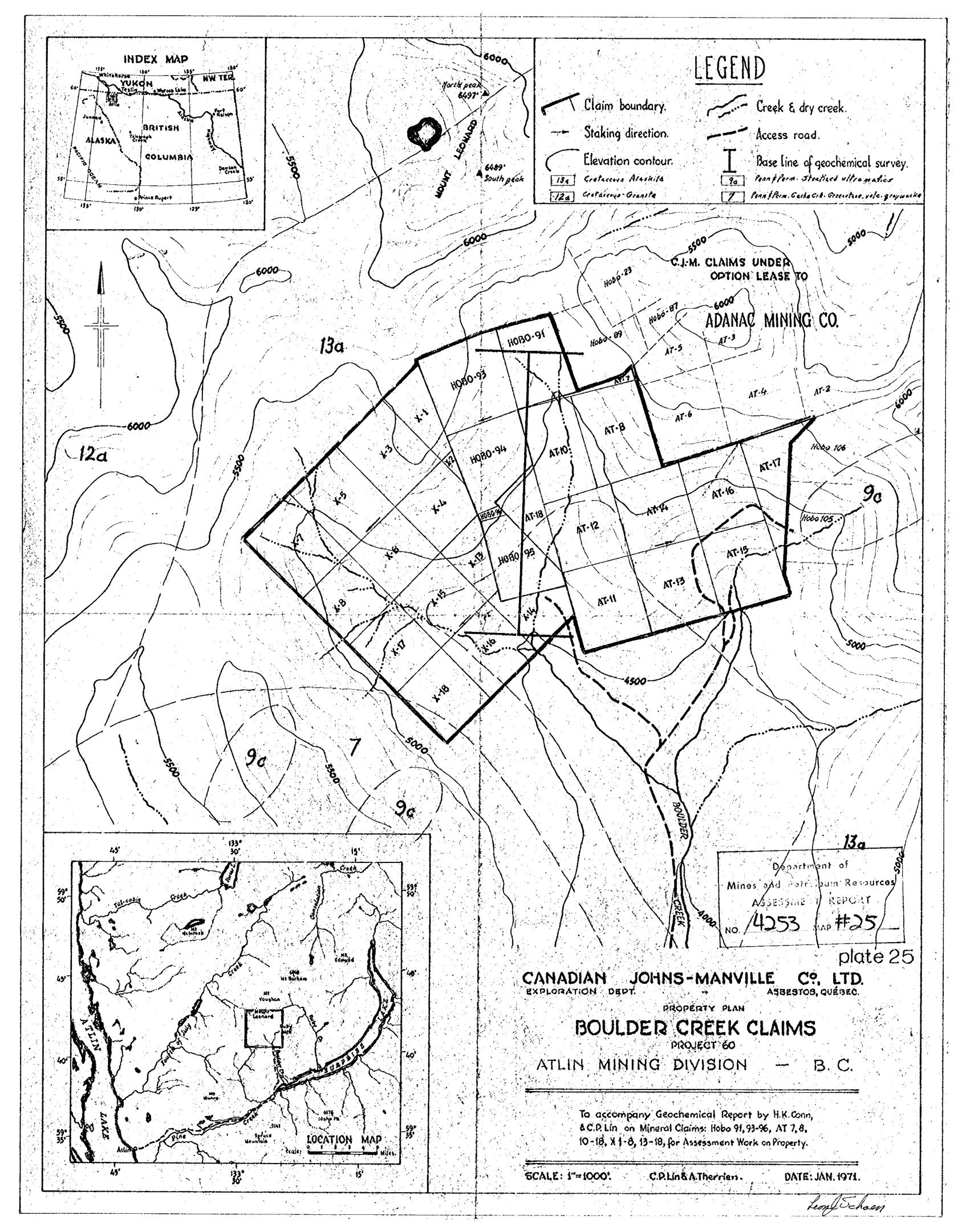
1) Line grid total line miles = 22.08 miles				
a) Contracted 12.68 line miles to G.R. Craft , Atlin	n,	В.	.C. 0 \$80 pe	er
	=	\$1	014.40	
b) Balance of 9.40 line miles done by Co. employees				
1) Charlie Binnie , 8 days @ \$22 per mile	=	\$	176.00	
2) Rick Smith, 8 days @ \$25 per mile	±	\$	200.00	
Magnetometer Operators:				
a) C. Aspinall, Atlin, B.C. @ \$54.16 per day	=	\$	433.28	
b) L. Schoen, Atlin, B.C. @ \$36.00 per day	=	\$	252.00	
Magnetometer Rental:				
1) Rental 1 Mcphar M-700 for 29 days @ \$9.50 per da 2) Air Express shipping charges Kamloops-Atlin-Kam.				
2) All mapless shipping charges hamitoops-Attin-ham.	**-	•	44.00	
Transportation				
Skidoo double track rental 5 days @ \$25 per day				
Gasoline for 2 skidoos and 4 x 4 vehicle 8 days	=	2	50.00	
Interpretation of Data, Report Writing				
L. Schoen, 20 days @ \$36 per day	=	\$	720.00	
Miscellaneous				
	_	•	40.00	
Typing of Report		-	•	
Reproduction of Maps and Data	=	\$	35.00	

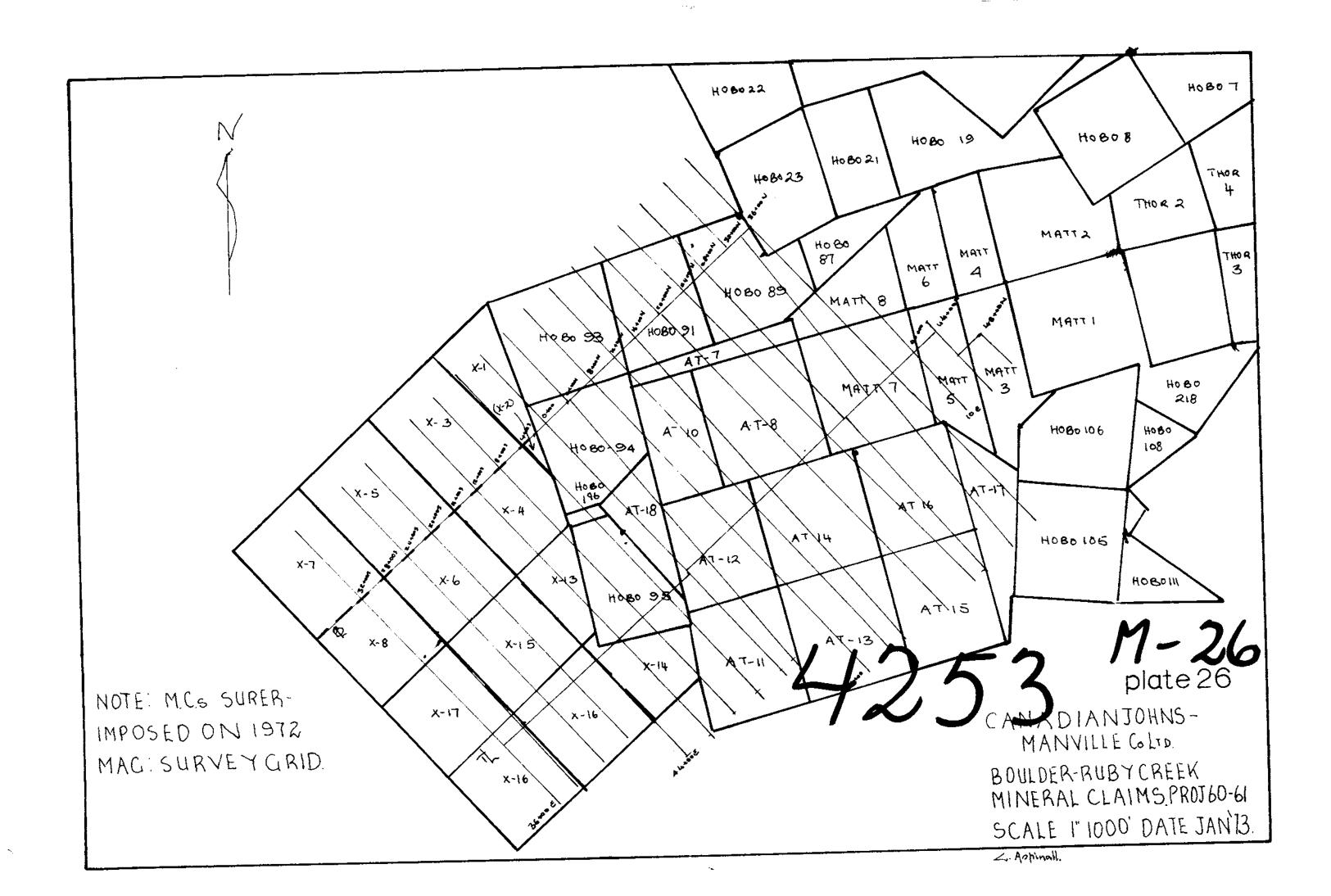
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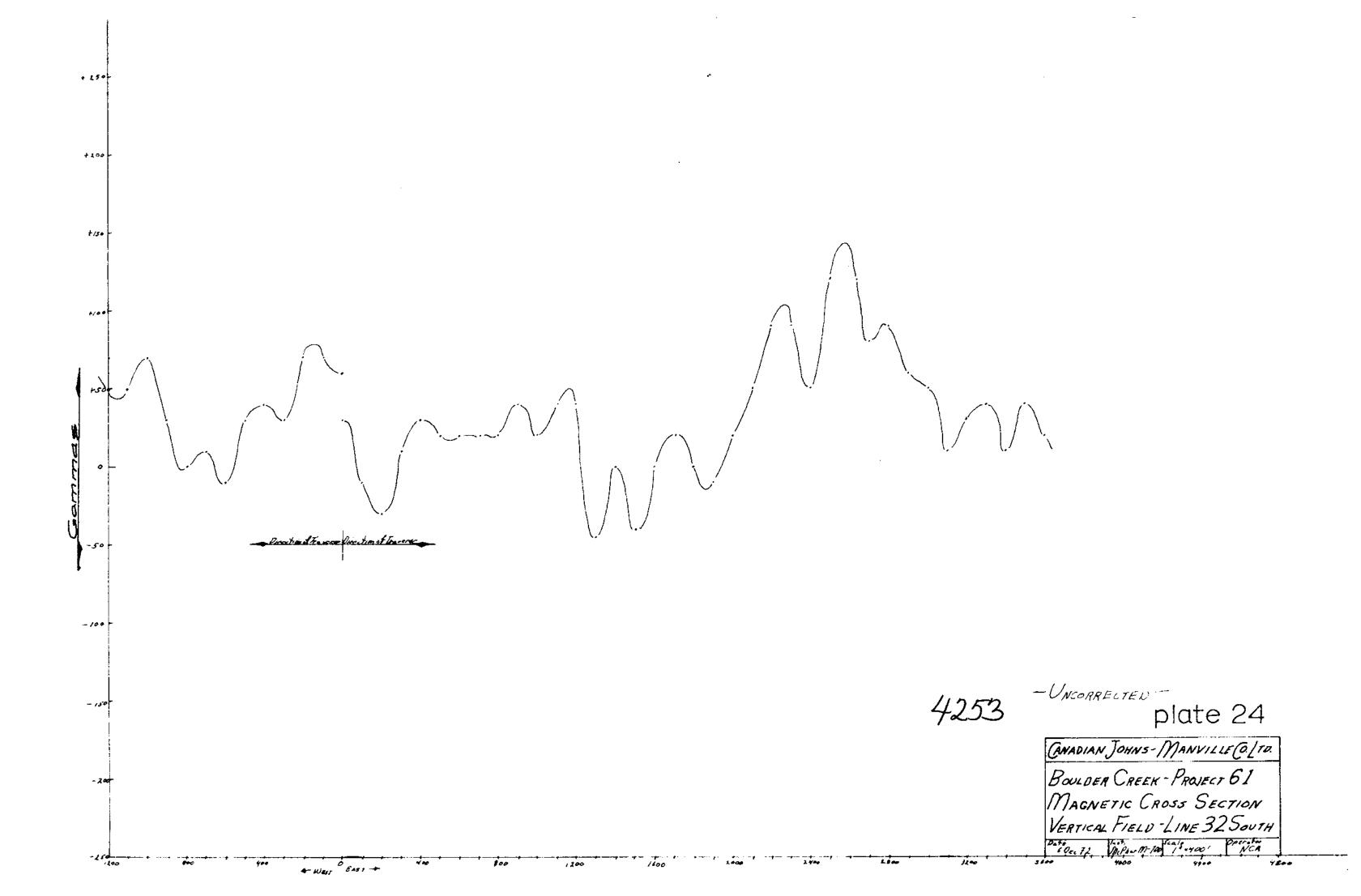
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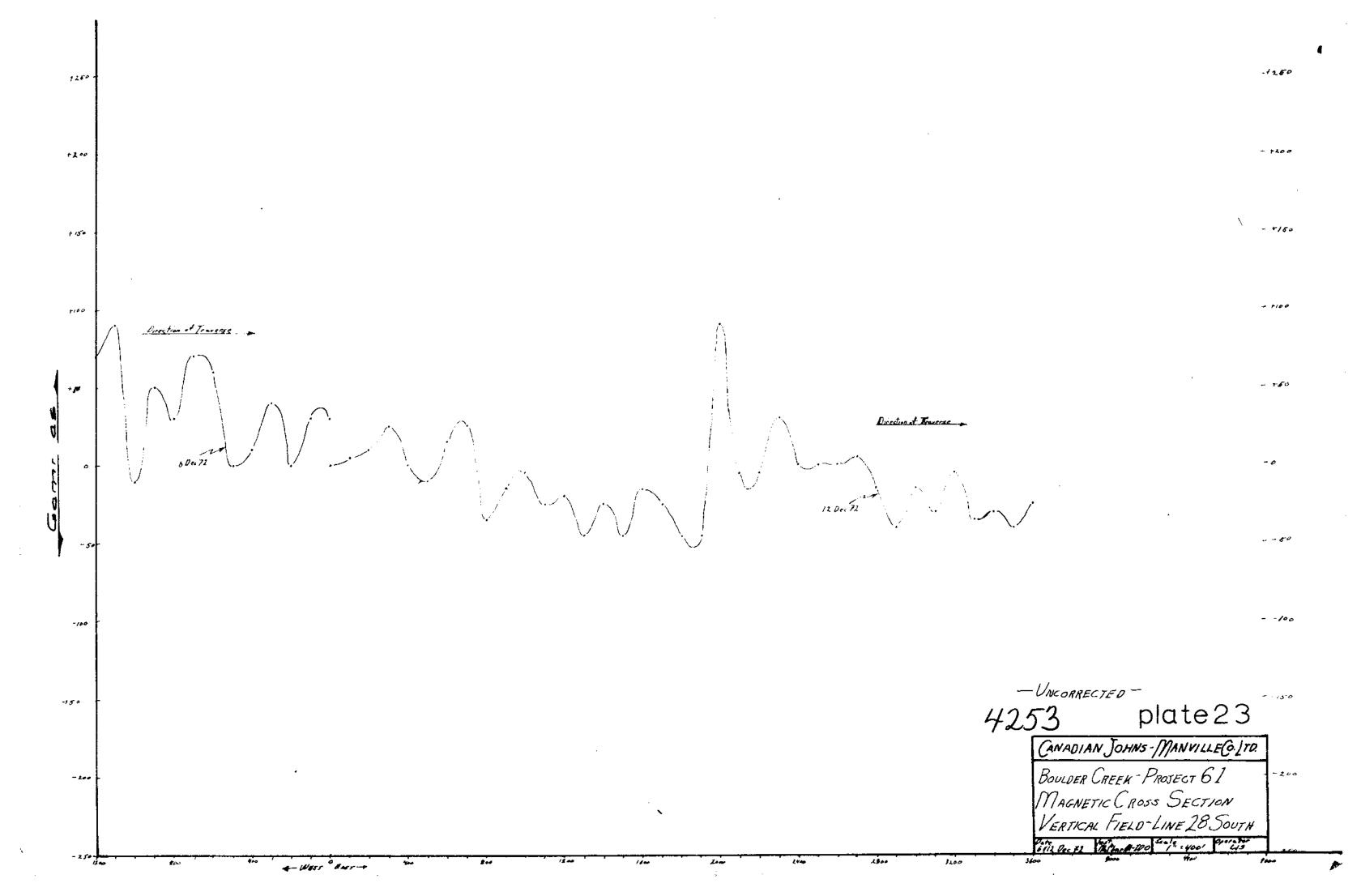


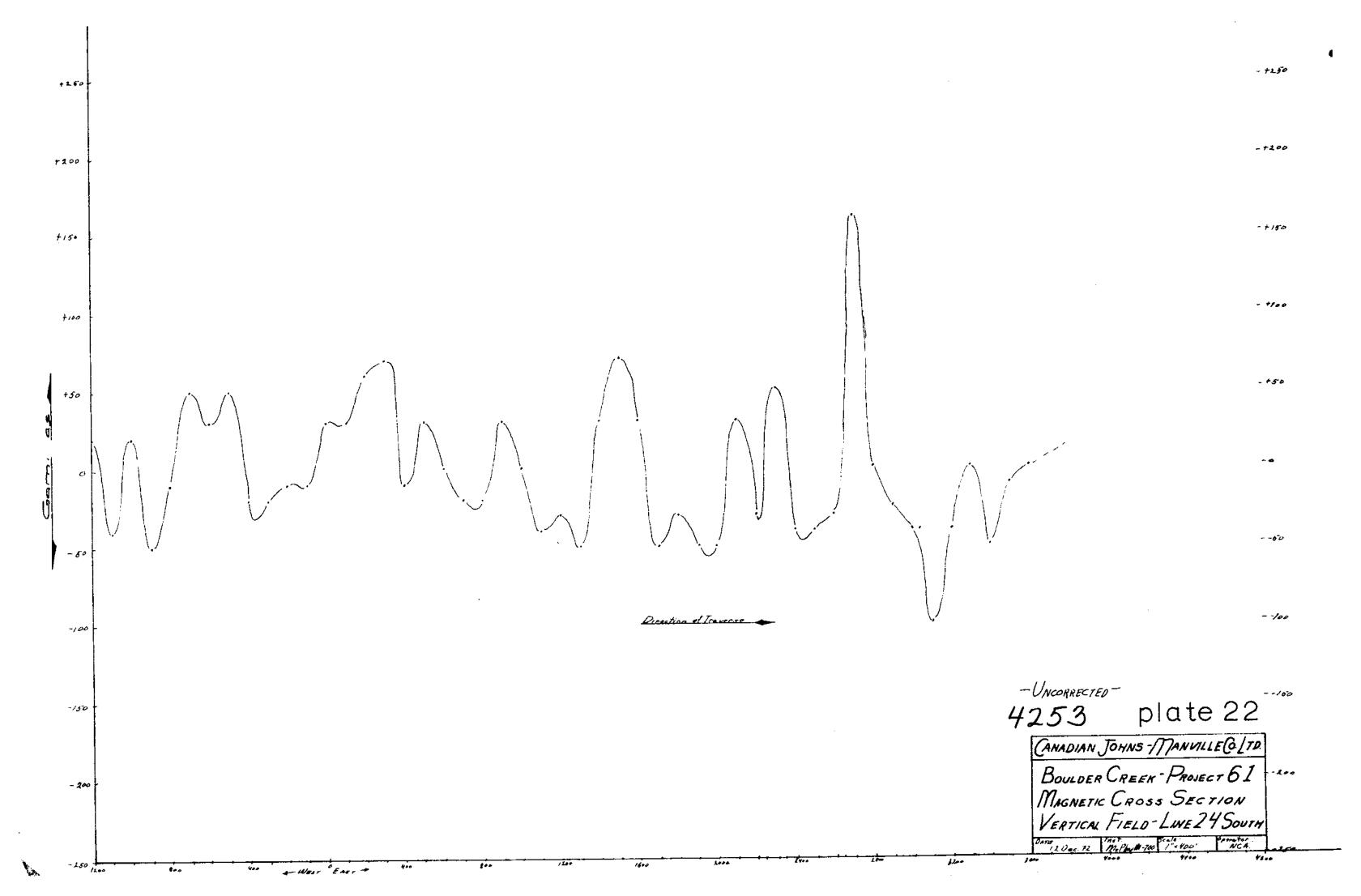


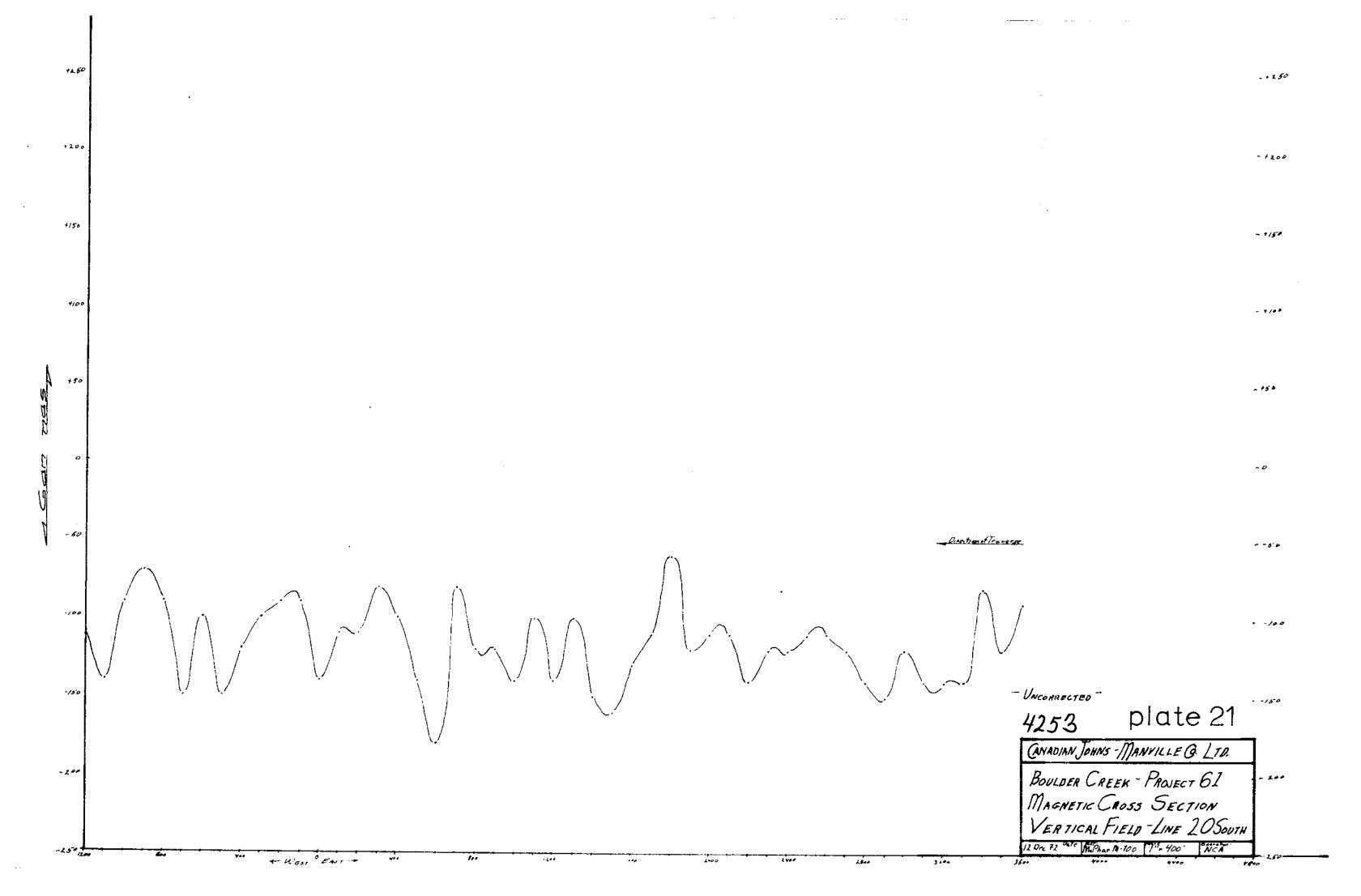


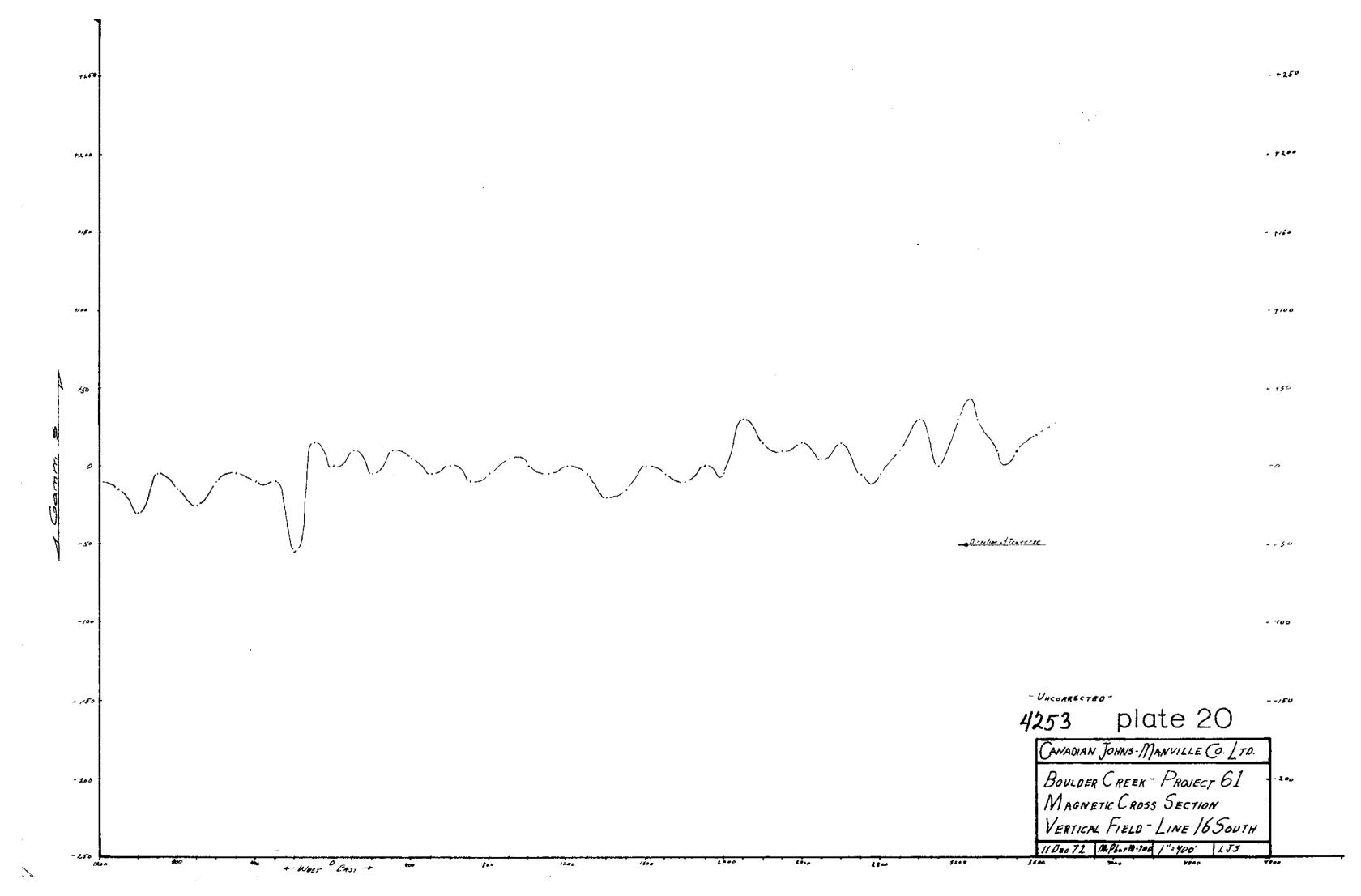


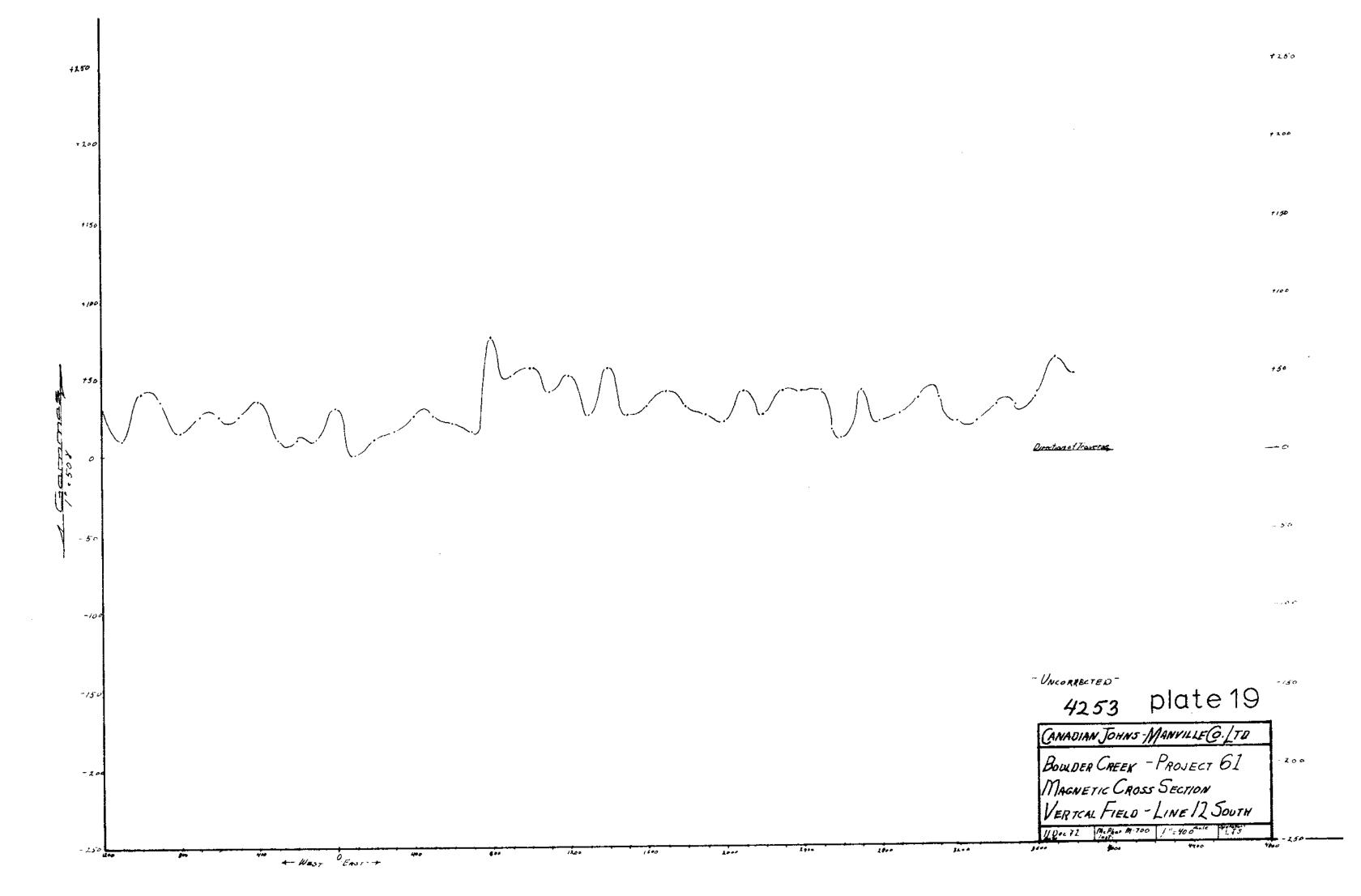


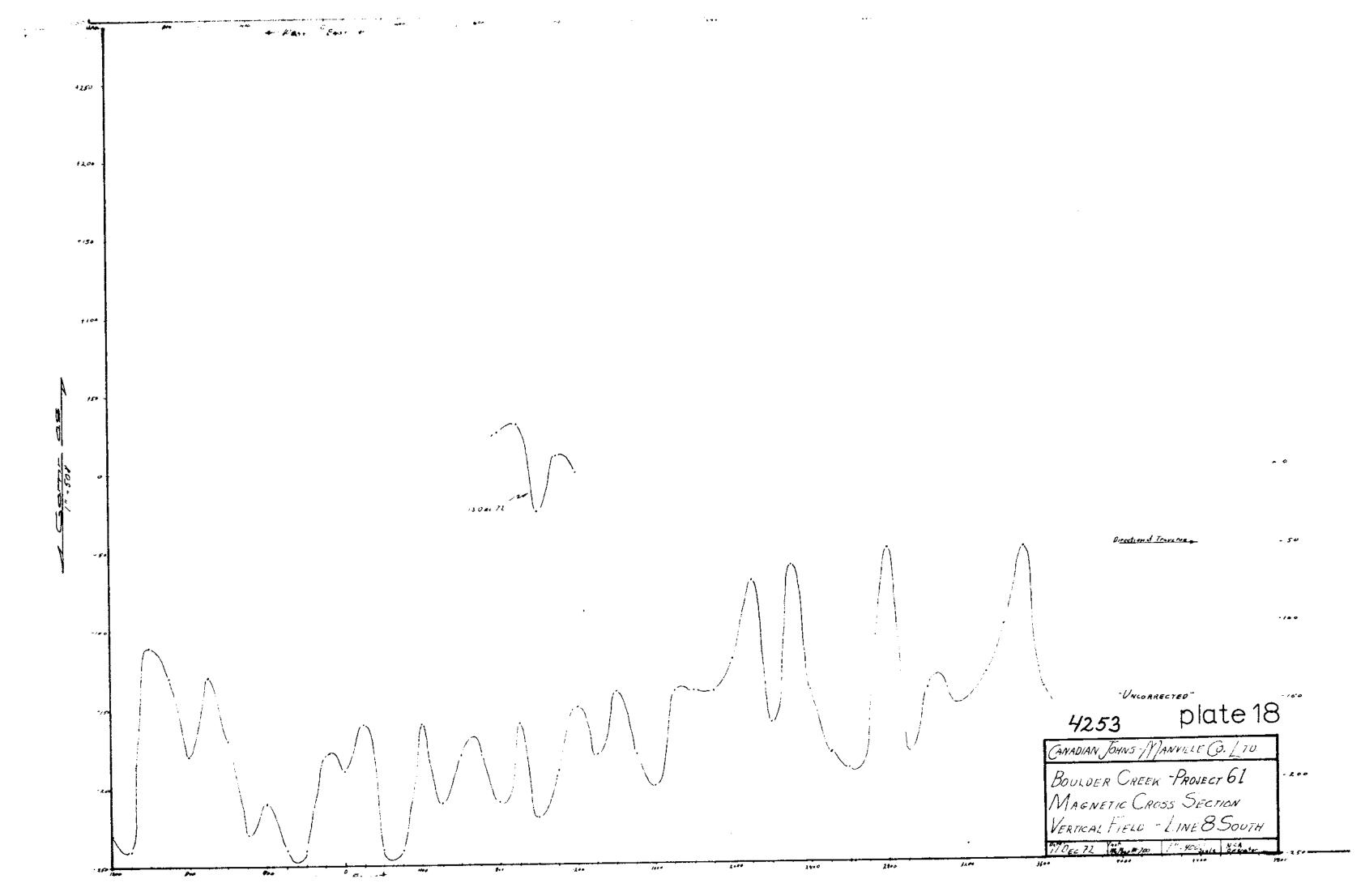


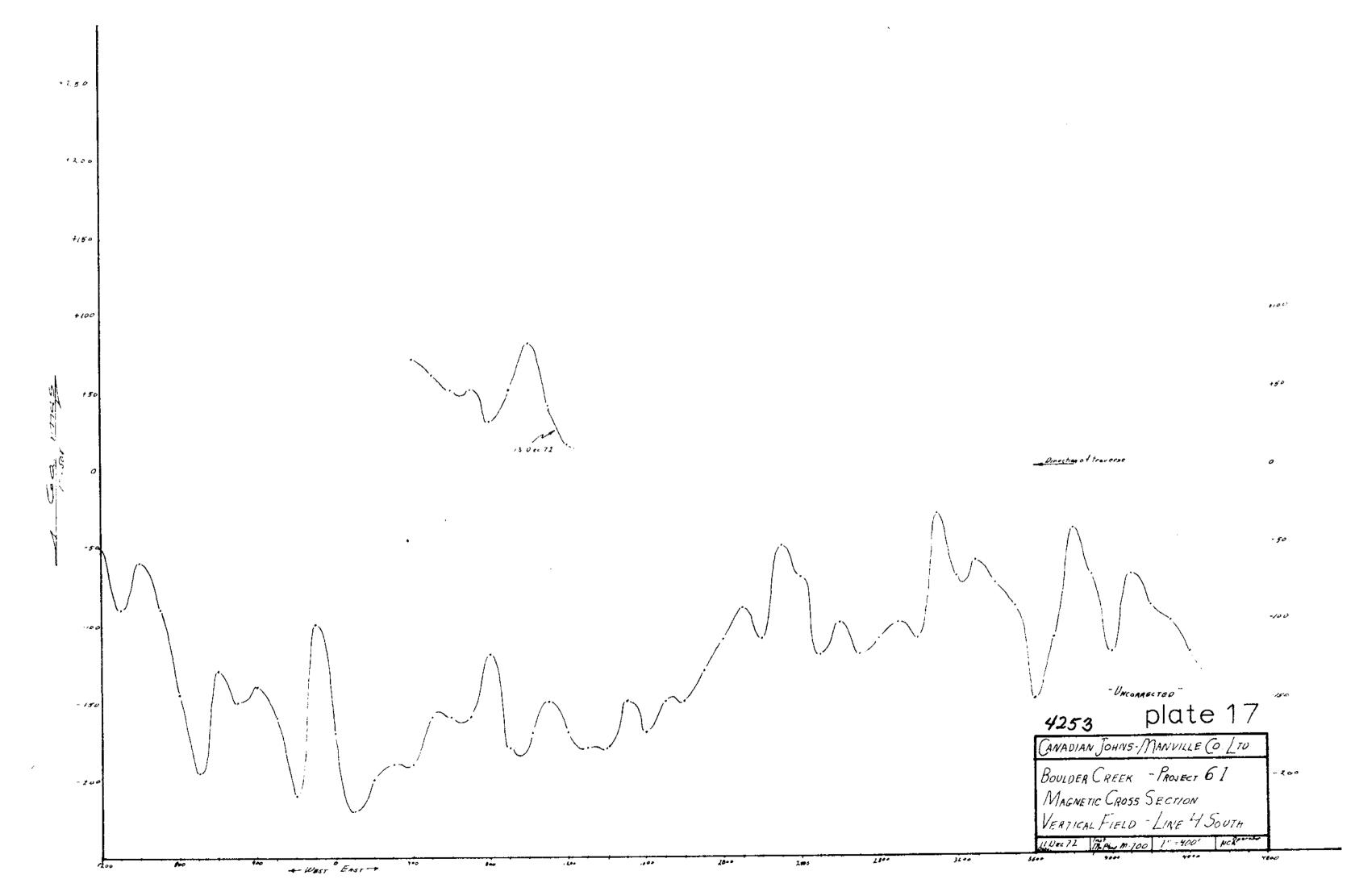


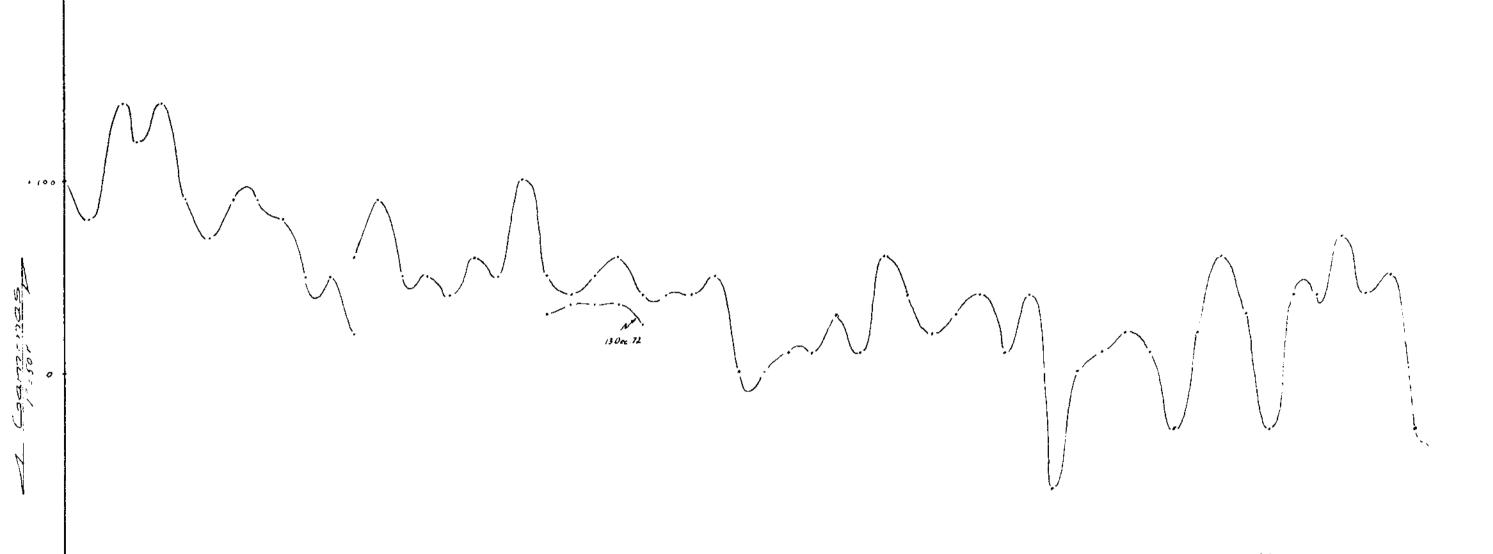












Orection of teneries .

-UNCORRECTED"

plate 16 4253

CANADIAN JOHNS - MANVILLE CO. LTD. BOWLDER CAK - PROVECT 61 MAGNETIC CROSS SECTION VERTICAL FIELD -LINE 0+0

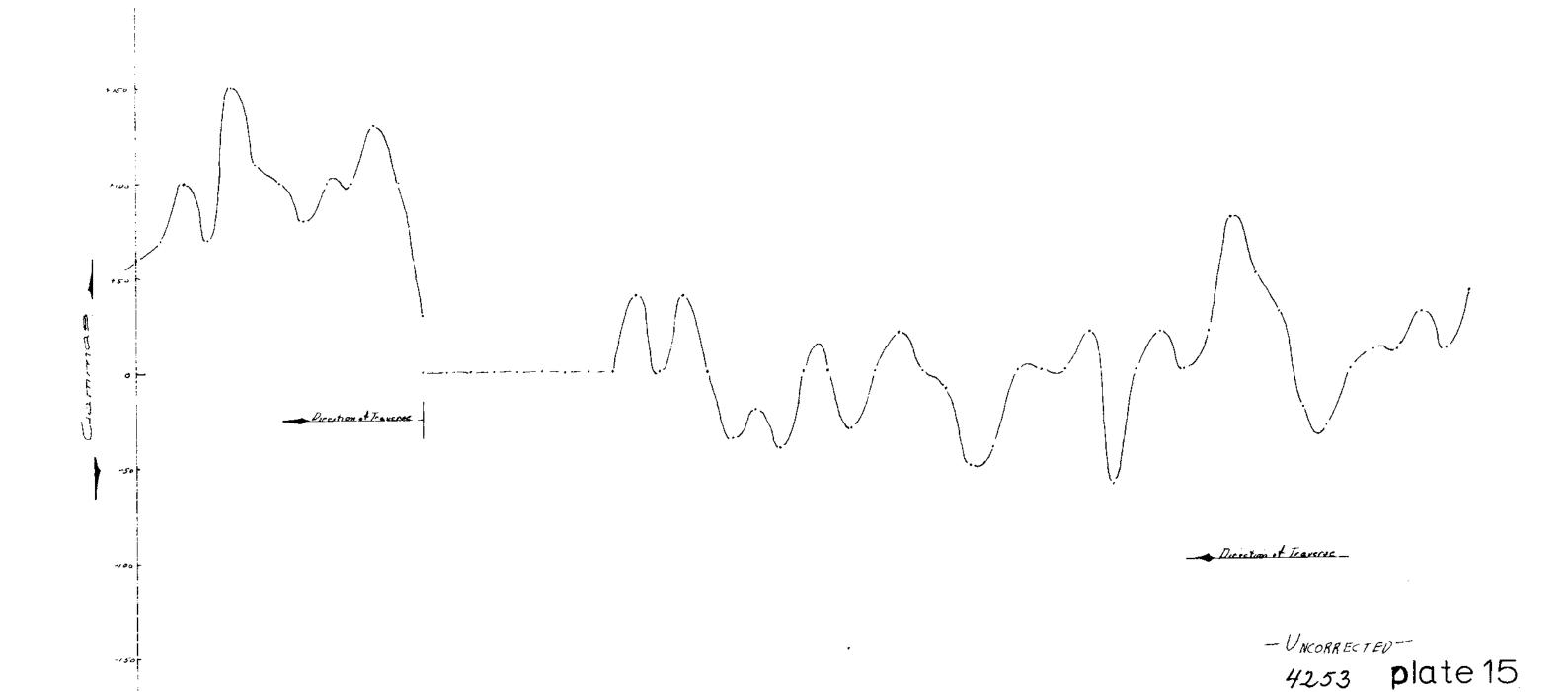
- 200

- /0d

+ 100

Wast East

2 400



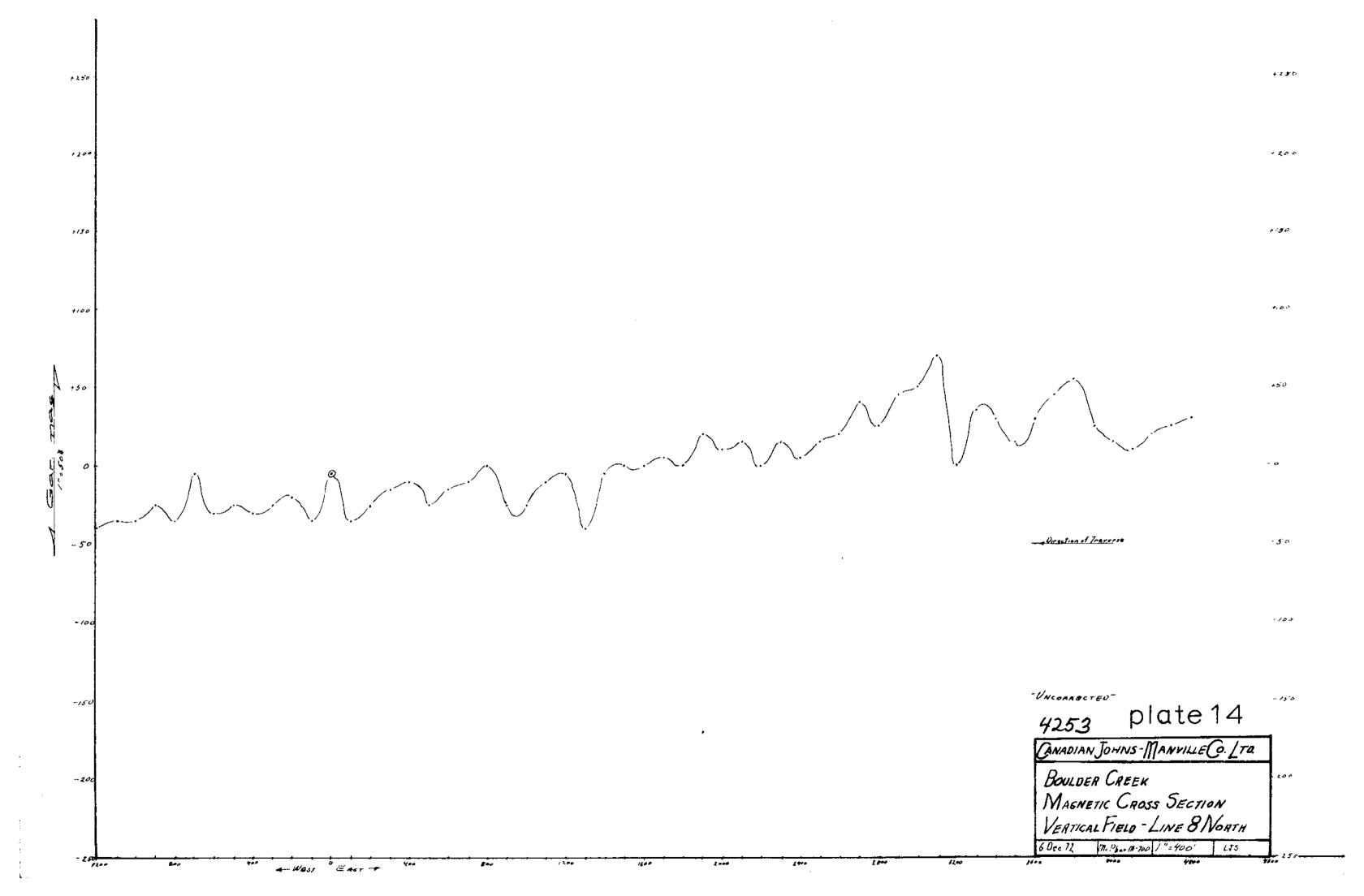
CANADIAN JOHNS-MANVILLE CO. LTD.

BOULDER CREEK-PROJECT 61

MAGNETIC CROSS SECTION

VERTICAL FIELD - LINE 4 NORTH

0 ate 6 Dec 74 DePhat 100 1"-400"



Direction of Traverse

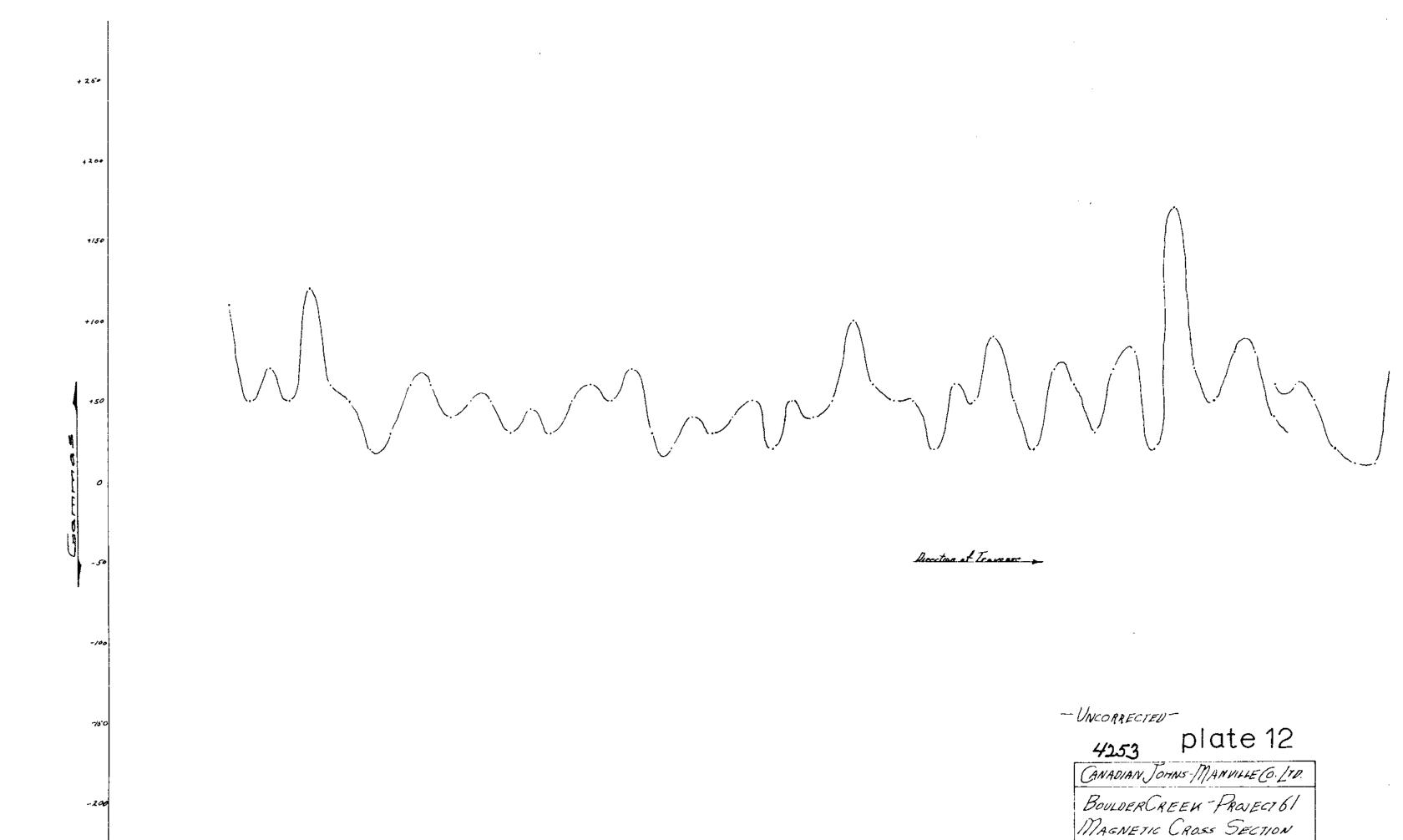
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4253

plate13

CANADIAN JOHNS-MANVILLE CO. LIU. BOULDER CREEK PROJECT 61 MAGNETIC CROSS SECTION VERTICAL FIELD LINE /2 NORTH

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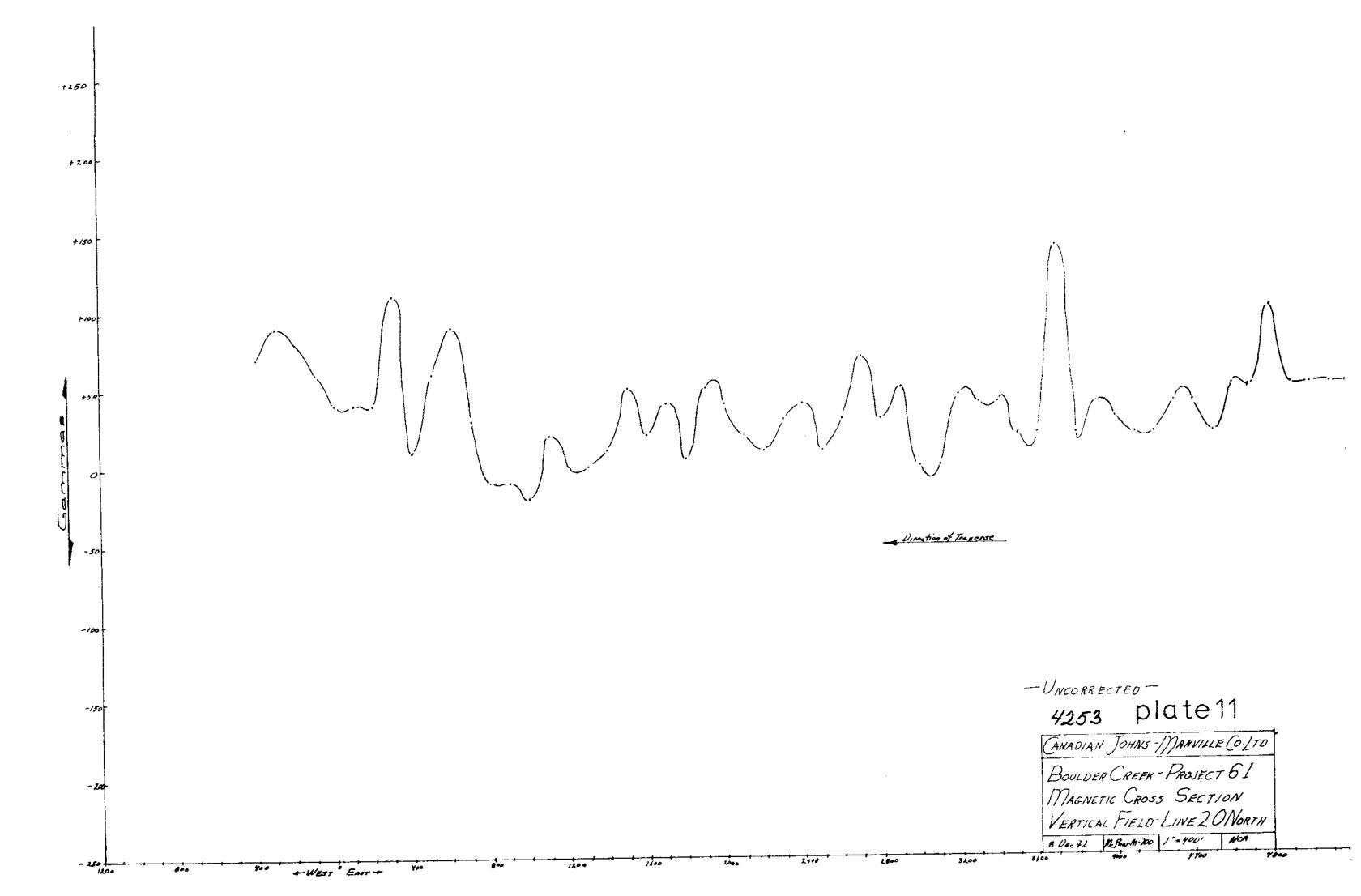


-West Ener-

VERTICAL FIELD LINE BNORTH

800. AL PARTH 100 1"-400" NCA

100.



+250

+200

-50+

13 December 72 Direction of Frances

- WARLOWER - 1821

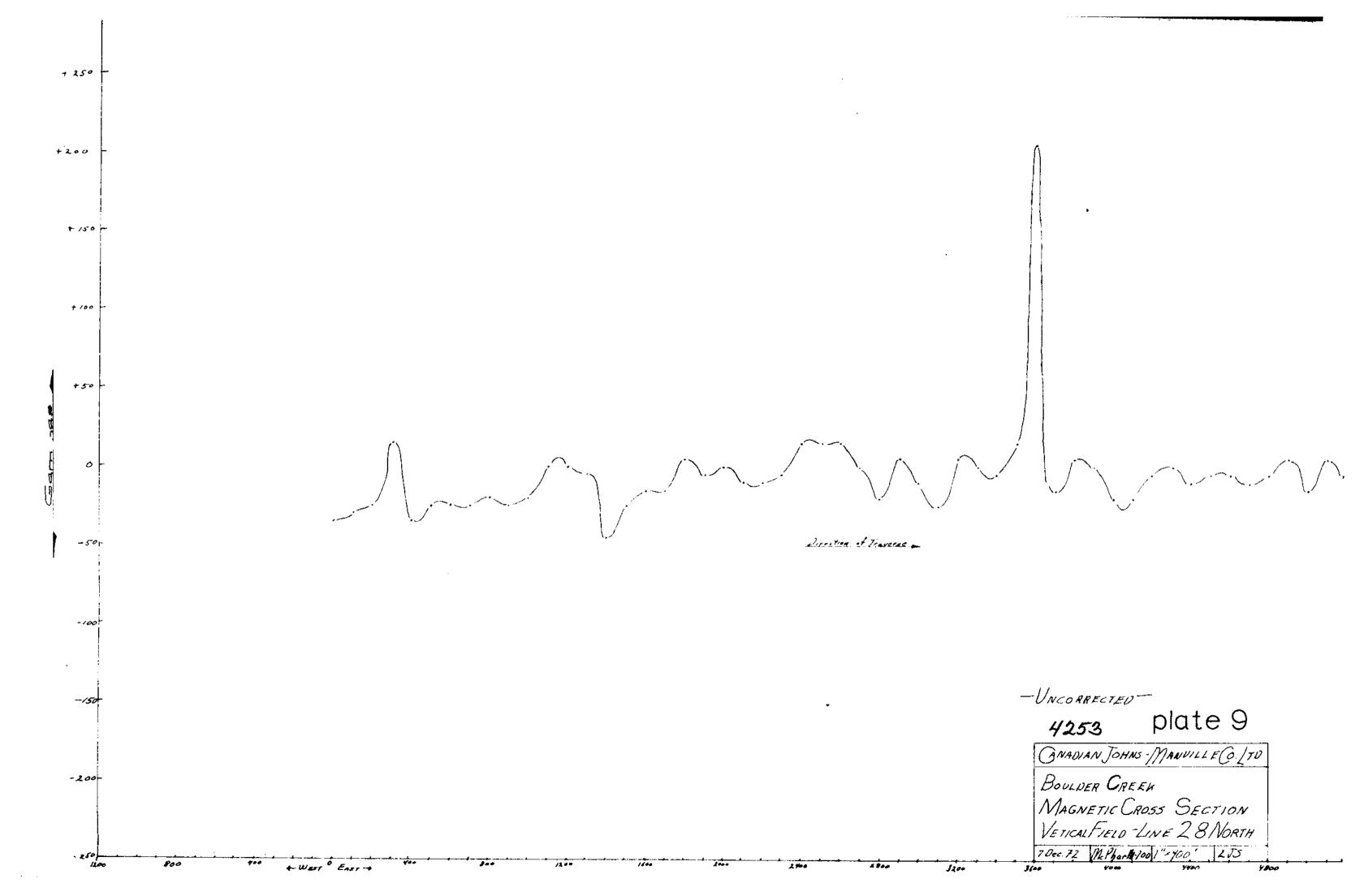
4253 plate 10

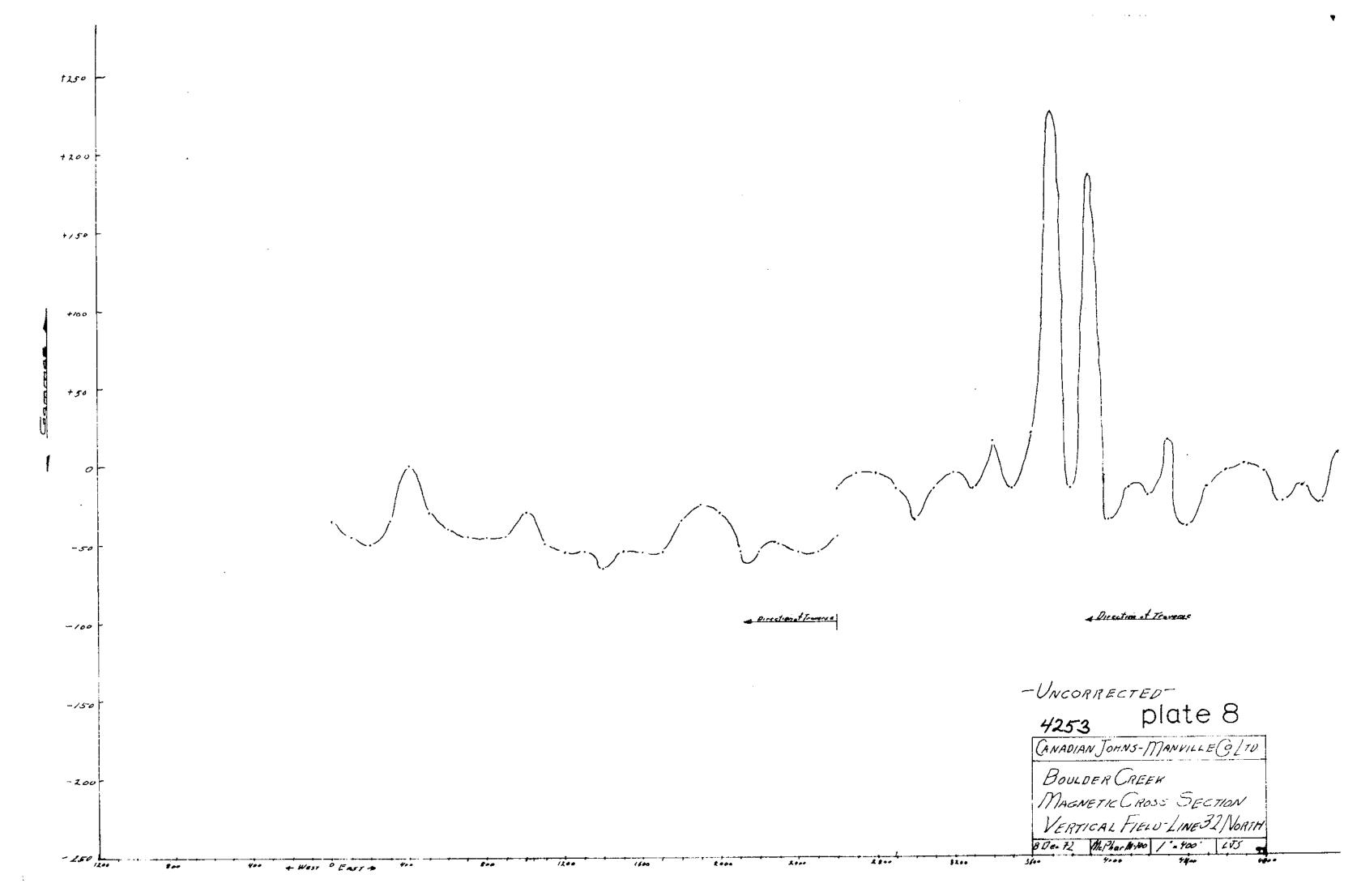
CANADIAN JOHNS-MANVILLE GO. LID.

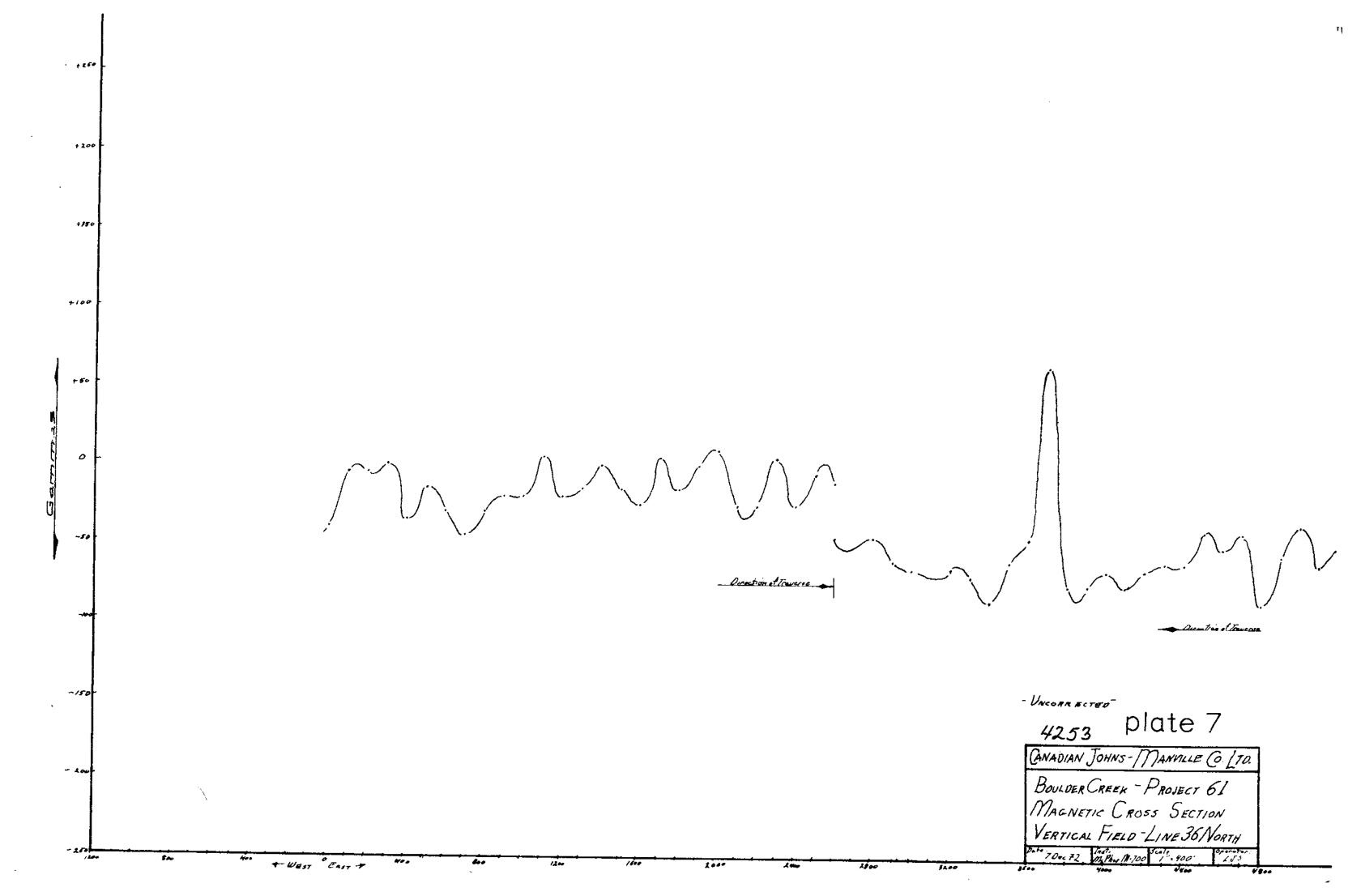
BOULDER CREEK
MAGNETIC CHOSS SECTION.

VERTICAL FIELD - LINE LY NORTH

24/3 Dec 42 1/2 Party 12 1" 100" 1







Operation of Traverse.

- Uncorrected -

4253 plate 6

CANADIAN JOHNS - MANVILLE GOLTD.

BOULDER CREEK

MAGNETIC CROSS SECTION

VERTICAL FIELD LINE 40N

7 Dec 12 M. Phom 100 1'-400' LVS

140 100 1400 1400

1200

+ 150

- 200

2700

X.

82.00

7000

4800

- UNCOARECTED -

4253 plate 5

CANADIAN JOHNS-MANVILLE CO. LTD. BOULDER CREEK - PROJECT 61 MAGNETIC CROSS SECTION
VERTICAL FIELD LINES 44:48 NORTH

Date: 12 MARIN 700 Sent 400 MCA

1250

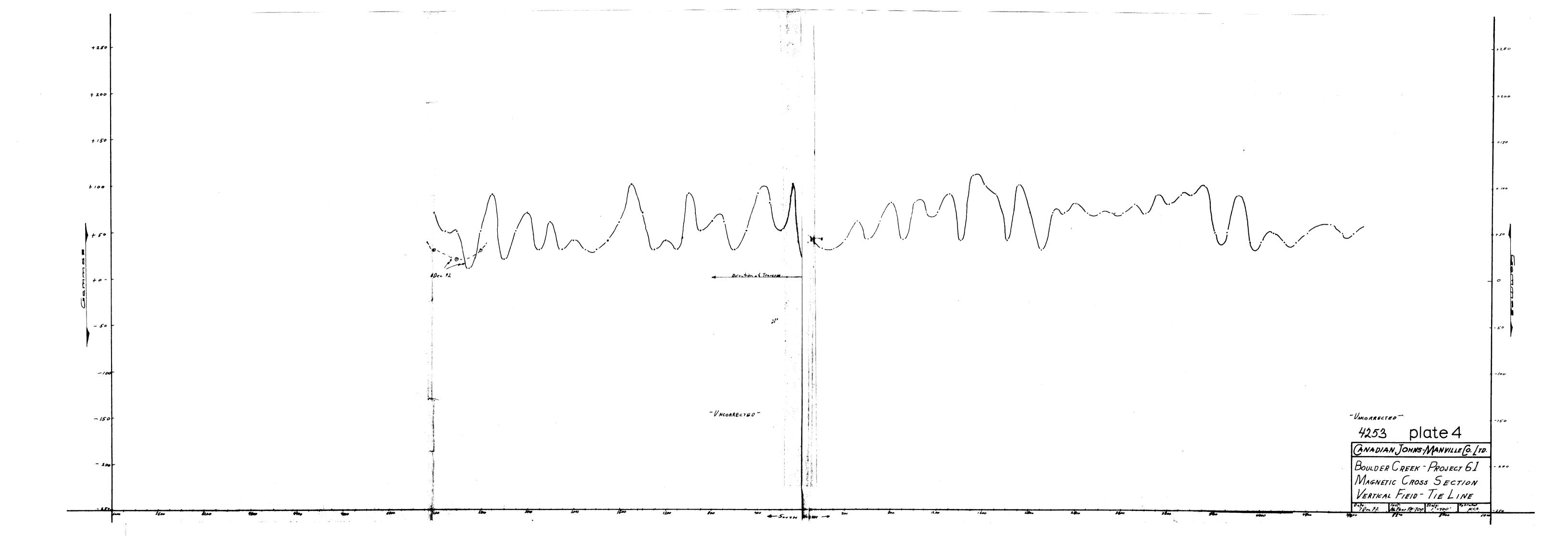


plate 2

