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REPORT OF GEOLOGICAL AND GEOPHYSICAL SURVEY

JAY #1, JAY #2, AND JAY #3 GROUPS

ALBERNI MINING DIVISION

By: J. McCue, P. Eng. (Man.)

Supervised By: D. M. Cannon, P. Eng.

For: Buttle Lake Mining Co.

June 15 - August 31, 1962.

C O N T E N T S

REPORT OF GEOLOGICAL AND GEOPHYSICAL SURVEY

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INTRODUCTION

This report presents the results of geological and geophysical work performed in order to determine whether or not the favourable strong sericite-chlorite schist zone found to the south on Western Mines property extends through the Buttle Lake Mining Company claims.

The claims lie at elevations ranging from 3700 feet to 5000 feet and access is by trail from the Western Mines adit. Camp equipment and initial supplies were placed on site by helicopter. Additional food supplies were packed in as required.

LOCATION

The Jay groups of claims are located on high ground adjacent to and north of the Western Mines claims in Strathcona Provincial Park on Vancouver Island. The claim outlines as shown in Figure 1 are based on compass and pace or chain locations and

are approximate only.

WORK PERFORMED

The personnel employed on the Jay groups of claims were as follows:

J. McCue B.Sc.(G.E.) P.Eng.(Man.)	Geologist
P. Chilcott B.Sc.	Geologist
D. Idiens	Assistant
A. Phillips	Assistant

under the supervision of D. M. Cannon, P. Eng.

The work consisted of line cutting, chain and picket location of points, geological survey, and electromagnetic survey. The topography is quite rugged in places, vegetation varied from slight to heavy, and overburden was generally moderate. A total of 276 man-days of work was done in the area, of which 242 man-days were done within the claim boundaries of the Jay groups. The work breakdown by groups is as follows:

Jay #1 Group (17 claims)	89 man-days
Jay #2 Group (14 claims)	74 man-days
Jay #3 Group (15 claims)	79 man-days

A total of 80,350 feet of line was cut. The base line (0), lines 20E, 40E, 20W, 40W, and 55N were run as control lines for the intervening cross lines. Lines were marked at 100 foot intervals east and west, and at 250 foot intervals on the north-south lines.

The cut lines were used as a base for geological observations which were made on the lines, between the lines, and beyond the grid area. Geophysical observations were made at 100 foot intervals along the cross lines.

Four trenches averaging 100 feet long by 5 feet wide were dug in overburden ranging from a few inches to 3 feet deep.

GEOLOGICAL SURVEY

General Statement:

H. C. Gunning, in a report on the Buttle Lake Map Area, in the Geological Survey Summary Report, 1930, Part A, lists the rocks of the area as Palaeozoic and Mesozoic volcanics and sediments with minor bodies of Coast Range Intrusives. There may be a conformable contact between the Permian volcanics and Mesozoic Vancouver volcanics just to the south of the claims but this was not confirmed.

Geology:

Andesitic pyroclastic volcanics are the predominating rock type. Tuffs and agglomerates form an alternating series of considerable thickness. The tuffs vary from very fine grained thin bedded cherts to the much more common medium grained type. Only the thin bedded cherty tuffs show bedding attitudes. The agglomerates are normally medium grained and contain rounded inclusions of andesite and diorite up to several inches in diameter. These

fragments are usually quite indistinct except where weathering has accentuated their boundaries. Megascopic differentiation of the tuffs , agglomerates, and andesites is frequently difficult in a small outcrop as they are mineralogically of the same composition and distinguishing characteristics are not marked. Extrusive and intrusive andesites are present but their proportion to each other and to the pyroclastic volcanics was not determined.

Traces of pyrite were found in some of the andesitic rocks and a slight chloritization of the ferromagnesians was noted. Narrow barren white quartz veins are sparsely scattered throughout the volcanics, as are veins and patches of epidote.

Intrusive rocks of dioritic and gabbroic composition predominate in the southwest and northeast areas of the line grid. Some narrow distinctive medium grained diorite dikes are present but most diorite occurs as a fine to medium grained rock that is in gradational contact with course grained ophitic gabbro. These rocks form intrusive masses and probably thick sills. The diorites contain a little magnetite and the coarse gabbros contain up to 10% magnetite in some sections. The outline of the main intrusive areas are shown on the map - other minor intrusive areas were not separated in the mapping.

Minor dikes of varying composition are common but are of quite narrow widths and are usually in the northwest trending fractures. Two major dikes averaging 50 feet in width and of gabbroic composition strike northerly across the property. They probably represent the last phase of magmatic activity in the area.

Structure:

No attempt was made to determine a detailed stratigraphic picture within the area. From the mapping a general northeast and northwest trending, easterly dipping, series of andesitic volcanics emerges and this is a similar pattern to that found in the Western Mines area although dips are steeper in the upper block.

Numerous faults intersect the area, the main direction being N 30° W. Less abundant faulting occurs with a due north trend, and at approximately N 75° W. Because of the abundant, though weak, breaks in the N 30° W direction it appears possible that stress relief is achieved by means of a series of parallel, probably overlapping faults of limited strike length. It could be that this represents the vertical depletion of the forces which developed the much stronger and more confined favourable schistose zone containing the Western mineralization at some 2500 feet greater depth.

The long fault indicated adjacent to the base line is not definitely continuous as shown but the fault zone from about 56 N to 80 N at 11 E has good continuity. This fault appears to be the strongest one in the area and contains a schistose slightly chloritic zone up to 50 feet thick towards the southern end. The trench across the most southerly exposure of this fault appears to be close to the intersection with the west trending fault there but the extensive stripping necessary to expose the intersection area does not seem warranted as only traces of pyrite are present. Trenches across this fault were sampled and only the normal trace amounts of copper, lead, and zinc are present.

The westerly fault (N 70° W) is best exposed at 50 N 20 E and has a few inches of gouge in the north wall of a narrow shear zone which indicates some movement along the fault plane but the amount and direction are indeterminate. The northerly trending zones are best expressed by the dikes which traverse the property. The northwesterly shear zones appear to be pre-dike but are not offset where cut by the dikes. The northerly fault at 32 N 6 E weakens considerably to the north but forms a deep gulch to the south on Western property.

The majority of faults are nearly vertical but some have local steep easterly dips. The whole area shows the effects of the three faulting directions with numerous intersecting joints and a resulting shatter pattern where jointing is more pronounced.

GEOPHYSICAL SURVEY

The electromagnetic survey was done with a Ronka G.E.M. Mark I unit using 200 foot coil separation. An excellent description of this equipment, its use, and the interpretation of results, is given in the December, 1960 issue of the Canadian Mining Journal.

The grid lines for the geophysical work were spaced at 500 foot intervals with provision for intermediate lines at 250 foot intervals to detail anomalous areas. A total of 36,200 feet of line was run with the Ronka equipment.

The results of this work indicates that there are no near surface electromagnetic conductors within the area surveyed. Due to abrupt topographic variations it was very difficult to keep the proper coil separation and orientation required for satisfactory readings. Minor anomalous conditions could well be masked by topographically induced errors. However, it is felt that any significant anomaly would not be missed as the pronounced negative anomaly of both the in-phase and out-of-phase readings would be apparent. (This was shown to be true over similar topography along Western's drill section with holes 8 and 9 where a good anomaly stood out in spite of the topographically induced anomalies.) Visual ground inspection of all potential anomalies was carried out. The two apparently marked anomalies at 60 N 5 E and 80 N 2 W occur over very rough topography with good rock exposure and no apparent faulting or mineralization.

The profiles for each line are shown plotted in Figure 2.

GENERAL COMMENT

The Western mineralization is in a wide (up to 500 feet) shear zone with sections of intensely sheared and contorted sericite and chlorite schists. Fairly strong pyrite is associated with the schistose zones and with the ore. This zone apparently weakens up slope to the north and could not be located above about 2200 feet. The average attitude is vertical with a steep westerly dip possible, and a strike of about N 30°W.

If this zone should swing more westerly up slope to the north (due to a strike change or an easterly dip) it would be masked or even obliterated by the gabbro body that lies west of the base line. If it maintains strike with a vertical or steep westerly dip it should be within 500 feet of the base line. The north-south fault (see 32 N 6 E) that apparently crosses the extension of the Western zone may have offset the zone in which case the extension of the zone would probably be shifted easterly (minor right hand offsets appear to be the rule) but still well within the area examined.

The faults located along the approximate Western boundary (5 W to 8 E on 40 N) have only narrow chloritic schist zones (a few feet) with traces of pryite. The intervening rocks

show some sheeted jointing and shattering but no schistosity. The net result of this work is fairly conclusive proof that the favourable Western Mines zone does not have any surface expression on the Buttle Lake Mining Company ground.

By: .....
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Supervised By: .....
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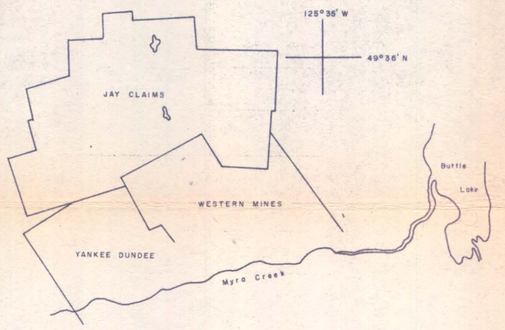
November 9, 1962



LEGEND

- 1 — INTRUSIVE AREAS
- 2 — DIKES
- VOLCANICS
- CHERTY TUFF BED
- JOINT
- WEAK SHEAR
- STRONG SHEAR OR FAULT
- TRENCH

JAY GROUP Nº 1 – Claims 15-20, 32-40, 45, 47 = 17
JAY GROUP Nº 2 – Claims 8-14, 29-31, 41-43, 48 = 14
JAY GROUP Nº 3 – Claims 1-7, 21-28 = 15
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WESTERN MINES PROPERTY

JAY # 44

JAY # 46

Department of
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ASSESSMENT REPORT
NO. 459 MAP 1

NEWMONT MINING CORPORATION OF CANADA

JAY CLAIMS
Buttle Lake, B.C.
Scale 1" = 500' September, 1962

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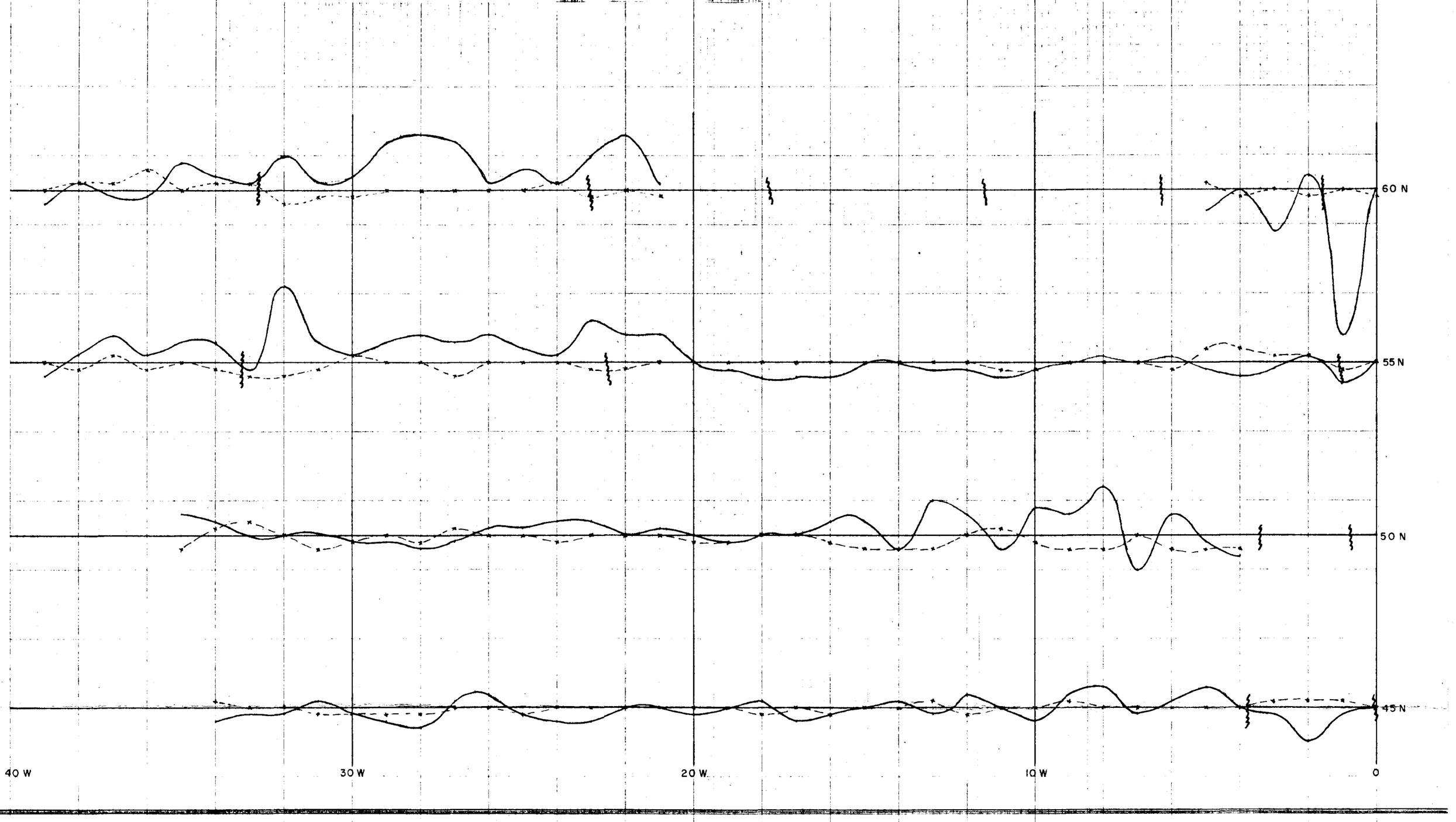

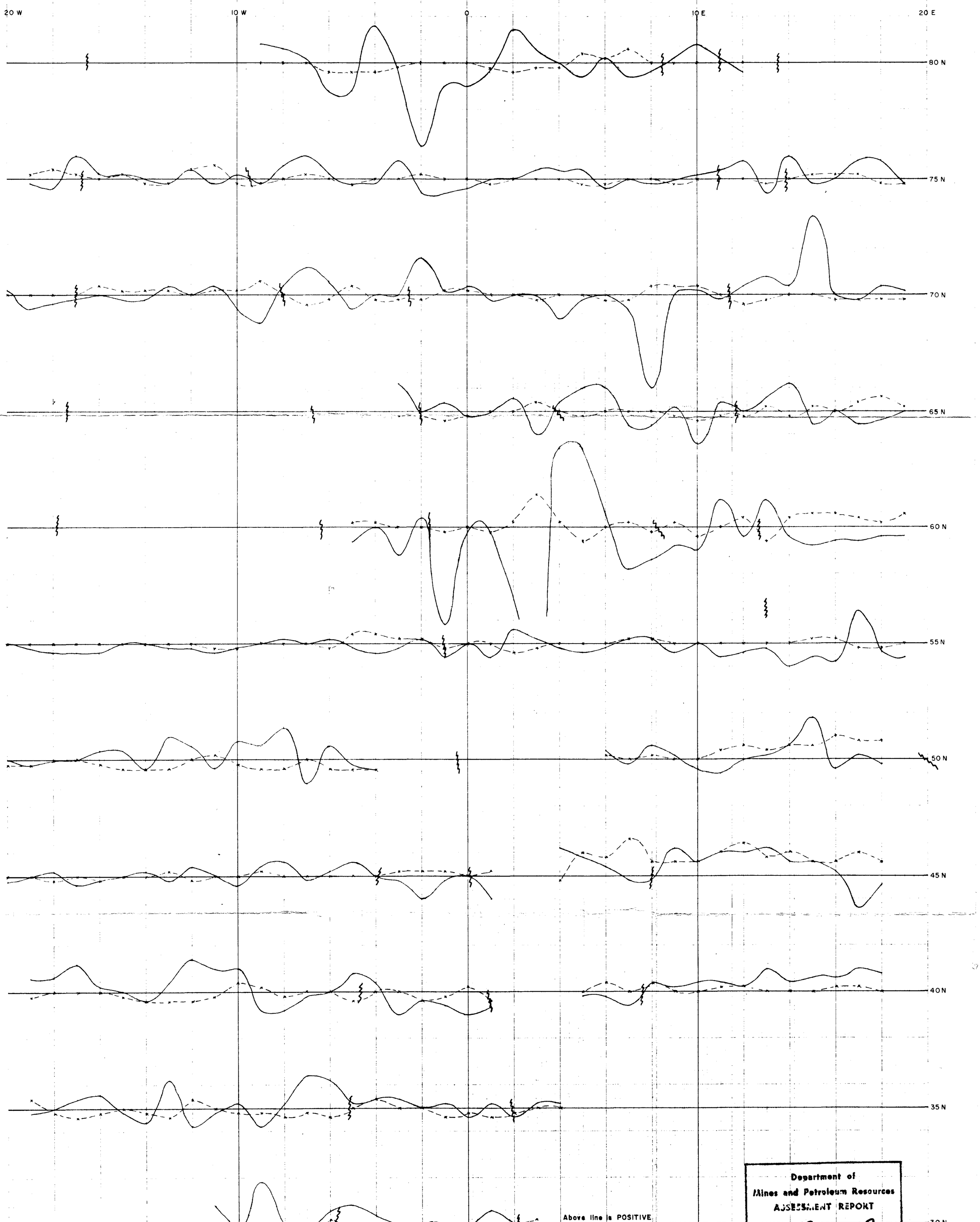

Above line is POSITIVE.
Below line is NEGATIVE

LEGEND

Inphase

Outphase

Fault

Department of
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ASSESSMENT REPORT
NO. 459 MAP 2

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NEWMONT MINING CORPORATION OF CANADA

JAY CLAIMS

E.M. Profiles

Scale Horizontal 1" = 200'
Vertical 1" = 10%

Sept. 1962