BY

NORTHWESTERN EXPLORATIONS, LIMITED

Final Report

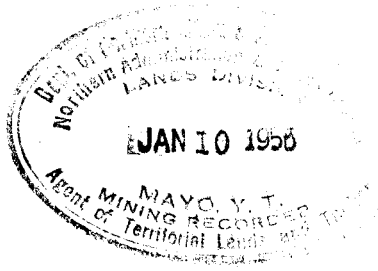
PAR GROUP

Mayo M. D.

Yukon Territory

by

G. A. Noel



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APPENDIX

SUMMARY

The Par Group of 32 claims is a zinc prospect about 25 miles northeast of Mayo Landing, Y.T. The claims were staked for Northwestern Explorations, Limited on a hydro-geochemical anomaly outlined on Parent Creek by the Geological Survey of Canada in 1954. During 1955, the geology was mapped, the stream water was checked for heavy metal content, and twigs and soil were sampled for analysis on a large grid in an effort to find the source of the anomaly. The water testing results corroborated those of the Geological Survey but neither mapping nor plant and soil sampling showed any local reason for the stream anomaly. The anomaly is thus thought to result from ground water passing over a sub-surface zinc concentration, probably at some distance, and reaching surface in the upper reaches of the creek.

INTRODUCTION

The Par Group, comprising 32 claims, is a lead-zinc prospect in the Mayo Mining District, about 25 miles northeast of Mayo Landing, the main supply centre for the area. The claims were located for Northwestern Explorations, Limited on March 17, 1955 along the Upper reaches of Parent Creek, a tributary of Duncan Creek to cover a long hydro-geochemical anomaly which was indicated in a survey of the heavy metal content of streams in the Mayo area during 1954 by a field party of the Geological Survey of Canada (Boyle, 1955). The property is reached by means of a five-mile pack trail which follows Parent Creek from a point on the Keno Hill road about 35 miles northeast of Mayo.

On Galena Hill and Keno Hill in the Mayo district are important silver-lead-zinc veins which have been mined almost continuously since 1920 with a total production of well over 50,000,000 dollars. Most of the present production is from the Calumet-Hector mine of United Keno Hill Mines Limited on Galena Hill.

During 1955, the two north forks of Parent Creek were checked for heavy metal ions, and the local geology was mapped on a 1000-foot scale. In addition, plant and soil samples were taken to cover an area 2000 feet by 500 feet in the vicinity of the highest zinc values in the stream. This work was completed in six weeks, from June 7 until July 22.

GENERAL GEOLOGY OF THE AREA

The Keno Hill area is underlain by a thick series of metamorphic rocks, the Yukon Group, of late Precambrian and early Paleozoic age. Here, this assemblage is at least 75,000 feet thick and includes quartzite, and mica, graphite, and chlorite schists. The schist sequence is overlain by sill-like masses of sheared greenstone, possibly Paleozoic in age. The youngest rocks in the area are sills of granite and rhyolite which intrude the highly sheared older rocks.

The metamorphic rocks form the southwest limb of a large anticline, the axis of which trends northwest through the east end of Mayo Lake. On this major anticline is imposed an east-west anticlinal fold which follows the McQuesten River and Ladue River valleys.

PROPERTY GEOLOGY

The upper Parent Creek area is underlain by a monotonous schist series at least 10,000 feet higher stratigraphically than the schist-quartzite series of the Keno Hill area. The most convenient sub-division of this schist series is into two groups:

1. Predominantly quartz-mica schist with minor chlorite and talc schist.

2. Predominantly graphite schist and chlorite schist with minor quartz-mica schist.

The graphitic schist sequence is overlain by the quartz-mica schist group with the schistosity dipping about 25 degrees southwest. Although sedimentary structures are rarely seen, the schistosity apparently conforms with the bedding.

On the western part of the claims, a fault trending N 25° E along the first north fork of Parent Creek has exposed older schists on the west side of the fault. On the northeast edge of the claims, a fault trending N 20° W has been mapped in the graphite schist.

FIELD WORK

1. Water Testing

Following geologic mapping of the claims on a scale of 1000 feet to one inch, the two north forks of Parent Creek were tested for heavy metal content using the Delavault (1949) mixed color method with the colorimetric reagent, dithizone. In this mixed color method the color produced in neutral or slightly acid solutions is a mixture of unreacted green dithizone and a contrasting hue of the metal dithizonate. The amount of metal is indicated by a change of hues from green to purplish-red. The use of xylene emulsion to collect and float the dithizone droplets, greatly increases the sensitivity of this test.

Two tests were run at each location, and if necessary a third test, to clarify any discrepancy. Since standard solutions were not available for comparative purposes, the heavy metal content of the water was estimated using an arbitrary color: concentration scale. The following table shows the comparative color values and relative zinc content, using standard dithizone solution (60 milligrams per litre solution).

Color of xylene	P.P.M. Zinc per 100 ml. water tested	
	½ ml dithizone sol.	1 ml dithizone sol.
dark green	0.25	1.0
grey	0.50	2.0
purple	0.75	3.0
red	1.0	4.0

The testing was done during July when the stream discharge was fairly uniform. Tests were made at 27 points on the two north forks of Parent Creek and at three springs. Most of the springs in the area actually represent surface seepage with the water moving out of almost dip-slope schist beds.

2. Plant and Soil Sampling

The water testing confirmed the G.S.C. results so it was decided to investigate the heavy metal content of the soil and plants along the northwest side of the creek in the

vicinity of the stream anomaly. A grid was laid out approximately 2000 feet long (N 30° E) and 500 feet wide, with sample locations at 100-foot centers. Due to fairly steep valley slopes, soil development in the area is quite poor. Therefore, twig samples were used where possible, supplemented by soil samples where the grid extended above timberline.

Alpine fir, Abies lasiocarpa, showed the best distribution over the grid, so twigs from this species were used for the samples. Each plant sample consisted of at least one gram of twigs representing the previous year's growth. In all, 79 twig samples were taken. These were shipped to the University of British Columbia biogeochemistry laboratory for analysis.

All of the soil samples were taken very near surface due to a combination of shallow overburden and occasional permafrost. These samples consist of wholly residual material, even including fragments of the original rock. Several pounds of soil were taken at each of 23 soil sample locations, and these samples were also shipped to the University of B.C. for analysis.

In addition, a suite of rocks was collected representing each rock type seen in the area, to determine by analysis the zinc concentration in each.

Results

1. Geologic Mapping

Initially, the zinc mineralization was thought to be concentrated along the mica-schist and graphite-schist contact. This contact was then outlined by structural contours and verified where possible in the field. The plant and soil sampling results showed that this contact exerted no control on the mineralization.

Close examination of all outcrop and float over the area in the vicinity of the anomalous zone along the creek showed the following results.

1. No quartz was found in either outcrop or float though some of the mica schist showed silicification.

2. No mineralization other than pyrite was found on the claims. Most of the pyrite appears to be an original constituent of the mica schist.

3. Quartz-mica schist and quartzite outcrops in the vicinity of the positive spring are rusty, containing disseminated pyrite. No other sulphides could be identified.

2. Water Testing

The results of the water testing verified the anomaly of the G.S.C. survey on Parent Creek. In evaluating the results for the arbitrary scale used in this test, only values above 0.5 parts per million are considered significant. Using these limits, the anomalous zone on the second north fork of the creek is about 2000 feet long with values increasing progressively upstream to a maximum of 1.0 parts per million near the graphite-schist contact and then dropping abruptly with an isolated high about 1500 feet upstream near the head of the creek. No anomalous values were obtained on either the first north fork of Parent Creek or on streams tributary to both forks. All of the springs tested gave negative results, except for the spring near creek level which showed the highest zinc content. The distribution of the water samples with their relative zinc content is shown on the geologic map of the claims, Plate 55-P-2.

3. Plant and Soil Sampling

The normal zinc content of Abies lasiocarpa in this negative area is from 45 to 65 parts per million in the dried twig sample. A zinc content above 75 parts per million is considered "possibly anomalous". A study of the zinc-copper ratios indicates the normal ratio in Abies lasiocarpa for this copper and zinc-negative area is from 5 to 9.5 with "possibly anomalous" ratios above 11.0. A comparison of the anomalous samples determined by both the zinc content and the zinc-copper ratio confirms only the anomalous sample towards the northeast end of the sample grid.

Considering the frequency curve for the soil sample values, the normal zinc content of the soil in this area is 150-200 parts per million, with a content above 300 parts per million in the "possibly anomalous" range. The normal zinc-copper ratio of the soil is 2.0 to 6.0 with anomalous zinc-copper ratios above 9.0. Only two soil samples are considered anomalous as indicated on Plate 55-P-3 (Appendix), and each of these is quite independent of other "possibly anomalous" samples.

At the time of this report, no results had been received for the various rock analyses. The zinc content is not expected to be high since the soil samples included much schist which was only slightly decomposed.

CONCLUSIONS AND RECOMMENDATIONS

Silver-lead-zinc mineralization in the Keno Hill area is confined to fault and fracture fillings which generally trend north to north-east. If this vein-type mineralization is present in the Parent Creek area, the vein must be (a) restricted in length and width, or (b) capped by an unfavorable rock formation since it gives no indication in float, outcrop or close plant and soil sampling.

The pattern of the stream anomaly coupled with the negative results of the plant and soil sampling suggests that this high zinc zone is likely caused by ground waters that have come into contact with sub-surface zinc mineralization. The location of such mineralization or its depth of burial are still unanswered questions.

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Whitehorse, Y.T.

October 31, 1955

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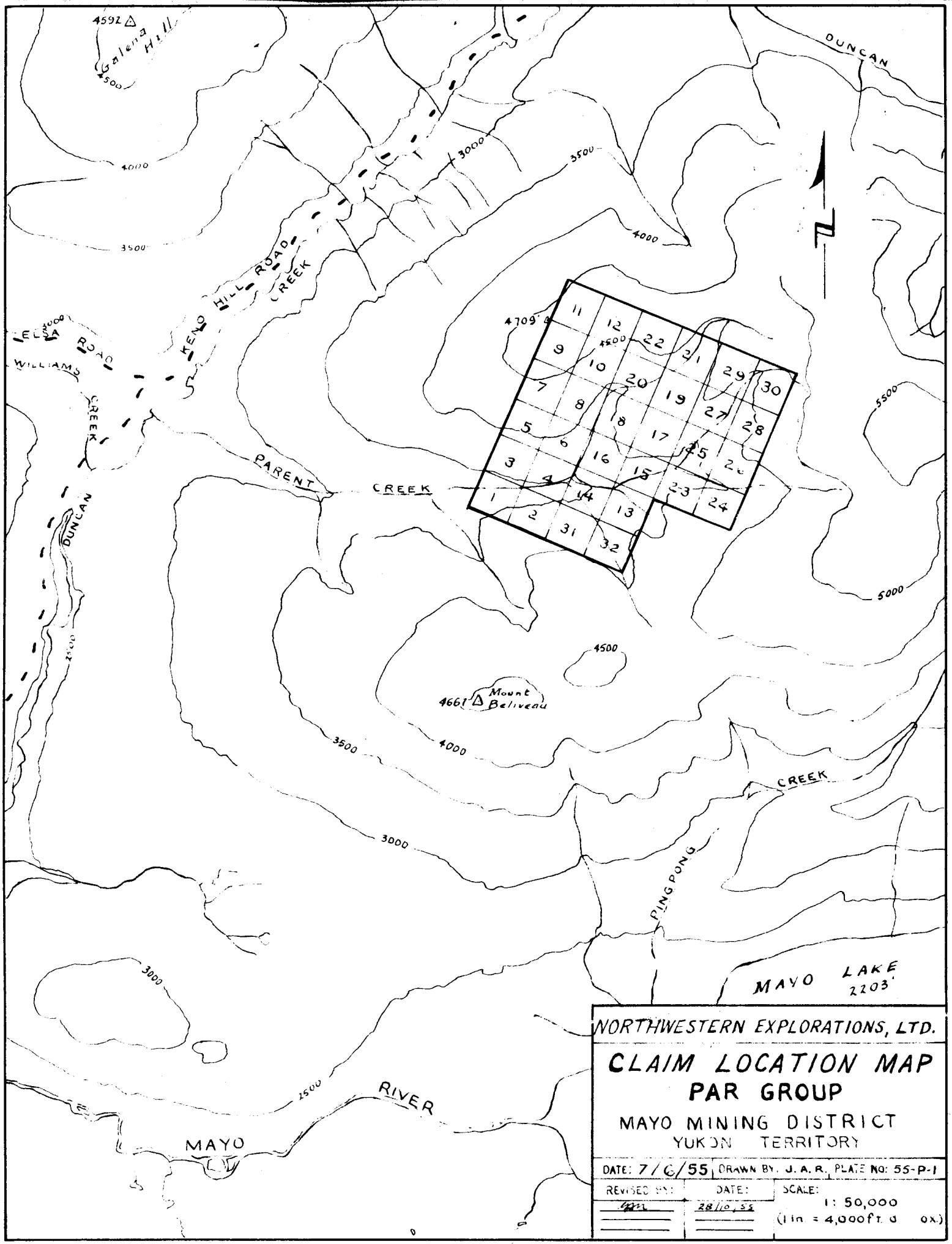


NORTHWESTERN EXPLORATIONS, LTD.

CLAIM LOCATION MAP
PAR GROUP

MAYO MINING DISTRICT
YUKON TERRITORY

DATE: 7/6/55	DRAWN BY: J. A. R.	PLATE NO: 55-P-1
REVISED BY:	DATE:	SCALE:
	28/10/55	1: 50,000
		(1 in = 4,000 ft. approx.)

PARENT CREEK

LEGEND

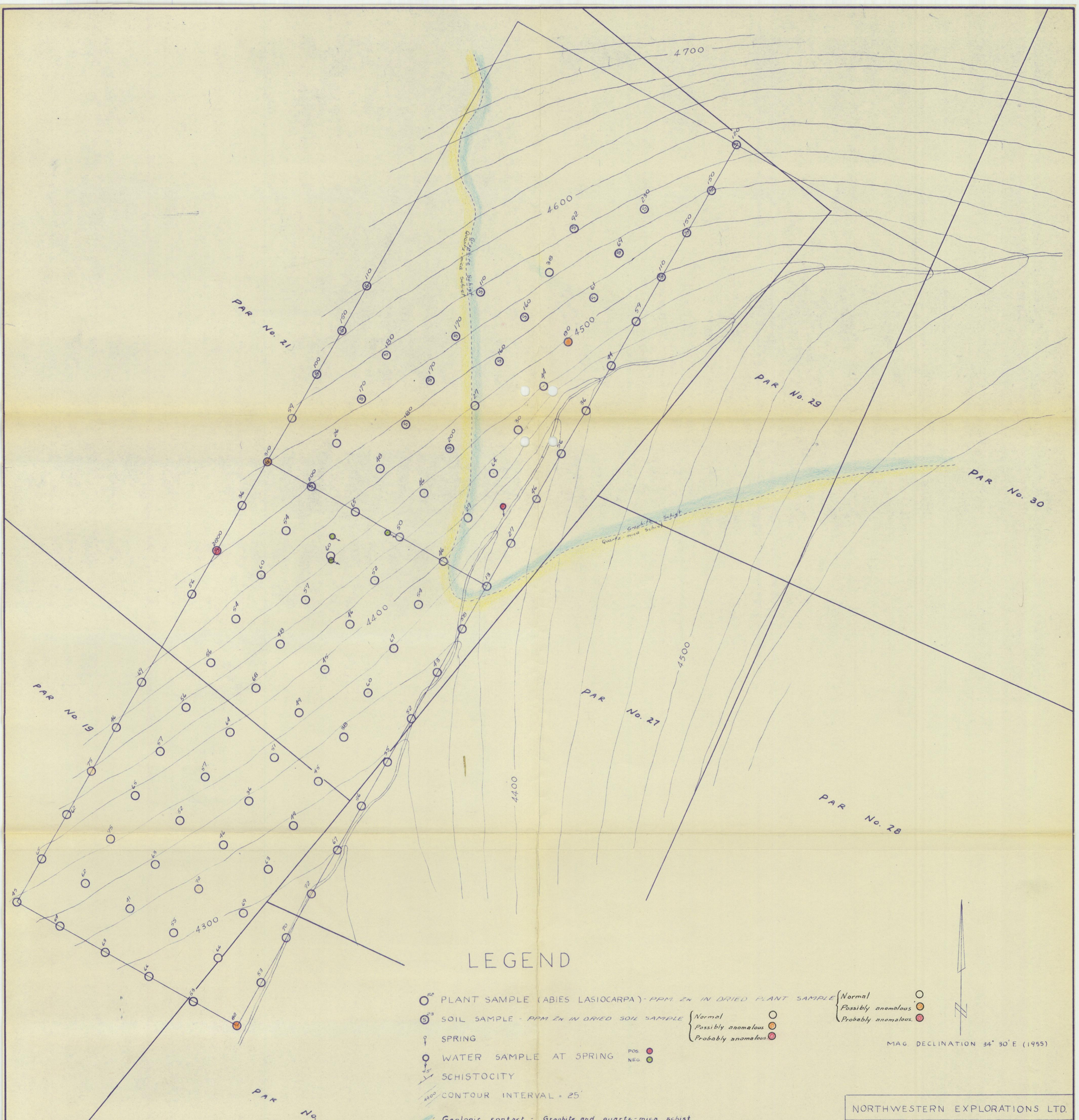
- Quartz-sericite schist; minor chlorite, talc schist
- Graphitic schist, chlorite schist; minor quartz-mica schist
- Geologic contact; defined, inferred
- Limit of outcrop
- 45 Schistocity attitude
- Fault
- Spring
- Water Sample Location — PPM Zn. Neg. – 0.2; 0.2 – 0.5; 0.5 – 0.7; 0.7 +
- Rock Sample Location
- 1000 Contour-interval = 100 ft

MAG. DECLIN. 34°30' E. (1955)

NORTHWESTERN EXPLORATIONS LTD.

GEOLOGIC MAP PAR GROUP MAYO MINING DIVISION YUKON TERRITORY

DATE 15/9/55	DRAWN BY: K.H.D.	PLATE NO. 55-P-2
REVISED BY:	DATE: 28/10/55	SCALE 1" = 1,000'



LEGEND

- PLANT SAMPLE (ABIES LASIOCARPA) - PPM Zn IN DRIED PLANT SAMPLE — Normal; Possibly anomalous; Probably anomalous.
- SOIL SAMPLE - PPM Zn IN DRIED SOIL SAMPLE — Normal; Possibly anomalous; Probably anomalous.
- SPRING
- WATER SAMPLE AT SPRING — POS. / NEG.
- SCHISTOCITY
- CONTOUR INTERVAL = 25'
- Geologic contact - Graphite and quartz-mica schist - as defined by structural contours

MAG. DECLINATION 34° 30' E (1955)

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BIOGEOCHEMICAL & STRUCTURE CONTOUR MAP
PAR GROUP
MAYO MINING DIVISION
YUKON TERRITORY

DATE: 12/9/55	DRAWN BY: K.H.O.	PLATE NO: 55-P-3
REVISED BY:	DATE: 28/10/55	SCALE: 1" = 100'