

1978 GEOLOGICAL ASSESSMENT  
REPORT



TITLE Anvil Creek Property  
LU 1-100 Claims

AUTHOR A.C. Hitchins

DATE September, 1978

COMMODITY Pb-Zn

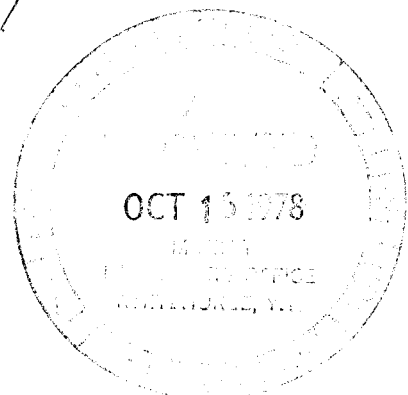


LOCATION Anvil Range, Yukon Territory  
Whitehorse Mining Division  
62°30'N 133°50'W 105 K 5 and 12

WORK PERIOD Work was carried out between  
May 27-June 10 and June 11-23, 1978

AMAX VANCOUVER OFFICE

090377



This report has been examined by the Geological Evaluation Unit and is recommended to the Commissioner to be considered as representation work in the amount of

\$11,904.65

*[Handwritten Signature]*

~~Geologist or  
Mining Engineer~~

Considered as representation work under Section 53 (4) Yukon Quartz Mining Act.

*[Handwritten Signature]*

B. R. BAXTER  
Supervising Mining Recorder

*[Handwritten Signature]*  
Commissioner of Yukon Territory

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## SUMMARY

The mapping of the LU claims has indicated the existence of several poorly exposed graphitic units in a quartz mica schist sequence remarkably similar to the schist hosting the Anvil ore body. Work to date suggests the structure is less complicated than in other areas of the Anvil district.

Several of the graphitic horizons should be drill tested but location of drill holes will depend on interpretation of the soil geochemistry and geophysical surveys.

## INTRODUCTION

The LU 1-100 claims were staked as a contiguous block in the summer of 1977 to cover Cambrian mica schists and calc-silicate rocks similar to the host for the Anvil ore bodies.

Access to the property is by helicopter from Faro, Y.T., 24 miles to the southeast.

The property encompasses steep treed valleys, buck-brush covered slopes and bare ridges. Elevations range from 1,000 to 1,870 m.

Work from late May to mid August 1978 included geological mapping, soil geochemistry, gravity, Max-Min and magnetic surveys. This report deals only with the geology of the LU claims.

Geological data collected between May 27 and June 23 was plotted on a contoured orthophoto base at a scale of 1:10,000. A 22 line km grid in the northwest portion of the property was tied into the orthophoto base.

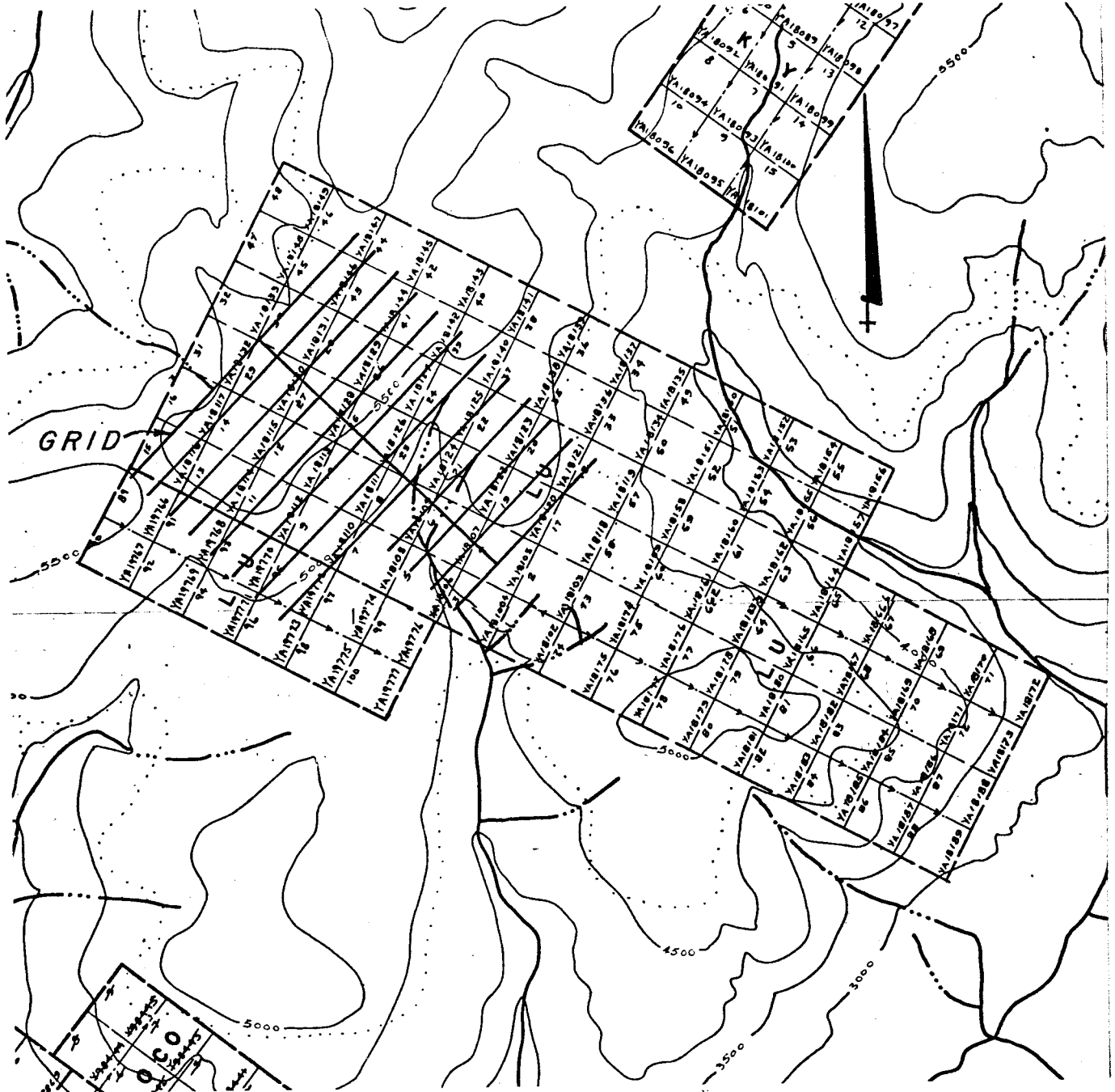
## PREVIOUS WORK

Several companies, including Cyprus Anvil and Welcome North have worked in the vicinity of the LU claims to the extent of drill testing geophysical anomalies, mainly to the south of the LU group in the Anvil Creek valley. No old claim posts were found on the LU claims.

Templeman-Kluit mapped the area from the LU claims southeast through the Anvil area deposits to Ross River for the G.S.C. in 1967-1968.

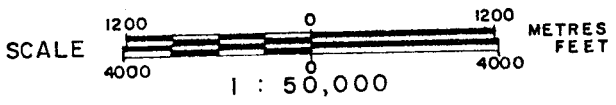
AMAX interest in the area began in 1975 with regional mapping and silt sampling. The main block of LU claims were





AMAX POTASH LIMITED  
 ANVIL CREEK PROPERTY  
 LU CLAIMS  
 WHITEHORSE MINING DISTRICT — YUKON TERRITORY

**CLAIM MAP**



staked in June 1977 to cover Lower Cambrian biotite schists and graphitic units considered favourable for Anvil-type mineralization. Additional claims were staked later in the season to include anomalies discovered in the course of an AEM survey carried out in 1977.

### REGIONAL GEOLOGY

The Cambro-Ordovician rocks in the Anvil Range are represented by a structurally deformed sequence of biotite-andalusite rich schist, various types of calc-silicate and chlorite phyllite-metabasite units. These rocks have been folded into a major, northwest trending anticline, termed the Anvil Arch, with a core of Cretaceous granitic rocks (Anvil Batholith). The Arch emerges from beneath younger cover near Tay River in the northwest and extends 80 km southeast to Blind Creek. The spatial relationship of the Anvil Arch with the Anvil Batholith suggests coeval development.

The most conspicuous structural feature in outcrop is a prominent pre-Anvil Arch crenulation foliation on which an earlier compositional banding has been transposed. Intercalated within the metamorphosed and structural deformed meta-sedimentary rocks are discontinuous but economically important graphitic horizons, hosts for all known stratiform Pb-Zn orebodies in the area.

The base of the biotite andalusite schist is not exposed but it may overlie the Hadrynian Grit Unit. Metamorphic grade decreases upward from the garnet-staurolite facies present in the biotitic schists to the albite-chlorite facies in the chloritic phyllite. Calc-silicate mineralogy varies from a crystalline marble to diopside-quartz-feldspar-garnet skarn with laminae of biotite-quartz schist. Spatially restricted graphitic horizons occur in all units and range in graphite content from slightly graphitic quartzite to sooty black schists

and phyllites. In spite of the diversity of graphitic horizons the ore zones are associated with a distinctive ribbon banded graphitic chert composed of alternating narrow bands of black chert and graphitic argillite with scattered pyrite laminae.

The schist and phyllite sequence of the Anvil area extends northeast through the LU claims to the Tay River, 16 miles northwest of the LU group.

#### PROPERTY GEOLOGY

The geology of the LU claims is separated into two blocks by a southwest-northeast trending fault zone or an unexposed Cretaceous quartz monzonite intrusion. North of the break quartz-biotite-sericite andalusite schist, calc-silicate and graphitic schists dip moderately to the northeast. These rocks probably represent the metamorphic equivalent of a grey-wacke-shale turbidite sequence with a redeposited argillaceous to fairly pure carbonate member. Narrow quartz graphite and quartz-sericite-graphite bands are poorly exposed but appear to be present in both the schist and calc-silicate. South of the break a sequence of schists and phyllites is present in which the lowest exposed rocks are quartz biotite schists and calc-silicate similar to those north of the break but which rapidly grade upward into cherty calc-schist rocks and a thick section of interbedded chlorite phyllite, and amphibolite (metabasite).

In outcrop the most visible structural feature is a lustrous crenulation foliation surface on which an earlier compositional banding has been transposed.

Geologic contacts between the schist and calc-silicate are almost parallel to the strike of the crenulation foliation.

Two faults at the north end of the property have repeated the section.

Degree of metamorphism, facies changes and poor exposure have complicated the stratigraphic relationships of the rock types. The quartz biotite schists of Unit 1 are thought to be the oldest exposed rocks in the area but may not be the oldest unit exposed on the property. Instead a light weathering, scarp forming calc-silicate-marble unit within the quartz biotite schists may be the oldest exposed lithology. Intercalation of quartz-biotite schist and calc-silicate is present in numerous outcrops and is discussed below under Unit 1a, 2b and 2d. Problems arise with the classification of the chloritic and amphibolitic metabasite unit exposed in the southeast corner of the property. The metabasite lies above a narrow band of quartz biotite schist and cherty calc-silicates but a Cretaceous intrusion has removed the overlying sections. The metabasite is included in the chlorite phyllite-basin volcanic of Unit 4 which generally occurs above the schist-calc-silicate sequence but may in fact be a metabasite lens within the quartz biotite schist.

A brief description of the various lithologies appears below. Only those units present on the property are discussed in the following paragraphs.

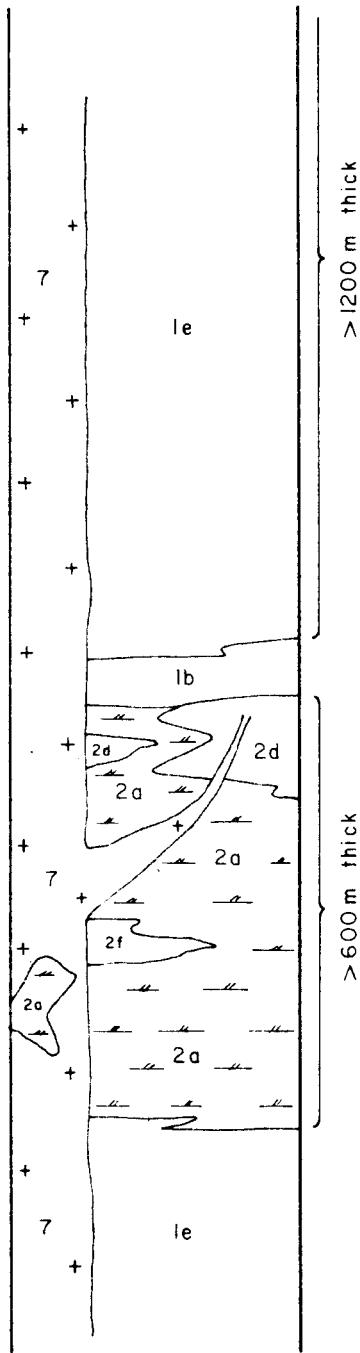
#### Lower Cambrian-Ordovician

Unit 1a is a cherty fine grained biotitic schist with less than 10% calc-silicate bands and up to 4% pyrite. This unit occurs south of the northwest trending fault in association with cherty calc-silicate.

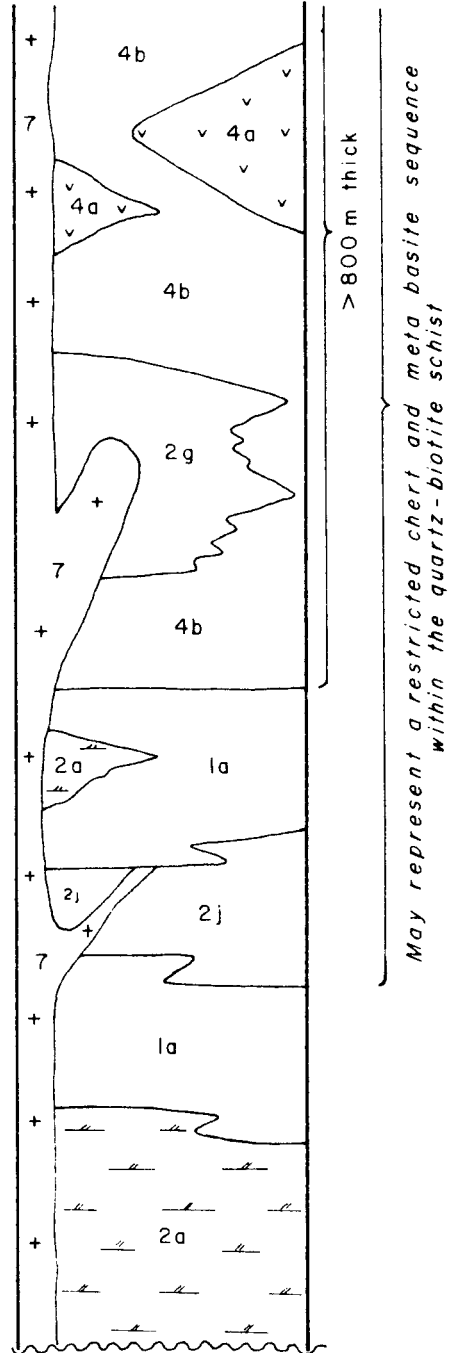
Unit 1b is a dark grey to black graphitic quartzite probably derived from an original graphitic chert. Sulphide content varies from trace to two per cent. Graphitic horizons on Knob 1796 (see map) are very siliceous, and have 10-15% rusty quartz lenses and veins which commonly parallel the crenulation foliation.

Unit 1e a distinctive brown-weathering unit, is the most common rock type on the property. It varies from a medium purplish brown quartz biotite andalusite+sericite schist to a grey quartz sericite andalusite+biotite schist. Andalusite metacrysts are concentrated in bands but the long axes of the crystals have a random orientation within the crenulation foliation plane.

NORTH END OF  
LU CLAIMS



SOUTHEAST END OF  
LU CLAIMS



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ANVIL CREEK PROPERTY  
LU CLAIMS

WHITEHORSE MINING DISTRICT — YUKON TERRITORY

STRATIGRAPHIC COLUMN

Vancouver —

H.P.

N. T. S. Ref. 105 K 5 and 12

Quartz lenses, rocks and bands are generally parallel to the foliation plane and may form up to 25% of biotite-rich schist outcrops.

Units 2a, 2b, 2d, 2f, 2g, 2j; are light weathering, scarp forming calc-silicate and marbles divided into several interfingering units outlined below:

Unit 2a best exposed on ridges at the northend of the property, consists of light grey to green calc-silicate bands, grey marble, and light coloured quartzites. With the addition of thin bands and laminations of biotite-rich schist this unit grades into interbedded calc-silicate and biotite schist of Unit 2b and 2d.

Unit 2f Several outcrops of quartz-sericite-graphitic schists and phyllite (Unit 2f) occur towards the base of the calc-silicate assemblage. These rocks are graphitic but are less cherty and more friable than the graphitic units of 1b. Up to 5% pyrrhotite and pyrite with trace chalcopyrite as disseminations, blebs and fracture coatings produce local rusty patches on outcrops.

Unit 2g consists of thinly banded purple cherts with bands of calc-silicate. It is enclosed by a much thicker amphibolitic section (4b) discussed under Unit 4b.

Unit 2j is a heterogeneous mixture of calc-silicate; grey crystalline marble and rusty purple to dark grey cherty bands that are often slightly biotitic and graphitic. Occasional chert bands may contain up to 5% pyrite and pyrrhotite but 3% is typical.

Unit 4b consists of interbanded light green calc-silicate and dark green actinolite-chlorite rich bands grading southward into non-calcareous medium to dark green chlorite phyllite of Unit 4a. Scattered quartz-sericite bands and rare outcrops of altered pyroxenite are included in the 4a metabasite unit.

Cretaceous

Unit 7 includes various phases of light coloured blocky weathering Cretaceous quartz monzonite intrusions. Textures range from fine grained quartz monzonite with 2% mafic minerals to a coarse grained porphyry in which the feldspar crystals are up to 4 cm long, often with a trachytic pattern.



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A.C. Hitchins

Sept 21 1978

