010

GEOLOGICAL REPORT

ON

IVANHOE PROPERTY

IVANHOE TOWNSHIP

TIMMINS AREA

January 1994

D. R. Pyke

K. M Cunnison

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Ivanhoe Township Property

Introduction

The property, located 95 km ESE of Timmins and 10 km south of Foleyet (Figure 1), consists of one mining claim (P1190038) made up of 15 claim units (Figure 2). Access is excellent; a logging road extends from Ivanhoe Provincial Park to the south boundary of the claim block.

D. Pyke and K. Cunnison are co-owners of the property.

Previous Work

Ivanhoe Township was first mapped by Harding (1937) as part of the Horwood lake area, and later formed part of a regional scale map of the Chapleau area by Thurston et al (1977). Subsequently, Percival (1981) included the area in a study of the Kapuskasing structural zone. In 1990, an airborne magnetic and electromagnetic survey by the Ontario Geological Survey of the North Swayze area included Ivanhoe Township. Recently, Ayer (1991) and Ayer and Puumala (1991) mapped Foleyet and Ivanhoe Townships.

There is no recorded exploration work on the property, although Ayer (1991), reports anomalous zinc and copper values (to 1050 and 520 ppm respectively) from two bedrock samples obtained near the central portion of the property. The mineralization occurs as narrow sulphide veinlets in a highly silicified basalt.

Immediately east of the property, Keevil Mining Group Limited drilled three diamond drill holes in 1965 (Figure 3). In hole 65-20, a 75 foot section of sediments was locally silicified and reportedly contained minor chalcopyrite and sphalerite throughout much of the section. Minor chalcopyrite was also reported in silicified flow top and chloritic basalt in hole 65-18.

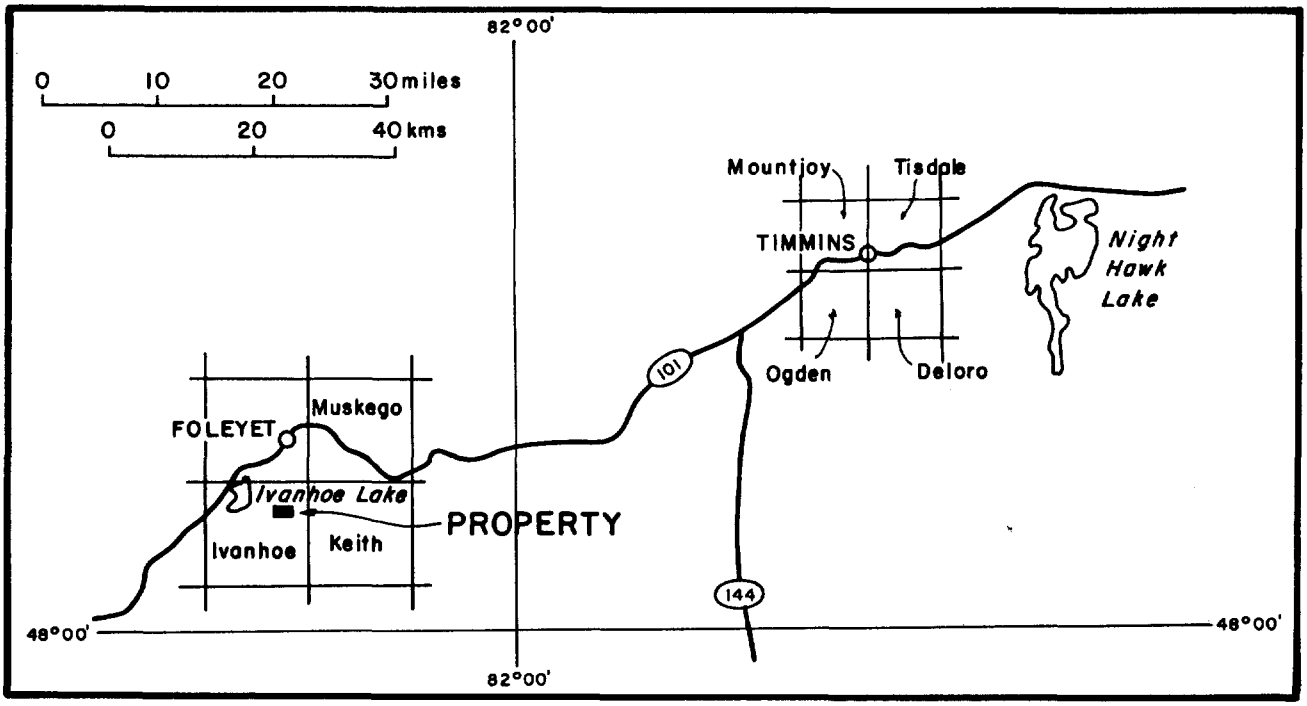


Figure 1 Location of Ivanhoe Township property

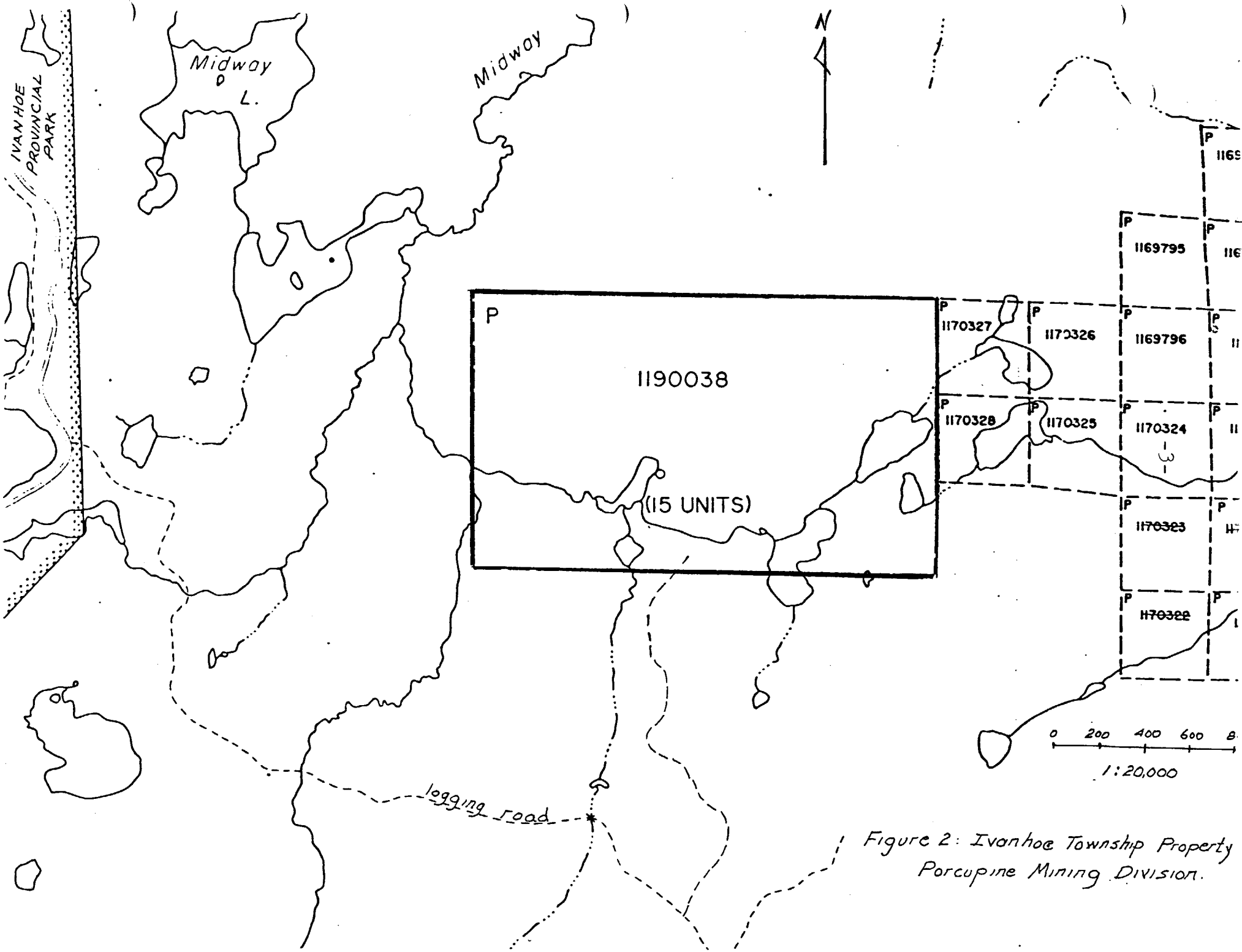


Figure 2: Ivanhoe Township Property
Porcupine Mining Division.

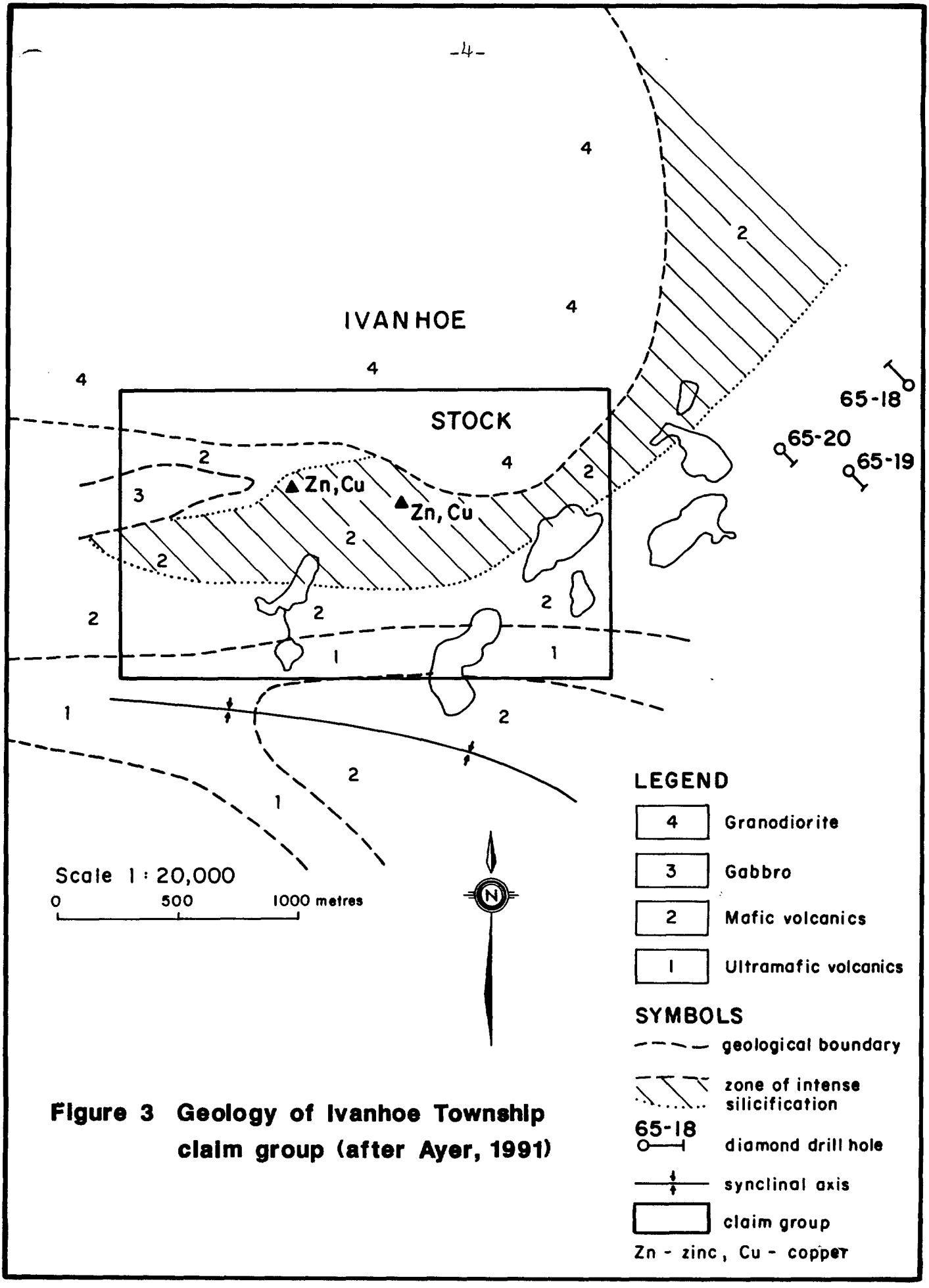


Figure 3 Geology of Ivanhoe Township claim group (after Ayer, 1991)

Present Survey

The present survey was done over the period June 28 - September 16, 1993 by D. Pyke and K. Cunnison.

The property was mapped at a scale of 1:2.500. A total of 56 bedrock samples were collected from the property. Twenty-two thin sections and two polished thin sections were subsequently cut and examined in detail. Whole rock major, trace and rare earth element analyses were carried out on five of the samples; in addition, 18 samples were assayed for gold and 12 samples were assayed for copper and zinc.

The original plan was to cut a conventional grid on the property and to use this for mapping control. After a day or two it became apparent that to establish an accurate baseline and grid would be very difficult as much of the area had been clear cut and large piles of slash occured throughout, effectively inhibiting the cutting of the lines (Photo 1). Even if lines had been cut over or through the slash piles, accurate chaining would have been next to impossible. It was decided, therefore, to establish a number of control stations/ survey hubs throughout the property using a transit (Photos 2 and 3). Distances between the hubs were determined either by chaining or, where applicable, with the use of a stadia rod. A total of 39 survey hubs were established, the locations of which are given on Map 1. Further control was afforded through a 1:5,000 scale air photo blow-up of the outcrop area. A number of prominent landmarks were also surveyed in: for example , three large white pine trees, herein termed the Hill, Windswept and West pines. Once reforestation of the claim group is well advanced, these pines will still serve to reorient anyone visiting the property. South of the outcrop area a large dead pine with an Osprey nest at the top (Photo 4) dominates the landscape. A good logging road extends onto the property and is driveable as far north as survey hub # 11 (Map 1).

Photo 1. Slash pile in cut-over area. The slash forms long linear piles up to 3 meters in height and 6 meters wide.

Photo 2. Typical survey hub used for mapping control.

Photo 4. Osprey nest atop a dead pine, forms a prominent landmark in the south part of the property. Windswept pine in background.

Photo 3. Transit utilized to accurately survey the position of the hubs as well as prominent topographic features.

General Geology and Considerations

The claim group covers part of a highly silicified zone of basaltic volcanic rocks intruded by the south margin of the Ivanhoe stock (Figure 3). The silicification is especially pronounced in the pillowed, amygdaloidal and brecciated (flow top, hyaloclastite) portions of the flows. Such an extensive zone of intense silicification is rarely observed, and it was primarily on the basis of this that the property was aquired. In addition, Ayer (1991) reported minor, though anomalous Cu-Zn mineralization as fine sulphide stringers in silicified portions of the basalt.

A possible analogy to the Ivanhoe property is the intense silicification observed within the Amulet "rhyolite" (silicified basalt-andesite), situated near the Flavrian-Powell stock in the Noranda base metal camp (Gibson et al, 1983). Although no conductors occur on the property, detailed mapping and lithogeochemical sampling were carried out to document the extent and intensity of silicification, and to determine if the major and trace element geochemistry corresponds to that of known mineralized volcanic sequences within the Superior Province.

Property Geology

The area mapped consists of a number of basaltic flows, intruded on the northern periphery by a stock of granodiorite. The striking feature of the outcrop area is the intense silicification that many of the rocks have undergone. The silicified basalts are very light weathering in shades of grey, pink and commonly white. Fresh surfaces are medium to dark grey, and the rock commonly breaks with a conchoidal fracture. The pillowed sections are typically highly vesicular (Photo 5); the vesicles are up to 2 cm in length, average 2-4 mm, are quartz filled and elongated parallel to the foliation. Pillow breccia is extremely common (Photos 6,7, 8) whereby

Photo 5. Silicified pillow basalt, light pink white weathering, vesicles to 20 mm by 5 mm, averaging 2-3 mm and filled with quartz. Photo from outcrop north of Hill pine by sample P48.

Photo 6. Highly silicified white to light grey weathering pillow breccia. Pillows and broken pillow fragments are highly vesicular and sit within a dull grey brown weathering matrix (no vestige of the original hyaloclastite texture).

Photo 7. Silicified pillow breccia rapidly transitional into a massive silicified basalt on left side of photo. Photo looking west, taken by sample P93.

Photo 8. Silicified pillow breccia fragments, strongly vesicular, in a dull brown weathering strongly foliated matrix. The primary hyaloclastitic texture in this and and all pillow breccias on the property is no longer evident.

Isolated and broken pillows are enclosed in a light to medium dull grey brown matrix, in which all vestiges of a hyaloclastitic texture have been destroyed. Isolated dark green chloritic patches (fragments ?) locally form up to 20 percent of the pillow breccia matrix (Photo 9). Gash fractures and veins of dark grey quartz (Photo 10) are especially common to some of the massive silicified basalts in the central portion of the area One of the most intense areas of silicification occurs near survey hub #18 near the west boundary of the map area. Here, massive basalt is particularly highly fractured and veined (Photos 11,12,13). In thin section, the silicified basalts are typically seen to be a fine mosaic of quartz and plagioclase with only about 10-15 percent mafic minerals, generally consisting wholly or mainly of pale green hornblende (Photo 14) and lesser pleochroic brown biotite; both show some retrograde alteration to chlorite. Other minerals include minor epidote (2-5 percent), sphene, apatite and opaques. One of the most highly silicified samples (P56-93) contains no hornblende, which is presumably all retrograded, and consists of 75 percent combined plagioclase and quartz, 10 percent clinozoisite/ epidote, 3-5% percent pale green chlorite, 5 percent fine sercite and 1-2 percent sphene (Photo 15). Typically the plagioclase forms a very fine (.02 mm) mesostasis with quartz, the two being difficult to distinguish. Rarely, a basaltic texture (lath-shaped and diffusely twinned plagioclase crystals to 0.3 mm) were seen to be preserved in a few pillowed samples. The matrix to the pillow breccias contain upwards to 30-35 percent biotite and only minor hornblende. The mineral assemblages appear to be mainly those of the upper greenschist facies (Fyfe, Turner and Verhoogen, 1958). Amphibolitized basalts appear to be restricted to the immediate contact zone with the granodiorite or as inclusions in the granodiorite (Photo 20). However, even here, it is apparent in thin section that amphibolitization is not pervasive; saussuritized plagioclase and

Photo 9. Matrix to pillow breccia, containing numerous dark green weathering fragments to 5 cm; minor small silicified fragments. From outcrop of sample P94.

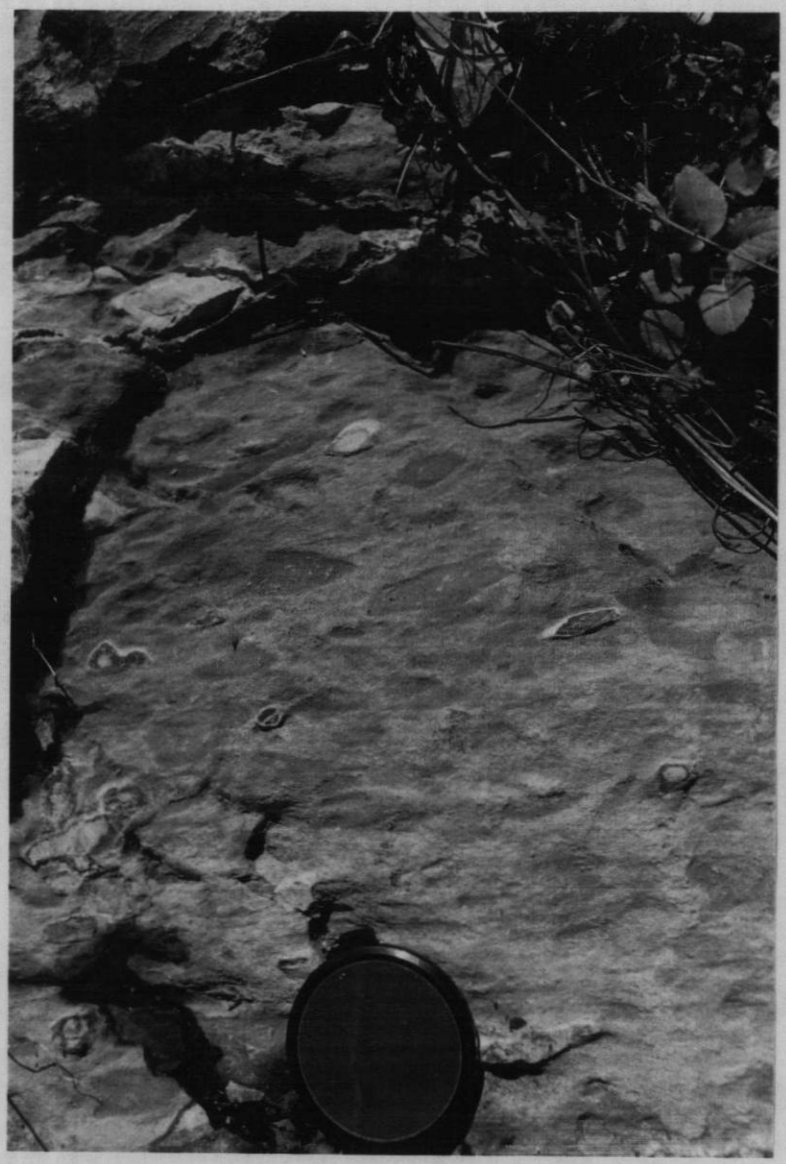


Photo 10. Massive silicified basalt cut by numerous grey to black quartz veins. Photo looking SSW. Granitic dike strikes at 216 degrees. Smokey quartz as veins and gash filled fractures are especially common in this general area of rock exposures. Photo taken 15 meters south of survey hub #8.

Photo 11. Extremely silicified, fractured, white weathering, black fresh, basalt. Outcrop is by survey hub #18, from which sample P56 was taken.

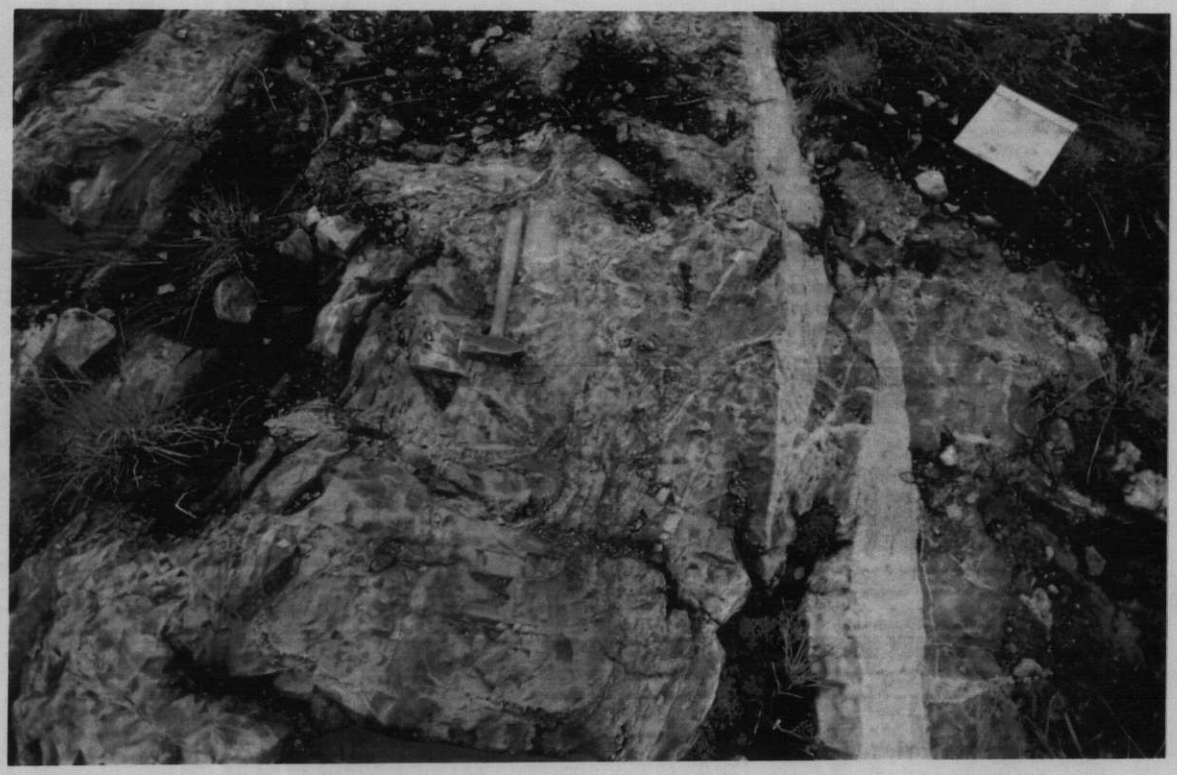
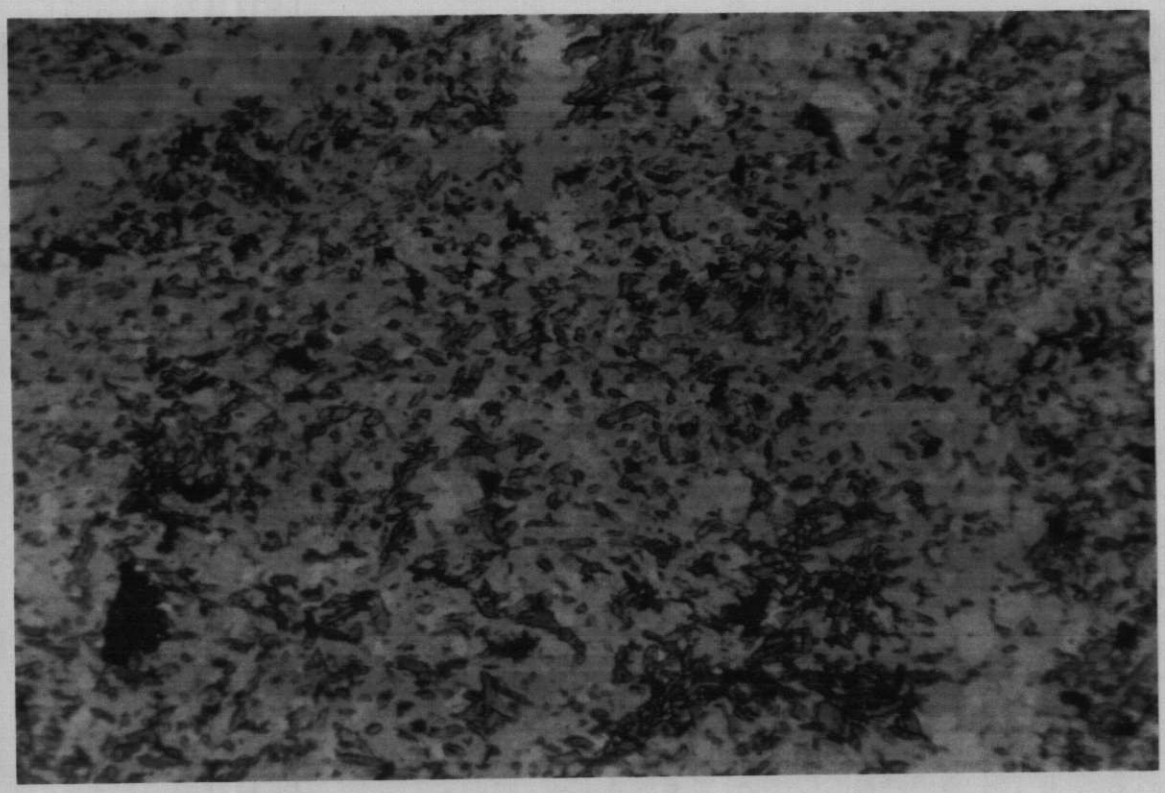


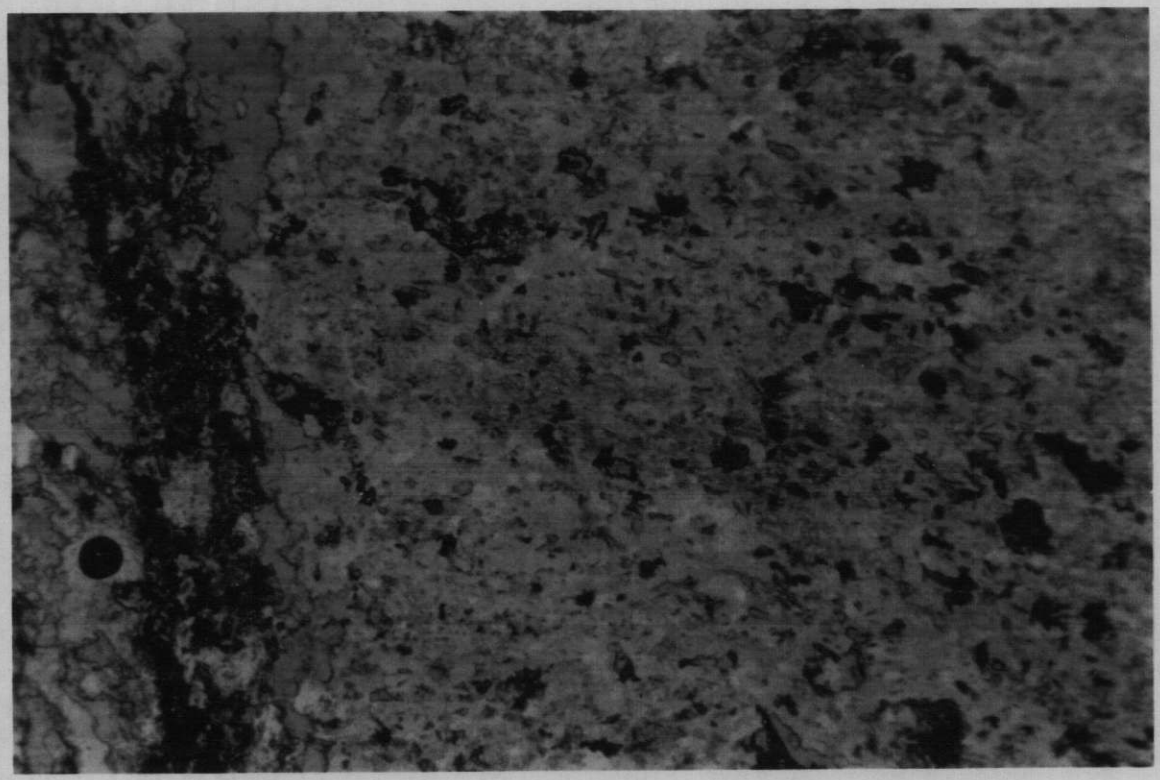
Photo 12. Massive basalt, highly silicified, fractured and veined. From same outcrop as photo 11.

Photo 13. Highly fractured, veined, silicified massive basalt. Main wide quartz veins strike at 135 degrees toward the top of the photo. Photo of outcrop between survey hub #18 and hub #19.

Photo 14. Photomicrograph of silicified, vesicular, pillow basalt; sample P16, taken by survey hub #34. Shows very fine grained crystalline, weakly pleochroic pale green hornblende (15%), within a matrix of fine anhedral plagioclase and quartz. Rare plagioclase aggregates retain a faint twinning (visible under polarized light), but most is indistinguishable from quartz. Plane light; length of photo is 2.3 mm.

Photo 15. Photomicrograph of massive silicified basalt. Sample P56 by survey hub #18. The slide consists of plagioclase/quartz (75%), 5-10% clinozoisite/epidote (the brownish high relief mineral in photo), minor (3-5% fine chlorite and sericite, and 1-2% sphene. A vein of chlorite-clinozoisite-quartz is on the left side of the photo. There is no hornblende in the slide, which is in marked contrast to Photo 14. Plane light; length of photo is 2.3 mm.





actinolite retain a basaltic texture only partially overgrown by poikiloblastic dark green hornblende. In the extreme NW part of the area, in the vicinity of survey hubs 27, 28 and 29, many of the basalts are not silicified and typically weather a dull medium grey (Photo 16,), in sharp contrast to the silicified basalts. In thin section (Photos 18a,b) these basalts consist of approximately 40 percent pale green weakly pleochroic actinolitic hornblende, very minor chlorite and opaques, with the remainder of the rock being largely clinozoisite - epidote with only minor plagioclase (5-10 percent) as fine anhedral recrystallized grains or rarely with a ghostly lath-shaped outline with a suggestion of relic twinning. Variolitic pillow basalt forms one of the non-silicified units (Photo17); the varioles occur near the pillow rims and in thin section are seen to be commonly cored, with coarse actinolite/chlorite centres and finer actinolite-epidote-plagioclase rims (Photos 19a,b).

The south margin of the Ivanhoe stock of granodiorite (Ayer, 1991) extends into the north part of the mapped area. The granodiorite is massive, light grey weathering, medium grained, equigranular, with a color index of 15 percent and a quartz content of approximately 20 percent. Narrow green weathering epidote veinlets and fractures are locally common. Minor dikes of granodiorite intrude the volcanics, some of which contain numerous partially digested and amphibolitized inclusions of the basalt (Photo 20). One thin section (P25-93) of a dike of granodiorite was examined and contained 55 percent plagioclase, 15 percent perthitic K-feldspar (micrecline), 18 percent quartz, 5 percent epidote, 4 percent biotite, 2 percent chlorite, one percent sphene and traces of zircon and apatite.

A penetrative ENE trending fabric is imparted by the mafic minerals, elongated pillows, pillow fragments and vesicles. Locally a strong more E-W trending fracture cleavage is developed (Photo 21). Pillow shapes and

Photo 16. Non-silicified, dullk grey green weathering pillow basalt, by survey hub #29.

Photo 17. Non-silicified, variolitic pillow basalt outcropping by survey hub #28.

Photo 18a. Photomicrograph of non-silicified pillow basalt. Sample P62, by survey hub #29. Consists of somewhat shreddy, green pleochroic hornblende (30-35%) in a matrix largely of clinozoisite/epidote and lesser plagioclase. Plane light; length of photo is 2.3 mm.

Photo 18b. Same; X-nicols. Note the blue interference color of the clinozoisite.

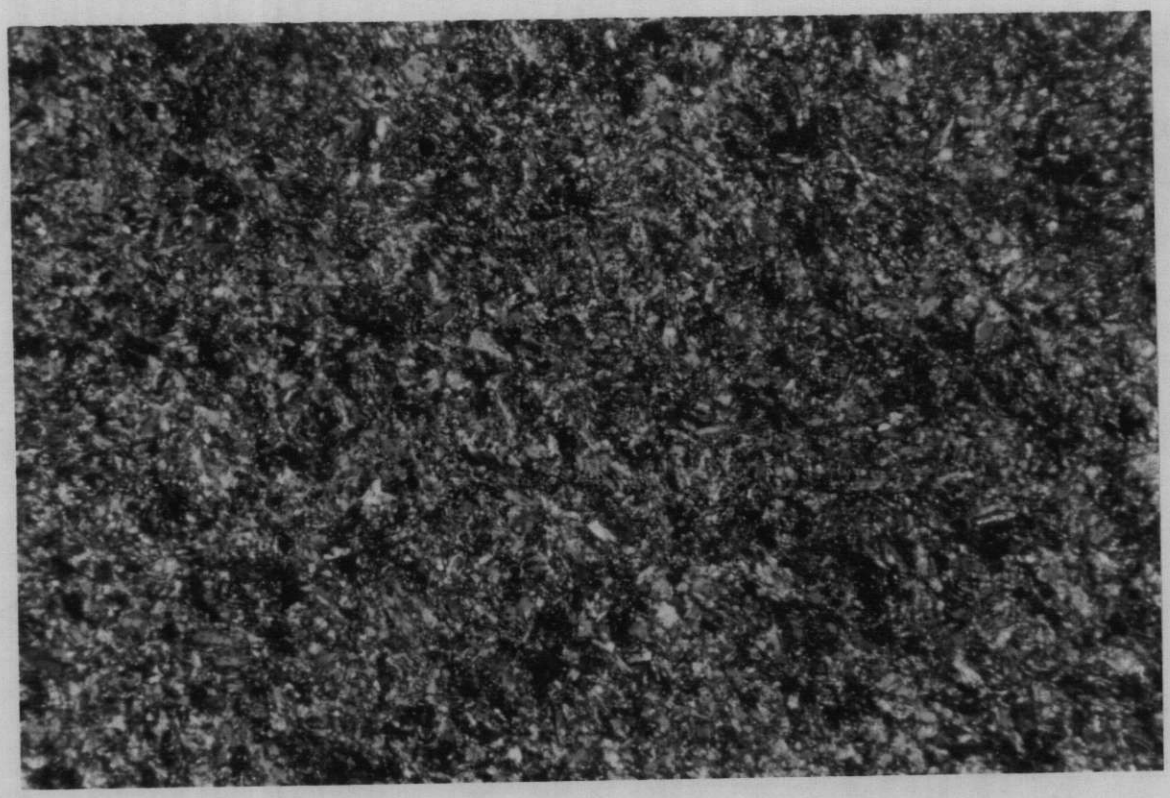


Photo 19a. Photomicrograph of variolitic pillow basalt (sample P101, in NW corner mapped north of hub #29). Interior of varioles contain blade-like crystals of clinozoisite and very fine saussurite (epidote-clinozoisite-carbonate and minor actinolite). Narrow oxide rim of variole contains very fine saussurite. Blade-like habit of clinozoisite probably pseudomorphs primary radiating texture of variole. Plane light; length of photo is 2.3 mm.

Photo 19b. Same; X-nicols.

flow morphology did not lend themselves to reliable facing directions. Although somewhat ambiguous, the distribution of vesicles within some of the pillows, more often than not, suggested that tops were south.

Geochemistry

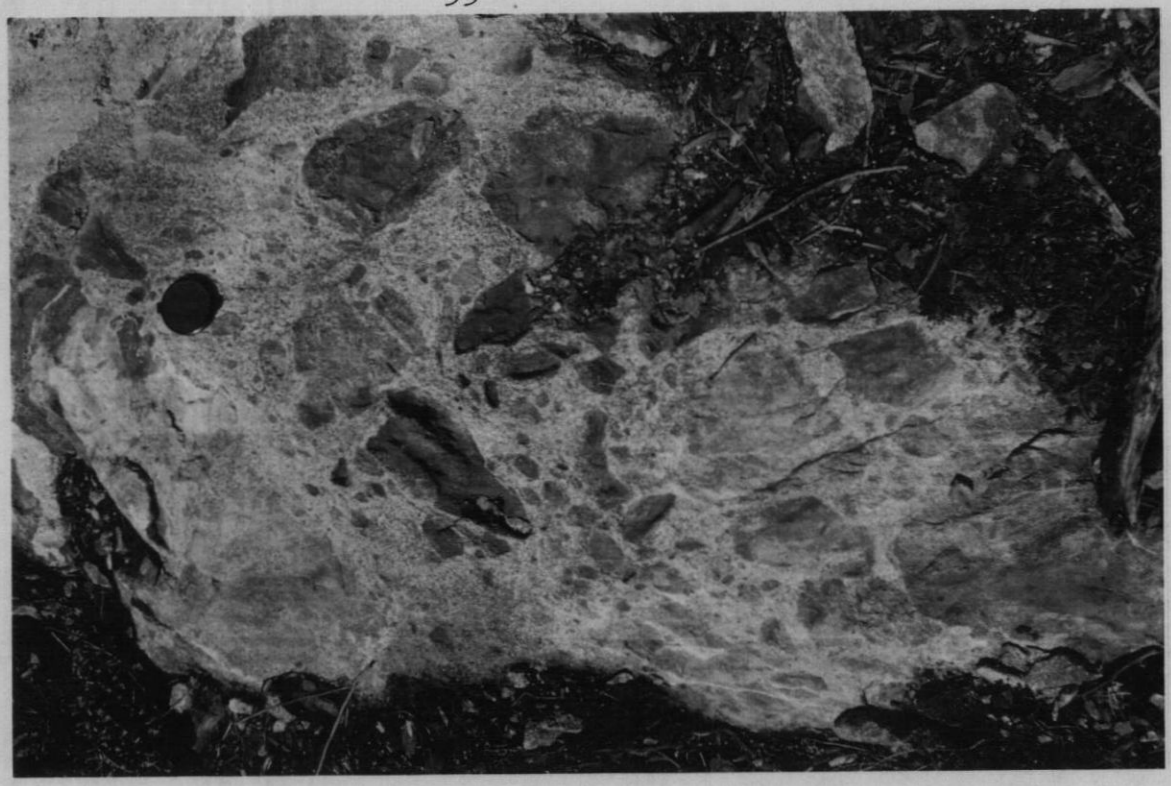
Five whole rock analyses were determined (Appendix B); three silicified basalts and two non-silicified basalts. Rare earth element (REE) geochemistry was also done for three of the whole rock samples; one of the silicified and two of the non-silicified basalts.

Various plots of the geochemical data are presented. The volcanics are subalkaline (Figures 4, and 5), and it is invariably seen that the silicified basalts lie within the calc-alkaline field and the non-silicified within the tholeiitic field (Figures 6, 7 and 8). This raises the question as to whether the apparent differing chemical affinities (ie.- calc-alkaliic vs tholeiitic) is a reflection of the alteration or whether there are actually two different suites of volcanic rocks on the property.

Chondrite normalized rare earth element plots (Figure 9) clearly indicate a tholeiitic affinity for the non-silicified basalts (P-62 and P101); the flat, non-enriched, weak light rare earth element (LREE) depleted profiles are typical of many primative tholeiitic basalts (Condie, 1984). By contrast, silicified basalt P56-93 is enriched in the LREE and has a steep sloping profile analogous to calc alkaline volcanics. Although silicification would be expected to dilute rare earth concentrations the relative proportions should remain consistent, as should the profiles. Also, both scandium and titanium , which are considered to be relatively immobile during alteration, have markedly higher concentrations in the non-silicified basalts, which would be consistent with a more mafic tholeiitic parentage. An SiO2 vs K2O plot also suggests a differing parentage (Figure 10), though conceivably the higher K2O may reflect minor sericitization during silicification.

Photo 20. Incipiently amphibolitized inclusions of basalt in granodiorite dike. In thin section the amphibole is seen to have a poikilitic texture and is overgrowing saussuritized plagioclase and actinolitic hornblende. Photo taken by hub #30.

Photo 21. Strong fracture cleavage trends 108/73N (pencil); foliation and pillow elongation at 65/70SE. Narrow veins of grey quartz strike 135-140 degrees. North to bottom of photo. Silicified pillow basalt by survey hub #6.



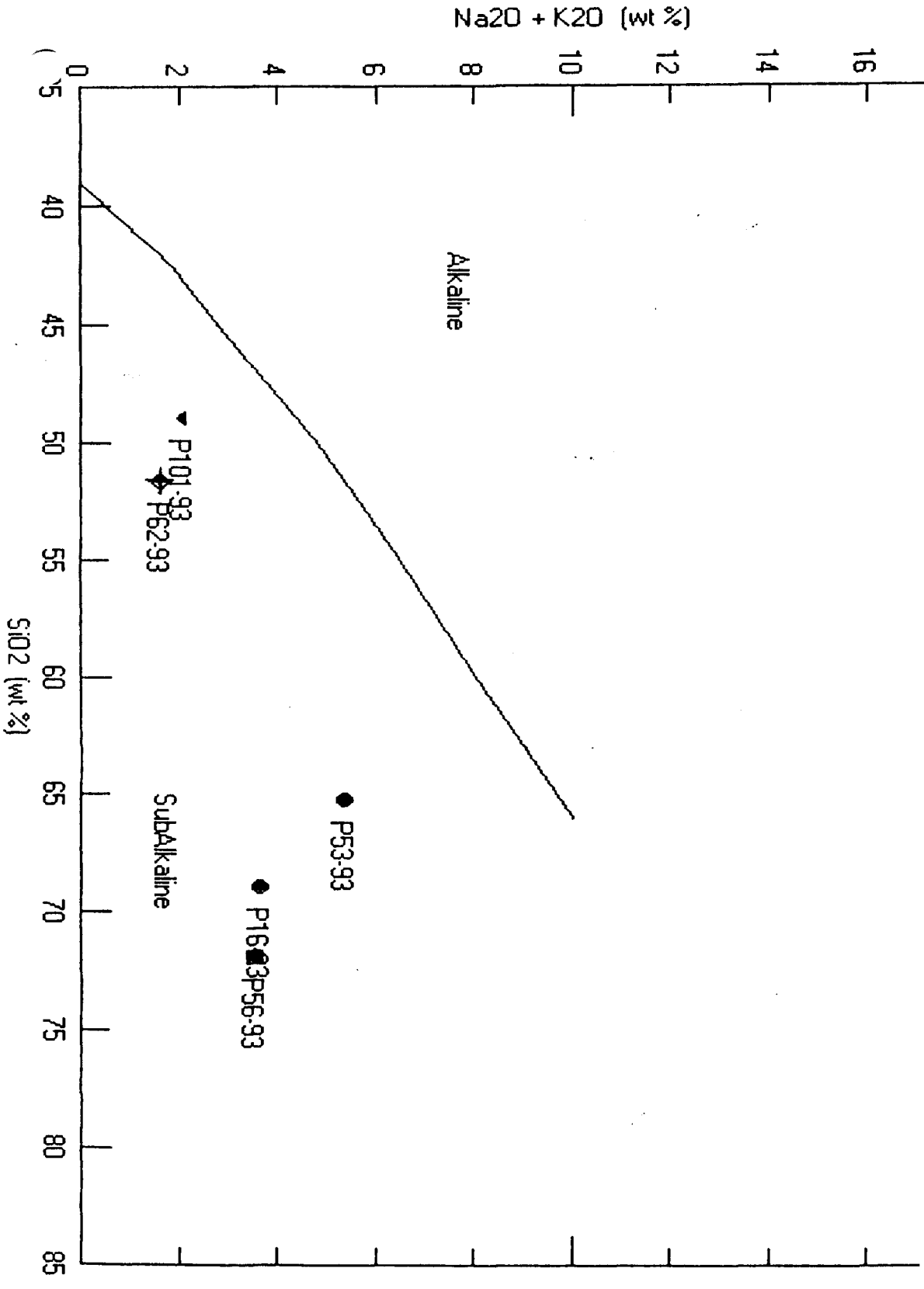

SiO2 vs. ALKALIS, IVANHOE 1993 DATA Irvine & Baragar 1971 (fig 3)
Na2O + K2O (wt %)
SiO2 (wt %)
Alkaline
SubAlkaline
P101-93
P62-93
P53-93
P16
3P56-93
Pillow basalt, non-silicified
Variolitic pillow basalt, non-silicified
Pillow basalt, silicified
Massive basalt, silicified

FIGURE 4

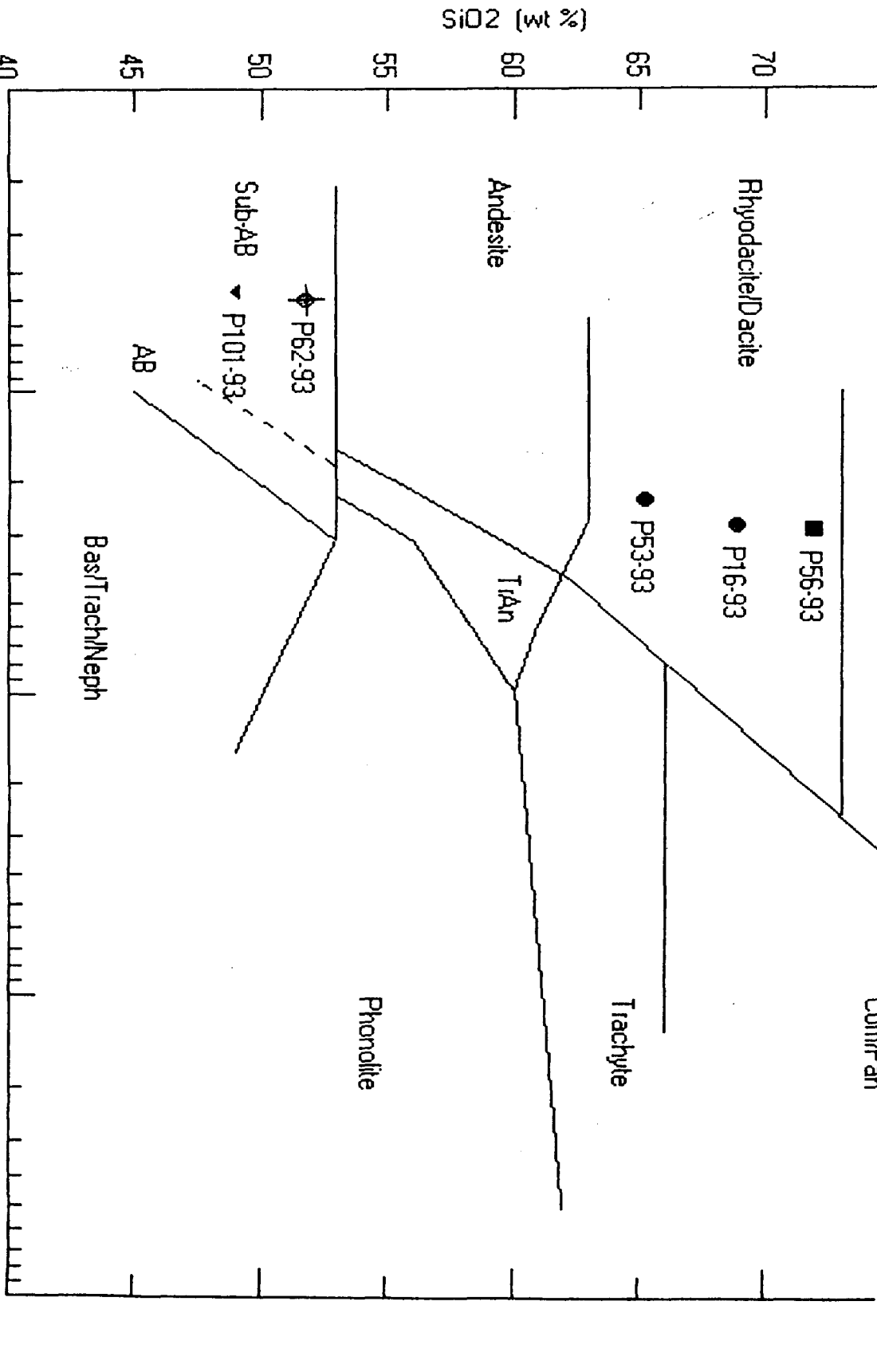

SiO2 vs. Zr/TiO2 Winchester & Floyd 1977 (fig 2)
SiO2 (wt %)
40
45
50
55
60
65
70
75
80
.001
.01
.1
1
10
Zr / TiO2
Rhyolite
Rhyodacite/Dacite
Andesite
Sub-AB
AB
Bas/Trach/Neph
TrAn
Phonolite
Trachyte
Com/Pan
P56-93
P16-93
P53-93
P62-93
P101-93
Basalt
Pillow basalt, non-silicified
Variolitic pillow basalt, non-silicified
Pillow basalt, silicified
Massive basalt, silicified

FIGURE 5

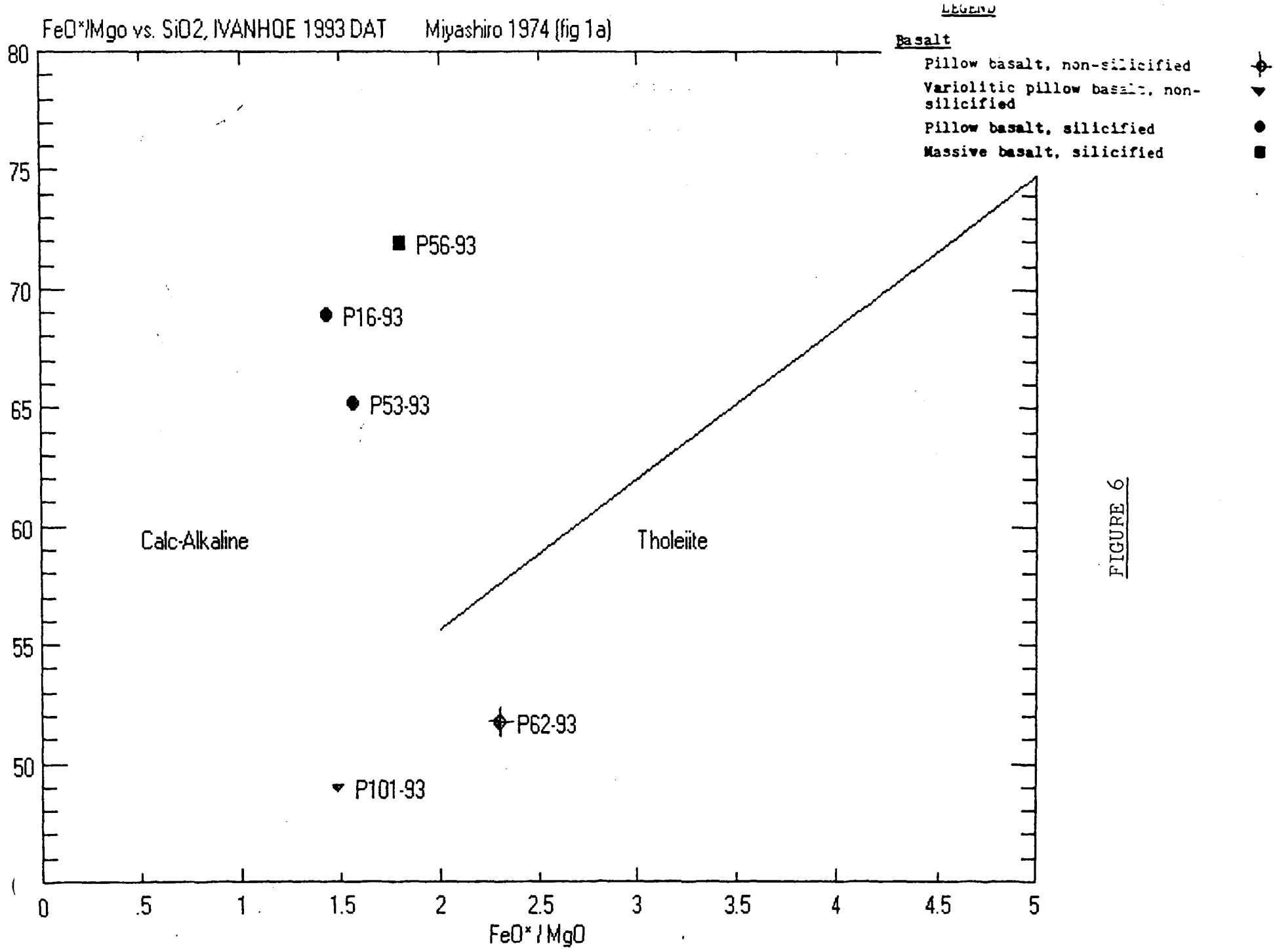

FeO*/Mgo vs. SiO2, IVANHOE 1993 DAT Miyashiro 1974 (fig 1a)
LEGEND
Basalt
Pillow basalt, non-silicified
Variolitic pillow basalt, non-silicified
Pillow basalt, silicified
Massive basalt, silicified
P56-93
P16-93
P53-93
P62-93
P101-93
Calc-Alkaline
Tholeiite
SiO2 (wt %)
FeO* / MgO
80
75
70
65
60
55
50
0
.5
1
1.5
2
2.5
3
3.5
4
4.5
5

FIGURE 6

JENSEN PLOT, IVANHOE 1993 DATA

Cation %

Jensen 1976 (fig 1)

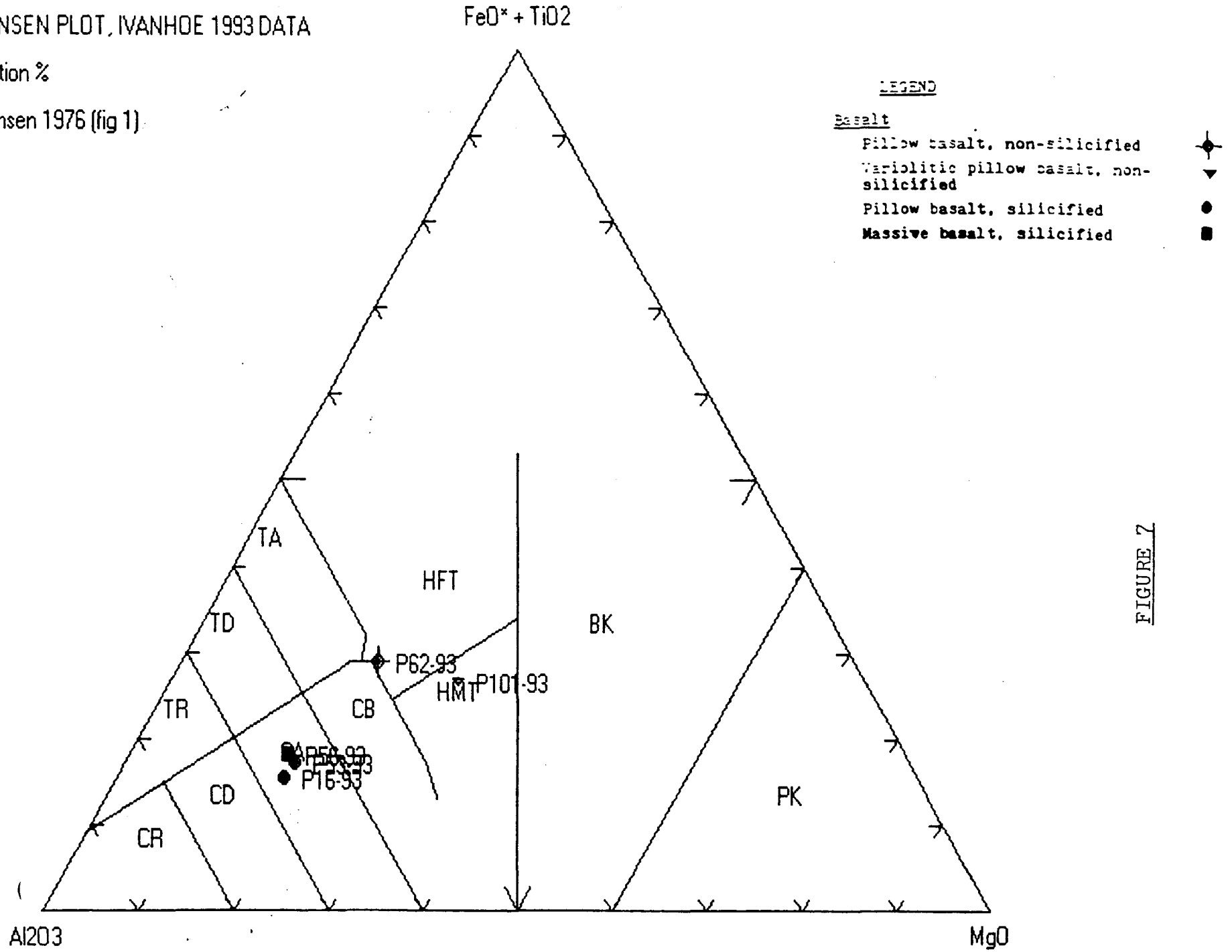


FIGURE 7

AFM DIAGRAM,IVANHOE 1993 SAMPLES

Irvine & Baragar 1971 (fig 2)

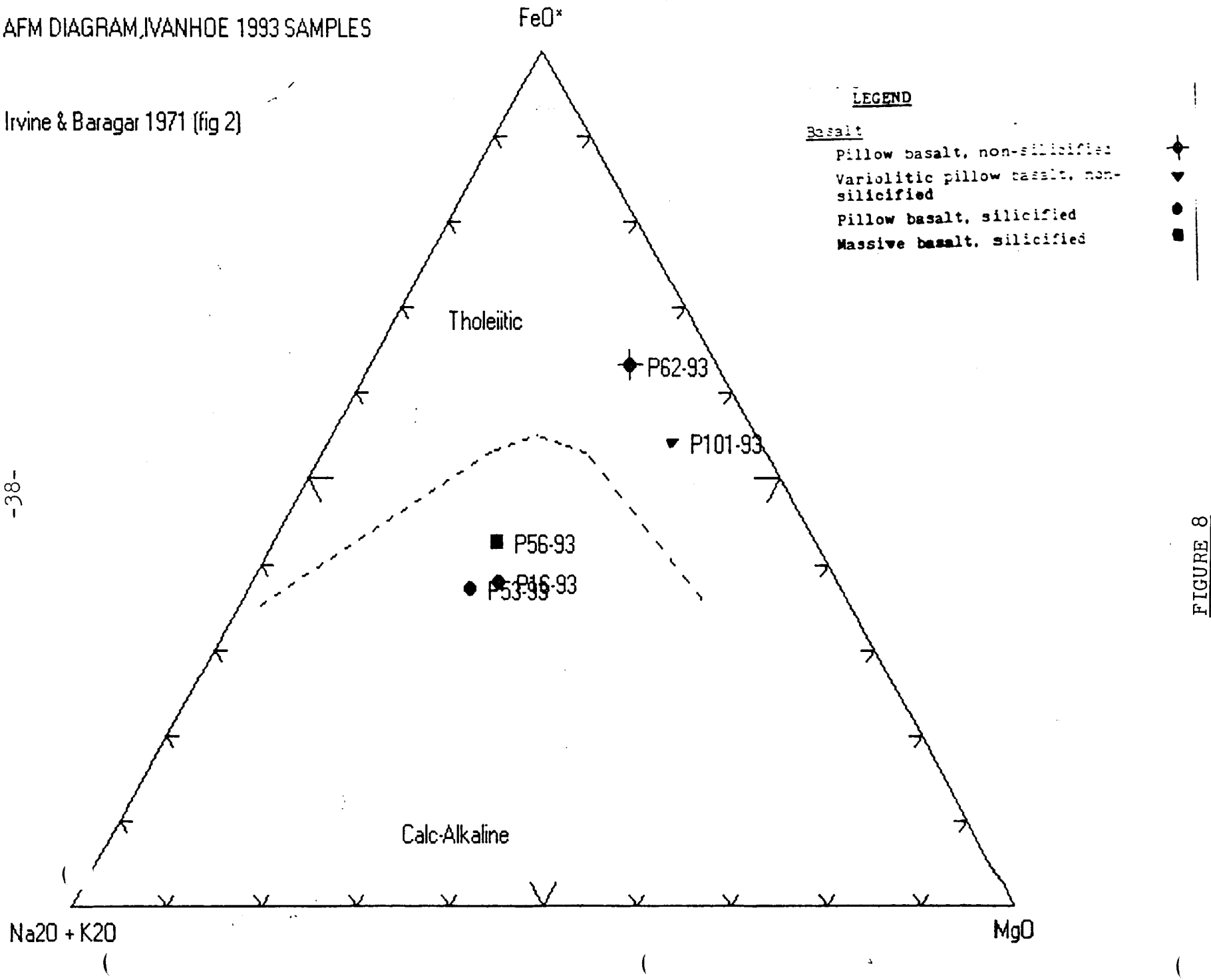


FIGURE 8

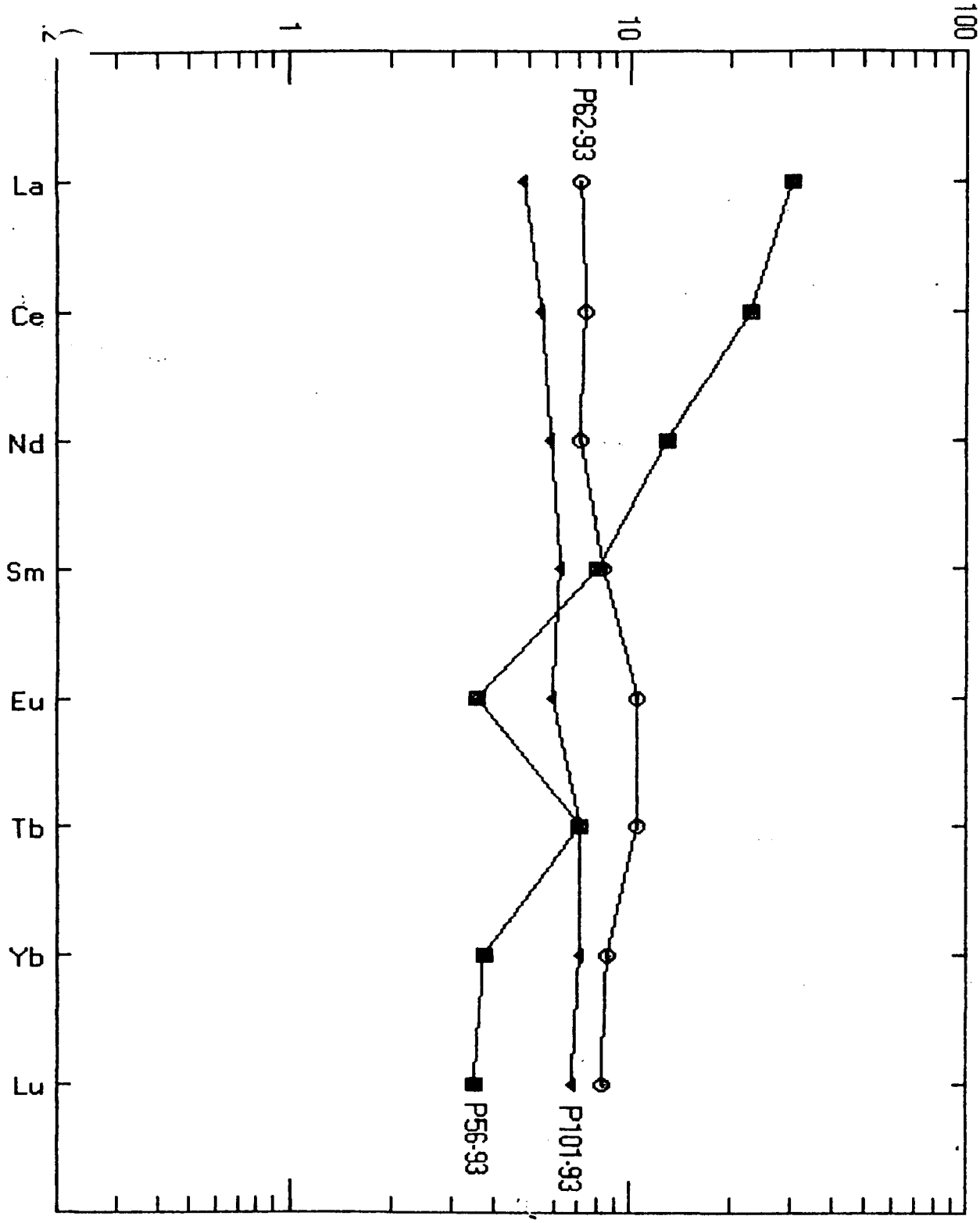

D:\WORK\IVANHOE.ROC
Norm: CHONDRITE
□P56-93 ○P62-93 ▽P101-93
100
10
1
.1
La
Ce
Nd
Sm
Eu
Tb
Yb
Lu
P62-93
P56-93
P101-93

FIGURE 9

Mineralization

A number of small rusty gossan zones, rarely extending over an area as large as 10 by 3 meters, are found within the silicified volcanics throughout the property. The mineralization typically consists of 2-3 percent fine disseminated pyrrhotite - pyrite within pillow selvages and fine fractures extending into the pillows. Two samples from such small rusty weathering zones, in the west part of the property, returned very anomalous zinc values (Appendix B); sample P60 from a rusty pillow selvage near hub #22 assayed 2150 ppm zinc and similarly sample P61 by survey hub#23 assayed 1590 ppm zinc. More rarely the sulphides are within weakly sheared portions of the massive basalt and in one such zone from which three samples were assayed (P31-33), one returned very anomalous (770 pppm) zinc values. A polished thin section of sample P32 contained minor chalcopyrite (Photo 22a,b).

Narrow (0.5-10 cm) sparsely mineralized (po-py-sp) quartz veins are associated with some of the gossan zones (eg- P70, near survey hub #28 in NW corner property). Here, a poorly exposed outcrop of rusty weathering non-silicified massive basalt contains a number of irregular quartz veins to 15-20 cm wide. A polished thin section from the quartz material was seen to contain minor shalerite (Photo 23a,b).

Conclusions and Recommendations

Although only minor sulphides were observed on the property, and there are no known airborne conductors (OGS, 1990) the area is considered worthy of closer scrutiny, particularly on the magnitude of the intense hydrothermal alteration (silicification), but also in conjunction with the few, yet distinctly anomalous zinc values that were obtained. To this end, two IP profiles are planned. The profiles would be done along the already existing north-south trails that traverse the silicified zone. The

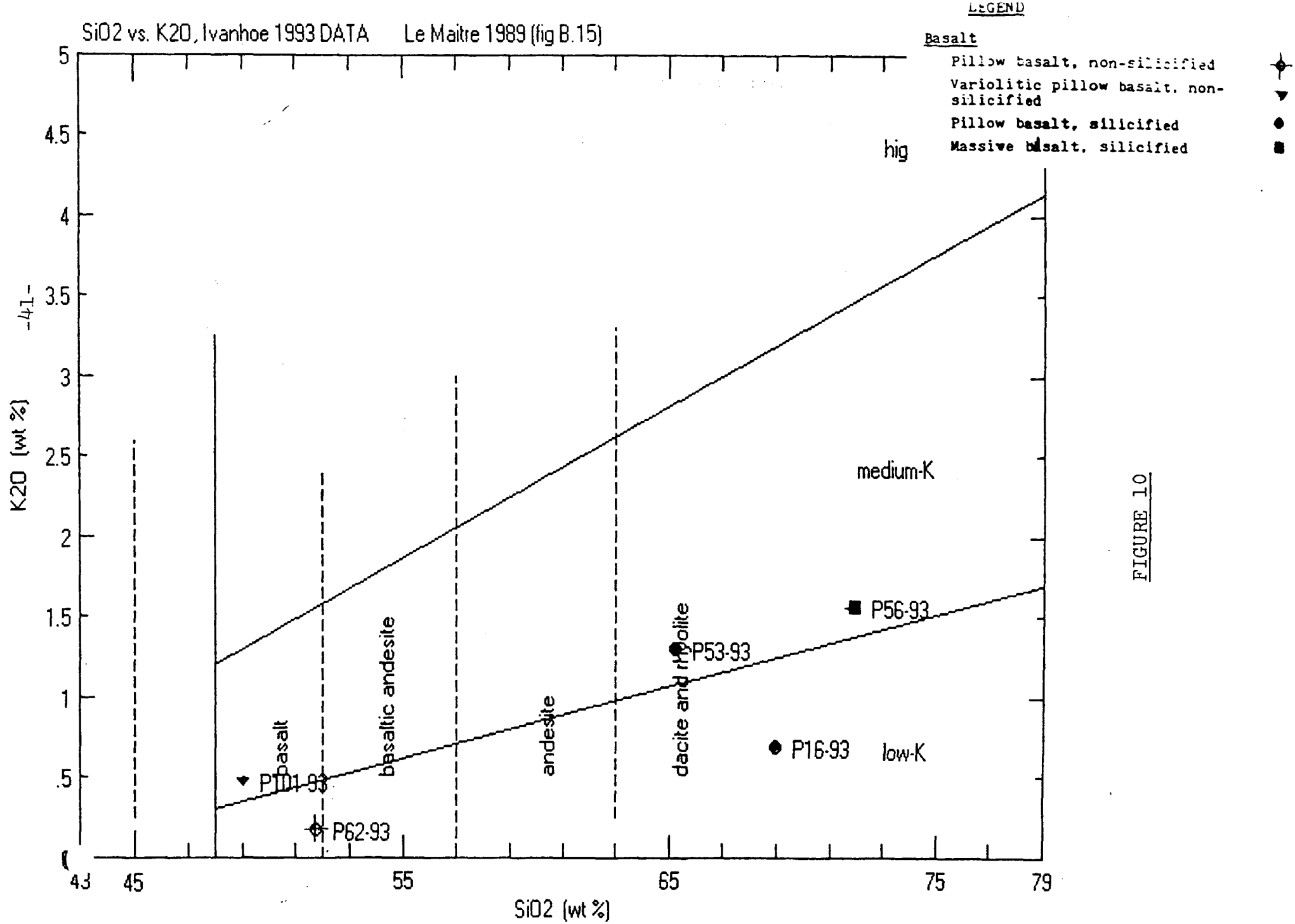
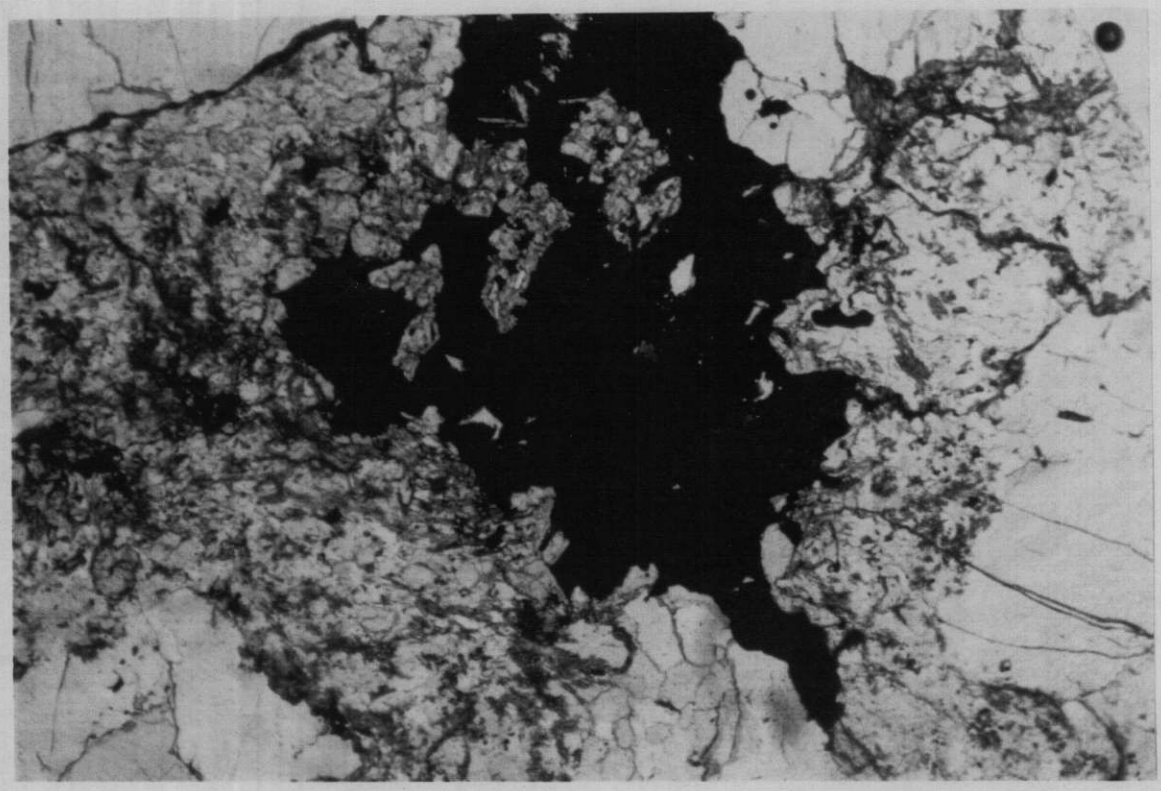

SiO2 vs. K2O, Ivanhoe 1993 DATA Le Maitre 1989 (fig B.15)
LEGEND
Basalt
Pillow basalt, non-silicified
Variolitic pillow basalt, non-silicified
Pillow basalt, silicified
Massive basalt, silicified
K2O (wt %)
SiO2 (wt %)
basalt
basaltic andesite
andesite
dacite and rhyolite
medium-K
low-K
P101-93
P62-93
P53-93
P56-93
P16-93
43
45
55
65
75
79
5
4.5
4
3.5
3
2.5
2
1.5
1
.5

FIGURE 10

Photo 22a. Photomicrograph of coarse grained red sphalerite within fine grained zone in quartz vein. Plane light; length of photo is 2.3 mm. Sample P70-93.

Photo 22b. Same, reflected light. Note fine exsolved chalcopyrite blebs with sphalerite. Pyrite occurs interstitial to quartz. Length of photo is 2.3 mm.



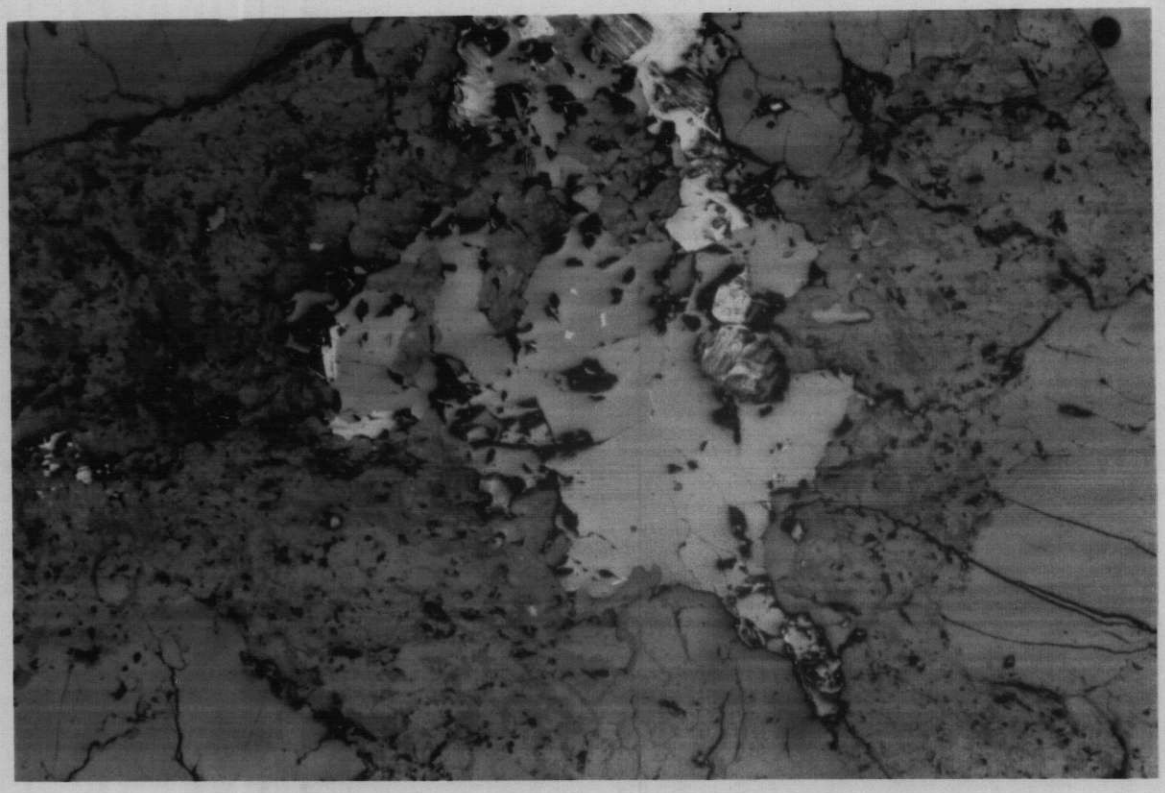
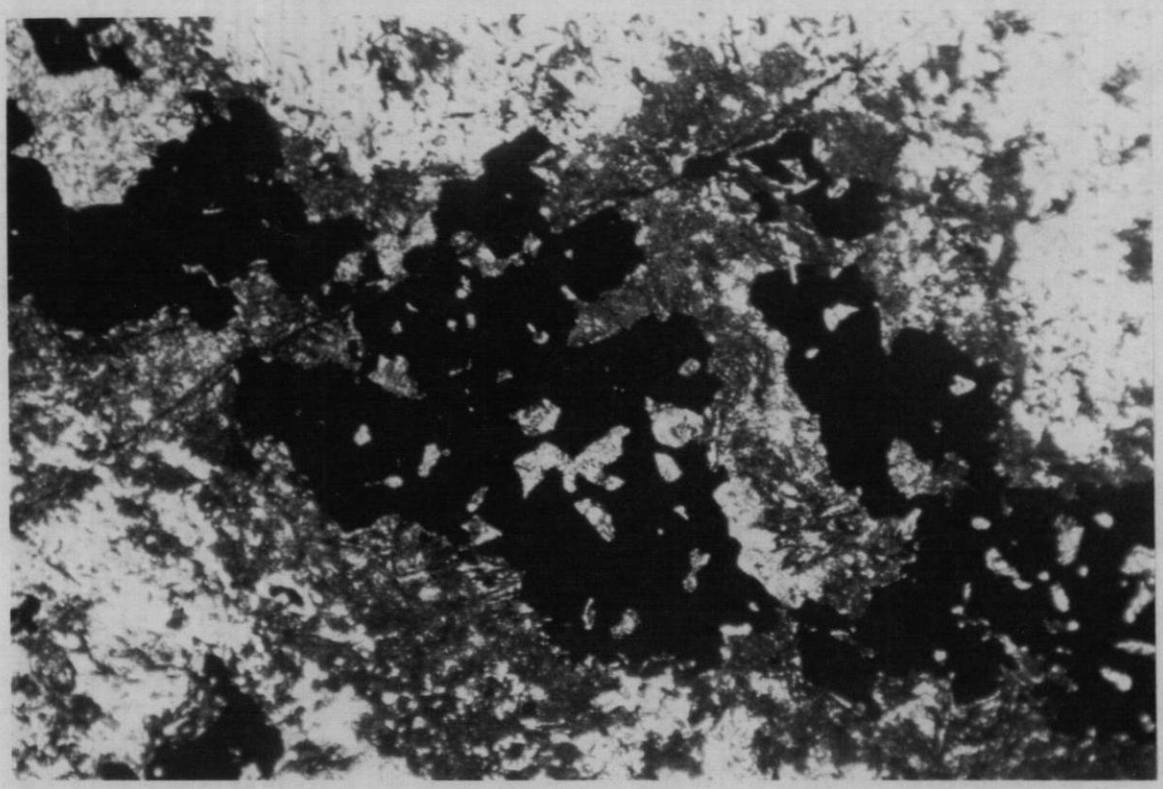
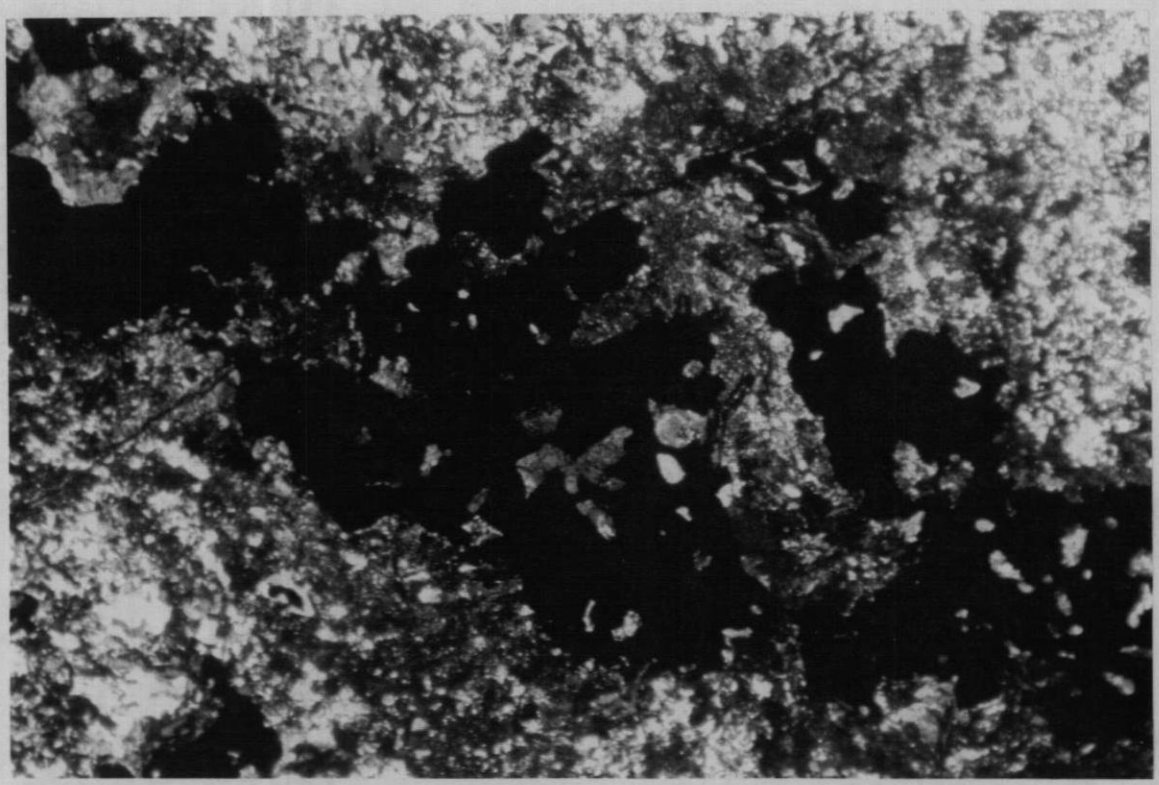


Photo 23a. Photomicrograph of sheared, silicified, massive basalt with 2-5% pyrrhotite and pyrite. Sample P32, taken 30 m north of hub #10. Photomicrograph shows a medium to coarse grained band of pyrrhotite with abundant clinozoisite and dusty oxides, minor pyrite and trace chalcopyrite. Plane light; length of photo is 3.6 mm.

Photo 23b. Same, polarized light. Length of photo is 3.6 mm.





aim would be to detect any potential disseminated mineralization or dominately sphalerite mineralization that the airborne survey would have missed.

In addition, questions regarding the silicification and metamorphism remain unanswered. For example, the pillow breccia matrix is less silicified than the breccia fragments, yet the matrix was presumably more porous and thus a more likely channel for the silicifying fluids. Retrograding of the matrix is considered unlikely. Also, amphibolitization of some of the basalts that are distant from the granodiorite(eg.- P16-93) is more intense than others (eg- variolitic flows) more proximal to the granodiorite. Further field and petrological observations will hopefully explain this.

D R Pyke.

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APPENDIX A

Sample descriptions

for

Ivanhoe P-93 Series

IVANHOE TOWNSHIP, TIMMINS AREA

Sample Descriptions (1993) for whole rock chemical analyses, geochemical analyses, thin sections, polished sections

P1-93	Variolitic pillow basalt, light to medium green, light grey weathering, varioles to 1cm.
P4-93	Basalt, massive, medium green weathering and fresh.
P5-93	Basalt, strongly foliated, light grey fresh.
P6-93	Basalt, massive, medium-light grey, weakly foliated.
P7-93	Variolitic pillow basalt, light grey green.
P8-93	Basalt, massive, moderately carbonated.
P9-93	Basalt, komatiitic, sheared, tremolite-talc alteration
P10-93	Conglomerate/debris flow, largely ultramafic matrix, minor biotite.
P16-93	Basalt, silicified, pillowed, vesicular, dark grey.
P17-93	Brown weathering, well foliated hyaloclastitic matrix to silicified pillow basalt.
P20-93	Basalt, well foliated, medium to dark green, vesicular.
P21-93	Basalt, pillowed, light grey, weathers light grey.
P25-93	Granodiorite, massive, medium grained equigranular, light grey, white weathering.
P26-93	Quartz vein - smokey
P30-93	Basalt, massive , silicified, dark grey, white weathering.
P31-93 P32-93 P33-93	From rusty zone within silicified massive basalt, contains 3-5 percent disseminated po-py.
P35-93	Basalt, massive(?), dull grey weathering, non-silicified.
P36-93	Quartz vein

= Samples from Ivanhoe Property

P37-93	Hyaloclastitic(?) looking material associated with a pill bx.
P38-93	Minor py-po in poorly exposed rusty weathering pillow basalt, non silicified.
P39-93	Same
P48-93	Basalt, pillowed, vesicular, silicified, dark grey, white weathering
P50-93	Granodiorite, massive, white weathering, biotite 15%, quartz 20%
P51-93	Basalt, pillowed, vesicular, weak (?) silicification.
P52-93	Quartz vein, dark grey to black, barren
P53-93	Basalt, pillowed, vesicular, silicified
P54-93	Basalt, pillowed, weak to non-silicified(?), minor pyrite
P56-93	Basalt, massive, silicified, highly fractured
P57-93	Float, 30 by 15 cm, rusty weathering, amphibolitized and contains spotty patches of sulphide (po + sp?).
P58-93	Basalt massive, white weathering, moderate silicification
P59-93	Float, rusty, 50 by 20 cm, mafic volcanic, possible green malachite(?)staining.
P60-93	Rusty weathering pillow rim containing 3-4 percent pyrite
P61-93	Narrow rusty weathering zone in silicified pillow basalt
P62-93	Basalt, pillowed, non-silicified, dull grey green weathering.
P64A-93	Basalt, massive, weakly vesicular, dark green
P67-93	Variolitic pillow basalt
P68-93	Quartz vein, 10-20 cm wide, minor po-py-sp(?)
P70-93	Quartz vein, minor po + cp?

P71-93	Conglomerate/debris flow, sample of ultramafic matrix
P72-93	Basalt(?), massive, light grey, minor biotite
P73-93	Debris flow/conglomerate, 3-4 percent pyrite.
P74-93	Basalt, massive, fine grain, light grey, 2-4 percent pyrite
P78 to 83 -93	Series of sulphide bearing samples taken from rubble pile at edge of a trench within poorly exposed conglomerate/debris flow.
P86 to 88 -93	Basalt, light grey, massive, locally containing 3-5% biotite, 2-5% pyrite and minor malachite stain.
P93-93	Highly silicified pillow breccia fragment
P95-93	Matrix to pillow breccia, dull grey green weathering
P99-93	Rusty zone in pillow basalt, 1 - 0.5 m wide, 2-3 % py-po.
P100-93	Amphibolitized pillow basalt
P101-93	Variolitic pillow basalt
P102-93	Rusty (po) zone at variolitic pillow margin, 15 cm wide.
P105-93	Drill core, basalt, massive, med-dark green, 2-3% leucoxene, Hole BW92- 1 (59m)
P107-93	Drill core, basaltic komatiite, abundant tremolit/actinolite, Hole BW92-1 (117 m)
P108-93	Drill core, basaltic komatiite, pyroxene spx texture. Hole BW92 -1 (122m)
P111-93	Drill core, peridotitic komatiite. Hole BW92-2 (28 m)
P115-93	Drill core, quartz vein. Hole BW92-2 (58 m)
P116-93	Drill core, variolitic pillow basalt. Hole BW92-2 (110 m)

P131-93 P132-93 P133-93 P134-93 P135-93	Drill core samples of light grey andesitic pillow basalt from hole BW92-2. Samples taken at 112m, 113m, 106m, 120m, 96m respectively
P137-93	Drill core, quartz vein containing emerald green mica and minor pyrrhotite. Hole BW92-2 (167m)
P139-93	Drill core, andesitic pillow basalt as P131 etc. Hole BW-2 at 87 m.

APPENDIX B

GEOCHEMICAL DATA

IVANHOE TOWNSHIP PROPERTY

XRAL

X-RAY ASSAY LABORATORIES

A DIVISION OF SGS CANADA INC.
1885 LESLIE STREET • DON MILLS, ONTARIO M3B 3J4 • CANADA
TEL: (416)445-5755 TELEX: 06-986947 FAX: (416)445-4152

CERTIFICATE OF ANALYSIS

REPORT 25228

TO: D.R. PYKE & ASSOCIATES
ATTN: D.R. PYKE
31 DELAIR CRESCENT
THORNHILL, ONTARIO
L3T 2M3

CUSTOMER No. 754

DATE SUBMITTED
1-Nov-93

REF. FILE 16625-D6

Total Pages 6

44R, W.CORES

	METHOD	DETECTION LIMIT
AU PPB	FADCP	1.
AU PPB	NA	5.
NA PPM	NA	100.
WRMAJ %	XRF-F	.01
CA %	NA	.5
SC PPM	NA	.1
CR PPM	NA	2.
FE %	NA	.05
CO PPM	NA	1.
NI PPM	NA	200.
CU PPM	ICP	.5
ZN PPM	NA	40.
ZN PPM	ICP	.5
AS PPM	NA	2.
SE PPM	NA	3.
BR PPM	NA	1.
RB PPM	NA	20.
WRMIN PPM	XRF-F	10.
SR PPM	NA	500.

	METHOD	DETECTION LIMIT
MO PPM	NA	5.
AG PPM	NA	5.
SB PPM	NA	.2
CS PPM	NA	1.
BA PPM	NA	100.
LA PPM	NA	.5
CE PPM	NA	3.
ND PPM	NA	5.
SM PPM	NA	.1
EU PPM	NA	.2
TB PPM	NA	.5
YB PPM	NA	.2
LU PPM	NA	.05
HF PPM	NA	.5
TA PPM	NA	1.
W PPM	NA	3.
IR PPB	NA	20.
TH PPM	NA	.5
U PPM	NA	.5

DATE 07-Dec-93

CERTIFIED BY .....

Jean H.L. Opdebeeck, General Manager

SAMPLE	AU PPB	AU PPB	NA PPM	CA %	SC PPM	CR PPM	FE %	CO PPM	NI PPM
P56-93	--	<5	12000	2.1	8.1	170	2.83	14	<200
P62-93	--	<5	11000	7.5	43.8	460	7.89	51	<200
P101-93	--	8	11000	7.3	45.8	550	8.21	54	<200
P139-93	--	<5	13000	2.3	8.9	180	3.02	14	<200
P11-93	<1	--	--	--	--	--	--	--	--
P12-63	<1	--	--	--	--	--	--	--	--
P13-93	<1	--	--	--	--	--	--	--	--
P14-93	<1	--	--	--	--	--	--	--	--
P18-93	<1	--	--	--	--	--	--	--	--
P27-93	<1	--	--	--	--	--	--	--	--
P31-93	<1	--	--	--	--	--	--	--	--
P32-93	1	--	--	--	--	--	--	--	--
P33-93	<1	--	--	--	--	--	--	--	--
P36A-93	<1	--	--	--	--	--	--	--	--
P38-93	<1	--	--	--	--	--	--	--	--
P39-93	<1	--	--	--	--	--	--	--	--
P52-93	<1	--	--	--	--	--	--	--	--
P54-93	<1	--	--	--	--	--	--	--	--
P57-93	<1	--	--	--	--	--	--	--	--
P59-93	<1	--	--	--	--	--	--	--	--
P60-93	1	--	--	--	--	--	--	--	--
P61-93	13	--	--	--	--	--	--	--	--
P68-93	1	--	--	--	--	--	--	--	--
P70-93	18	--	--	--	--	--	--	--	--
P73-93	3	--	--	--	--	--	--	--	--
P74-93	1	--	--	--	--	--	--	--	--
P78-93	<1	--	--	--	--	--	--	--	--
P79-93	22	--	--	--	--	--	--	--	--
P80-93	2	--	--	--	--	--	--	--	--
P81-93	<1	--	--	--	--	--	--	--	--
P82-93	<1	--	--	--	--	--	--	--	--
P83-93	<1	--	--	--	--	--	--	--	--
P86-93	<1	--	--	--	--	--	--	--	--
P87-93	<1	--	--	--	--	--	--	--	--
P88-93	28	--	--	--	--	--	--	--	--
P99-93	14	--	--	--	--	--	--	--	--
P102-93	3	--	--	--	--	--	--	--	--
P104-93	3	--	--	--	--	--	--	--	--
P115-93	<1	--	--	--	--	--	--	--	--
D P31-93	--	--	--	--	--	--	--	--	--
D P59-93	<1	--	--	--	--	--	--	--	--
D P78-93	--	--	--	--	--	--	--	--	--
D P83-93	<1	--	--	--	--	--	--	--	--
D P115-93	--	--	--	--	--	--	--	--	--

D - QUALITY CONTROL DUPLICATE

= Samples from Ivanhoe Property.

SAMPLE	CU PPM	ZN PPM	ZN PPM	AS PPM	SE PPM	BR PPM	RB PPM	SR PPM	MO PPM
P56-93	--	40	--	<2	<3	4	20	<500	<5
P62-93	--	90	--	<2	<3	3	<20	<500	<5
P101-93	--	130	--	<2	<3	4	30	<500	<5
P139-93	--	40	--	<2	<3	4	30	<500	<5
P11-93	--	--	--	--	--	--	--	--	--
P12-63	--	--	--	--	--	--	--	--	--
P13-93	--	--	--	--	--	--	--	--	--
P14-93	--	--	--	--	--	--	--	--	--
P18-93	--	--	--	--	--	--	--	--	--
P27-93	--	--	--	--	--	--	--	--	--
P31-93	32.5	--	36.9	--	--	--	--	--	--
P32-93	57.3	--	58.5	--	--	--	--	--	--
P33-93	56.5	--	707	--	--	--	--	--	--
P36A-93	--	--	--	--	--	--	--	--	--
P38-93	175	--	154	--	--	--	--	--	--
P39-93	157	--	121	--	--	--	--	--	--
P52-93	--	--	--	--	--	--	--	--	--
P54-93	276	--	19.0	--	--	--	--	--	--
P57-93	44.7	--	19.2	--	--	--	--	--	--
P59-93	42.2	--	88.9	--	--	--	--	--	--
P60-93	156	--	2150	--	--	--	--	--	--
P61-93	228	--	1590	--	--	--	--	--	--
P68-93	--	--	--	--	--	--	--	--	--
P70-93	--	--	--	--	--	--	--	--	--
P73-93	85.3	--	65.3	--	--	--	--	--	--
P74-93	81.1	--	117	--	--	--	--	--	--
P78-93	54.8	--	178	--	--	--	--	--	--
P79-93	157	--	143	--	--	--	--	--	--
P80-93	133	--	128	--	--	--	--	--	--
P81-93	252	--	1090	--	--	--	--	--	--
P82-93	273	--	893	--	--	--	--	--	--
P83-93	156	--	132	--	--	--	--	--	--
P86-93	88.0	--	75.7	--	--	--	--	--	--
P87-93	65.4	--	87.0	--	--	--	--	--	--
P88-93	118	--	112	--	--	--	--	--	--
P99-93	347	--	454	--	--	--	--	--	--
P102-93	171	--	68.8	--	--	--	--	--	--
P104-93	77.5	--	78.3	--	--	--	--	--	--
P115-93	50.7	--	33.5	--	--	--	--	--	--
D P31-93	32.4	--	37.5	--	--	--	--	--	--
D P59-93	--	--	--	--	--	--	--	--	--
D P78-93	51.4	--	173	--	--	--	--	--	--
D P83-93	--	--	--	--	--	--	--	--	--
D P115-93	51.4	--	33.1	--	--	--	--	--	--

D - QUALITY CONTROL DUPLICATE

SAMPLE	AG PPM	SB PPM	CS PPM	BA PPM	LA PPM	CE PPM	ND PPM	SM PPM	EU PPM
P56-93	<5	<.2	<1	400	10.8	21	9	1.8	.3
P62-93	<5	<.2	<1	200	2.6	7	5	1.9	.9
P101-93	<5	.3	<1	100	1.7	5	<5	1.4	.5
P139-93	<5	<.2	<1	500	11.0	22	10	1.9	.5
P11-93	--	--	--	--	--	--	--	--	--
P12-63	--	--	--	--	--	--	--	--	--
P13-93	--	--	--	--	--	--	--	--	--
P14-93	--	--	--	--	--	--	--	--	--
P18-93	--	--	--	--	--	--	--	--	--
P27-93	--	--	--	--	--	--	--	--	--
P31-93	--	--	--	--	--	--	--	--	--
P32-93	--	--	--	--	--	--	--	--	--
P33-93	--	--	--	--	--	--	--	--	--
P36A-93	--	--	--	--	--	--	--	--	--
P38-93	--	--	--	--	--	--	--	--	--
P39-93	--	--	--	--	--	--	--	--	--
P52-93	--	--	--	--	--	--	--	--	--
P54-93	--	--	--	--	--	--	--	--	--
P57-93	--	--	--	--	--	--	--	--	--
P59-93	--	--	--	--	--	--	--	--	--
P60-93	--	--	--	--	--	--	--	--	--
P61-93	--	--	--	--	--	--	--	--	--
P68-93	--	--	--	--	--	--	--	--	--
P70-93	--	--	--	--	--	--	--	--	--
P73-93	--	--	--	--	--	--	--	--	--
P74-93	--	--	--	--	--	--	--	--	--
P78-93	--	--	--	--	--	--	--	--	--
P79-93	--	--	--	--	--	--	--	--	--
P80-93	--	--	--	--	--	--	--	--	--
P81-93	--	--	--	--	--	--	--	--	--
P82-93	--	--	--	--	--	--	--	--	--
P83-93	--	--	--	--	--	--	--	--	--
P86-93	--	--	--	--	--	--	--	--	--
P87-93	--	--	--	--	--	--	--	--	--
P88-93	--	--	--	--	--	--	--	--	--
P99-93	--	--	--	--	--	--	--	--	--
P102-93	--	--	--	--	--	--	--	--	--
P104-93	--	--	--	--	--	--	--	--	--
P115-93	--	--	--	--	--	--	--	--	--
D P31-93	--	--	--	--	--	--	--	--	--
D P59-93	--	--	--	--	--	--	--	--	--
D P78-93	--	--	--	--	--	--	--	--	--
D P83-93	--	--	--	--	--	--	--	--	--
D P115-93	--	--	--	--	--	--	--	--	--

D - QUALITY CONTROL DUPLICATE

SAMPLE	TB PPM	YB PPM	LU PPM	HF PPM	TA PPM	W PPM	IR PPB	TH PPM	U PPM
P56-93	<.5	.9	.13	2.4	<1	<3	<20	2.1	.5
P62-93	.6	2.1	.31	1.7	<1	<3	<20	<.5	<.5
P101-93	<.5	1.7	.25	1.0	<1	<3	<20	<.5	<.5
P139-93	<.5	1.0	.15	2.7	<1	<3	<20	2.2	.5
P11-93	--	--	--	--	--	--	--	--	--
P12-63	--	--	--	--	--	--	--	--	--
P13-93	--	--	--	--	--	--	--	--	--
P14-93	--	--	--	--	--	--	--	--	--
P18-93	--	--	--	--	--	--	--	--	--
P27-93	--	--	--	--	--	--	--	--	--
P31-93	--	--	--	--	--	--	--	--	--
P32-93	--	--	--	--	--	--	--	--	--
P33-93	--	--	--	--	--	--	--	--	--
P36A-93	--	--	--	--	--	--	--	--	--
P38-93	--	--	--	--	--	--	--	--	--
P39-93	--	--	--	--	--	--	--	--	--
P52-93	--	--	--	--	--	--	--	--	--
P54-93	--	--	--	--	--	--	--	--	--
P57-93	--	--	--	--	--	--	--	--	--
P59-93	--	--	--	--	--	--	--	--	--
P60-93	--	--	--	--	--	--	--	--	--
P61-93	--	--	--	--	--	--	--	--	--
P68-93	--	--	--	--	--	--	--	--	--
P70-93	--	--	--	--	--	--	--	--	--
P73-93	--	--	--	--	--	--	--	--	--
P74-93	--	--	--	--	--	--	--	--	--
P78-93	--	--	--	--	--	--	--	--	--
P79-93	--	--	--	--	--	--	--	--	--
P80-93	--	--	--	--	--	--	--	--	--
P81-93	--	--	--	--	--	--	--	--	--
P82-93	--	--	--	--	--	--	--	--	--
P83-93	--	--	--	--	--	--	--	--	--
P86-93	--	--	--	--	--	--	--	--	--
P87-93	--	--	--	--	--	--	--	--	--
P88-93	--	--	--	--	--	--	--	--	--
P99-93	--	--	--	--	--	--	--	--	--
P102-93	--	--	--	--	--	--	--	--	--
P104-93	--	--	--	--	--	--	--	--	--
P115-93	--	--	--	--	--	--	--	--	--
D P31-93	--	--	--	--	--	--	--	--	--
D P59-93	--	--	--	--	--	--	--	--	--
D P78-93	--	--	--	--	--	--	--	--	--
D P83-93	--	--	--	--	--	--	--	--	--
D P115-93	--	--	--	--	--	--	--	--	--

D - QUALITY CONTROL DUPLICATE

SAMPLE \ %	SIO2	AL2O3	CAO	MGO	NA2O	K2O	FE2O3	MNO	TIO2	P2O5	CR2O3	LOI	SUM
P1-93	46.7	18.3	9.88	5.48	1.69	.09	10.2	.21	.371	.05	.09	5.25	98.3
P16-93	68.4	12.8	6.94	2.66	2.94	.69	4.24	.08	.422	.11	.04	.85	100.2
P53-93	63.6	14.4	4.92	3.15	3.95	1.27	5.49	.10	.497	.12	.02	1.15	98.8
P56-93	69.9	12.1	3.83	2.44	1.92	1.53	4.89	.09	.378	.11	.02	1.70	99.0
P62-93	50.9	14.7	12.8	4.84	1.43	.17	12.4	.25	.871	.08	.05	1.05	99.6
P101-93	47.4	14.4	10.5	8.05	1.56	.47	13.3	.29	.694	.06	.07	1.25	98.1
P105-93	54.0	14.3	9.29	5.49	2.62	.05	9.16	.18	.749	.08	.03	3.00	99.0
P107-93	56.0	8.08	6.66	8.06	.09	.07	10.5	.35	.512	.05	.50	8.55	99.4
P139-93	57.7	16.2	10.1	2.57	2.96	.20	4.71	.14	.363	.05	.09	5.25	100.4
D P1-93	46.9	18.3	9.84	5.49	1.71	.09	10.1	.21	.372	.05	.09	5.25	98.4

D - QUALITY CONTROL DUPLICATE

XRF W.R.A. SUMS INCLUDE ALL ELEMENTS DETERMINED. FOR SUMMATION, ELEMENTS ARE CALCULATED AS OXIDES

SAMPLE \ PPM	RB	SR	Y	ZR	NB	BA
P1-93	<10	74	<10	19	17	86
P16-93	25	85	10	116	17	256
P53-93	14	226	28	113	20	328
P56-93	41	183	10	109	16	514
P62-93	17	96	18	43	24	88
P101-93	15	48	16	32	15	103
P105-93	11	76	<10	40	23	88
P107-93	<10	36	<10	17	16	102
P139-93	<10	111	19	14	30	110
D P1-93	<10	79	<10	<10	10	83

D - QUALITY CONTROL DUPLICATE

M.L.

Ministry of Northern Development and Mines
Ontario

Report of Work Conducted After Recording Claim

Mining Act

Transaction Number: W9460.00087

Personal information collected on this form is obtained under the authority of the Mining Act. This information will be used for correspondence. Questions about this collection should be directed to the Provincial Manager, Mining Lands, Ministry of Northern Development and Mines, Fourth Floor, 159 Cedar Street, Sudbury, Ontario, P3E 6A5, telephone (705) 670-7264.

Instructions:
- Please type or print and submit in duplicate.
- Refer to the Mining Act and Regulations for re Recorder.
- A separate copy of this form must be comple
- Technical reports and maps must accompany
- A sketch, showing the claims the work is assi

2.15429

42B01NW0012 2.15429 IVANHOE

900

Recorded Holder(s)		Client No.
DALE R. Pyke		184975
Address		**Telephone No.**
31 DELAIR CRES. Thornhill, ONT L3T 2M3		905-731-1913
Mining Division	**Township/Area**	**M or G Plan No.**
PORCUPINE	IVANHOE	
Dates Work Performed From: JUNE 28/93	To: JAN 30/94	

Work Performed (Check One Work Group Only)

	Work Group	Type
	Geotechnical Survey	GEOLOGICAL 916 715
	Physical Work, Including Drilling	
	Rehabilitation	
	Other Authorized Work	
	Assays	
	Assignment from Reserve	

RECEIVED
MAY 17 1994
MINING LANDS BRANCH

RECORDED
APR 27 1994
Receipt

Total Assessment Work Claimed on the Attached Statement of Costs $ 30,869.

Note: The Minister may reject for assessment work credit all or part of the assessment work submitted if the recorded holder cannot verify expenditures claimed in the statement of costs within 30 days of a request for verification.

Persons and Survey Company Who Performed the Work (Give Name and Address of Author of Report)

Name	Address
D. Pyke	31 Delair Cres Thornhill, ONT. L3T 2M3
K. CUNNISON	Apt 707, 540 Proudfoot LANE, LONDON, ONT N6H 1W4

attach a schedule if necessary)

Certification of Beneficial Interest * See Note No. 1 on reverse side

I certify that at the time the work was performed, the claims covered in this work report were recorded in the current holder's name or held under a beneficial interest by the current recorded holder.	Date	Recorded Holder or Agent (Signature)

Certification of Work Report

I certify that I have a personal knowledge of the facts set forth in this Work report, having performed the work or witnessed same during and/or after its completion and annexed report is true.

Name and Address of Person Certifying

D.R. PYKE 31 DELAIR CRES Thornhill ONT L3T 2M3

Telephone No.	Date	Certified By (Signature)
905-731-1913	APRIL 27/94	D.R. Pyke D.R. Pyke

For Office Use Only

Total Value Cr. Recorded	Date Recorded	Mining Recorder	Date Approved
$30,869.	APR. 27, 1994	A White	
	Deemed Approval Date: JULY 26, 1994		
	Date Notice for Amendments Sent		

RECEIVED
APR 27 1994
@ 9:45 am
PORCUPINE MINING DIVISION

241 (03/91)

Total Number of Claims	Claim Number (see Note 2)	Number of Claim Units	Work Report Number for Applying Reserve	Total Value Work Done	Total Value Work Applied	Value of Assessment Work Done on this Claim	Value Applied to this Claim	Total Assigned From	Total Reserve	Value Assigned from this Claim	Reserve: Work to be Claimed at a Future Date
1	1190038	15		$30,869	$30,869	$30,869	$30,869				

Credits you are claiming in this report may be cut back. In order to minimize the adverse effects of such deletions, please indicate from which claims you wish to priorize the deletion of credits. Please mark (✓) one of the following:

1. ☐ Credits are to be cut back starting with the claim listed last, working backwards.
2. ☐ Credits are to be cut back equally over all claims contained in this report of work.
3. ☐ Credits are to be cut back as priorized on the attached appendix.

In the event that you have not specified your choice of priority, option one will be implemented.

Note 1: Examples of beneficial interest are unrecorded transfers, option agreements, memorandum of agreements, etc., with respect to the mining claims.

Note 2: If work has been performed on patented or leased land, please complete the following:

I certify that the recorded holder had a beneficial interest in the patented or leased land at the time the work was performed.	Signature	Date

Ontario

Ministry of
Northern Development
and Mines

Min. Ju
Développement du Nord
et des mines

Statement of Costs for Assessment Credit

État des coûts aux fins du crédit d'évaluation

Mining Act/Loi sur les mines

Transaction No./N° de transaction: W9460.00087

Personal information collected on this form is obtained under the authority of the **Mining Act**. This information will be used to maintain a record and ongoing status of the mining claim(s). Questions about this collection should be directed to the Provincial Manager, Minings Lands, Ministry of Northern Development and Mines, 4th Floor, 159 Cedar Street, Sudbury, Ontario P3E 6A5, telephone (705) 670-7264.

Les renseignements personnels contenus dans la présente formule sont recueillis en vertu de la **Loi sur les mines** et serviront à tenir à jour un registre des concessions minières. Adresser toute quesiton sur la collece de ces renseignements au chef provincial des terrains miniers, ministère du Développement du Nord et des Mines, 159, rue Cedar, 4e étage, Sudbury (Ontario) P3E 6A5, téléphone (705) 670-7264.

1. Direct Costs/Coûts directs

Type	Description	Amount Montant	Totals Total global
Wages Salaires	Labour Main-d'oeuvre	26,650	
82 man days	Field Supervision Supervision sur le terrain		26,650
Contractor's and Consultant's Fees Droits de l'entrepreneur et de l'expert-conseil	Type THIN SECTION GEOCHEM	910.00	
	DRAFTING, Reprod, photography	757.00	
	CONSULTANT	150.00	1817
Supplies Used Fournitures utilisées	Type CHAIN SAW	20.00	
			20
Equipment Rental Location de matériel	Type TRANSIT	150.00	
			150
	Total Direct Costs Total des coûts directs		28637

2. Indirect Costs/Coûts indirects

** **Note:** When claiming Rehabilitation work Indirect costs are not allowable as assessment work.
Pour le remboursement des travaux de réhabilitation, les coûts indirects ne sont pas admissibles en tant que travaux d'évaluation.

Type	Description	Amount Montant	Totals Total global
Transportation Transport	Type TRUCK 5640 km @ .30/km	1692	
			1692
Food and Lodging Nourriture et hébergement	FOOD 54 man days @ $10/DAY	540	540
Mobilization and Demobilization Mobilisation et démobilisation			
	Sub Total of Indirect Costs Total partiel des coûts indirects		2232
Amount Allowable (not greater than 20% of Direct Costs) Montant admissible (n'excédant pas 20 % des coûts directs)			
Total Value of Assessment Credit (Total of Direct and Allowable Indirect costs) / **Valeur totale du crédit d'évaluation (Total des coûts directs et indirects admissibles)**			30869

Note: The recorded holder will be required to verify expenditures claimed in this statement of costs within 30 days of a request for verification. If verification is not made, the Minister may reject for assessment work all or part of the assessment work submitted.

Note : Le titulaire enregistré sera tenu de vérifier les dépenses demandées dans le présent état des coûts dans les 30 jours suivant une demande à cet effet. Si la vérification n'est pas effectuée, le ministre peut rejeter tout ou une partie des travaux d'évaluation présentés.

Filing Discounts

. Work filed within two years of completion is claimed at 100% of the above Total Value of Assessment Credit.

. Work filed three, four or five years after completion is claimed at 50% of the above Total Value of Assessment Credit. See calculations below:

Total Value of Assessment Credit	Total Assessment Claimed
× 0.50 =	

Remises pour dépôt

1. Les travaux déposés dans les deux ans suivant leur achèvement sont remboursés à 100 % de la valeur totale susmentionnée du crédit d'évaluation.

2. Les travaux déposés trois, quatre ou cinq ans après leur achèvement sont remboursés à 50 % de la valeur totale du crédit d'évaluation susmentionné. Voir les calculs ci-dessous.

Valeur totale du crédit d'évaluation	Évaluation totale demandée
× 0,50 =	

Certification Verifying Statement of Costs

I hereby certify:
That the amounts shown are as accurate as possible and these costs were incurred while conducting assessment work on the lands shown on the accompanying Report of Work form.

That as Recorded Holder (Recorded Holder, Agent, Position in Company) I am authorized to make this certification

Attestation de l'état des coûts

J'atteste par la présente :
que les montants indiqués sont le plus exact possible et que ces dépenses ont été engagées pour effectuer les travaux d'évaluation sur les terrains indiqués dans la formule de rapport de travail ci-joint.

Et qu'à titre de _____ (titulaire enregistré, représentant, poste occupé dans la compagnie) je suis autorisé à faire cette attestation.

Signature	Date
D. R. Lyke	April 27/94

12 (04/91)

Nota : Dans cette formule, lorsqu'il désigne des personnes, le masculin est utilisé au sens neutre.

Ontario

Ministry of Northern Development and Mines

Ministère du Développement du Nord et des Mines

Geoscience Approvals Office
933 Ramsey Lake Rd., 6th Fl
Sudbury, Ontario
P3E 6B5

Telephone: (705) 670-5853
Fax: (705) 670-5863

Our File: 2.15429
Transaction #: W9460.00087

July 26, 1994

Mining Recorder
Ministry of Northern
Development and Mines
60 Wilson Avenue
1st Floor
Timmins, Ontario
P4N 2S7

Dear Mr. White:

RE: Approval of Assessment Work on Mining Claims P 1190038 et. al. in Ivanhoe Township.

The assessment credits for Geology, section 12 of the Mining Act Regulations, as listed on the original Report of Work, have been approved as of **July 25, 1994.**

Please indicate this approval on the claim record sheets.

If you have any questions concerning this submission please contact Dale Messenger at 670-5858.

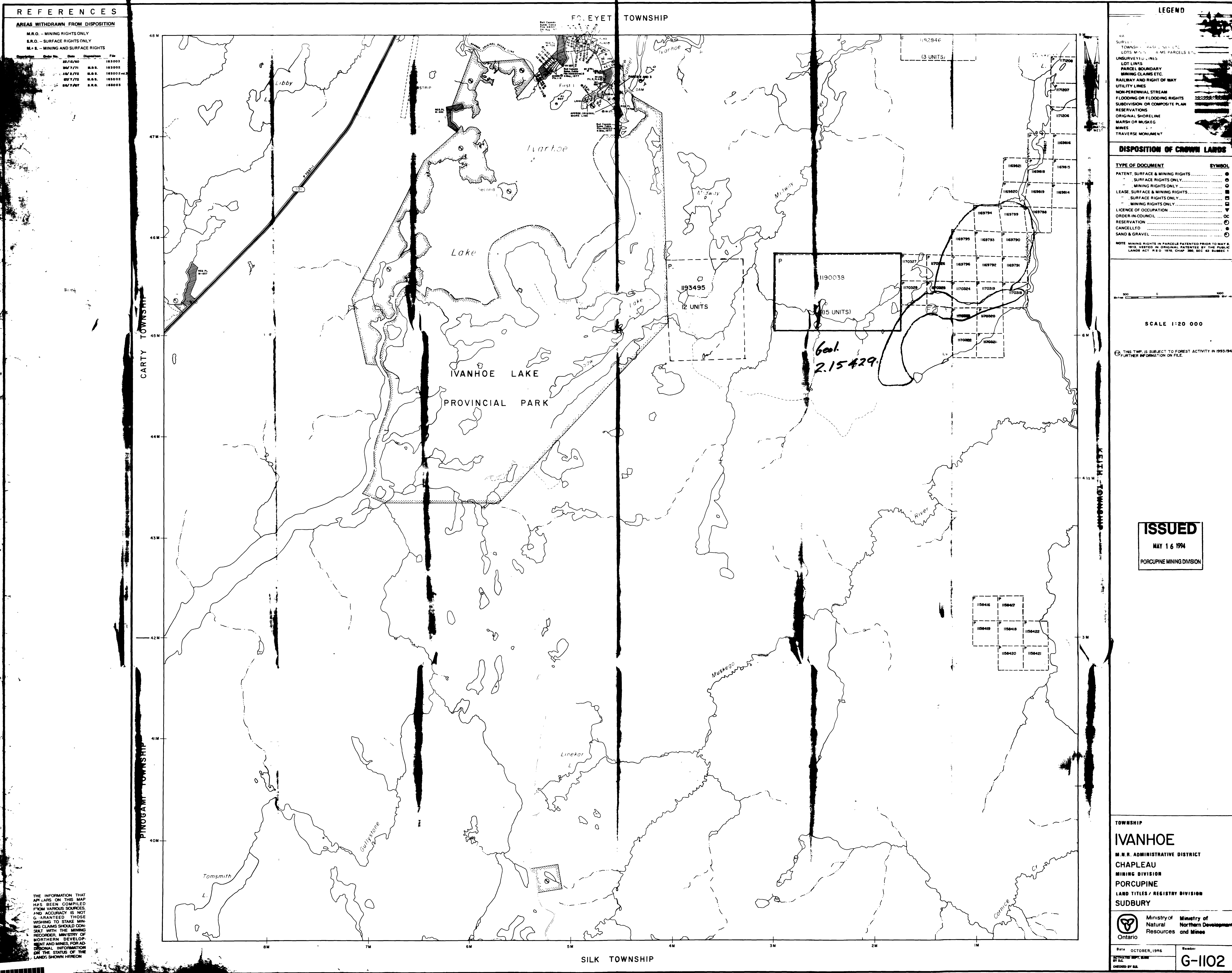
Yours sincerely,

Ron C. Gashinski
Senior Manager, Mining Lands Section
Mining and Land Management Branch
Mines and Minerals Division

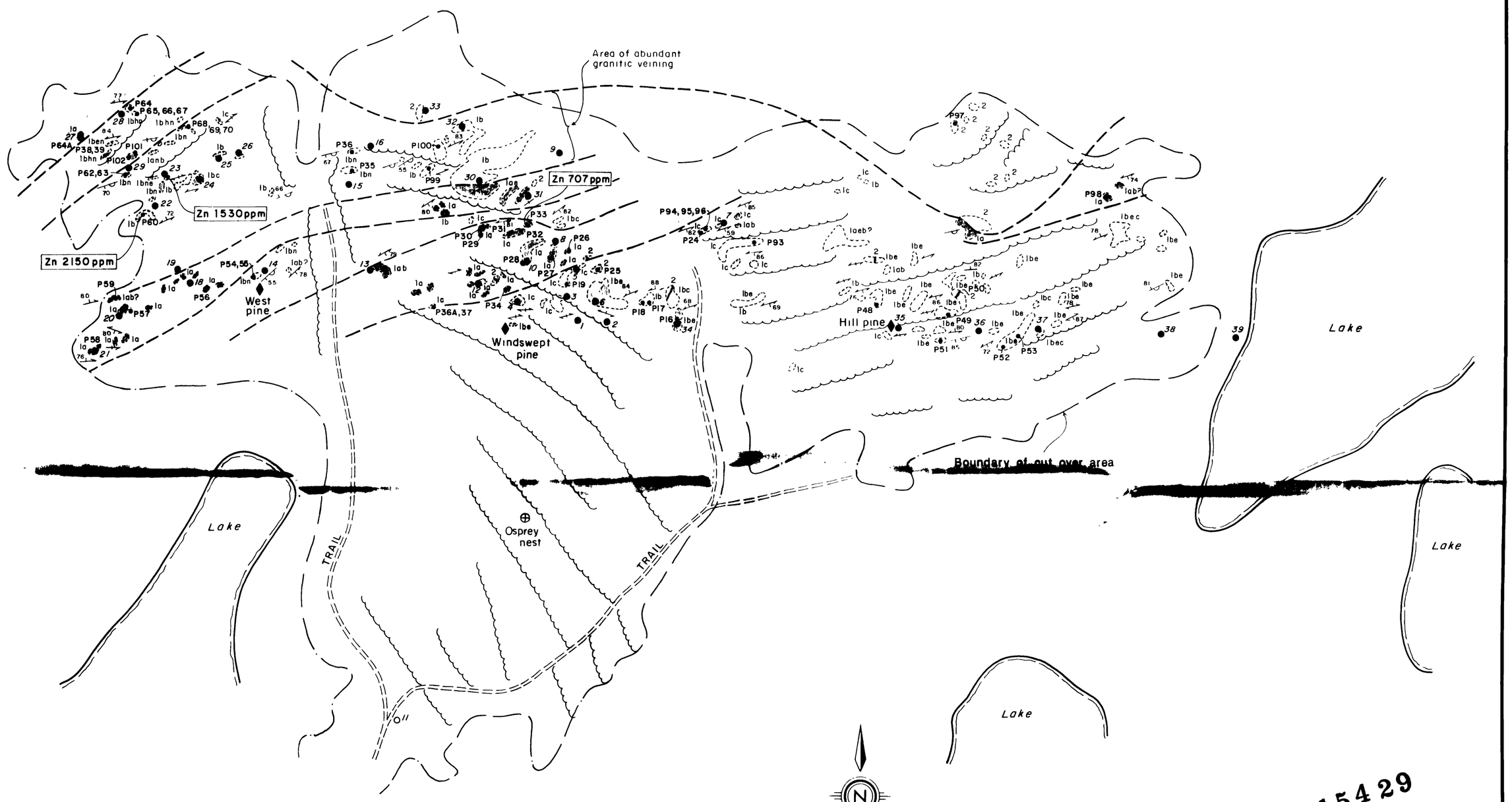
DEM/dl
Enclosures:

cc: Assessment Files Office ✓
Sudbury, Ontario

Resident Geologist
Timmins, Ontario



REFERENCES
AREAS WITHDRAWN FROM DISPOSITION
M.R.O. – MINING RIGHTS ONLY
S.R.O. – SURFACE RIGHTS ONLY
M.+ S. – MINING AND SURFACE RIGHTS
FOLEYET TOWNSHIP
CARTY TOWNSHIP
PINOGAMI TOWNSHIP
KEITH TOWNSHIP
SILK TOWNSHIP
Ivanhoe Lake
IVANHOE LAKE PROVINCIAL PARK
Libby L.
1193495
12 UNITS
1190038
(15 UNITS)
Geol. 2.15429.
River
Muskego
Linekar L.
Gullystone
Tomsmith L.
LEGEND
DISPOSITION OF CROWN LANDS
TYPE OF DOCUMENT
SYMBOL
PATENT, SURFACE & MINING RIGHTS
SURFACE RIGHTS ONLY
MINING RIGHTS ONLY
LEASE, SURFACE & MINING RIGHTS
SURFACE RIGHTS ONLY
MINING RIGHTS ONLY
LICENCE OF OCCUPATION
ORDER-IN-COUNCIL
RESERVATION
CANCELLED
SAND & GRAVEL
SCALE 1:20 000
THIS TWP. IS SUBJECT TO FOREST ACTIVITY IN 1993/94. FURTHER INFORMATION ON FILE.
ISSUED
MAY 16 1994
PORCUPINE MINING DIVISION
THE INFORMATION THAT APPEARS ON THIS MAP HAS BEEN COMPILED FROM VARIOUS SOURCES, AND ACCURACY IS NOT GUARANTEED. THOSE WISHING TO STAKE MINING CLAIMS SHOULD CONSULT WITH THE MINING RECORDER, MINISTRY OF NORTHERN DEVELOPMENT AND MINES, FOR ADDITIONAL INFORMATION ON THE STATUS OF THE LANDS SHOWN HEREON.
TOWNSHIP
IVANHOE
M.N.R. ADMINISTRATIVE DISTRICT
CHAPLEAU
MINING DIVISION
PORCUPINE
LAND TITLES / REGISTRY DIVISION
SUDBURY
Ministry of Natural Resources
Ministry of Northern Development and Mines
Ontario
Date OCTOBER, 1986
Number
G-1102



LEGEND

Archean

FELSIC INTRUSIVE ROCKS

2 Granodiorite

MAFIC VOLCANIC ROCKS

Basalt (Pillowed / Massive)

- 1a Massive
- 1b Pillowed
- 1c pillow breccia
- 1e Vesicular
- 1h Variolitic
- 1n Non-silicified

SYMBOLS

- Area of outcrop
- Geological contact
- Foliation
- Fracture cleavage
- Strike and dip of pillows
- Slash pile
- Survey hub
- Sample location (1993)
- Landmark pines (Hill, Windswept, West)
- Osprey nest

Scale 1 : 2500

IVANHOE TOWNSHIP PROPERTY

IVANHOE TOWNSHIP

Timmins Area, Ontario

GEOLOGICAL MAP

Geology by K. M. Cunnison & D. R. Pyke, 1993

D. Pyke

2.15429