86-301-14934

GEOLOGY, LITHOGEOCHEMISTRY & ECONOMIC POTENTIAL

OF THE

ACE-IN-THE-HOLE GROUP AREA

ROSSLAND - SALMO, B.C.

NELSON MINING DIVISION

NTS 82F/3W

117° ~~00~~ 22.7' W 49° ~~06~~ 07' N

FILMED

BY

C.M. BURGE

Owner/Operator: Falconbridge Limited

February, 1986

PN 103

GEOLOGICAL BRANCH
ASSESSMENT REPORT

14,934

ABSTRACT

In fall of 1985 a 60 day mapping, lithogeochemical and VLF survey was conducted on Swift, Gus and Ace In The Hole claims. The Swift Claims were staked by Falconbridge Limited in the fall of 1984 resulting from a regional lithogeochemical survey of the Rossland Volcanic Belt.

The geological mapping identified a felsic volcanic event within a package of sub-greenschist mafic fragmental rocks of the Rossland group. Thick sequences of pyritic chert beds were also mapped in as well as abundance of intrusive rock of variable compositions.

Lithogeochemical data provided us with knowledge of the alteration chemistry existing in the area. Zones of base and precious metal enrichment as well as sodium, silica and potassium depletion were located.

Preliminary VLF-EM surveys revealed potential conductors on the western part of the project area.

There is good field evidence that this property warrants close examination for a volcanogenic massive sulphide with associated precious metals target.

TABLE OF CONTENTS

TABLE OF CONTENTS cont'd

APPENDICES

LIST OF FIGURES

PLATES

TABLES

1. INTRODUCTION

This report examines the geology and geochemistry of the Ace-in-the-hole Claim group area and assesses its potential for hosting volcanogenic massive sulphide deposits with associated precious metals.

A 1:10,000 scale mapping, lithogeochemical sampling program and preliminary geophysical survey were carried out over a sixty day period in the fall of 1985. These surveys were conducted by a three man team based in Salmo, B.C.

The Swift claims were staked as a result of a regional reconnaissance lithogeochemical survey of the Rossland volcanics in the summer of 1984 (Falconbridge Report 146-095-84). This sampling indicated volcanic rocks of the project area were regionally anomalous. Lithogeochemistry showed base metal and barium enrichment combined with marked soda depletion.

The Ace-in-the-hole claims area, (Figure 1) is 30 kilometres due east of the old Rossland camp which produced 6.2 million tons of massive sulphide ore grading .47 oz/t gold, .6 oz/t silver and 1% copper (Gilbert, 1948, P 189).

Cominco Limited's Trail smelting operations are only 30 kilometres of paved highway and 14 kilometres of logging road from the Ace-in-the-hole project area (see Figure 2).

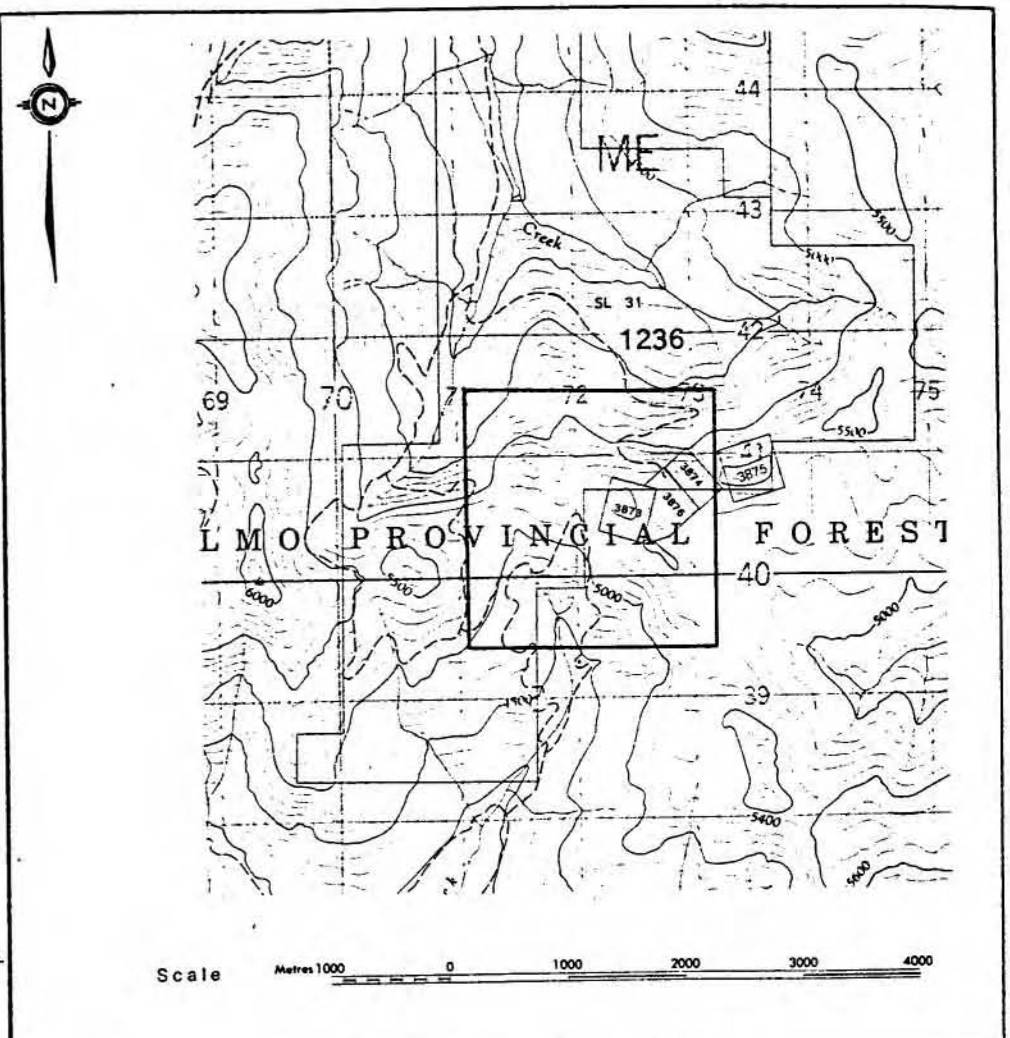
1.1 Previous Work

This report details the first systematic mapping and rock sampling program in the Ace-in-the-hole claim area. A number of collapsed trenches and pits exist in the area, a common feature of the Rossland area. During the Rossland mining boom, work was done on all quartz veins found intersecting a unit called "augite porphyrite".

Two small pits on the southern boundary of the Swift 3 claim, both exposing narrow (10 cm) quartz veins were discovered and a small adit with a 5 metre deep shaft have been developed on the "Ace In The Hole" claim.

More recent investigations in the area include two small soil grids sampled during the 1984 field season on the Gus and the Ace In The Hole claims (see Falconbridge Report #146-095-84). Adjoining the Swift 2 claim are the Katie claims (formerly the Jim group) where AMOCO CANADA outlined an anomalous copper zone in the soils and reported a felsic tuff horizon (Assessment Report #8258). These felsic rocks have not been verified by Falconbridge geologists.

The Nova claims, 2 kilometres west of the Ace-in-the-hole project area were staked by BILLITON CANADA. Subsequent trenching revealed argillites and siltstones of the Archibald Formation which quite often provide elevated zinc values and are not indicative of

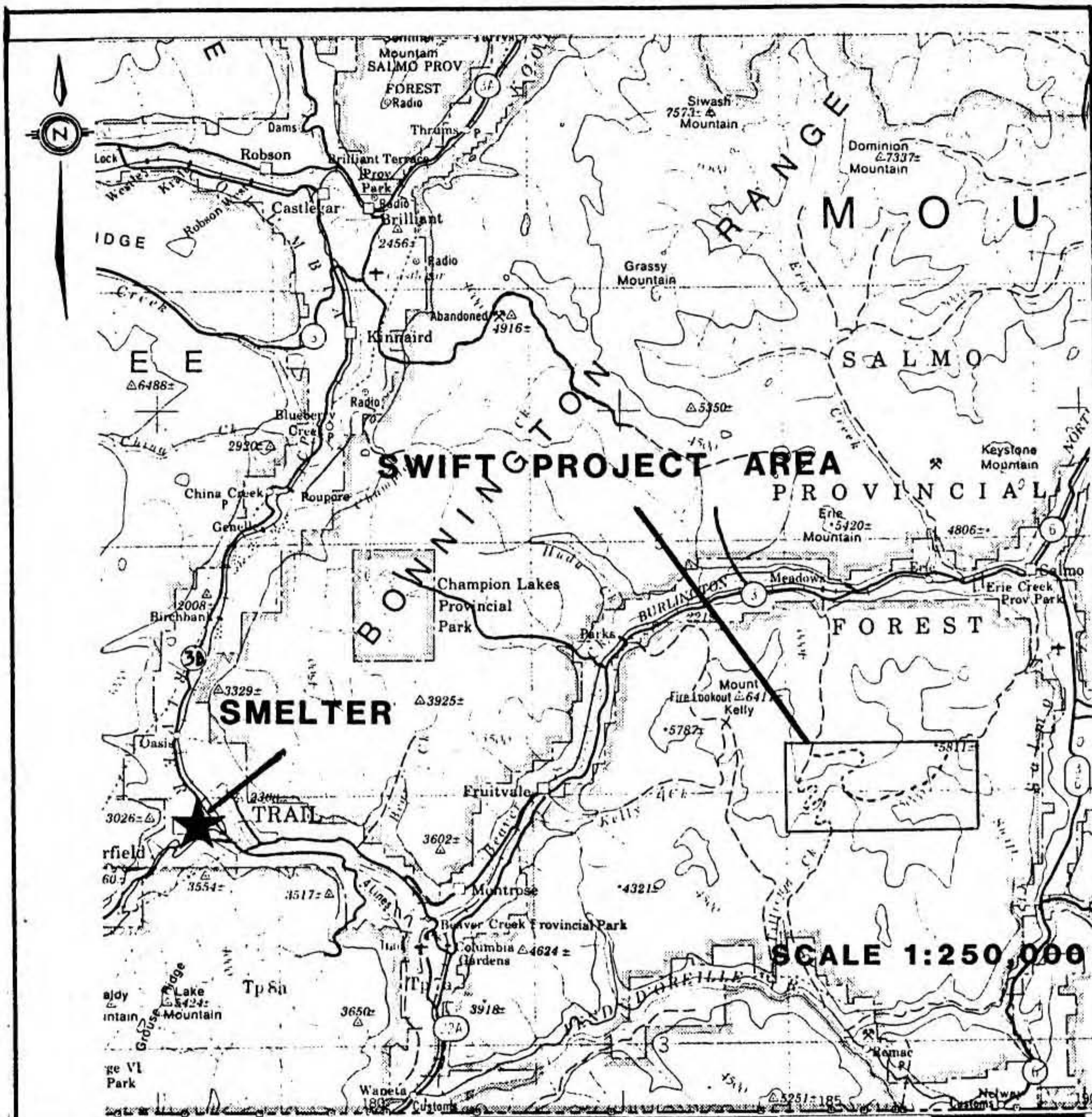


FALCONBRIDGE LTD.

LOCATION MAP

ACE IN THE HOLE CLAIM

DRAWN BY: CMB	FIG. NO: 1
DATE: Feb. 18/86	
N.T.S. 82F/3	



FALCONBRIDGE LTD.

TRAIL-NELSON MAP AREA

DRAWN BY: CMR	FIG. NO:
DATE: FEB 1986	**2**
N.T.S. 82F/3W	

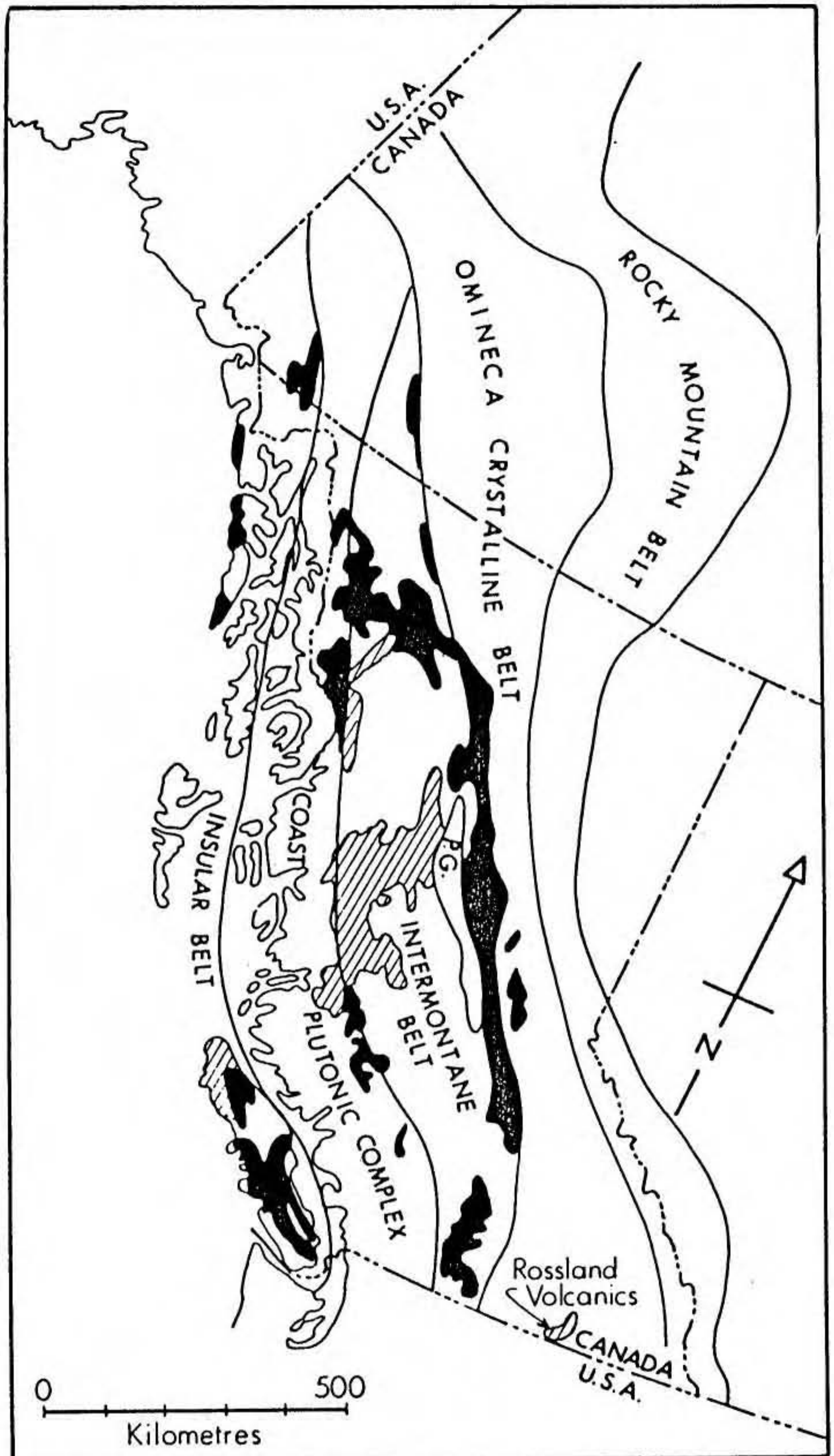


Figure 3. Major tectonic elements of the Canadian Cordillera and the distribution of Upper Triassic (black) and Lower Jurassic (vertical shading) volcanic rocks (Beddoes-Stephens and Lambert, 1980).

economic mineralization (Falconbridge memorandum 132/85). NORANDA EXPLORATION is currently conducting geophysical investigations of pyritic chert horizons on claims adjacent to Swift 4.

1.2 Regional Geology

Early workers classified the rocks of the Ace-in-the-hole claim area as being Cretaceous in age. However, shallow water marine ammonites of Jurassic age were found in these sediments (Frebold, 1959), which led to the inclusion of these rocks in the Rossland Volcanic group (Little, 1960).

The Rossland Volcanic group lie in a crescent shape with Rossland in the west and Nelson in the north. The Kooteny Arc metasediments are immediately east of the Rossland group (Figure 3).

Most writers divide the Rossland group into three formations, beginning with the oldest, the Archibald, followed by the Elise and the Hall Formations. (Figure 4)

The Archibald Formation (immediately west of the Ace-in-the-hole claim area) is made up of a series of argillites, siltstones, ash units and quartzites, all of which were deposited in the Ace-in-the-hole claim area although rocks of the Elise Formation predominate.

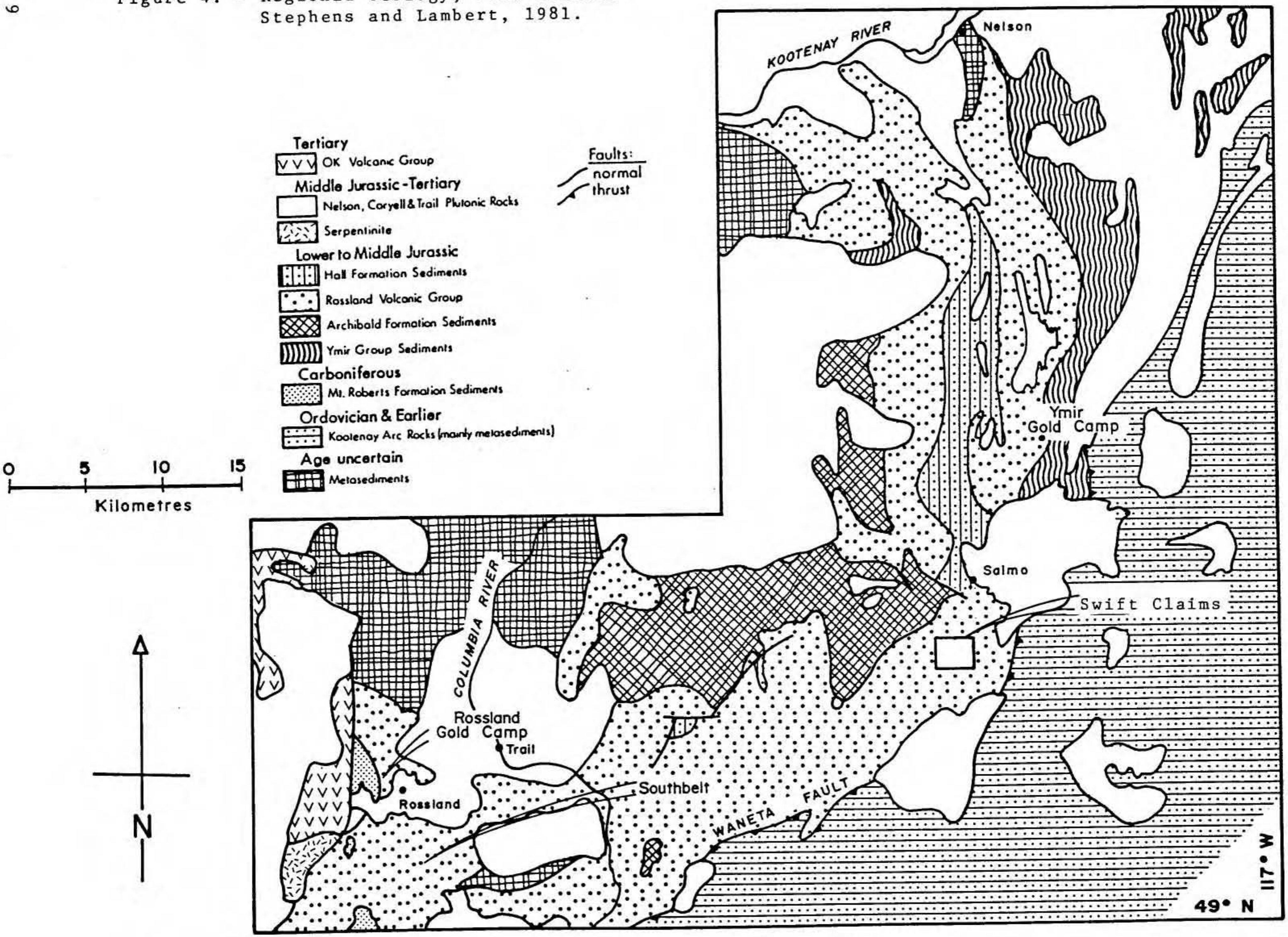
The Elise Formation consists of various volcanics of both fragmental and flow type lithologies with occasional sedimentary horizons of siltstone and minor shale. Beddos-Stephens and Lambert, 1981, interpret these rocks as pyroclastic and epiclastic debris accumulated around isolated volcanic centres. These volcanics are most often characterized by augite and plagioclase phenocrysts and are clearly basaltic in composition. Samples collected by Beddoes-Stephens and Lambert, indicate these lavas although showing calc-alkaline affinities, are more likely alkalic as they tend to be both low in alumina and titania. This suggests these rocks represent late phases in the development of the island arc and may be some distance from an oceanic trench. These rocks were most likely laid down in a destructive-margin tectonic regime (see Figure 5).

Finally, the youngest Hall Formation is composed of carbonaceous argillites and argillaceous quartzites. These sediments correlate with sediments of the Fernie Group to the east (Little, 1982).

Government publications available describing the eastern portion of the Ace-in-the-hole claim area have left the rocks as undivided Rossland volcanics and mapped the western portion area, as Elise Formation (Little, 1965).

The Ace-in-the-hole claim area stratigraphy is interrupted along its southern boundary by late Jurassic Cretaceous age Nelson plutonic rocks.

Figure 4. - Regional Geology, from Beddoes-Stephens and Lambert, 1981.



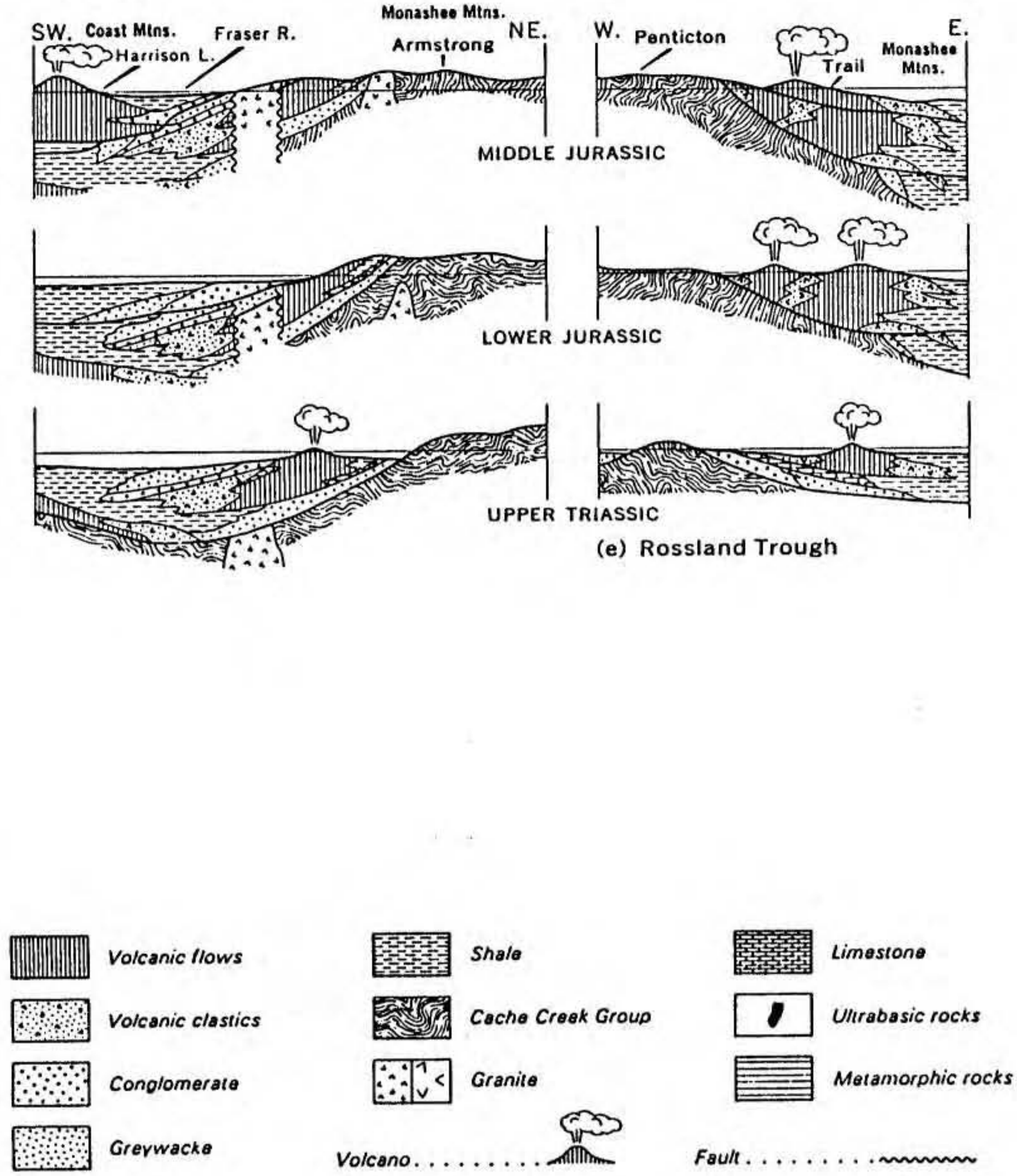


Figure 5. - Cross-section of Rossland Trough adapted from "Geology and Economic Minerals of Canada", 1970, P. 433.

1.3 REGIONAL GEOLOGIC HISTORY

Paleozoic — The deposition of the Mount Roberts carbonate rocks with interbeds of ash and tuff occurred in the Carboniferous. These lithologies most likely indicate relatively quiet marine conditions near volcanic centres representing islands (Drysdale, 1915).

Mesozoic — Early Jurassic saw the development of the Rossland Trough (see Figure 5) and the deposition of the Archibald sediments. These fossiliferous sediments accumulated rapidly and were most likely derived from some source to the west (Little, 1982). Fossil ammonites (Arnioceratids) pinpoint the age at lower Jurassic (Frebold, 1959). Volcanism in the Rossland townsite area produced the Elise Formation and small ellipsoid fragments of the Mt. Roberts formation are found in its basal sections. These fragments were observed by the writer six kilometers to the north-west of the Ace-in-the-hole Claim area.The Rossland volcanic group was accumulating contemporaneously with both the Hazelton Formation and the Quesnel Trough in a back-arc or in a faulted tensional environment (Beddoes-Stephens and Lambert, 1981).

The Nelson Plutonic rocks intruded during the Cretaceous as well as the Rossland monzonite which is associated with the main mineralized veins of the Rossland camp (Drysdale, 1915).

Tertiary — The Tertirary was marked by the intrusion of the Coryell plutonic rocks comprised of distinctive pink syenites with large orthoclase phenocrysts (Little, 1985)

1.4 MINERALIZATION IN THE ROSSLAND BELT

The extremely high grade and persistant main veins of the Rossland camp are so far the most important deposits in the region. 6.2 million tons of massive chalcopyrite-pyrrhotite ore grading 0.47 oz/t gold, 0.62 oz/t silver and 1% copper. The Rossland camp is therefore the second largest gold producer in the Canadian Cordillera. The veins are hosted in a Rossland Volcanic unit referred to in the literature as an "augite porphyrite" (Drysdale 1915, P 202). The petrographic and sample description closely match the "mafic crystal tuff" unit described later in the report as observed by the writer in the Ace-in-the-hole claim area (Fyles, 1984, P 19).

Gold production has also been reported from the Rossland "South Belt" mines known as Homestake and Mayflower. Twelve kilometres north of Salmo the Ymir gold camp produced some 500,000 tons of ore grade material at the turn of the century (Drysdale, 1917, P 62). The bulk of this material has come from small operations where quartz veins have come in contact with "augite porphyrite". Local "old-time" prospectors often refer to this "gold-favouring" unit as the key in their exploration throughout the Rossland-Slocan Valley area.

Current investigations indicate that the Willa deposit (3.4 million tons of 0.05 oz/t gold containing a 560,000 ton zone of 0.22 ounce material), located 45 kilometres north of Nelson is related to a volcanic centre within the Rossland Group Volcanics (British Columbia Department of Mines 1985 Review).

Rocks hosting the Tillicum gold deposit (60,000 tons 0.60 oz/t Au) have also been identified as Rossland Group volcanics.

2. PRESENT STUDY

2.1 LOCATION, ACCESS & PHYSIOGRAPHY

The Ace-in-the-hole claim group is located 8 kilometres south west of Salmo, British Columbia at an elevation of about 1500 metres (5000 ft). (See Figure 1). This area is covered by NTS map 82F/3W and is in the Nelson Mining District.

Access to the north eastern portion of the claim group is by an 8 km logging road leaving B.C. Highway 3 and 6 two kilometers south of Salmo. The western extent of the Ace-in-the-hole 18+00 North base line can be reached by a 14 km logging road turning south from the junction of Highway 3 and 3B approximately 32 kilometres east of Trail (Figure 2).

2.2 Claims & Status

Topography on the Ace-in-the-hole claim group is relatively slight and most of the claim area has recently or is currently being logged by Beaumont Timber Co. No large stands of timber exist except in the Tillicum Creek valley on the south-west portion of the claims. Unlike many properties in B.C., the Ace-in-the-hole Group is amenable to modern geophysical and geochemical surveys with good road access and easily traversable ground (see Plate 1). Outcrops are scarce in creek valleys while the ridges are completely exposed. Large erratics occur on the property indicating glaciation has occurred.

Field seasons could probably begin in late April, early May and stretch into mid October.

The Swift Group consists of 4 claims totalling 52 units. Falconbridge Limited also has an agreement to earn 100% interest in the Ace In The Hole claim jointly owned by Mr. Dak Giles and Mr. Jordan Planidin (Figure 35). Claim information is as follows:

Claim Name	Record No.	Units	Expiry Date
Swift 1	3874	16	4/9/86
Swift 2	3875	20	4/9/86
Swift 3	3876	8	4/9/86

Swift 4	3877	8	4/9/86
Ace-In-Hole	3425	16	22/8/86

2.3 FIELD METHODS

A six week field program of lithogeochemical sampling, geologic mapping and VLF-EM traverses was undertaken by a three-man crew. A set of two parrallel baselines trending 55 degrees northwest and one perpendicular line up the Swift Creek valley provided control for the work done. These lines were slope corrected, chained and marked with pickets every 25 metres.

A total of 54 line kilometres of cross lines were compassed and hip chained in as the mapping and lithogeochemical sampling progressed. Over most of the grid lines were 500 metres apart except the Ace In The Hole and Gus zones where fill in lines 200 metres apart were put in (see Figure 35). Lithogeochemical samples were taken every 100 to 150 metres where possible and all data were recorded and plotted on a 1:10,000 blow-up of the 1:50,000 Salmo Map sheet (82F/3W).

Geophysics traverses with a Sabre VLF-EM unit were run using the Seattle transmitting station to try and obtain cross-overs.

3. GEOLOGY OF THE Ace-In-the-hole CLAIM GROUP AREA

The Ace-in-the-hole claim group area is underlain by a package of volcanic and volcano-sedimentary rocks of the lower Jurassic Rossland Group. The mafic volcanic rock consist of two major subdivisions (with limited exposures of few others) which appear to be interbedded and quite variable in thickness. The first and most likely lowest in the stratigraphy is a lapilli and block size, heterolithic, poorly-sorted volcanic breccia which is most often framework supported. The other commonly occuring mafic volcanic rock has been termed a mafic crystal tuff due to an abundance of pyroxene crystals. Plagioclase crystals are also quite common in this unit and it is usually matrix supported. It is important to pay careful attention to field relations and saw hand samples from outcrops to distinguish these units and avoid confusing volcanics with mafic intrusions.

A single felsic volcanic unit was recognized on the Ace In The Hole ground of considerable size. Outcrops display good flow banding textures and contain quartz phenocrysts ("eyes") throughout.

A number of sedimentary units occur on the property usually consisting of argillite mixed with ash or fine grained, greywacke or quartzite interbeds. These units provide useful structural information. In southeast portion of the study area, thinly laminated argillite and ash beds likely representing waning stages of volcanism. A relatively small amount of time was spent inspecting this unit despite silver and zinc anomalies.

Thick pyritic chert sequences are found on Ace In The Hole and Swift 4. This chert has pyrite laminae in it as well as ash beds.

3.1 VOLCANIC ROCKS

3.1.1 MAFIC VOLCANICS

Volcanic Flow Breccia

The fragment sizes range from lapilli to block or bomb size and their compositions vary from crystalline rock to volcanic rock fragments. This rock is distinctive due to it's heterolithic nature and clasts are usually sub rounded to sub angular and most often poorly sorted. This unit is remarkably undeformed and occasionally carbonate altered. Rhyolite lapilli and even bombs where noted within this flow breccia near the felsic event. Outcrops in the area of SS-57 (line 25 West, 26+00 North) are recommended for viewing the well stratified rhyolite lapilli in an otherwise chaotic rock as well as some surge deposits (Plate 2).

Mafic Crystal Tuff

Black crystalline fragments characterize this tuffaceous volcanic rock. Feldspar (plagioclase most likely) are also quite common as part of the framework. The black crystals (up to 1 mm) are usually pyroxene (augite) crystals in various stages of alteration to amphibole (hornblende). On the Gus and Swift 3 claim area this unit can be traced into an extremely sericitized and sodium depleted zone with up to 20% fine disseminated pyrite. This unit has distinctive high magnesia component.

Additional Mafic Units

Lithic tuffs and ash units do occur in the Ace-in-the-hole claim group however in relative low abundances. Occasionaly olivine flow basalts were noted east of the fault (see Plate 3) suggesting these rocks may have moved south and are lower stratigraphically than the Ace In The Hole package. No pillow lavas were encountered anywhere on the mapping traverses.

The present classification scheme for the mafic rocks was developed to suit a 1:10,000 scale mapping system.

3.1.2 FELSIC VOLCANICS

This distinctive quartz porphyritic rhyolite occurs on the Ace In The Hole claim in the northwest portion of the study area measuring about 700 metres in a north-south direction and 200 metres across its widest exposure. Flow banding is common throughout and the composition of this unit appears to be quite uniform.

This unit is described as a quartz-eye rhyolite in the field due to an abundance of 1-2 mm sub-rounded quartz phenocrysts. The matrix is white to a faint olive green and aphanitic. Pyrite crystals occur in some samples. Thin section examinations reveal the presence of large (1-2 mm) feldspar phenocrysts as well as quartz and

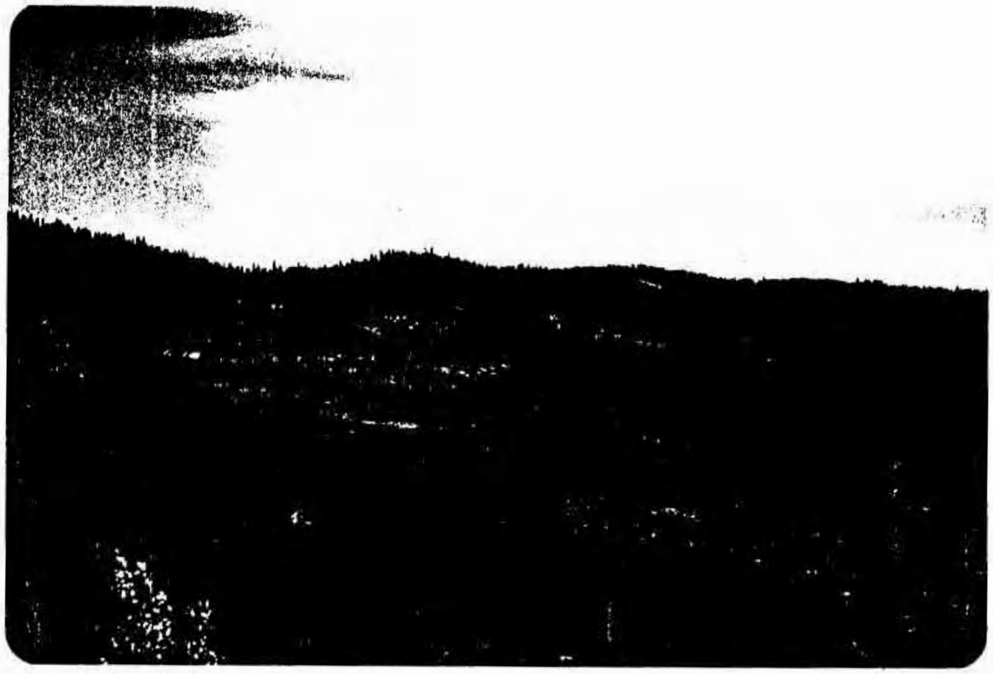


PLATE 1: Looking east across Ace in the Hole and Swift 4. Relatively gentle topography combined with good road access.

PLATE 2: Rhyolite fragments showing preferred orientation in a mafic volcanic.

PLATE 3: Lapilli tuff

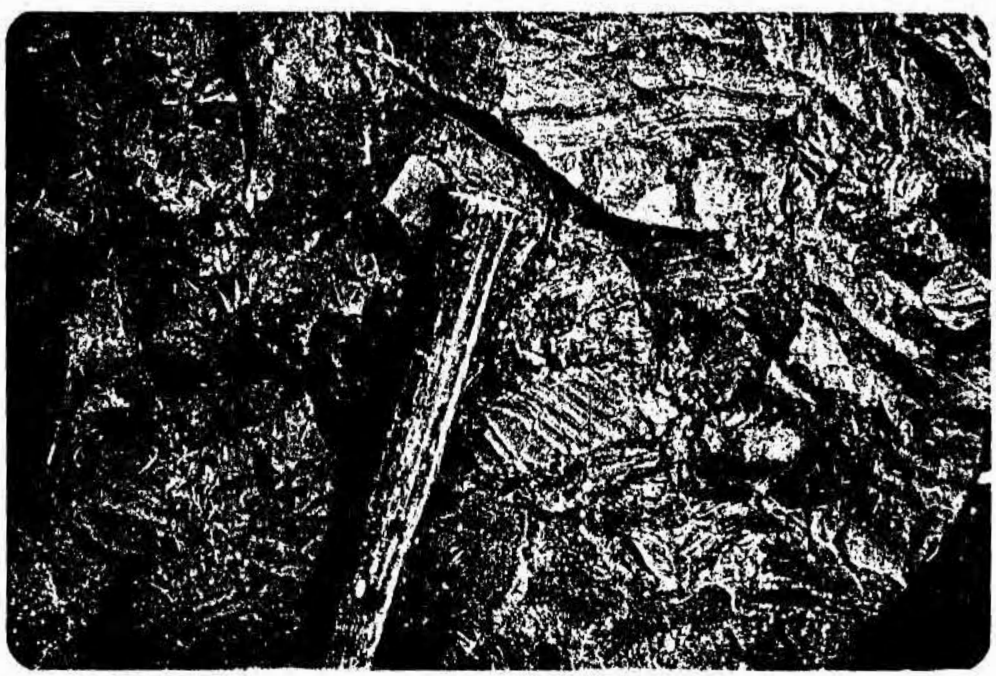


PLATE 4: Blocks of chert with pyrite laminae floating chaotically in a pyritic volcanic matrix.

devitrification textures in the matrix range from spherulites to micrographic intergrowths. This suggest the rock was originally a quartz-feldspar porphyritic glass flow.

3.2 SEDIMENTARY ROCKS

Several mixed argillite and ash units exist in the project area and these proved useful in obtaining structural information. They also indicate a marine environment and are not usually more than 10 or 20 metres thick.

Two extensive chert horizons were found on the property both are located in the southwest portion of the study area. These outcrops are difficult to study in detail as the weathered surface is very rusty and fractures never provide a fresh surface. Care must be taken to avoid overlooking an exhalative horizon within these chert and pyrite accumulations. (Plate 4)

Samples cut from these outcrops display alternating thinly laminated pyrite and chert with occasional ash units. The chert laminae are slightly hematitic giving a faint pink tinge to them and are low in silica (SiO_2 content is around 60% by weight). This is probably due to high ash or clastic component.

In the south eastern portion of the project area alternating thin laminations of ash and carbonaceous argillite are found. Thin section inspection indicates. These also contain laminae of quartzite. These rocks are in contact with the Nelson plutonic rocks along the southern boundary of the Swift claims.

3.2 INTRUSIVE ROCKS

An impressive variety of compositions exist among intrusive rocks scattered throughout the property. Rock types range from gabbro to monzonites with feldspar porphyritic diorites being most common. Although intrusive rocks are frequently encountered on the property only the Nelson granite to the south is of any great size.

The occurrence of a diverse range of intrusives and especially acidic intrusions near the volcanic centre are characteristic of ore-containing volcanic piles (Sangster 1972, P 2). The hydrothermally altered feldspar-augite porphyry (SS-122, L27W, 20+75N0 and feldspar porphyry collected at SS-138 may play significant roles in localizing mineralization. This rock may even be a feeder dyke for mafic tuff lavas.

3.3 PRELIMINARY GEOLOGIC INTERPRETATION

A volcano more than likely located in the Rossland area has volcanic debris flows on it's flank while producing the mafic tuff lava. A small volcanic centre develops on the Ace In The Hole claim and felsic lavas appear along with nearby intrusive rocks. Further mafic lava accumulation followed by a period of quiescence and considerable chert accumulating. Again a distal mafic event is followed by sediment and ash laminations as volcanism wanes. The mafic volcanic rock contains many vitric and porphyritic lava fragments indicating quick cooling on a steep slope. The felsic lava is now present as a spherulitic quartz eye rhyolite dome.

The changes in type of volcanic and episodes of sedimentation all likely in a sub-aqueous island-arc environment provide many opportunities for the production of massive sulphides with precious metal associations (Sangster, 1972).

4. MINERALIZATION

The only significant assays obtained to date on the Ace-in-the-hole Claim area have been from quartz-carbonate veins. The veins systems encountered which occur in a roughly east west lineation on Ace In The Hole and the southern boundary of Swift 3. SS-133 is a float sample of quartz-barite from near the west trench on Swift 3 gave the following assay: Cu 280 ppm, Pb 150 ppm, Zn 310 ppm, Au 188 ppb, Ag 14,200 ppb.

These veins could very well have been carrying barium, base metal and precious rich solutions upward from beneath the alteration zone on the Gus claims.

Disseminated pyrite is common throughout the rocks on the property and especially in the Gus zone where up to 20% pyrite exists. Nowhere was any sort of stockwork encountered.

Encouraging sulphide fragments were noticed in the mafic volcanic unit close to pyritic chert sequence (SS - 25).

In the area around the adit on the southern boundary of Swift 3 and Gus cherty looking volcanics containing green micas exist. These have been identified as fuchsite (Appendix IV).

The structural geology of outcrops of these exposures around SS-36 and SS-95 appears complicated and will require closer examination. SS - 36 was an extemely carbonate altered volcanic with 2020 ppb Au. SS - 39, a quartz vein gave the following results: Cu, 7700 ppm, Pb 1020 ppm and Zn 6500 ppb, Au 496 ppb, Ag 7500 ppb.

On the Ace In The Hole a shaft about 5 metres was sunk a narrow quartz vein pinching and swelling to a maximum of approximately 40 cm. A sample of a sulphide rich pocket in the vein gave the following values: 750 ppb Au, 132 ppm Ag, 9900 ppm Cu, 46,500 ppm Pb, 1150 ppm Zn.

the-hole project area is restricted to a series of quartz-carbonate veins which trend roughly ENE along the southern part of Swift 3. These veins are hosted in carbonate altered volcanic rocks along the north side of the main logging road.

Pyrite content ranges up to 25% in some altered volcanics in the Gus zone. The following of lithogeochemical samples contain up to 25% pyrite: SS - 021, SS - 017, SS - 183, SS - 142, SS - 110, SS - 44.

5. LITHOGEOCHEMISTRY

Samples were taken at 100 to 150 metre intervals, where possible, at a line spacing of 500 metres over most of the study area (see Figure 35). The rocks selected for sampling were identified in the field as being volcanic or having a high volcanic component. The geochemical analysis was done by Terramin Research Labs of Calgary according to methods described in Appendix III. Data processing was done on a PDP-11 utilizing the Q-Gas software package. The data was subsequently refined by removing all samples of quartz veins, sediments or apparent intrusions from the original data set to leave a representative population of volcanic and volcano-sedimentary rocks present.

All rocks collected (218 samples) were included in trace and minor element statistical calculations and histograms. Major element oxide data processing is for mafic volcanic rocks only, and only 13 samples of the felsic volcanic were collected. This is not enough to provide a normal population.

5.1 TRACE & MINOR ELEMENT GEOCHEMISTRY

The trace and minor elements of copper, lead, zinc, barium, silver and gold were analysed. Only barium and zinc are normally distributed while copper and silver display log normal distributions. Unfortunately lead and gold showed neither normal nor log normal distributions. Enrichment is defined as being one standard deviation greater than the calculated mean for normally or log normally distributed populations.

<u>Barium (Figure 6)</u>

Barium enriched samples (>1330 ppm) are scattered throughout the property (Figure 32). However, the largest concentration of anomalous samples are in altered mafic rocks in the area of the Swift 3 and Gus boundary (Gus zone) and extend due east on to Swift 2. Barium highs are often accompanied by zinc highs. The felsic volcanic have comparitively low barium values.

<u>Copper (Figures 7, 8)</u>

Copper shows a negatively skewed lognormal distribution suggesting a group of copper poor rocks exist. In fact, Table 3 shows the felsic volcanics are copper poor. Copper highs are again found in largest amounts in the Gus zone and Swift 2 extension. Copper values in fact rarely assayed higher than 200 ppm except in sulphide pods within quartz-carbonate veins.

Lead (Figures 9, 10)

Unfortunately lead data was not normally distributed and therefore statistical methods are not valid. A threshold value of 25 ppm was arbitrarily chosen. Table 1 illustrates the association of lead with the felsic rocks.

Zinc (Figure 11)

Zinc correlates well with silver (Table 1) and is not present in any great amount in the felsic rocks. Zinc highs were obtained from mixed volcanics and sediments in the southeast. Sample SS-46 shows anomalous zinc and silver combined with considerable silica and soda depletion.

Gold (Figure 12)

Gold values were not normally distributed therefore an arbritrary threshold of 25 ppb was chosen. Gold and silver anomalous samples cluster around the Gus zone with gold reaching a high 2020 ppb (.065 oz/t). The felsic volcanic samples appear to be enriched with respect to gold as half of the sample set are above our threshold value (Table 3).

Silver (Figures 13, 14)

As previously mentioned silver enrichment occurs in the Gus zone as well as being associated with copper highs. The felsic rocks do not seem to show silver enrichment.

In conclusion the pathways elements seem to target the Gus zone and Swift 2 extension area. Zinc and barium enriched samples occur in the volcano-sedimentary rocks in the southeast part of the study area. A number of spot highs exist from quartz-carbonate veins along the Swift 3-Gus boundary (see Figure 33).

5.2 MAJOR ELEMENTS

Oxide Geochemistry

Histograms of cumulative frequency versus weight per cent for silica and potash represent normal distributions while gold and magnesia display bimodal distribution. Titania is rarely affected by hydrothermal activity and usually reflects the degree of differentiation from the original magina (McConnell 1976, Pg. 93). It has therefore been left out of the alteration geochemistry discussion. Mafic volcanic rocks only in the following calculations.

Silica (Figure 15)

Silica shows a marked depletion in the Gus zone area. Samples taken of the volcanics in the northeast are characterized by lower silica values combined with higher magnesia and titania. Silica lower silica values combined with higher magnesia and titania. Silica was found to be enriched in some samples usually in close proximity to quartz-carbonate vein systems. Silica depletion characterizes pipe alteration zones at a number of massive sulphide deposits; Norbec, Millenbach, Mattabi and East Waite deposits in the Canadian shield and Killingdal in Norway (Govett and Nichol, 1979, McConnell 1976). The bimodal distribution of silica will be discussed later in this report.

Soda (Figure 16)

Soda is bimodally distributed representing the two unaltered volcanic. Soda depleted rocks concentrate in the Gus zone and the Swift 2 extention. None of the felsic volcanic rocks show any soda depletion. Soda - poor rocks define the pipe alteration zones of most volcangenic massive sulphide deposits (Govett and Nichol, 1979).

Magnesia (Figure 17)

The magnesia histogram shows a bimodal distribution illustrating again the difference in chemistry between the mafic tuff and volcanic breccia. The samples above 6.75 weight percent likely represent a magnesia enriched population. Magnesia enrichment is a common feature of alteration geochemistry of many volcanogenic massive sulphide deposits (Govett and Nichol, 1979). In the northeast section of study area high magnesia exists due to ankaramitic lavas.

Potash (Figure 19)

Potash although usually enriched in wall rocks of massive sulphide deposits may also be depleted. Mafic volcanics of the Gus zone are in fact enriched in potash while the mafic rocks in the vicinity of the felsic volcanic show are potash depletion.

5.3 DISCUSSION OF ALTERATION GEOCHEMISTRY

Correlation & Scatterplot Analysis

A correlation matrix was calculated and appears in Figure 20. A strong positive correlation exists between titania and magnesia as well as the alkalies and silica. Strong negative correlations exist between titania and silica, magnesia and silica copper and silica and finally potash and magnesia.

These relationships reflect the chemistry of the three different lavas present on Ace-in-the-hole claim group study area. Rhyolite high in silica and alkalies with low magnesia, titania and copper occur on the Ace In The Hole claim. In the northeast quadrant of the property samples show higher magnesia, titania and copper values while silica and alkalies are deficient (Figure 31). Basaltic lava is found over most of the claim area.

Potash was shown to correlate positively with silver, barium and silica. Weaker negative correlation exist between soda and silver, soda and potash, titania and potash. This seems to indicate that zones of potash enrichment and soda depletion are most likely to be enriched in silver and barium.

As part of the data analysis presentation Figures 21 through 26 are plots of the stronger correlations discovered.

Figure 28 is an alkali-silica plot. All samples were plotted in an attempt to classify the different lavas present. Figure 15, the histogram for silica suggests two populations of mafic rocks exist. The smaller population appears to be somewhat enriched in silica. A number of samples were expected to contain more silica due to a high chert component and many were sampled near a quartz vein. The combined alkalis-silica plot, Figure 28 clearly shows the felsic rocks in the subalkaline field while the mafic volcanics cluster about the alkalic sub-alkalic border. Whether the samples higher in silica are a result of alteration or represent the chemistry of the volcanic flow breccia is a matter for speculation. Beddoes-Stephens' 1982 study of whole-rock geochemistry of Rossland volcanics arrived at a similar conclusion, that is the rocks tend to be alkalic at low SiO2 and cross the line to become sub-alkaline at higher SiO2 values. The occurrence of felsic volcanics on the Ace-in-the-hole claim area is indicative of calc-alkaline volcanics which lends credence to the theory that both alkaline and calc-alkaline are indeed present in the Rossland suite. The following classification rocks was used by Beddoes-Stephens to divide mafic volcanic rocks collected:

	SiO2 Wt.%	MgO Wt.%	Cpx. Vol.%	Plag. Vol.%	Other Phenocrysts
Ankaramite	46-50	14-9	>30	0-5	Olivine
Basalt	48-54	9-5	30-10	5-25	Olivine
Andesite	54-60	6-2	10-0	<25	Amphibole

Figure 27 shows Harker variation diagrams for mafic and intermediate volcanics. The above table was used to approximate rock type boundaries. Figure 27a. has dotted lines representing approximate rock type boundarys. It is evident that the bulk of the Ace-in-the-hole Group mafic rocks fall into the basalt range while there are some with ankaramitic tendencies (mostly in the northeast). A number of samples which plot in the andesite range may in fact be volcanics with a high chert component and have given the impression of a large andesit

e

population which is not apparent in the field.

Concluding Remarks

In conclusion the rocks of the Ace-in-the-hole project area are alkaline ranging to calc-alkaline and show some very strong associations (Silica increases while magnesia, titania and copper decrease). The most encouraging zones of alteration occur on the Gus zone and can be traced along toward the east and on to Swift 2 (L8W, 20+00N to L10E, 12+00N). None of the samples of felsic volcanic showed any alteration, however, half the thirteen samples taken were anomalous with respect to gold. The mafic volcanics show silica and soda depletion combined with potash and magnesium enrichment in altered zones. Cherty volcanic outcrops did not provide any trace metal anomalies but sampling of mixed argillites and volcanics did provide zinc and barium highs.

Table 4 compares fresh and altered specimens from the Rossland volcanics with Ace-in-the-hole samples.

6. GEOPHYSICAL SURVEY

A series of VLF-EM traverses were made on lines in the western part of the grid at 500 metre intervals (Figure 34). Readings were taken every 25 metres and traverses and chosen were prioritized with respect to geology due to time constraints.

The surveys outlined a number of weak to moderate anomalies most of which define creek valley faults and lithologic contents. The broad weak anomalies of Ace and Swift 4 appear to be responding to pyritic chert horizons which are likely responses to high pyrite content.

The Gus zone alteration zone produced a crossover on L10W, 21+25 north and L8W at 21+00 north. Fraser filtered data suggests these are weak anomalies, however they do coincide with the alteration zone targeted by lithogeochemistry.

More interesting and stronger anomalies occur on Line 12 west in the mixed volcanic and sediment (Figure 29). The argillaceous horizons may be conductive, however assays indicate anomalous barium, zinc and silver.

ECONOMIC POTENTIAL OF ACE-IN-THE-HOLE CLAIM AREA

The following is a list of reasons why the writer feels the Ace-in-the-hole Claim area could produce volcanogenic massive sulphides and precious metals and would be an excellent project area:

1. Island - arc tectonic setting.
2. Felsic volcanic (quartz porphyritic rhyolite) indicating nearness to volcanic centre and calc-alkaline affinity.
3. Creek draining Swift 4 historically a placer producer of gold.
4. Alteration geochemistry. Base metal and barium enriched geochemical zones. Soda, silica depleted zone, potash enriched.
5. 40 kilometers from Cominco Limited, Trail smelting operation.
6. Ease of access and relative lack of relief making exploration surveys efficient and effective.
7. Lack of metamorphism (sub-greenschist) and deformation simplifys matters.
8. Anomalous gold assays already encountered.
9. Numerous intrusions of various compositions on property.
10. Volcano-sediments, chert sequences and various mafic events provide ample occasion for production of massive sulphide ore bodies between dykes.
11. Pyrite lapilli fragments within volcanic unit.

12. Augite porphyry (mafic tuff) historically has hosted many deposits within the Rossland group, notably the War Eagle, LeRoi, Josie and Centre Star massive sulphide veins producing 6.2 m.t. of .47 oz/t Au.
13. Recent indications are that the Willa deposit (3 m.t. of 1.37 g/t including .56 m.t. 6.17 g/t) is hosted in volcanic centre within the Rossland volcanics (Preto, BCDM Review 1985).

RECOMMENDATIONS

1. Concentrated sampling and mapping in the following areas:

    1. Gus zone, L10W 20+00N, to Swift 3 extention, L10E 12+00N.

    2. Felsic volcanics, Ace In The Hole and intrusives L27W 20+75N.

    3. Pyritic chert accumulations (SS-20, SS-09)

2. Silt sampling of all creeks draining property.

3. Pulse EM geophysical survey.

4. Airborne geophysical survey.

I would caution against a geochemical sampling program over the Gus zone area. This is because the quartz-carbonate vein systems have most likely left a geochemical overprint in the soil horizon. I would predict that a geochemical survey would lead directly to known quartz-carbonate veins on topographic highs.

I feel this property has good potential to host volcanogenic style massive sulphides with associated precious metals and I believe that with careful geologic mapping combined with modern geophysical techniques an orebody will be located in this environment.

REFERENCES

BRITISH COLUMBIA DEPARTMENT OF MINES 1985 Annual Review, p. 5.

BEDDOES-STEPHENS, B. 1982 "The Petrology of the Rossland Volcanic Rocks, southern B.C." Geological Society of America Bulletin v.93, p. 585-594.

BEDDOES-STEPHEND AND LAMBERT, 1981 "Geochemical Mineralogical and Isotopic Data Relating to the Origin and Tectonic Setting of the Rossland Volcanic Rocks, southern B.C.," Canadian Journal of Earth Science, v.18, p. 858-868.

DOUGLAS, R.J.W., 1970 "Geology and Economic Minerals of Canada", Geological Survey of Canada, Economic Geology Report No. 1.

DRYSDALE, C.W., 1915 "Geology and Ore Deposits of Rossland, British Columbia", Geological Survey Canada, Mem. 77.

DRYSDALE, C.W., 1917 "Ymir Mining Camp" Geological Survey of Canada, Memoir 94.

FREBOLD, H., 1959 "Marine Jurassic Rocks in Nelson and Salmo Areas", Southern B.C., Geological Survey Canada, Bulletin 49.

FYLES, JAMES, 1984 "Geological Setting of the Rossland Mining Camp", British Columbia Ministry of Energy, Mines & Petroleum Bulletin 74.

GILBERT, G., 1948 "Rossland Camp", in Structural Geology of Canadian Ore Deposits (Jubilee Vol.), C.I.M., pg 189-196.

GOVETT AND NICHOL, 1979 "Lithogeochemistry in Mineral Exploration", Economic Geology v.31, p. 339-362.

IRVINE AND BARAGER, 1971 "A Guide to the Chemical Classification of the Common Volcanic Rocks", Canadian Journal of Earth Science, v.8, p. 523.

LITTLE, H.W., 1960 "Nelson Map-Area British Columbia", Geological Survey Canada, Memoir 308.

LITTLE, H.W., 1982 "Geology of the Rossland-Trail Map Area, B.C.", Geological Survey Canada, Paper 79-26.

LITTLE, H.W., 1985 "Geological Notes Nelson West Half (82F, W1/2) Map Area", Open File 1195.

REFERENCES (cont'd)

MCCONNELL, J.W., 1976 "Geochemical Dispersion in Wallrocks of Archean Massive Sulphide Deposits", M.Sc. Thesis, Queen's University, Kingston, Ontario

SANGSTER, D.F., 1980 "Quantitative Characteristics of Volcanogenic Massive Sulphide Deposits", C.I.M. Bulletin, February.

SANGSTER, D.F., 1972 "Precambrian Volcanogenic Massive Sulphide Deposits in Canada", A Review: Geological Survey of Canada, Paper 72-22, 44.

Statement of Expenditures - Ace-in-the-hole Claims

1. Salaries

J.L. Hardy (Project manager)	over period Sept. 1/85 to Mar 13/86 5 days @ $180/day	=$900.00
C.M. Burge (Project geologist)	Days worked: August 22-23, 26-31 Sept 1-6 14 days @ $140/day	=$~~1~~960.00
R. Anselmo (Geophysical technician)	Days worked: August 27-31 5 days @ $80/day	=$400.00
	Total salaries	=$3260.00

2. Analytical costs

Terramin Labs 77 wholerock analyses	@ $22/sample	=$1694.00
	Total Analytical costs	$1694.00

TOTAL PROJECT EXPENDITURES	$4954.00

FALCONBRIDGE LIMITED
6415 - 64th Street, Delta, B.C., Canada V4K 4E2
Tel. (604) 946-0441
Telex 04-357583

Expl. 717/85
November 14, 1985

Chief Gold Commissioner
Ministry of Energy, Mines &
Petroleum Resources
Parliament Buildings
Victoria, B.C.
V8V 1X4

STATEMENT OF QUALIFICATIONS

Dear Sir:

This is to state that I have obtained a Bachelor of Science in Earth Sciences in 1981 from the University of Waterloo, Waterloo, Ontario. I have been actively engaged in mineral exploration in the province of British Columbia since 1983.

Yours truly,
FALCONBRIDGE LIMITED

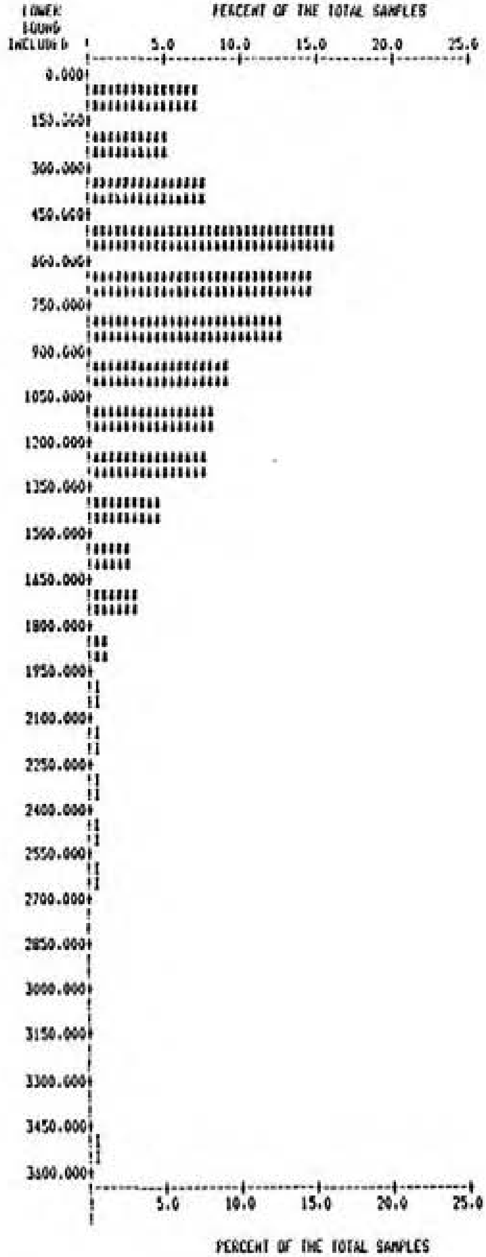
Colin Burge
Geologist

CB:mm

Figure 6. Barium: cumulative frequency vs. PPM histogram and statistical parameters

DATA TITLE : SWIFT LITHOGEOCHEMICAL PROGRAM 1985

VARIABLE : BA



NUMBER OF SAMPLES IN THIS CATEGORY	PERCENTAGE OF THE TOTAL SAMPLES	CUMULATIVE PERCENT BELOW LOWER BOUND	LOWER BOUND
		0.00	0.000
15	6.88		
		6.88	150.000
11	5.05		
		11.93	300.000
16	7.34		
		19.27	450.000
35	16.06		
		35.32	600.000
32	14.68		
		50.00	750.000
27	12.39		
		62.39	900.000
20	9.17		
		71.56	1050.000
17	7.80		
		79.36	1200.000
16	7.34		
		86.70	1350.000
10	4.59		
		91.28	1500.000
5	2.29		
		93.58	1650.000
6	2.75		
		96.33	1800.000
2	0.92		
		97.25	1950.000
1	0.46		
		97.71	2100.000
1	0.46		
		98.17	2250.000
1	0.46		
		98.62	2400.000
1	0.46		
		99.08	2550.000
1	0.46		
		99.54	2700.000
0	0.00		
		99.54	2850.000
0	0.00		
		99.54	3000.000
0	0.00		
		99.54	3150.000
0	0.00		
		99.54	3300.000
0	0.00		
		99.54	3450.000
1	0.46		
		100.00	3600.000

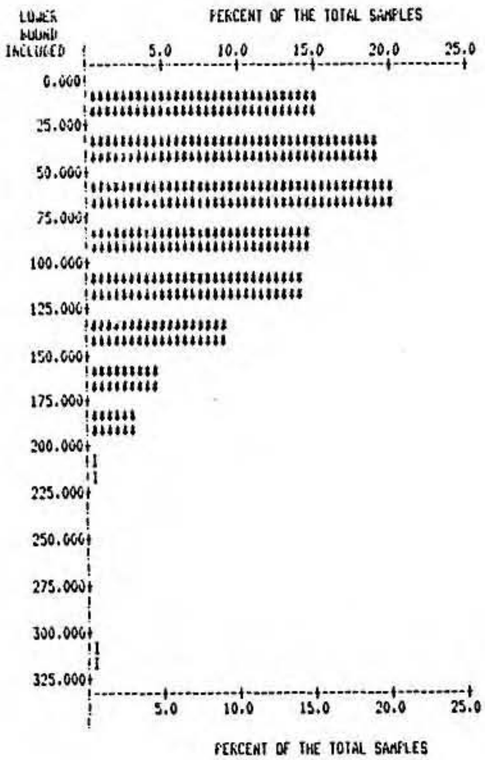
VARIABLE:	BA
NUMBER OF OBSERVATIONS:	218
MINIMUM:	40.000
MAXIMUM:	3550.000
MEAN:	828.073
STANDARD ERROR OF MEAN:	34.487
STANDARD DEVIATION:	509.188
COEFFICIENT OF VARIATION:	61.491
SKEWNESS:	1.306
KURTOSIS:	3.744

Figure 7. Copper: cumulative frequency vs. PPM

histogram and statistical parameters

DATA TITLE : SWIFT LITHOGEOCHEMICAL PROGRAM 1985

VARIABLE : CU



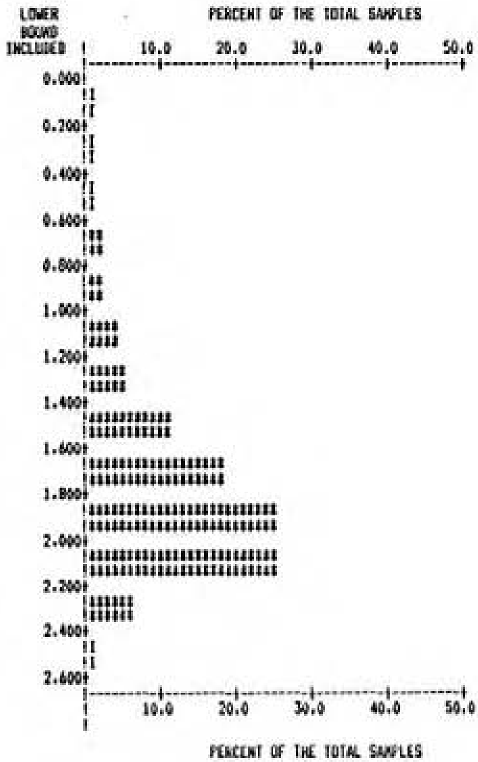
NUMBER OF SAMPLES IN THIS CATEGORY	PERCENTAGE OF THE TOTAL SAMPLES	CUMULATIVE PERCENT BELOW LOWER BOUND	LOWER BOUND
		0.00	0.000
33	15.14	15.14	25.000
41	18.81	33.94	50.000
44	20.18	54.13	75.000
32	14.68	68.81	100.000
30	13.76	82.57	125.000
20	9.17	91.74	150.000
10	4.59	96.33	175.000
6	2.75	99.08	200.000
1	0.46	99.54	225.000
0	0.00	99.54	250.000
0	0.00	99.54	275.000
0	0.00	99.54	300.000
1	0.46	100.00	325.000

VARIABLE:	CU
NUMBER OF OBSERVATIONS:	218
MINIMUM:	0.000
MAXIMUM:	300.000
MEAN:	76.229
STANDARD ERROR OF MEAN:	3.413
STANDARD DEVIATION:	50.392
COEFFICIENT OF VARIATION:	66.106
SKEWNESS:	0.739
KURTOSIS:	0.826

Figure 8. Copper cumulative frequency, logged

DATA TITLE : SWIFT LITHOGEOCHEMICAL PROGRAM 1985

VARIABLE : LOGCU

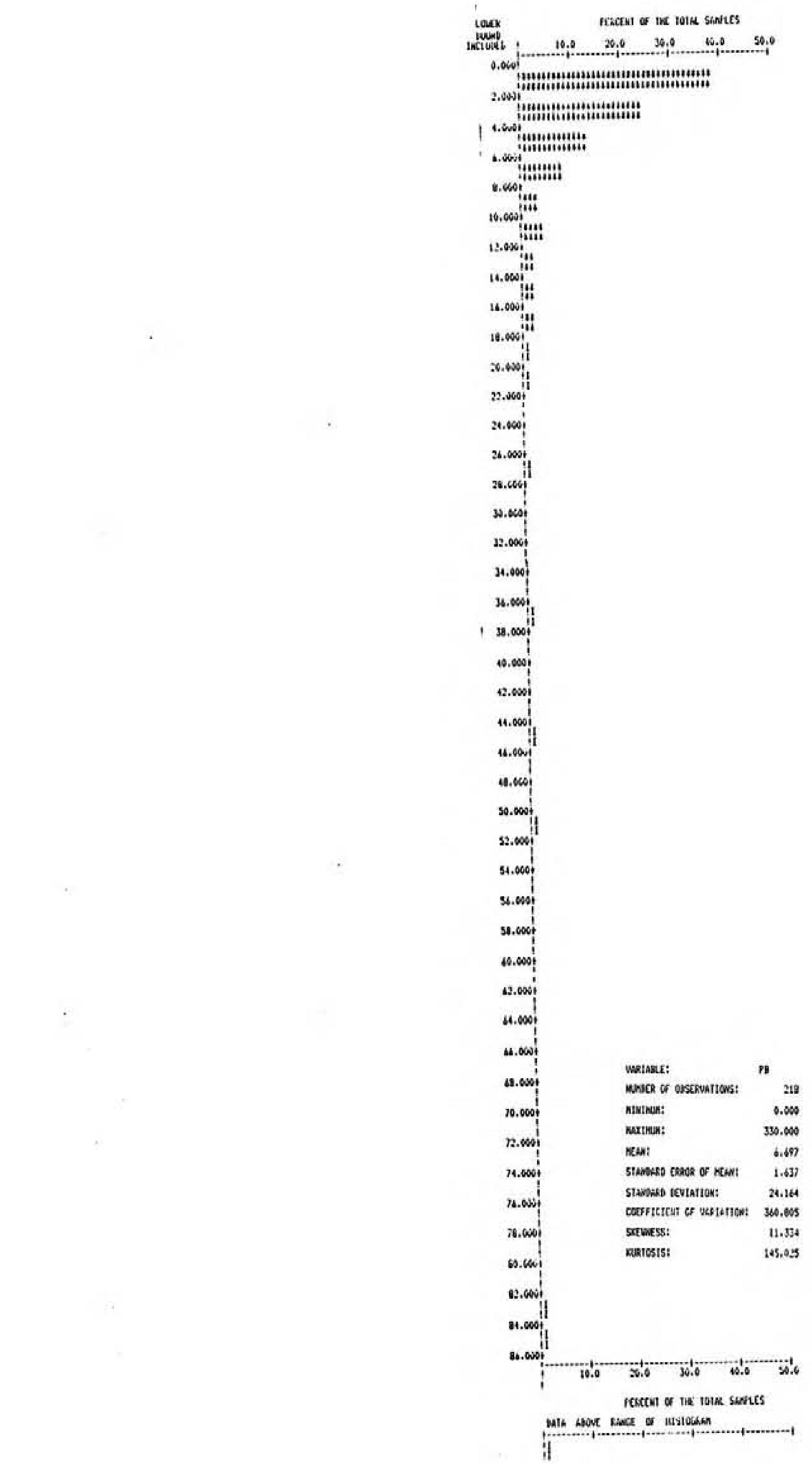


NUMBER OF SAMPLES IN THIS CATEGORY	PERCENTAGE OF THE TOTAL SAMPLES	CUMULATIVE PERCENT BELOW LOWER BOUND	LOWER BOUND
		0.00	0.000
1	0.47		
		0.47	0.200
1	0.47		
		0.93	0.400
2	0.93		
		1.87	0.600
5	2.34		
		4.21	0.800
4	1.87		
		6.07	1.000
8	3.74		
		9.81	1.200
10	4.67		
		14.49	1.400
24	11.21		
		25.70	1.600
38	17.76		
		43.46	1.800
53	24.77		
		68.22	2.000
54	25.23		
		93.46	2.200
13	6.07		
		99.53	2.400
1	0.47		
		100.00	2.600

VARIABLE:	LOGCU
NUMBER OF OBSERVATIONS:	214
MINIMUM:	0.000
MAXIMUM:	2.477
MEAN:	1.758
STANDARD ERROR OF MEAN:	0.028
STANDARD DEVIATION:	0.410
COEFFICIENT OF VARIATION:	23.312
SKEWNESS:	-1.474
KURTOSIS:	2.549

DATA TITLE : SWIFT LITHOGEOCHEMICAL PROGRAM 1965

VARIABLE : PB



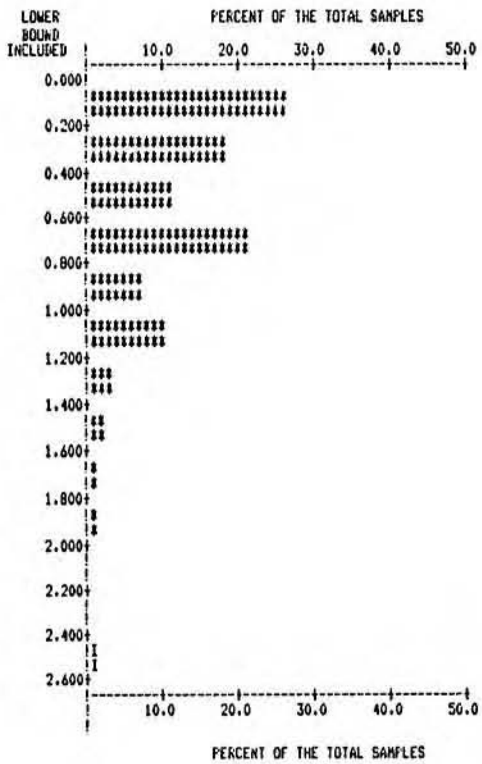
NUMBER OF SAMPLES IN THIS CATEGORY	PERCENTAGE OF THE TOTAL SAMPLES	CUMULATIVE PERCENT BELOW LOWER BOUND	LOWER BOUND
		0.00	0.000
82	37.61	37.61	2.000
53	24.31	61.93	4.000
28	12.84	74.77	6.000
17	7.80	82.57	8.000
6	2.75	85.32	10.000
9	4.13	89.45	12.000
4	1.83	91.28	14.000
5	2.29	93.58	16.000
4	1.83	95.41	18.000
1	0.46	95.87	20.000
1	0.46	96.33	22.000
0	0.00	96.33	24.000
0	0.00	96.33	26.000
2	0.92	97.25	28.000
0	0.00	97.25	30.000
0	0.00	97.25	32.000
0	0.00	97.25	34.000
0	0.00	97.25	36.000
1	0.46	97.71	38.000
0	0.00	97.71	40.000
0	0.00	97.71	42.000
0	0.00	97.71	44.000
1	0.46	98.17	46.000
0	0.00	98.17	48.000
0	0.00	98.17	50.000
1	0.46	98.62	52.000
0	0.00	98.62	54.000
0	0.00	98.62	56.000
0	0.00	98.62	58.000
0	0.00	98.62	60.000
0	0.00	98.62	62.000
0	0.00	98.62	64.000
0	0.00	98.62	66.000
0	0.00	98.62	68.000
0	0.00	98.62	70.000
0	0.00	98.62	72.000
0	0.00	98.62	74.000
0	0.00	98.62	76.000
0	0.00	98.62	78.000
0	0.00	98.62	80.000
0	0.00	98.62	82.000
1	0.46	99.08	84.000
1	0.46	99.54	86.000
1	0.46	*****	

Figure 9: Lead: Cumulative frequency vs. PPM, histogram and statistical parameters.

Figure 10: Lead: Cumulative frequency logged.

DATA TITLE : SWIFT LITHOGEOCHEMICAL PROGRAM 1985

VARIABLE : LOGPB

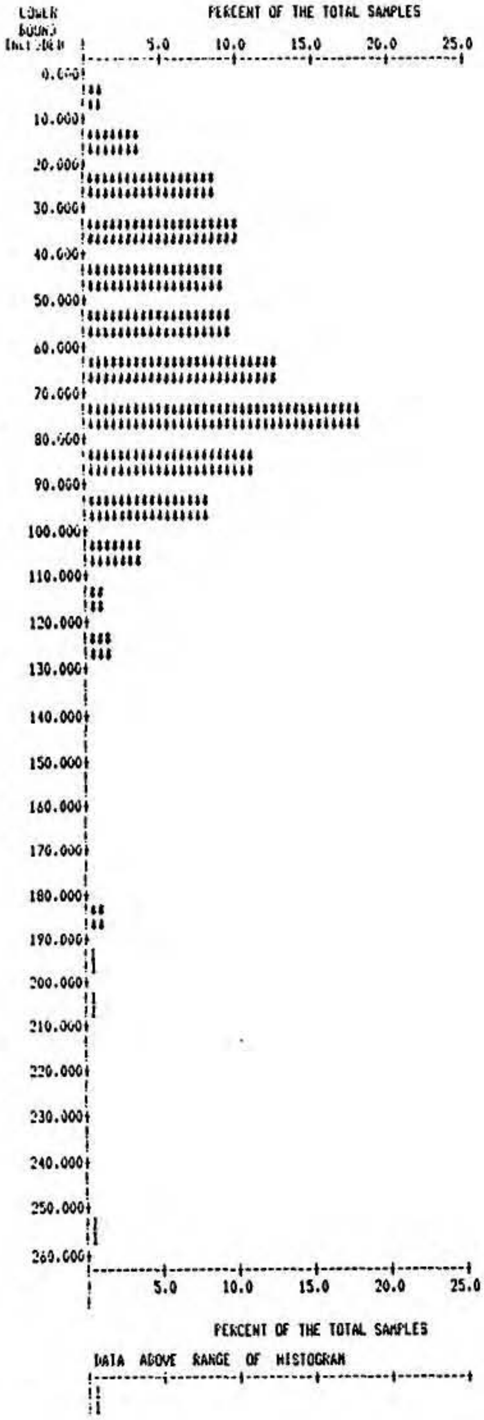


NUMBER OF SAMPLES IN THIS CATEGORY	PERCENTAGE OF THE TOTAL SAMPLES	CUMULATIVE PERCENT BELOW LOWER BOUND	LOWER BOUND
		0.00	0.000
48	26.09	26.09	0.200
33	17.93	44.02	0.400
20	10.87	54.89	0.600
38	20.65	75.54	0.800
13	7.07	82.61	1.000
18	9.78	92.39	1.200
6	3.26	95.65	1.400
3	1.63	97.28	1.600
2	1.09	98.37	1.800
2	1.09	99.46	2.000
0	0.00	99.46	2.200
0	0.00	99.46	2.400
1	0.54	100.00	2.600

VARIABLE:	LOGPB
NUMBER OF OBSERVATIONS:	184
MINIMUM:	0.000
MAXIMUM:	2.519
MEAN:	0.532
STANDARD ERROR OF MEAN:	0.034
STANDARD DEVIATION:	0.465
COEFFICIENT OF VARIATION:	87.385
SKEWNESS:	0.918
KURTOSIS:	1.212

Figure 11: Zinc: Cumulative frequency vs. PPM, histogram and statistical parameters.

DATA TITLE : SWIFT LITHOGEOCHEMICAL PROGRAM 1985
VARIABLE : ZN

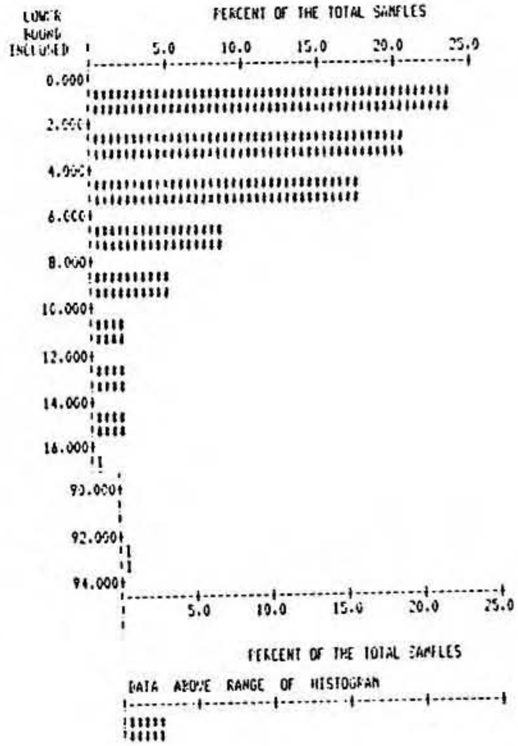


NUMBER OF SAMPLES IN THIS CATEGORY	PERCENTAGE OF THE TOTAL SAMPLES	CUMULATIVE PERCENT BELOW LOWER BOUND	LOWER BOUND
		0.00	0.000
2	0.92		
		0.92	10.000
8	3.67		
		4.59	20.000
19	8.72		
		13.30	30.000
22	10.09		
		23.39	40.000
20	9.17		
		32.57	50.000
21	9.63		
		42.20	60.000
27	12.39		
		54.59	70.000
39	17.89		
		72.48	80.000
24	11.01		
		83.49	90.000
17	7.80		
		91.28	100.000
8	3.67		
		94.95	110.000
2	0.92		
		95.87	120.000
3	1.38		
		97.25	130.000
0	0.00		
		97.25	140.000
0	0.00		
		97.25	150.000
0	0.00		
		97.25	160.000
0	0.00		
		97.25	170.000
0	0.00		
		97.25	180.000
2	0.92		
		98.17	190.000
1	0.46		
		98.62	200.000
1	0.46		
		99.08	210.000
0	0.00		
		99.08	220.000
0	0.00		
		99.08	230.000
0	0.00		
		99.08	240.000
0	0.00		
		99.08	250.000
1	0.46		
		99.54	260.000
1	0.46	*****	

VARIABLE:	ZN
NUMBER OF OBSERVATIONS:	218
MINIMUM:	3.000
MAXIMUM:	1260.000
MEAN:	70.550
STANDARD ERROR OF MEAN:	5.939
STANDARD DEVIATION:	87.685
COEFFICIENT OF VARIATION:	124.287
SKEWNESS:	11.511
KURTOSIS:	152.496

DATA TITLE : SWIFT LITHOGEOCHEMICAL PROGRAM 1985

VARIABLE : AU



NUMBER OF SAMPLES IN THIS CATEGORY	PERCENTAGE OF THE TOTAL SAMPLES	CUMULATIVE PERCENT BELOW LOWER BOUND	LOWER BOUND
		0.00	0.000
51	23.39	23.39	2.000
45	20.64	44.04	4.000
38	17.43	61.47	6.000
19	8.72	70.18	8.000
11	5.05	75.23	10.000
4	1.83	77.06	12.000
4	1.83	78.90	14.000
4	1.83	80.73	16.000
1	0.46	[illegible]	[illegible]
0	0.00	97.25	92.000
1	0.46	97.71	94.000
5	2.29	*****	

Figure 12. Gold: Cumulative frequency vs. PPB

histogram and statistical parameters

Figure 13: Silver: Cumulative frequency vs. PPb, histogram and statistical parameters.

DATA TITLE : SWIFT LITHOGEOCHEMICAL PROGRAM 1985

VARIABLE : AG

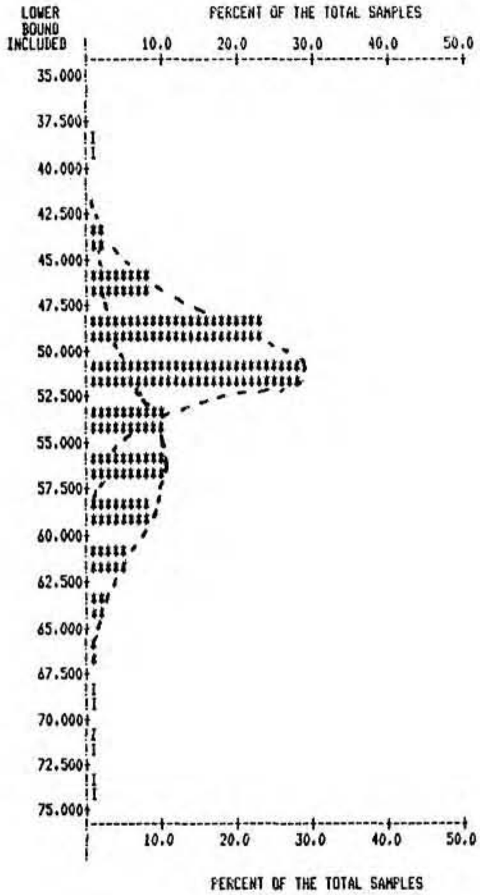
NUMBER OF SAMPLES IN THIS CATEGORY	PERCENTAGE OF THE TOTAL SAMPLES	CUMULATIVE PERCENT BELOW LOWER BOUND	LOWER BOUND

LOWER PERCENT OF THE TOTAL SAMPLES

Figure 15: Silica: Cumulative frequency vs. wt.%, histogram and statistical parameters for mafic volcanics.

DATA TITLE : SWIFT LITHOGEOCHEMICAL PROGRAM 1985

VARIABLE : SIO2



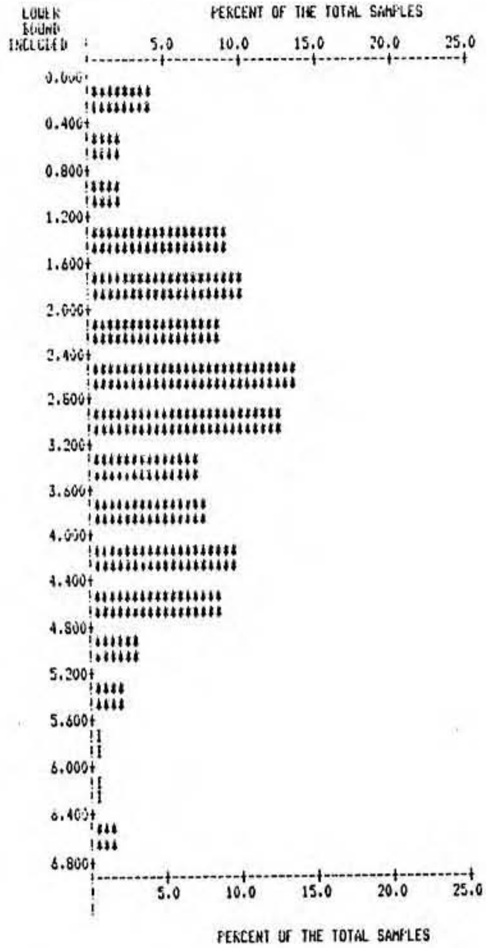
NUMBER OF SAMPLES IN THIS CATEGORY	PERCENTAGE OF THE TOTAL SAMPLES	CUMULATIVE PERCENT BELOW LOWER BOUND	LOWER BOUND
		0.00	35.000
0	0.00	0.00	37.500
1	0.49	0.49	40.000
0	0.00	0.49	42.500
5	2.44	2.93	45.000
17	8.29	11.22	47.500
48	23.41	34.63	50.000
57	27.80	62.44	52.500
20	9.76	72.20	55.000
20	9.76	81.95	57.500
17	8.29	90.24	60.000
10	4.88	95.12	62.500
4	1.95	97.07	65.000
3	1.46	98.54	67.500
1	0.49	99.02	70.000
1	0.49	99.51	72.500
1	0.49	100.00	75.000

VARIABLE:	SIO2
NUMBER OF OBSERVATIONS:	205
MINIMUM:	38.500
MAXIMUM:	72.900
MEAN:	52.611
STANDARD ERROR OF MEAN:	0.369
STANDARD DEVIATION:	5.282
COEFFICIENT OF VARIATION:	10.040
SKEWNESS:	1.023
KURTOSIS:	1.426

Figure 16: Soda: Cumulative frequency vs. wt.% histogram and statistical parameters for mafic volcanics.

DATA TITLE : SWIFT LITHOGEOCHEMICAL PROGRAM 1985

VARIABLE : NA2O



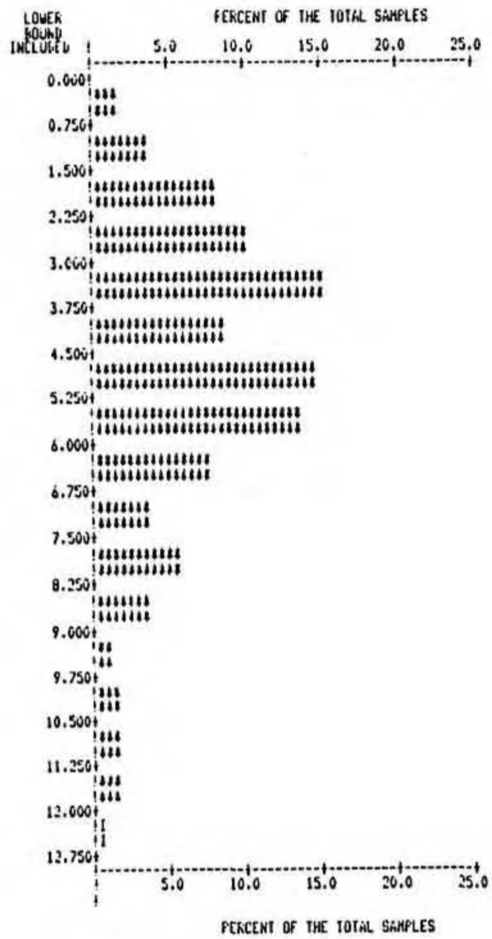
NUMBER OF SAMPLES IN THIS CATEGORY	PERCENTAGE OF THE TOTAL SAMPLES	CUMULATIVE PERCENT BELOW LOWER BOUND	LOWER BOUND
		0.00	0.000
8	3.90		
		3.90	0.400
4	1.95		
		5.85	0.800
4	1.95		
		7.80	1.200
18	8.78		
		16.59	1.600
20	9.76		
		26.34	2.000
17	8.29		
		34.63	2.400
28	13.66		
		48.29	2.800
26	12.68		
		60.98	3.200
14	6.83		
		67.80	3.600
15	7.32		
		75.12	4.000
19	9.27		
		84.39	4.400
17	8.29		
		92.68	4.800
6	2.93		
		95.61	5.200
4	1.95		
		97.56	5.600
1	0.49		
		98.05	6.000
1	0.49		
		98.54	6.400
3	1.46		
		100.00	6.800

VARIABLE:	NA2O
NUMBER OF OBSERVATIONS:	205
MINIMUM:	0.028
MAXIMUM:	6.550
MEAN:	2.942
STANDARD ERROR OF MEAN:	0.095
STANDARD DEVIATION:	1.363
COEFFICIENT OF VARIATION:	46.335
SKEWNESS:	0.147
KURTOSIS:	-0.324

Figure 17: Magnesia: Cumulative frequency vs. wt.%, histogram and statistical parameters for mafic volcanics.

DATA TITLE : SWIFT LITHOGEOCHEMICAL PROGRAM 1985

VARIABLE : MGO



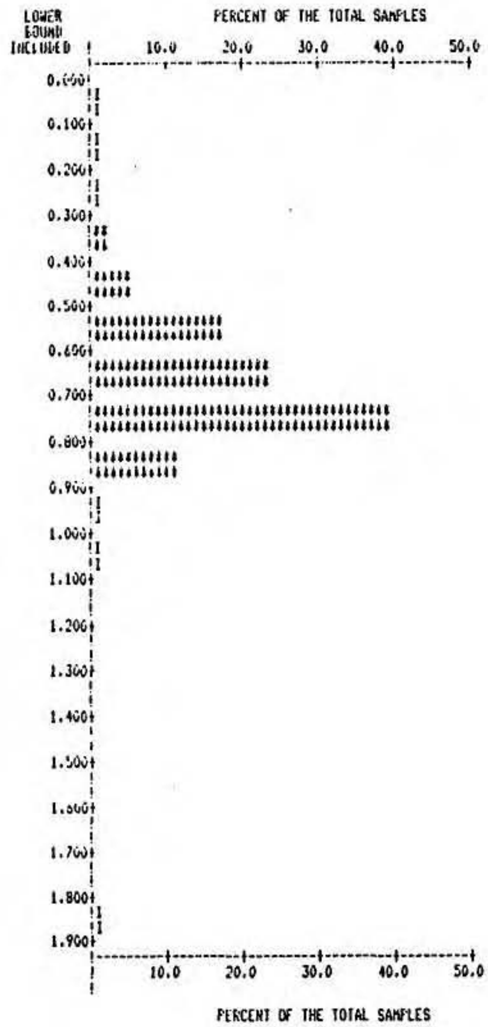
NUMBER OF SAMPLES IN THIS CATEGORY	PERCENTAGE OF THE TOTAL SAMPLES	CUMULATIVE PERCENT BELOW LOWER BOUND	LOWER BOUND
		0.00	0.000
3	1.46	1.46	0.750
7	3.41	4.88	1.500
16	7.80	12.68	2.250
21	10.24	22.93	3.000
31	15.12	38.05	3.750
17	8.29	46.34	4.500
30	14.63	60.98	5.250
28	13.66	74.63	6.000
15	7.32	81.95	6.750
7	3.41	85.37	7.500
11	5.37	90.73	8.250
7	3.41	94.15	9.000
2	0.98	95.12	9.750
3	1.46	96.59	10.500
3	1.46	98.05	11.250
3	1.46	99.51	12.000
1	0.49	100.00	12.750

VARIABLE:	MGO
NUMBER OF OBSERVATIONS:	205
MINIMUM:	0.050
MAXIMUM:	12.400
MEAN:	4.836
STANDARD ERROR OF MEAN:	0.169
STANDARD DEVIATION:	2.426
COEFFICIENT OF VARIATION:	50.167
SKEWNESS:	0.681
KURTOSIS:	0.292

Figure 18: Titania: Cumulative frequency vs. wt.% and statistical parameters for mafic volcanics.

DATA TITLE : SWIFT LITHOGEOCHEMICAL PROGRAM 1985

VARIABLE : TIO2



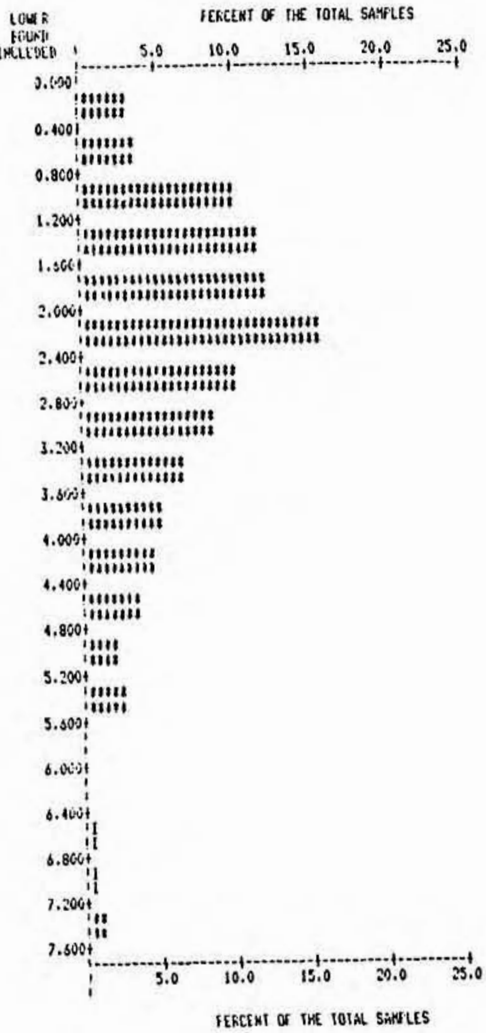
NUMBER OF SAMPLES IN THIS CATEGORY	PERCENTAGE OF THE TOTAL SAMPLES	CUMULATIVE PERCENT BELOW LOWER BOUND	LOWER BOUND
		0.00	0.000
1	0.49	0.49	0.100
1	0.49	0.98	0.200
1	0.49	1.46	0.300
4	1.95	3.41	0.400
10	4.88	8.29	0.500
34	16.59	24.88	0.600
48	23.41	48.29	0.700
79	38.54	86.83	0.800
23	11.22	98.05	0.900
2	0.98	99.02	1.000
1	0.49	99.51	1.100
0	0.00	99.51	1.200
0	0.00	99.51	1.300
0	0.00	99.51	1.400
0	0.00	99.51	1.500
0	0.00	99.51	1.600
0	0.00	99.51	1.700
0	0.00	99.51	1.800
1	0.49	100.00	1.900

VARIABLE:	TIO2
NUMBER OF OBSERVATIONS:	205
MINIMUM:	0.020
MAXIMUM:	1.830
MEAN:	0.675
STANDARD ERROR OF MEAN:	0.011
STANDARD DEVIATION:	0.158
COEFFICIENT OF VARIATION:	23.396
SKEWNESS:	1.107
KURTOSIS:	14.463

Figure 19: Potash: Cumulative frequency vs. wt.%, histogram and statistical parameters for mafic volcanics.

DATA TITLE : SWIFT LITHOGEOCHEMICAL PROGRAM 1985

VARIABLE : K2O



NUMBER OF SAMPLES IN THIS CATEGORY	PERCENTAGE OF THE TOTAL SAMPLES	CUMULATIVE PERCENT BELOW LOWER BOUND	LOWER BOUND
		0.00	0.000
6	2.93	2.93	0.400
7	3.41	6.34	0.800
21	10.24	16.59	1.200
24	11.71	28.29	1.600
25	12.20	40.49	2.000
32	15.61	56.10	2.400
21	10.24	66.34	2.800
17	8.29	74.63	3.200
13	6.34	80.98	3.600
10	4.88	85.85	4.000
9	4.39	90.24	4.400
7	3.41	93.66	4.800
4	1.95	95.61	5.200
5	2.44	98.05	5.600
0	0.00	98.05	6.000
0	0.00	98.05	6.400
1	0.49	98.54	6.800
1	0.49	99.02	7.200
2	0.98	100.00	7.600

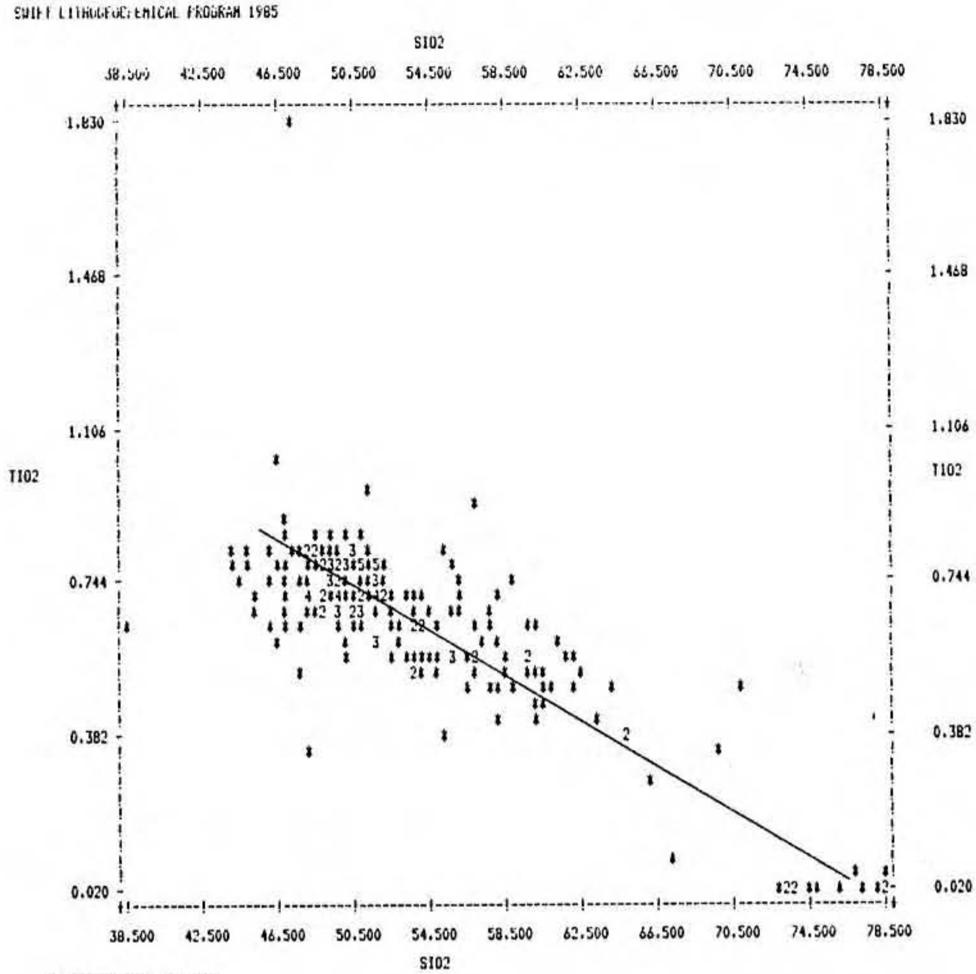
VARIABLE:	K2O
NUMBER OF OBSERVATIONS:	205
MINIMUM:	0.034
MAXIMUM:	7.450
MEAN:	2.469
STANDARD ERROR OF MEAN:	0.097
STANDARD DEVIATION:	1.392
COEFFICIENT OF VARIATION:	56.360
SKEWNESS:	0.967
KURTOSIS:	1.152

SWIFT LITHOGEOCHEMICAL PROGRAM 1985

CORRELATION MATRIX: (99.0 INDICATES COEFFICIENT COULD NOT BE CALCULATED)

	SIO2	MGO	NA2O	K2O	TIO2	BA	CU	PB	ZN	AU	AG	NA2OK2O
SIO2	1.000	-0.694	0.217	0.316	-0.826	-0.204	-0.537	0.192	-0.113	-0.000	-0.053	0.448
MGO	-0.694	1.000	-0.236	-0.496	0.656	0.014	0.379	-0.188	0.075	-0.072	-0.032	-0.615
NA2O	0.217	-0.236	1.000	-0.291	-0.178	-0.180	-0.058	0.058	-0.037	-0.109	-0.290	0.594
K2O	0.316	-0.496	-0.291	1.000	-0.309	0.298	-0.011	0.159	-0.134	0.210	0.316	0.597
TIO2	-0.826	0.656	-0.178	-0.309	1.000	0.189	0.409	-0.102	0.133	-0.028	0.054	-0.409
BA	-0.204	0.014	-0.180	0.298	0.189	1.000	0.151	-0.016	0.182	0.096	0.028	0.100
CU	-0.537	0.379	-0.058	-0.011	0.409	0.151	1.000	-0.201	0.135	-0.027	0.271	-0.058
PB	0.192	-0.188	0.058	0.159	-0.102	-0.016	-0.201	1.000	-0.050	-0.004	-0.016	0.183
ZN	-0.113	0.075	-0.037	-0.134	0.133	0.182	0.135	-0.050	1.000	-0.026	0.149	-0.144
AU	-0.000	-0.072	-0.109	0.210	-0.028	0.096	-0.027	-0.004	-0.026	1.000	0.220	0.086
AG	-0.053	-0.032	-0.290	0.316	0.054	0.028	0.271	-0.016	0.149	0.220	1.000	0.023
NA2OK2O	0.448	-0.615	0.594	0.597	-0.409	0.100	-0.058	0.183	-0.144	0.086	0.023	1.000

Figure 20: Correlation Table.

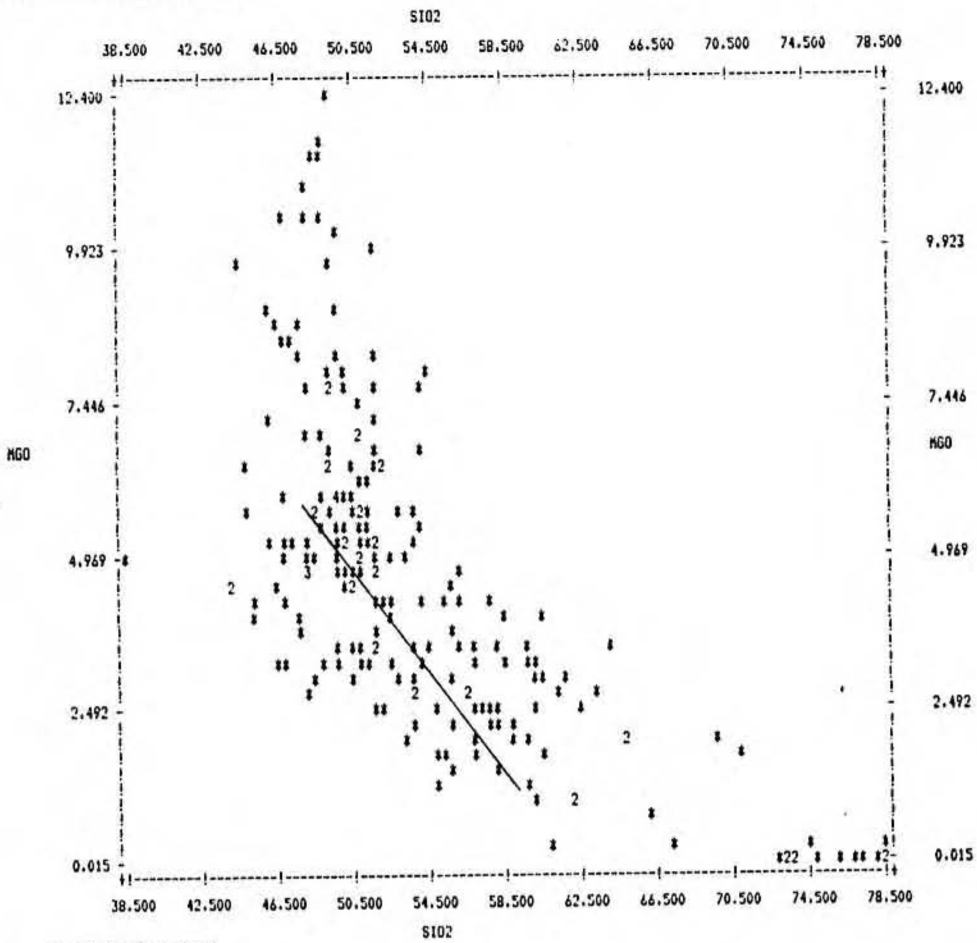


0 POINTS OUT OF RANGE

STATISTICS FOR VARIABLES:	SIO2	TIO2
NUMBER OF OBSERVATIONS:	218	218
MINIMUM:	38.50	0.02
MAXIMUM:	78.50	1.83
MEAN:	54.00	0.64
STANDARD ERROR OF MEAN:	0.51	0.01
STANDARD DEVIATION:	7.55	0.22
COEFFICIENT OF VARIATION:	13.98	33.99
SKEWNESS:	1.56	-0.63
KURTOSIS:	2.27	5.71
CORRELATION COEFFICIENT:	-0.8263	

Figure 21: Silica-Titania plot.
Note strong negative correlation.

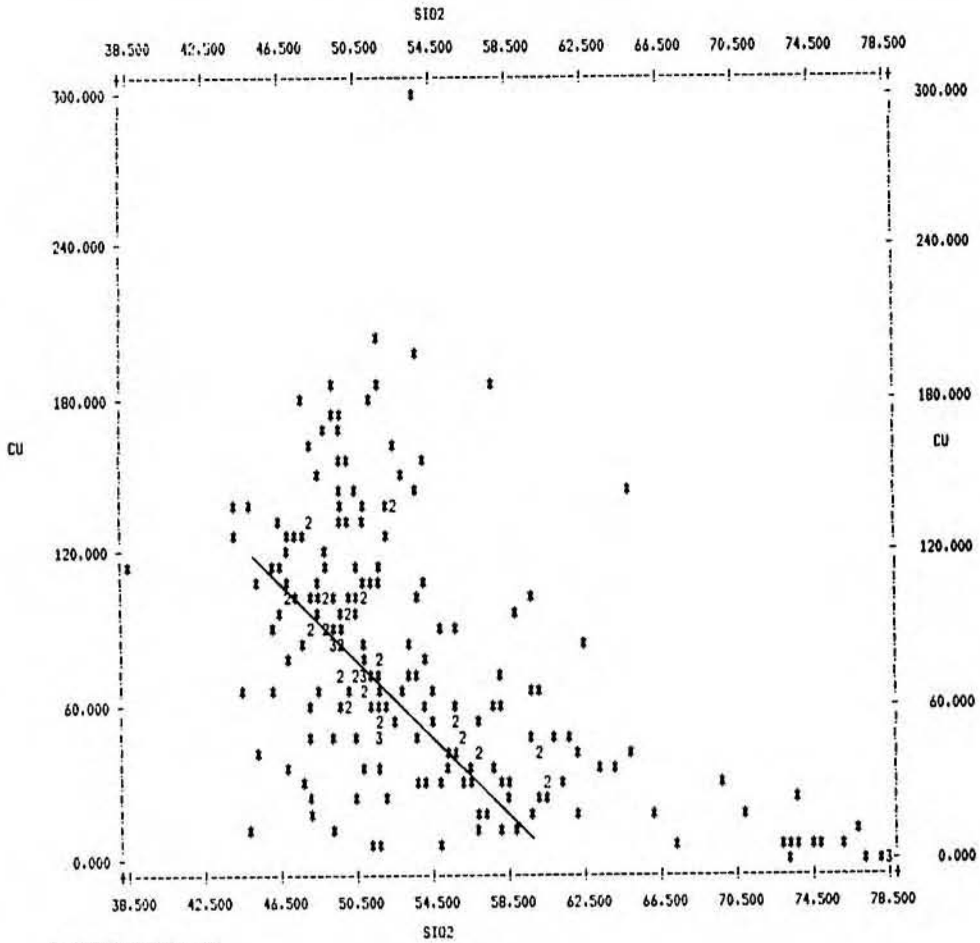
SWIFT LITHOGEOCHEMICAL PROGRAM 1985



0 POINTS OUT OF RANGE

STATISTICS FOR VARIABLES:	SIO2	MGO
NUMBER OF OBSERVATIONS:	218	218
MINIMUM:	38.50	0.01
MAXIMUM:	78.50	12.40
MEAN:	54.00	4.55
STANDARD ERROR OF MEAN:	0.51	0.18
STANDARD DEVIATION:	7.55	2.61
COEFFICIENT OF VARIATION:	13.98	57.35
SKEWNESS:	1.56	0.48
KURTOSIS:	2.27	0.11
CORRELATION COEFFICIENT:	-0.6941	

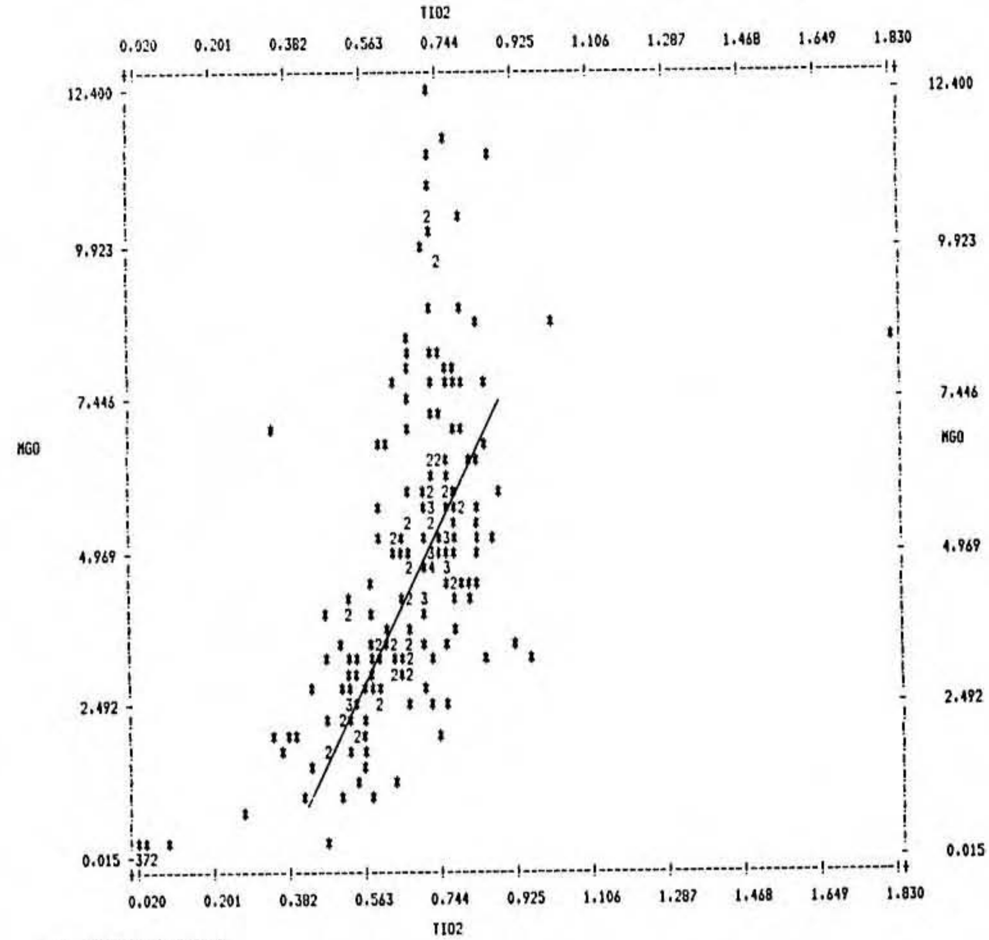
Figure 22: Silica-Magnesia plot.



STATISTICS FOR VARIABLES:	SIO2	CU
NUMBER OF OBSERVATIONS:	218	218
MINIMUM:	38.50	0.00
MAXIMUM:	78.50	300.00
MEAN:	54.00	76.23
STANDARD ERROR OF MEAN:	0.51	3.41
STANDARD DEVIATION:	7.55	50.39
COEFFICIENT OF VARIATION:	13.98	66.11
SKEWNESS:	1.56	0.74
KURTOSIS:	2.27	0.83
CORRELATION COEFFICIENT:	-0.5373	

Figure 23: Silica-Copper plot.

SWIFT LITHOGEOCHEMICAL PROGRAM 1985

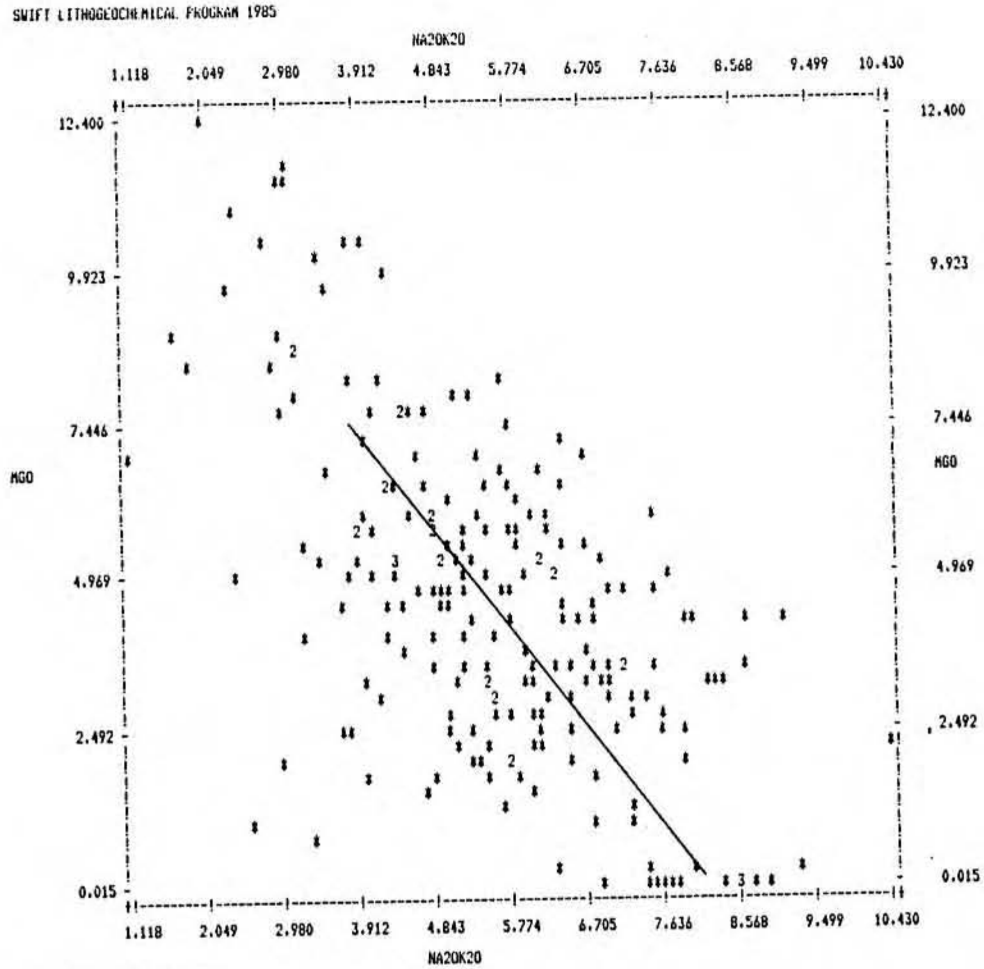


0 POINTS OUT OF RANGE

STATISTICS FOR VARIABLES:	TIO2	MGO
NUMBER OF OBSERVATIONS:	218	218
MINIMUM:	0.02	0.01
MAXIMUM:	1.83	12.40
MEAN:	0.64	4.55
STANDARD ERROR OF MEAN:	0.01	0.18
STANDARD DEVIATION:	0.22	2.61
COEFFICIENT OF VARIATION:	33.99	57.35
SKEWNESS:	-0.63	0.48
KURTOSIS:	5.71	0.11
CORRELATION COEFFICIENT:	0.6556	

Figure 24: Titania-Magnesia plot.

SWIFT LITHOGEOCHEMICAL PROGRAM 1985

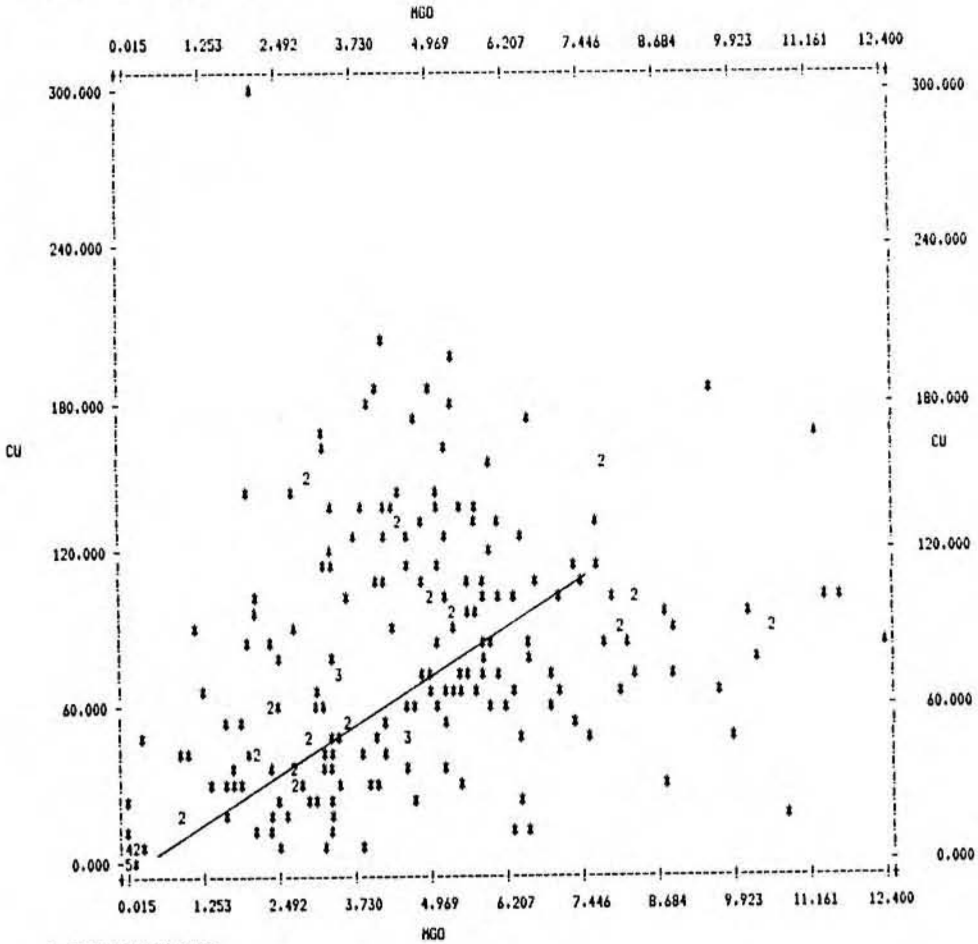


0 POINTS OUT OF RANGE

STATISTICS FOR VARIABLES:	NA2OK20	MGO
NUMBER OF OBSERVATIONS:	218	218
MINIMUM:	1.12	0.01
MAXIMUM:	10.43	12.40
MEAN:	5.56	4.55
STANDARD ERROR OF MEAN:	0.11	0.18
STANDARD DEVIATION:	1.64	2.61
COEFFICIENT OF VARIATION:	29.49	57.35
SKEWNESS:	0.04	0.48
KURTOSIS:	-0.20	0.11
CORRELATION COEFFICIENT:	-0.6149	

Figure 25: Alkalies-Magnesia plot.

SWIFT LITHOGEOCHEMICAL PROGRAM 1985

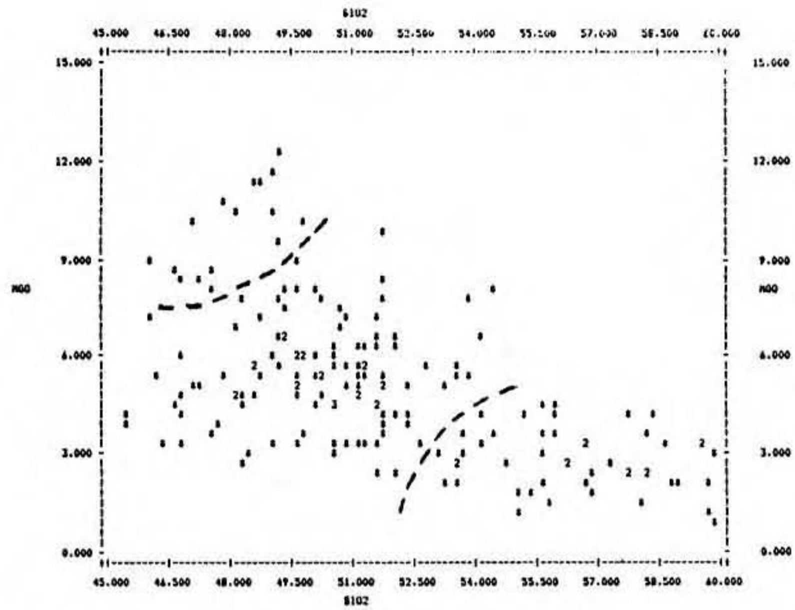


0 POINTS OUT OF RANGE

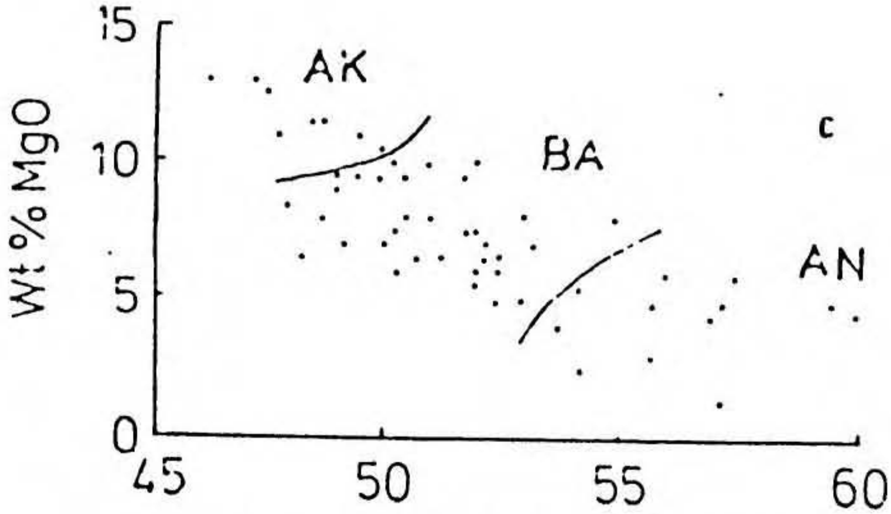
STATISTICS FOR VARIABLES:	MGO	CU
NUMBER OF OBSERVATIONS:	218	218
MINIMUM:	0.01	0.00
MAXIMUM:	12.40	300.00
MEAN:	4.55	76.23
STANDARD ERROR OF MEAN:	0.18	3.41
STANDARD DEVIATION:	2.61	50.39
COEFFICIENT OF VARIATION:	57.35	66.11
SKEWNESS:	0.48	0.74
KURTOSIS:	0.11	0.83
CORRELATION COEFFICIENT:	0.3791	

Figure 26: Magnesia-Copper plot.

Figure 27. Comparison of Harker Variation Diagrams
for Magnesia vs. Silica



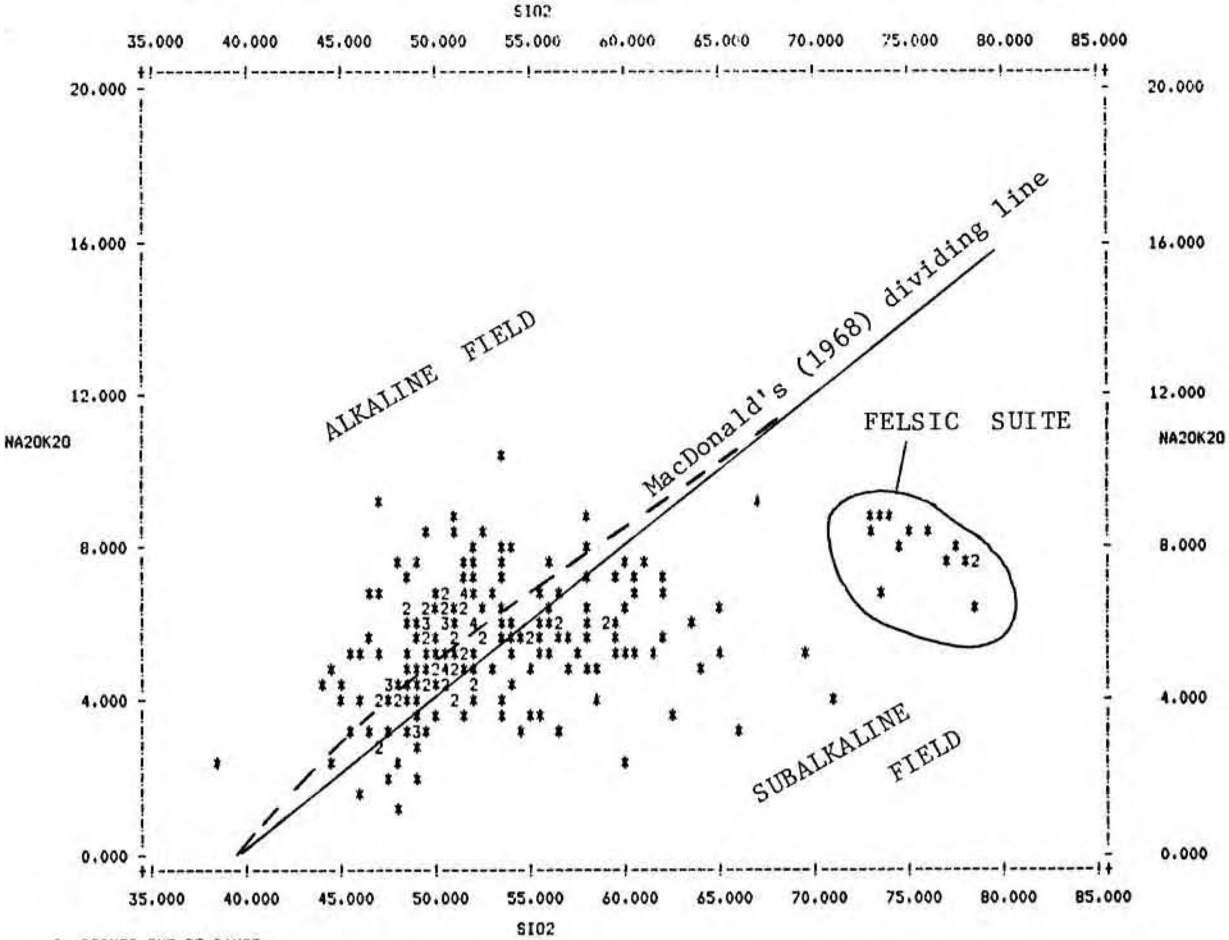
a. Swift claim area mafic volcanics



b. Rossland volcanic belt from Beddoes-Stephens 1982 study

AK = Ankaramite, BA = Basalt, AN = Andesite

SWIFT LITHOGEOCHEMICAL PROGRAM 1985



0 POINTS OUT OF RANGE

STATISTICS FOR VARIABLES:	SIO2	NA2OK2O
NUMBER OF OBSERVATIONS:	218	218
MINIMUM:	38.50	1.12
MAXIMUM:	78.50	10.43
MEAN:	54.00	5.56
STANDARD ERROR OF MEAN:	0.51	0.11
STANDARD DEVIATION:	7.55	1.64
COEFFICIENT OF VARIATION:	13.98	29.49
SKEWNESS:	1.56	0.04
KURTOSIS:	2.27	-0.20
CORRELATION COEFFICIENT:	0.4483	

Figure 28: Alkalies-Silica plot.
Note: The mafic rocks are generally alkaline in nature. Dotted line represents dividing line proposed by Irving and Barager, 1971.

APPENDIX 1

THIN SECTION DESCRIPTIONS

SAMPLE NO: HC-1 LOCATION: L29+50W, 27+00N

ROCK NAME:	Quartz porphyritic rhyolite
TEXTURE:	Quartz and occasional feldspar phenocrysts (1-2mm) in quartzofeldspathic matrix
MINERALOGY:	Quartz 80% Feldspar 20% Calcite Acc. Sericite Acc. Pyrite Acc.
ALTERATION:	Classic devitrification textures range from spherules to micrographitic intergrowths
REMARKS:	Original rock may have been a quartz-feldspar porphyritic obsidian flow. (Harold Gibson, pers. comm.)

SAMPLE NO: N.A. LOCATION: L27W, 20 + 75M

ROCK NAME:	Feldspar porphyry dacitic intrusion
TEXTURE:	Porphyritic Feldspar phenocrysts 1-3mm and poikiolitic mafics in fine grain siliceous matrix.
MINERALOGY:	Feldspar 30% Quartz 45% Chlorite 20% Carbonate 10% Opaques 5%
ALTERATION:	Sercite, Silica flooded, alteration haloes around feldspars
REMARKS:	Mafic phenocrysts obliterated feldspars poikiolitic, silica flooded hydrothermally altered rock.

SAMPLE NO: SS-122 LOCATION: L27W, 27 + 00N

ROCK NAME:	Augite-feldspar tuff	
TEXTURE:	Crystal tuff	
MINERALOGY:	Feldspar	60%
	Pyrite	20%
	Epidote	15%
	Calcite	Acc.
	Barite	Acc. associated with pyrite
ALTERATION:	Sericite, Pyrite and Epidote occur together in clusters.	
REMARKS:	Extremely altered volcanic rock with pyrite fragments.	

SAMPLE NO: SS 118 LOCATION: L2+10E 18+30N

ROCK NAME:	Ankaramite
TEXTURE:	Mafic phenocrysts (up to 5mm) in a feldspathic matrix
MINERALOGY:	Hornblende 65% Feldspar 30% Augite 3% Pyrite 2% Magnetite Acc.
ALTERATION:	Original Augite almost totally altered to hornblende
REMARKS:	Assay indicates high magnesia low silica (SiO_2 = 48.6%, MgO = 11.4%)

SAMPLE NO: SS 210 LOCATION: L12+40W, 5+30S

ROCK NAME: Laminated sediments

TEXTURE: Mixed quartzite and carbonaceous argillite

MINERALOGY:

Quartz	30%
Carbonaceous Material	40%
Ash Lamina	20%
Pyrite	10%

ALTERATION: -

REMARKS: Pyrite found in ash and siliceous laminae
Ag = 490 ppb

SAMPLE NO. SS142 LOCATION: L8W 21+40N

ROCK NAME:	Crystal tuff	
TEXTURE:	Tuffaceous feldspar laths dominate	
MINERALOGY:	Feldspar	80%
	Pyrite	15%
	Silica	5%
	Sercite	Acc.
ALTERATION:	Vague feldspars indicate hydrothermal alteration	
REMARKS:	Silica and pyrite form matrix of brecciated part of mafic volcanic.	

APPENDIX II

WHOLE ROCK ANALYTICAL PROCEDURES & RESULTS

ANALYTICAL METHODS FOR WHOLE ROCK

Geochemical samples for whole rock analytical procedure were processed by Terra-Min Laboratories Limited at 14-2235-30th Avenue, N.E., Calgary, Alberta, employing the following procedures:

Rock samples are crushed to approximately one-eighth of an inch in a jawcrusher, riffled to obtain a representative sample and pulverized to 100 mesh (180 micron particle size).

A portion of the prepared sample is mixed with a lithium metaborate flux and fused. The resulting melt is poured into an acid matrix and completely dissolved. The solution is analyzed by AA technique for the required major element and calculated as oxides of these elements.

Base metal values calculated are from a portion of the prepared sample that is digested in hot nitric/perchloric acid mixture, or hot aqua regia (nitric/hydrochloric acids). The elements are then determined by atomic absorption spectrophotometry.

-> JLH, -> XC CIS

TML TERRAMIN RESEARCH LABS LTD.

Falconbridge Limited - Colin Burge

JOB # 85-205

Page 1/2

	Client No.	SiO_2 %	MgO %	Na_2O %	K_2O %	TiO_2 %	Ba ppm		Cu ppm	Pb ppm	Zn ppm		Au ppb	Ag ppb	
1	DS-001-85	56.0	3.81	3.63	1.04	0.70	650		29	4	79		40	90	
2	002	58.2	3.51	3.38	1.99	0.65	1140		35	7	77		8	80	
3	003	50.9	4.61	3.03	2.65	0.97	1590		90	-1	81		4	40	
4	004	50.1	5.22	2.99	2.40	0.67	860		127	4	76		4	90	
5	005	54.5	3.40	4.69	2.18	0.62	650		154	3	80		8	50	
6	006	52.4	1.57	3.69	4.10	0.52	990		117	5	73		10	50	
7	007	54.8	2.58	4.29	2.61	0.50	860		61	4	60		2	80	
8	008	53.5	2.17	3.24	4.86	0.55	1480		138	3	98		2	80	
9	009	49.8	4.77	3.13	1.54	0.92	990		112	-1	77		16	130	
10	010	58.4	3.00	3.24	2.51	0.63	1140		31	3	85		4	70	
1	011	61.0	2.66	3.61	1.84	0.60	950		28	5	72		4	50	
2	012	59.7	2.44	3.44	1.87	0.62	1170		20	5	80		2	50	
3	013	59.7	3.36	4.30	1.00	0.63	960		27	-1	83		8	40	
4	014	51.6	3.25	4.29	1.83	0.72	1480		104	2	66		12	10	
5	015	53.5	3.63	5.54	1.86	0.57	770		128	-1	67		8	190	
6	016	43.4	3.14	1.04	1.41	0.70	470		132	1	74		4	60	
7	017	58.8	2.57	2.75	1.81	0.72	830		38	2	83		6	60	
8	018 mafic [illegible]	51.1	6.23	2.72	1.12	0.70	940		140	82	76		8	80	
9	019	61.6	3.07	2.66	1.75	0.55	820		29	1	77		2	70	
20	020	55.8	4.07	3.87	1.87	0.70	1620		30	1	82		2	30	

TerraMin Research Labs Ltd.

	Client No.	SiO_2 %	MgO %	Na_2O %	K_2O %	TiO_2 %	Ba ppm		Cu ppm	Pb ppm	Zn ppm		Au ppb	Ag ppb
21	DS-021-85	53.7	4.34	2.79	2.39	0.63	890		113	2	58		-2	90
2	022	50.9	7.84	2.28	.982	1.10	940		165	-1	89		-2	70
3	023	75.9	.114	3.83	4.01	0.07	90		2	14	25		-2	10
4	024	61.2	2.28	5.14	4.10	0.47	1680		21	1	28		2	30
5	025	50.7	4.12	1.95	5.19	0.82	1950		75	1	82		2	10
6	026	56.3	3.43	3.17	3.01	0.68	940		81	2	89		4	60
7	027	53.7	3.60	3.68	2.00	0.68	1070		119	3	70		-2	90
8	028	52.6	5.04	3.37	1.42	0.68	500		66	1	100		-2	10
9	029	58.2	1.62	.791	4.93	0.62	1130		19	6	42		4	60
30	030	53.5	3.34	2.78	1.42	0.67	800		135	1	66		2	50
1	031	49.8	3.96	2.52	1.41	0.63	450		61	32	300		2	500
2	032	53.5	4.86	1.89	.235	0.70	260		151	-1	77		4	130
3	033	50.9	6.81	1.66	.217	1.08	380		172	-1	95		2	120
4	034	51.3	8.22	1.97	2.01	0.67	1060		117	2	72		10	130
5	035	62.9	3.43	3.59	1.45	0.60	830		26	3	78		2	60
6	036	52.8	5.67	2.48	1.83	0.70	1440		60	3	70		2	30
7	037	61.0	3.27	3.28	1.66	0.60	870		24	3	66		4	10
8	SS-001	62.2	1.03	.074	6.77	0.50	470		39	4	10		20	610
9	002	64.0	3.42	3.21	1.63	0.50	350		34	3	60		8	60
40	003	78.3	.034	3.96	3.52	0.05	50		1	26	23		42	120
41	004	61.4	2.84	2.28	2.74	0.60	390		31	4	31		4	10

TML **TERRAMIN RESEARCH LABS LTD.**

Falconbridge Limited

JOB # 85-219

Page 1/2

	Client No.	SiO_2 %	MgO %	Na_2O %	K_2O %	TiO_2 %	Ba ppm		Cu ppm	Pb ppm	Zn ppm		Au ppb	Ag ppb	
1	SS 005	51.1	4.81	3.83	1.83	0.68	820		74	5	41		34	110	
2	006	53.5	2.70	6.43	1.18	0.52	620		141	-1	32		4	160	
3	007	47.3	5.21	3.15	1.22	0.83	640		124	1	95		-2	80	
4	008	47.1	5.21	2.74	1.16	0.87	600		36	1	70		-2	90	
5	009	53.1	2.94	4.66	2.31	0.65	870		152	1	31		46	330	
6	010	50.5	5.64	4.22	.640	0.70	210		98	-1	31		2	90	
7	011	49.4	7.57	3.75	.853	0.72	250		48	-1	46		-2	110	
8	012	51.1	5.21	4.31	.601	0.70	210		99	5	53		2	90	
9	013	50.1	5.32	2.67	2.25	0.60	910		97	3	83		2	80	
10	014	55.4	1.73	2.32	3.53	0.37	2270		37	5	18		36	160	
1	015	76.2	.100	3.94	4.07	0.05	100		1	12	25		2	680	
2	016	49.2	6.55	2.06	2.27	0.75	350		14	11	127		6	140	
3	017	56.3	2.78	2.52	3.28	0.50	620		27	2	15		16	360	
4	018	59.5	3.42	3.06	2.12	0.63	490		19	2	31		4	300	
5	019	58.6	3.35	2.79	1.21	0.55	250		26	5	45		-2	120	
6	020	56.9	2.43	1.91	3.08	0.52	710		15	4	32		2	20	
7	021	48.1	4.91	1.86	2.00	0.72	470		102	3	33		8	220	
8	022	60.1	3.19	3.17	1.93	0.47	450		40	2	37		6	180	
9	023	59.5	3.35	3.01	2.92	0.52	970		46	3	43		4	60	
20	024	50.5	6.08	2.35	2.52	0.68	1020		72	1	34		2	160	

TML TERRAMIN RESEARCH LABS LTD.

JOB # 85-219

Page 2/2

	Client No.	SiO_2 %	MgO %	Na_2O %	K_2O %	TiO_2 %	Ba ppm		Cu ppm	Pb ppm	Zn ppm		Au ppb	Ag ppb	
21	SS-025	51.8	8.31	1.87	2.34	0.67	670		70	1	42		4	140	
2	026	54.1	3.29	3.42	2.65	0.58	660		58	1	23		4	120	
3	027	56.7	3.35	5.01	1.87	0.65	590		42	1	20		4	40	
4	028	48.3	2.75	3.88	3.42	0.70	460		88	1	86		2	10	
5	029	57.8	2.34	4.08	1.98	0.48	820		35	1	55		6	40	
6															
7															
8															
9															
0															
1															
2															
3															
4															
5															
6															
7															
8															
9															
0															

Falconbridge Limited

JOB # 85-220

Page 1/2

TERRAMIN RESEARCH LABS LTD.

	Client No.	SiO_2 %	MgO %	Na_2O %	K_2O %	TiO_2 %	Ba ppm		Cu ppm	Pb ppm	Zn ppm		Au ppb	Ag ppb	
1	SS-030	51.3	5.60	3.88	1.29	0.72	600		108	1	47		22	230	
2	031	50.5	6.34	3.21	1.05	0.83	300		103	1	26		8	110	
3	032	49.6	5.09	3.19	1.18	0.83	450		60	1	32		2	140	
4	033	52.4	3.91	4.02	1.55	0.58	730		135	1	30		4	160	
5	034	54.2	6.64	3.24	2.46	0.62	1280		77	15	70		4	160	
6	035	75.9	.194	4.00	4.05	0.07	90		1	13	23		2	10	
7	050	46.2	5.28	3.21	1.93	0.65	410		65	2	74		4	10	
8	051	78.5	.146	4.07	2.25	0.02	140		-1	4	3		2	20	
9	052	51.6	6.68	2.45	1.11	0.60	410		110	2	69		8	130	
10	053	77.4	.033	4.88	2.95	0.03	60		-1	336	26		14	130	
1	054	54.1	4.16	4.95	2.92	0.53	2420		110	1	89		-2	10	
2	055	38.5	5.07	.617	1.84	0.63	450		111	5	49		4	120	
3	056	54.5	3.58	3.73	1.81	0.58	890		51	6	70		10	40	
4	057	56.3	2.70	3.17	2.43	0.57	750		35	1	64		4	60	
5	058	58.4	4.09	1.56	3.24	0.52	1260		29	5	36		2	40	
6	059	53.9	7.79	2.20	2.28	0.63	570		153	1	18		2	100	
7	060	53.5	5.30	1.20	2.22	0.63	490		197	2	67		4	210	
8	061	69.7	1.90	2.93	2.43	0.35	350		27	4	24		2	130	
9	062	51.8	3.84	4.58	1.34	0.78	720		5	1	55		-2	60	
20	063	49.6	5.14	2.48	1.89	0.63	1100		143	2	70		2	50	

TML TERRAMIN RESEARCH LABS LTD.

JOB # 85-220

Page 2/2

	Client No.	SiO_2 %	MgO %	Na_2O %	K_2O %	TiO_2 %	Ba ppm		Cu ppm	Pb ppm	Zn ppm		Au ppb	Ag ppb	
2 1	SS-064	78.3	.042	4.08	3.60	0.03	50		-1	16	24		32	60	
2	065	55.6	2.18	2.70	2.42	0.57	880		39	2	72		4	40	
3	066	77.9	.030	3.81	3.93	0.03	40		-1	17	27		44	70	
4	067	48.1	6.96	.028	1.09	0.35	240		62	-1	41		22	490	
5	068	76.8	.067	4.19	3.34	0.05	80		9	18	28		6	140	
6	069	55.6	3.08	3.42	2.19	0.55	780		57	7	69		8	700	
7	070	52.8	5.73	4.38	.475	0.60	260		63	2	77		6	150	
8	071	60.3	3.98	2.74	2.49	0.47	870		30	6	28		2	80	
9															
0															
1															
2															
3															
4															
5															
6															
7															
8															
9															
0															

Falconbridge Limited - Colin Burge

JOB # 85-237

Page 1/4

TML TERRAMIN RESEARCH LABS LTD.

	Client No.	SiO_2 %	MgO %	Na_2O %	K_2O %	TiO_2 %	Ba ppm		Cu ppm	Pb ppm	Zn ppm		Au ppb	Ag ppb	
1	SS - 072	49.0	3.32	4.50	.986	0.67	730		111	3	83		4	170	
2	073	51.1	5.43	4.54	.447	0.78	440		71	8	120		2	60	
3	074	50.1	5.99	3.86	1.57	0.77	700		58	6	66		26	240	
4	075	53.5	2.71	3.59	2.48	0.58	1100		29	2	72		-2	70	
5	076	50.5	3.43	4.69	1.82	0.68	710		69	6	79		2	50	
6	077	53.7	3.59	4.91	2.22	0.62	1090		103	5	90		4	80	
7	078	47.9	5.27	2.84	1.53	0.78	790		164	-1	91		4	110	
8	079	51.1	4.92	2.97	1.11	0.72	490		100	2	74		-2	110	
9	standard 080	74.4	.107	3.86	4.10	0.07	110		2	11	24		2	20	
10	081	55.2	4.18	4.60	1.17	0.82	890		40	-1	96		-2	20	
1	082	46.8	4.90	3.91	1.29	0.65	460		108	6	61		6	200	
2	083	50.3	5.33	2.53	3.65	0.77	1650		94	-1	72		2	80	
3	084	48.6	4.94	3.90	2.04	0.77	1130		64	2	85		2	40	
4	085	49.6	5.87	3.41	2.61	0.78	1000		85	3	76		4	50	
5	086	43.9	4.38	1.59	2.88	0.83	640		137	16	90		6	150	
6	087	46.8	3.32	2.74	4.00	0.73	1670		120	-1	64		-2	90	
7	088	51.3	5.57	3.38	3.34	0.83	1430		71	4	86		6	30	
8	089	51.3	5.31	4.66	2.21	0.77	1220		179	1	91		-2	60	
9	090	53.3	2.04	4.23	3.71	0.55	1200		84	3	73		2	90	
20	091	48.3	7.65	4.06	.449	0.80	230		133	3	109		-2	90	

TML TERRAMIN RESEARCH LABS LTD.

JOB # 85-237

Page 2/4

	Client No.	SiO_2 %	MgO %	Na_2O %	K_2O %	TiO_2 %	Ba ppm		Cu ppm	Pb ppm	Zn ppm		Au ppb	Ag ppb	
21	SS - 092	49.6	5.98	4.26	1.96	0.73	1080		158	7	75		-2	100	
2	093	70.8	1.63	.119	3.86	0.48	260		19	1	21		-2	270	
3	094	55.0	1.18	.084	5.57	0.63	460		88	2	42		46	1130	
4	095	52.0	2.39	2.04	4.11	0.77	850		58	10	50		24	130	
5	096	56.9	1.86	.267	5.23	0.57	760		54	20	102		14	320	
6	097	51.8	5.22	3.90	2.21	0.77	780		66	5	69		-2	50	
7	098	49.4	6.59	3.13	3.01	0.85	1310		82	6	80		2	50	
8	099	44.9	5.73	2.59	1.29	0.80	480		139	1	89		6	130	
9	100	58.2	2.36	2.83	2.66	0.50	1260		11	1	64		6	10	
30	101	54.8	2.55	.677	3.10	0.55	1130		4	-1	66		-2	20	
1	102	59.9	.919	.256	2.33	0.42	460		40	15	31		92	410	
2	103	50.5	4.59	4.58	.454	0.82	720		50	7	101		6	70	
3	104	73.6	.065	3.99	2.86	0.02	110		4	6	4		12	180	
4	105	53.7	2.95	1.47	2.68	0.67	780		50	6	92		2	80	
5	106	55.0	1.76	1.94	2.86	0.53	1410		28	1	69		-2	20	
6	107	60.5	3.02	4.62	2.65	0.52	2020		25	3	69		-2	20	
7	108	50.9	5.73	3.73	.395	0.73	1600		129	-1	80		-2	110	
8	109	60.1	2.46	4.60	1.90	0.53	940		23	1	57		2	60	
9	201	44.3	4.55	1.67	3.25	0.77	810		127	5	85		8	160	
40	202	56.0	4.60	2.78	2.41	0.73	920		48	44	58		10	140	

TML TERRAMIN RESEARCH LABS LTD.

JOB # 85-237

Page 3/4

	Client No.	SiO_2 %	MgO %	Na_2O %	K_2O %	TiO_2 %	Ba ppm		Cu ppm	Pb ppm	Zn ppm		Au ppb	Ag ppb	
41	SS - 203 ✓	49.6	3.20	3.13	5.11	0.67	1680		167	1	84		-2	120	
2	204 ✓	49.8	5.96	3.03	1.54	0.72	520		82	3	86		2	100	
3	205 ✓	62.5	2.39	2.28	1.43	0.52	1620		81	4	1260		4	470	
4	206 ✓	58.8	2.07	3.06	2.75	0.75	600		12	7	49		28	110	
5	207 ✓	56.7	3.37	1.59	4.47	0.93	1070		13	7	52		2	110	
6	208 ✓	57.8	2.43	4.18	2.92	0.68	700		61	4	34		4	300	
7	209 ✓	49.2	9.61	2.40	1.16	0.75	570		183	2	56		-2	160	
8	210 ✓	55.6	4.41	1.31	2.40	0.78	1000		89	11	102		24	490	
9	211 ✓	54.5	8.05	1.90	1.24	0.67	480		68	-1	55		4	50	
50	212 ✓	48.6	5.80	2.55	1.40	0.83	500		106	1	77		2	70	
1	213 ✓	49.6	8.88	1.54	1.48	0.72	690		73	1	76		-2	160	
2	214 ✓	46.8	6.08	1.67	2.30	0.88	590		99	9	116		42	420	
3	215 ✓	48.1	10.5	1.50	2.30	0.80	1010		92	1	65		-2	60	
4	216 ✓	47.5	8.80	1.94	1.21	0.83	500		29	-1	46		-2	90	
5	217 ✓	49.2	12.4	1.22	.827	0.73	350		86	-1	66		2	460	
6	218 ✓	49.0	11.7	1.48	1.58	0.77	620		100	3	53		-2	220	
7	219 ✓	45.4	3.88	.105	3.13	0.70	680		43	1	78		-2	180	
8	Standard 220	74.4	.123	3.88	4.12	0.07	80		3	95	23		4	60	
9	221 ✓	79.8	.060	4.17	1.02	0.05	190		3	6	30		6	120	
60	222 ✓	53.3	4.96	4.42	1.92	0.72	980		71	1	66		4	110	

TML TERRAMIN RESEARCH LABS LTD.

JOB # 85-237

	Client No.	SiO2 %	MgO %	Na2O %	K2O %	TiO2 %	Ba ppm		Cu ppm	Pb ppm	Zn ppm		Au ppb	Ag ppb	
61	SS - 223	51.1	6.27	3.50	2.40	0.77	1200		67	6	60		4	130	
2	224	51.8	5.25	4.39	.913	0.75	400		53	10	66		-2	110	
3	225	51.1	5.80	2.51	3.22	0.78	1140		80	2	49		-2	100	
4	226	49.2	7.79	1.77	1.17	0.77	380		82	-1	96		4	150	
5	227	48.1	2.99	1.79	4.72	0.67	1030		148	1	67		-2	90	
6	228	51.8	7.73	2.48	1.60	0.78	960		114	8	95		-2	260	
7	229	49.8	10.2	1.63	1.77	0.72	700		98	1	40		-2	90	
8	230	47.5	8.19	1.83	2.00	0.73	1060		86	-1	76		2	110	
9	231	50.1	7.98	3.26	2.02	0.78	1070		100	-1	71		2	240	
70	232	49.6	8.10	1.91	3.76	0.75	1830		90	1	58		2	150	
1	233	48.8	11.3	.946	2.06	0.72	990		168	3	70		4	210	
2	234	46.6	8.79	1.12	2.02	1.02	1350		96	-1	60		6	140	
3	235	48.8	7.05	2.48	2.19	0.80	1380		100	-1	98		4	400	
4	236	61.8	3.04	3.15	2.42	0.58	1670		46	4	32		8	220	
5															
6															
7															
8															
9															
0															

TERRAMIN RESEARCH LABS LTD.

Falconbridge Limited - Colin Burge

Seds   Standard

JOB # 85-244

Page 1/4

	Client No.	SiO_2 %	MgO %	Na_2O %	K_2O %	TiO_2 %	Ba ppm		Cu ppm	Pb ppm	Zn ppm		Au ppb	Ag ppb	
1	SS - 36	50.5	3.10	.787	5.42	0.63	1440		24	2	49		2020	420	
2	37	49.0	5.99	4.14	3.37	0.77	1000		118	3	82		732	750	
3	38 Cherty	64.8	2.01	1.23	4.10	0.40	1380		145	2	19		310	370	
4	39 Qtz vein	96.3	.207	.187	.594	0.05	2950		7700	1020	6500		496	7500	
5	40	59.0	2.16	2.01	4.10	0.50	1680		94	8	85		64	360	
6	41	59.7	2.07	1.09	4.70	0.55	1310		103	1	35		46	360	
7	42	46.6	4.51	2.49	4.33	0.78	1450		133	2	58		50	940	
8	43	46.0	8.97	.833	.835	0.80	330		90	1	198		18	700	
9	44	46.8	4.18	1.63	7.45	0.78	2100		124	10	186		106	1140	
10	45	49.6	4.73	2.25	3.57	0.77	1060		174	-1	89		28	480	
1	46	50.5	4.51	1.39	2.89	0.80	580		141	3	55		32	900	
2	47	49.0	10.5	2.24	1.78	0.72	730		92	1	60		14	290	
3	48	51.8	4.26	4.56	2.24	0.70	470		205	5	99		34	500	
4	49	52.0	4.28	2.48	5.57	0.70	890		136	7	56		56	650	
5	110	52.6	3.22	3.71	4.63	0.63	580		162	2	106		46	500	
6	111	53.5	2.17	3.14	7.29	0.53	1260		300	6	23		68	390	
7	112	47.9	10.8	1.60	.828	0.72	590		15	-1	80		4	180	
8	113	46.8	8.34	2.01	.856	0.67	500		100	-1	65		6	160	
9	114	44.9	6.37	2.24	2.12	0.77	600		14	1	106		14	270	
20	115	48.6	5.75	5.00	1.21	0.80	440		93	2	68		8	420	

JOB # 85-244

Page 2/4

TERRAMIN RESEARCH LABS LTD.

	Client No.	SiO_2 %	MgO %	Na_2O %	K_2O %	TiO_2 %	Ba ppm		Cu ppm	Pb ppm	Zn ppm		Au ppb	Ag ppb	
21	SS - 116	49.2	5.79	4.61	1.25	0.77	360		100	1	70		4	270	
2	117	51.8	4.97	3.15	4.59	0.75	1380		188	2	85		2	280	
3	118	48.6	11.4	1.32	1.76	0.87	720		102	-1	62		-2	260	
4	119	74.7	.358	4.03	4.76	0.07	110		6	12	27		2	180	
5	120	51.8	9.95	2.49	1.77	0.70	850		49	-1	44		12	90	
6	121	59.9	3.10	4.33	3.11	0.63	990		67	-1	28		152	90	
7	122	51.1	3.22	2.82	5.51	0.85	1940		38	1	24		8	-10	
8	123	51.3	3.20	3.14	3.81	0.97	1390		7	330	38		2	60	
9	124	56.0	3.51	4.46	3.10	0.70	810		30	11	25		-2	-10	
30	125	60.3	1.64	2.56	4.25	0.48	580		27	5	41		-2	-10	
1	126	55.6	3.61	5.20	1.48	0.68	1120		55	4	83		2	90	
2	127	52.0	6.47	4.15	1.65	0.72	710		128	1	75		4	230	/
3	128	52.4	4.28	6.40	.178	0.70	150		53	5	72		2	180	
4	129	56.0	4.13	5.37	1.02	0.68	550		46	3	78		-2	190	
5	130	47.3	8.32	1.82	.034	0.83	90		103	-1	86		2	320	
6	131	50.3	7.79	3.38	1.40	0.85	560		153	-1	77		6	470	
7	132	74.4	.245	4.35	3.62	0.03	40		7	13	26		32	160	
8	237	51.8	3.51	5.58	1.61	0.77	450		49	4	93		8	130	
9	238	52.0	6.40	3.06	1.66	0.75	770		25	2	30		-2	100	
40	239	53.9	5.52	2.78	2.39	0.72	700		31	4	38		-2	130	

TERRAMIN RESEARCH LABS LTD.

JOB # 85-244

Page 3/4

	Client No.	SiO_2 %	MgO %	Na_2O %	K_2O %	TiO_2 %	Ba ppm		Cu ppm	Pb ppm	Zn ppm		Au ppb	Ag ppb	
4 1	SS - 240	51.3	6.15	2.75	2.29	0.73	1350		57	-1	93		-2	100	
2	241	48.3	4.71	2.78	2.06	0.73	670		22	2	72		6	60	
3	242	48.1	4.81	2.60	4.92	0.72	1310		133	1	122		-2	160	
4	243	50.9	7.05	4.30	1.06	0.78	450		65	3	188		-2	160	
5	244	49.4	6.52	2.87	2.65	0.82	1220		173	2	250		2	280	
6	245	50.9	5.09	2.45	3.84	0.78	1550		82	3	60		-2	160	
7	246	62.0	.942	2.24	5.01	0.58	840		16	5	14		18	190	
8	247	46.0	7.30	3.61	.380	0.75	170		114	1	89		-2	100	
9	248	49.4	8.04	1.62	3.52	0.77	1740		90	11	45		4	80	
5 0	249	48.8	5.39	2.08	1.22	0.67	420		90	1	79		2	40	
1	250	66.1	.822	1.26	2.06	0.28	2690		15	8	34		12	220	
2	251	56.7	2.07	1.30	1.71	0.57	3550		40	11	200		36	460	
3	252	48.3	4.64	2.84	2.19	0.68	1320		50	2	85		4	140	
4	253	50.3	5.49	4.10	1.74	0.73	1000		66	1	86		4	190	
5	254	53.5	5.80	2.57	2.88	0.72	1230		73	11	103		4	130	
6	255	44.5	9.65	1.23	1.13	0.75	1030		66	1	77		-2	-10	
7	256	57.3	2.57	3.71	1.60	0.60	510		16	5	86		2	80	
8	257	47.1	10.3	1.58	1.22	0.72	550		76	-1	79		4	120	
9	258	51.6	7.28	2.60	3.84	0.73	1610		52	1	70		2	20	
6 0	259	49.6	5.47	4.02	2.39	0.68	640		139	2	94		2	70	

TML **TERRAMIN RESEARCH LABS LTD.**

JOB # 85-244

Page 4/4

	Client No.	SiO_2 %	MgO %	Na_2O %	K_2O %	TiO_2 %	Ba ppm		Cu ppm	Pb ppm	Zn ppm		Au ppb	Ag ppb	
6 1	SS - 260	51.6	2.47	5.31	2.33	0.60	750		75	-1	70		6	-10	
2	261	63.3	2.77	2.25	3.86	0.43	1160		33	2	58		4	180	
6 3	262	50.7	7.48	2.82	3.00	0.67	1310		109	4	56		6	230	
4															
5															
6															
7															
8															
9															
0															
1															
2															
3															
4															
5															
6															
7															
8															
9															
0															

TML TERRAMIN RESEARCH LABS LTD.

Falconbridge Limited - Colin Burge

JOB # 85-249

	Client No.	SiO_2 %	MgO %	Na_2O %	K_2O %	TiO_2 %	Ba ppm		Cu ppm	Pb ppm	Zn ppm		Au ppb	Ag ppb	
1	DS - 038	51.3	4.46	2.86	1.90	0.72	590		35	30	310		2	340	
2	039	51.6	2.65	1.56	4.54	0.77	1420		310	1	43		24	180	
3	040	52.8	3.12	3.06	3.02	0.73	790		9	-1	40		-2	50	
4	041	52.8	2.35	5.26	1.30	0.72	670		82	1	26		4	120	
5	042	47.3	8.84	1.91	1.37	0.70	710		121	2	72		-2	170	
6	043	56.3	2.30	4.99	4.47	0.55	1630		25	1	34		-2	150	
7	044	54.3	2.57	2.63	2.36	0.72	1290		168	-1	30		18	180	
8	SS - 133	86.2	.085	.081	.501	0.03	16600		280	150	310		188	14200	
9	134	73.8	.015	4.72	3.89	0.03	140		22	26	38		36	260	
10	135	47.5	3.70	2.04	2.42	0.62	890		124	1	83		-2	150	
1	136	74.9	.096	6.05	2.48	0.03	50		7	14	27		-2	120	
2	137	46.4	3.23	3.03	2.49	0.60	1230		113	2	74		-2	130	
3	138	64.8	.398	4.97	2.80	0.28	1060		10	7	38		2	20	
4	139	75.9	.028	4.22	4.12	0.03	50		4	82	22		48	130	
5	140	58.2	3.48	4.25	2.11	0.60	1080		72	14	94		-2	60	
6	141	51.6	4.64	3.38	1.55	0.77	1020		33	2	54		2	80	
7	142	52.4	5.04	1.86	3.60	0.67	760		136	4	70		46	440	
8	143	49.8	3.51	1.94	4.89	0.68	900		70	2	47		12	140	
9	144	47.7	3.93	.736	3.59	0.52	670		180	3	75		2	440	
20	145	50.3	4.74	4.73	2.24	0.72	830		62	2	77		6	270	

Plotted

JOB # 85-249

Page 2/3

TERRAMIN RESEARCH LABS LTD.

	Client No.	SiO_2 %	MgO %	Na_2O %	K_2O %	TiO_2 %	Ba ppm		Cu ppm	Pb ppm	Zn ppm		Au ppb	Ag ppb	
21	SS - 146	67.2	.187	5.43	3.84	0.10	1070		5	2	27		-2	10	
2	147	57.8	4.11	5.06	3.57	0.65	900		188	9	115		2	300	
3	148	55.8	1.59	3.13	2.94	0.57	200		52	13	66		7[illegible]	1030	
4	STANDARD	72.7	.096	4.11	4.63	0.03	80		2	11	22		2	30	
5	150	50.5	6.23	3.28	3.21	0.73	1220		93	1	64		-2	110	
6	151	58.2	2.49	3.80	4.16	0.72	750		59	12	56		4	310	
7	160	51.6	3.42	5.74	1.25	0.60	860		78	1	79		-2	70	
8	161	59.7	1.23	3.02	4.21	0.55	1510		63	7	41		4	80	
9	162	72.9	.050	4.10	4.43	0.02	140		3	85	10		76	320	
30	163	50.5	4.61	3.53	1.10	0.77	570		115	16	109		2	110	
1	164	49.8	6.05	4.69	.127	0.70	1240		132	-1	92		-2	100	
2	165	58.0	1.41	1.54	3.18	0.43	730		27	-1	58		2	30	
3	166	50.1	4.53	6.25	.167	0.58	380		133	-1	78		6	130	
4	167	51.6	4.64	6.55	.586	0.70	650		57	3	73		10	70	
5	168	73.4	.027	4.56	4.36	0.02	60		2	14	45		8	130	
6	169	51.6	6.42	4.76	1.71	0.72	740		49	3	72		2	60	
7	170	73.2	.046	4.54	4.19	0.03	90		3	50	58		4	230	
8	171	50.7	6.93	3.72	3.01	0.68	1040		71	2	63		2	140	
9	180	45.4	4.28	1.70	3.59	0.68	470		109	-1	99		-2	60	
40	181	74.4	.075	4.15	2.36	0.13	170		5	-3	27		52	360	

JOB # 85-249

Page 3/3

TERRAMIN RESEARCH LABS LTD.

	Client No.	SiO_2 %	MgO %	Na_2O %	K_2O %	TiO_2 %	Ba ppm		Cu ppm	Pb ppm	Zn ppm		Au ppb	Ag ppb	
4 1	SS - 182	65.0	2.02	2.20	4.31	0.38	850		39	1	35		10	160	
2	183	60.8	.270	.293	7.13	0.48	1090		47	13	12		3[illegible]	450	
3	184	50.9	3.38	4.26	4.40	0.63	1140		140	-1	54		32	380	
4															
5															
6															
7															
8															
9															
0															
1															
2															
3															
4															
5															
6															
7															
8															
9															
0															

APPENDIX III

FIRE GOLD & BASE METAL ANALYSIS RESULTS

ANALYTICAL PROCEDURES FOR FIRE GOLD GEOCHEMICAL ANALYSIS

Geochemical samples for fire gold processed by Min-En Laboratories Ltd., at 705 W. 15th St., North Vancouver Laboratory employing the following procedures.

After drying the samples at 95 degrees Celsius, soil and stream sediment samples are screened by 80 mesh sieve to obtain the minus 80 mesh fraction for analysis. The rock samples are crushed and pulverized by ceramic plated pulverizer.

A suitable sample weight 15.00 or 30.00 grams are fire assay preconcentrated.

After pretreatments the samples are digested with Aqua regia solution, and after digestion the samples are taken up with 25% HC1 to suitable volume.

Further oxidation and treatment of at least 75% of the original sample solution are made suitable for extraction of gold with Methyl Iso-Butyl Ketone.

With a set of suitable standard solution gold is analysed by Atomic Absorption instruments. The obtained detection limite is 1ppb.

MIN-EN Laboratories Ltd.
Specialists in Mineral Environments
705 WEST 15th STREET NORTH VANCOUVER, B.C. CANADA V7M 1T2

PHONE: (604)980-5814 OR (604)988-4524 TELEX: 04-352828

GEOCHEMICAL ANALYSIS CERTIFICATE

COMPANY: FALCONBRIDGE LTD.
PROJECT: 103
ATTENTION: C.BURGE/J. HARDY

FILE: 5-833
DATE: OCT.23/85.
TYPE: ROCK GEOCHEM

We hereby certify **that the following are the results of the geochemical analysis made on 6 samples submitted.**

SAMPLE NUMBER	CU PPM	PB PPM	ZN PPM	AG PPM	AS PPM	AU-FIRE PPB	BA PPM	LOCATIONS
38718	129	50	92	2.4		16		Hall Formation, Hwy.3&6
19	48	34	36	2.0	51	100	260	line 6+70W 23+75N SWIFT 3
20	22	90	560	1.4	23	705	200	
21	35	51	52	1.6	32	148	300	
22	1670	108	170	9.6		132		Line 7+70West, 24+00NOrth
38723	9900	46500	1150	132.0		750		ACE ADIT

Certified by [signature]

APPENDIX IV

MINERAL IDENTIFICATION

LAKEFIELD RESEARCH
A DIVISION OF FALCONBRIDGE LIMITED

PHONE (705) 652-3341
TELEX NO. 06962842

December 2, 1985.

Ms. Jenna L. Hardy,
Falconbridge Limited,
6415 - 64th Street,
Delta, B.C. V4K 4E2

Dear Jenna:

The platy green mineral in your sample L.R.-146 has been identified as muscovite, probably a chromium variety. Its colour prompted me to scrape out some for qualitative spectrographic analysis and the only trace element which showed up in greater than trace amounts was chromium. Chromium muscovite (fuchsite) is commonly developed as a secondary mineral in the wall rocks of several Precambrian gold deposits (Helmo, Lac Shortt, etc). Its association with ankerite in your sample L.R.-146 is therefore quite interesting as it relates to prospective gold mineralization.

Your sample and PTS are returned herewith as requested.

Yours sincerely,
LAKEFIELD RESEARCH

Bob Buchan

R. Buchan, P. Eng.,
Head, Mineralogy.

RB:tmg
Encl.

RECEIVED
DEC 6 1985

TABLES

TABLE 1

SAMPLES WITH ANOMALOUS TRACE METAL VALUES

COPPER (GREATER THAN 175 ppm)

SAMPLE NO.	SIO2	MGO	NA2O	K2O	TIO2	BA	CU	PB	ZN	AU	AG
SS-048	51.800	4.260	4.560	2.240	0.700	470.000	205.000	5.000	99.000	34.000	500.000
SS-060	53.500	5.300	1.200	2.220	0.630	490.000	197.000	2.000	67.000	4.000	210.000
SS-089	51.300	5.310	4.660	2.210	0.770	1220.000	179.000	1.000	91.000	0.000	60.000
SS-111	53.500	2.170	3.140	7.290	0.530	1260.000	300.000	6.000	23.000	68.000	390.000
SS-117	51.800	4.970	3.150	4.590	0.750	1300.000	188.000	2.000	85.000	2.000	280.000
SS-144	47.700	3.930	0.736	3.590	0.520	670.000	180.000	3.000	75.000	2.000	440.000
SS-147	57.800	4.110	5.060	3.570	0.650	900.000	188.000	9.000	115.000	2.000	300.000
SS-209	49.200	9.610	2.100	1.160	0.750	570.000	183.000	2.000	56.000	0.000	160.000

ZINC (GREATER THAN 200 ppm)

SAMPLE NO.	SIO2	MGO	NA2O	K2O	TIO2	BA	CU	PB	ZN	AU	AG
SS-205	62.500	2.390	2.280	1.430	0.520	1620.000	81.000	4.000	1260.000	4.000	470.000
SS-244	49.400	6.520	2.870	2.650	0.820	1220.000	173.000	2.000	250.000	2.000	280.000
SS-251	56.700	2.070	1.300	1.710	0.570	3550.000	10.000	11.000	200.000	36.000	460.000

LEAD (GREATER THAN 20 ppm)

SAMPLE NO.	SIO2	MGO	NA2O	K2O	TIO2	BA	CU	PB	ZN	AU	AG
SS-003	78.300	0.034	3.960	3.520	0.050	50.000	1.000	26.000	23.000	42.000	120.000
SS-053	77.400	0.033	4.880	2.950	0.030	60.000	0.000	36.000	26.000	14.000	130.000
SS-096	56.900	1.860	0.267	5.230	0.570	760.000	54.000	20.000	102.000	14.000	320.000
SS-123	51.300	3.200	3.140	3.810	0.970	1370.000	7.000	330.000	33.000	2.000	60.000
SS-134	73.800	0.015	4.720	3.890	0.030	140.000	22.000	26.000	38.000	36.000	260.000
SS-139	75.900	0.028	4.220	4.120	0.030	50.000	4.000	82.000	22.000	48.000	130.000
SS-162	72.900	0.050	4.100	4.430	0.020	140.000	3.000	85.000	10.000	76.000	320.000
SS-170	73.200	0.045	4.340	4.190	0.030	90.000	3.000	50.000	58.000	4.000	230.000
SS-202	56.000	4.600	2.780	2.410	0.730	920.000	48.000	44.000	58.000	10.000	140.000

BARIUM (GREATER THAN 1400 ppm)

SAMPLE NO.	SIO2	MGO	NA2O	K2O	TIO2	BA	CU	PB	ZN	AU	AG
SS-014	55.400	1.730	2.320	3.530	0.370	2270.000	37.000	5.000	18.000	36.000	160.000
SS-036	50.500	3.100	0.787	5.420	0.630	1440.000	24.000	2.000	49.000	2020.000	420.000
SS-040	59.000	2.160	2.010	4.100	0.500	1630.000	94.000	5.000	85.000	64.000	360.000
SS-042	46.600	4.510	2.490	4.330	0.780	1450.000	133.000	2.000	58.000	50.000	940.000
SS-044	46.800	4.180	1.630	7.450	0.780	2100.000	124.000	10.000	186.000	106.000	1140.000
SS-054	54.100	4.160	4.950	2.920	0.530	2420.000	110.000	1.000	89.000	0.000	10.000
SS-083	50.300	5.330	2.530	3.650	0.770	1650.000	94.000	0.000	72.000	2.000	80.000
SS-087	46.800	3.320	2.740	4.000	0.730	1670.000	120.000	0.000	64.000	0.000	90.000
SS-088	51.300	5.570	3.380	3.340	0.830	1430.000	71.000	4.000	86.000	6.000	30.000
SS-106	55.000	1.760	1.940	2.860	0.530	1410.000	28.000	1.000	69.000	0.000	20.000
SS-107	60.500	3.020	4.620	2.650	0.520	2020.000	25.000	3.000	69.000	0.000	20.000
SS-108	50.900	5.730	3.730	0.395	0.730	1600.000	129.000	0.000	80.000	0.000	110.000
SS-122	51.100	3.220	2.820	5.510	0.850	1940.000	38.000	1.000	24.000	8.000	0.000
SS-161	59.700	1.230	3.020	4.210	0.550	1510.000	63.000	7.000	41.000	4.000	80.000
SS-203	49.600	3.200	3.130	5.110	0.670	1600.000	167.000	1.000	84.000	0.000	120.000
SS-205	62.500	2.390	2.280	1.430	0.520	1620.000	81.000	4.000	1260.000	4.000	470.000
SS-232	49.600	8.100	1.910	3.760	0.730	1830.000	90.000	1.000	58.000	2.000	150.000
SS-236	61.800	3.040	3.150	2.420	0.580	1670.000	46.000	4.000	32.000	8.000	220.000
SS-245	50.900	5.090	2.450	3.840	0.780	1550.000	82.000	3.000	60.000	0.000	160.000
SS-248	49.400	8.040	1.620	3.520	0.770	1740.000	90.000	11.000	45.000	4.000	80.000
SS-250	66.100	0.822	1.260	2.060	0.280	2690.000	15.000	8.000	34.000	12.000	220.000
SS-251	56.700	2.070	1.300	1.710	0.570	3550.000	40.000	11.000	200.000	36.000	460.000
SS-258	51.600	7.280	2.400	3.840	0.730	1610.000	52.000	1.000	70.000	2.000	20.000

GOLD (GREATER THAN 50 ppb)

SAMPLE NO.	SIO2	MGO	NA2O	K2O	TIO2	BA	CU	PB	ZN	AU	AG
SS-036	50.500	3.100	0.787	5.420	0.630	1440.000	24.000	2.000	49.000	2020.000	420.000
SS-037	49.000	5.990	4.140	3.370	0.770	1000.000	118.000	3.000	82.000	732.000	750.000
SS-038	61.800	2.010	1.230	4.100	0.400	1390.000	115.000	2.000	19.000	310.000	370.000
SS-040	59.000	2.160	2.010	4.100	0.500	1630.000	94.000	8.000	85.000	64.000	360.000
SS-042	46.600	4.510	2.490	4.330	0.780	1450.000	133.000	2.000	58.000	50.000	940.000
SS-044	46.800	4.180	1.630	7.450	0.780	2100.000	124.000	10.000	186.000	106.000	1140.000
SS-049	52.000	4.280	2.480	5.570	0.700	890.000	136.000	7.000	56.000	56.000	650.000
SS-102	59.900	0.919	0.256	2.330	0.420	460.000	40.000	15.000	31.000	92.000	410.000
SS-111	53.500	2.170	3.140	7.290	0.530	1260.000	300.000	6.000	23.000	68.000	390.000
SS-121	59.900	3.100	4.330	3.110	0.630	990.000	67.000	0.000	28.000	152.000	90.000
SS-148	55.800	1.590	3.130	2.940	0.570	200.000	52.000	13.000	66.000	78.000	1030.000
SS-162	72.900	0.050	4.100	4.430	0.020	140.000	3.000	85.000	10.000	76.000	320.000

SILVER (GREATER THAN 500 ppb)

SAMPLE NO.	SIO2	MGO	NA2O	K2O	TIO2	BA	CU	PB	ZN	AU	AG
SS-001	62.200	1.030	0.074	6.770	0.500	470.000	39.000	4.000	10.000	20.000	610.000
SS-037	49.000	5.990	4.140	3.370	0.770	1000.000	118.000	3.000	82.000	732.000	750.000
SS-042	46.600	4.510	2.490	4.330	0.780	1450.000	133.000	2.000	58.000	50.000	940.000
SS-043	46.000	8.970	0.833	0.835	0.800	330.000	90.000	1.000	198.000	18.000	790.000
SS-044	46.800	4.180	1.630	7.450	0.780	2100.000	124.000	10.000	186.000	106.000	1140.000
SS-046	50.500	4.510	1.390	2.890	0.800	580.000	141.000	4.000	55.000	32.000	900.000
SS-048	51.800	4.260	4.560	2.240	0.700	470.000	205.000	5.000	99.000	34.000	500.000
SS-049	52.000	4.280	2.480	5.570	0.700	890.000	136.000	7.000	56.000	56.000	650.000
SS-069	55.600	3.080	3.420	2.190	0.550	780.000	57.000	7.000	69.000	8.000	700.000
SS-094	55.000	1.180	0.084	5.570	0.630	460.000	33.000	2.000	43.000	46.000	1130.000
SS-110	52.600	3.220	3.710	4.630	0.630	580.000	162.000	2.000	106.000	46.000	570.000
SS-148	55.800	1.590	3.130	2.940	0.570	200.000	52.000	13.000	66.000	73.000	1030.000

TABLE 2

SAMPLES ENRICHED OR DEPLETED IN MAJOR OXIDES

SILICA ENRICHED: SiO2 greater than 63% (mafics only)

SAMPLE NO.	SIO2	MGO	NA2O	K2O	TIO2	BA	CU	PB	ZN	AU	AG
SS-002	64.000	3.420	3.210	1.630	0.500	350.000	34.000	3.000	60.000	8.000	60.000
SS-038	64.800	2.010	1.230	4.100	0.400	1380.000	145.000	2.000	19.000	310.000	370.000
SS-061	69.790	1.900	2.930	2.430	0.350	350.000	27.000	4.000	24.000	2.000	130.000
SS-093	70.800	1.630	0.119	3.860	0.480	260.000	19.000	1.000	21.000	0.000	270.000
SS-146	67.200	0.187	5.430	3.840	0.100	1070.000	5.000	2.000	27.000	0.000	10.000
SS-162	72.900	0.050	4.100	4.430	0.020	140.000	3.000	85.000	10.000	76.000	320.000
SS-182	65.600	2.020	2.200	4.310	0.380	850.000	39.000	1.000	35.000	10.000	160.000
SS-250	66.100	0.822	1.260	2.060	0.280	2690.000	15.000	8.000	34.000	12.000	220.000
SS-261	63.300	2.770	2.250	3.860	0.430	1160.000	33.000	2.000	58.000	4.000	180.000

SILICA DEPLETED: SiO2 less than 47.32% (mafic volcanics)

SAMPLE NO.	SIO2	MGO	NA2O	K2O	TIO2	BA	CU	PB	ZN	AU	AG
SS-007	47.300	5.210	3.150	1.220	0.830	640.000	124.000	1.000	95.000	0.000	80.000
SS-008	47.100	5.210	2.740	1.160	0.870	600.000	36.000	1.000	70.000	0.000	90.000
SS-042	46.600	4.510	2.490	4.330	0.780	1450.000	133.000	2.000	58.000	50.000	940.000
SS-043	46.050	8.970	0.833	0.835	0.800	330.000	90.000	1.000	198.000	18.000	700.000
SS-044	46.800	4.180	1.630	7.450	0.780	2100.000	124.000	10.000	186.000	106.000	1140.000
SS-050	46.200	5.280	3.210	1.730	0.650	410.000	65.000	2.000	74.000	4.000	10.000
SS-055	38.500	5.070	0.617	1.840	0.630	450.000	111.000	5.000	47.000	4.000	120.000
SS-082	46.800	4.900	3.910	1.290	0.650	460.000	108.000	6.000	61.000	6.000	200.000
SS-086	43.900	4.390	1.590	2.880	0.830	640.000	137.000	16.000	90.000	6.000	150.000
SS-087	46.600	3.320	2.740	4.000	0.730	1670.000	120.000	0.000	64.000	0.000	90.000
SS-099	44.900	5.730	2.590	1.290	0.800	480.000	139.000	1.000	89.000	6.000	130.000
SS-113	46.800	6.340	2.010	0.856	0.670	500.000	100.000	0.000	65.000	6.000	160.000
SS-114	44.900	6.370	2.240	2.120	0.770	600.000	14.000	1.000	106.000	14.000	270.000
SS-130	47.300	8.320	1.820	0.034	1.830	90.000	103.000	0.000	86.000	2.000	320.000
SS-137	46.400	3.230	3.030	2.490	0.600	1230.000	113.000	2.000	74.000	0.000	130.000
SS-160	45.400	4.280	1.700	3.590	0.680	470.000	109.000	0.000	99.000	0.000	60.000
SS-201	44.300	4.550	1.670	3.250	0.770	810.000	127.000	5.000	85.000	8.000	160.000
SS-214	46.800	6.000	1.670	2.300	0.880	590.000	99.000	9.000	116.000	42.000	420.000
SS-219	45.400	3.880	0.105	3.130	0.700	680.000	43.000	1.000	78.000	0.000	180.000
SS-234	46.600	8.790	1.120	2.020	1.020	1350.000	96.000	0.000	60.000	6.000	140.000
SS-247	46.600	7.300	3.610	0.380	0.750	170.000	114.000	1.000	89.000	0.000	100.000
SS-255	44.500	9.650	1.230	1.110	0.750	1030.000	66.000	1.000	77.000	0.000	0.000
SS-257	47.100	10.300	1.580	1.220	0.720	550.000	76.000	0.000	79.000	4.000	120.000

SODIUM DEPLETED: Na2O less than 0.8%

SAMPLE NO.	SIO2	MGO	NA2O	K2O	TIO2	BA	CU	PB	ZN	AU	AG
SS-001	62.200	1.030	0.074	6.770	0.500	470.000	39.000	4.000	10.000	20.000	610.000
SS-036	50.500	3.100	0.787	5.420	0.630	1440.000	24.000	2.000	49.000	2020.000	420.000
SS-055	38.500	5.070	0.617	1.840	0.630	450.000	111.000	5.000	49.000	4.000	120.000
SS-067	48.100	6.960	0.028	1.090	0.350	240.000	62.000	0.000	41.000	22.000	490.000
SS-093	70.800	1.630	0.119	3.860	0.480	260.000	19.000	1.000	21.000	0.000	270.000
SS-094	55.000	1.180	0.084	5.570	0.630	460.000	88.000	2.000	42.000	46.000	1130.000
SS-096	56.900	1.860	0.267	5.230	0.570	760.000	54.000	20.000	102.000	14.000	320.000
SS-101	54.800	2.550	0.677	3.100	0.550	1130.000	4.000	0.000	66.000	0.000	20.000
SS-102	59.900	0.919	0.256	2.330	0.420	460.000	40.000	15.000	31.000	92.000	410.000
SS-144	47.700	3.930	0.736	3.590	0.520	670.000	180.000	3.000	75.000	2.000	440.000
SS-183	60.800	0.270	0.293	7.130	0.480	1090.000	47.000	13.000	12.000	36.000	450.000
SS-219	45.400	3.880	0.105	3.130	0.700	680.000	41.000	1.000	78.000	0.000	180.000

POTASH ENRICHED: K2O greater than 5.2%

SAMPLE NO.	SIO2	MGO	NA2O	K2O	TIO2	BA	CU	PB	ZN	AU	AG
SS-001	62.200	1.030	0.074	6.770	0.500	470.000	39.000	4.000	10.000	20.000	610.000
SS-036	50.500	3.100	0.787	5.420	0.630	1440.000	24.000	2.000	49.000	2020.000	420.000
SS-044	46.900	4.180	1.630	7.450	0.780	2100.000	124.000	10.000	186.000	106.000	1140.000
SS-049	52.000	4.280	2.480	5.570	0.700	890.000	136.000	7.000	56.000	56.000	650.000
SS-094	55.000	1.180	0.084	5.570	0.630	460.000	88.000	2.000	42.000	46.000	1130.000
SS-096	56.900	1.860	0.267	5.230	0.570	760.000	54.000	20.000	102.000	14.000	320.000
SS-111	53.500	2.170	3.140	7.290	0.530	1260.000	300.000	6.000	23.000	68.000	390.000

POTASH DEPLETED: K2O less than 0.8%

SAMPLE NO.	SIO2	MGO	NA2O	K2O	TIO2	BA	CU	PB	ZN	AU	AG
SS-010	50.500	5.640	4.220	0.640	0.700	210.000	98.000	0.000	31.000	2.000	90.000
SS-012	51.100	5.210	4.310	0.601	0.700	210.000	99.000	5.000	53.000	2.000	90.000
SS-070	52.800	5.730	4.380	0.475	0.600	260.000	63.000	2.000	77.000	6.000	150.000
SS-073	51.100	5.430	4.540	0.447	0.780	440.000	71.000	8.000	120.000	2.000	60.000
SS-091	48.300	7.650	4.060	0.449	0.800	230.000	133.000	3.000	109.000	0.000	90.000
SS-103	50.500	4.590	4.580	0.454	0.820	720.000	50.000	7.000	101.000	6.000	70.000
SS-109	50.900	5.730	3.730	0.395	0.730	1600.000	129.000	0.000	80.000	0.000	110.000
SS-128	52.400	4.280	6.400	0.178	0.700	150.000	53.000	5.000	72.000	2.000	180.000
SS-130	47.300	8.320	1.920	0.034	1.830	90.000	103.000	0.000	86.000	2.000	320.000
SS-164	49.800	6.050	4.690	0.127	0.700	1240.000	132.000	0.000	92.000	0.000	100.000
SS-166	50.100	4.530	6.250	0.167	0.580	380.000	133.000	0.000	78.000	6.000	130.000
SS-167	51.600	4.640	6.550	0.586	0.700	650.000	57.000	3.000	73.000	10.000	70.000
SS-247	46.000	7.300	3.610	0.380	0.750	170.000	114.000	1.000	89.000	0.000	100.000

MAGNESIUM ENRICHED: MgO greater than 9.0%

SAMPLE NO.	SIO2	MGO	NA2O	K2O	TIO2	BA	CU	PB	ZN	AU	AG
SS-047	49.000	10.500	2.240	1.780	0.720	730.000	92.000	1.000	60.000	14.000	290.000
SS-112	47.900	10.800	1.600	0.828	0.720	590.000	15.000	0.000	80.000	4.000	180.000
SS-118	48.600	11.400	1.320	1.760	0.870	720.000	102.000	0.000	62.000	0.000	260.000
SS-120	51.800	9.950	2.470	1.770	0.700	850.000	49.000	0.000	44.000	12.000	90.000
SS-209	49.200	9.610	2.400	1.160	0.750	570.000	183.000	2.000	56.000	0.000	160.000
SS-215	48.100	10.500	1.500	2.300	0.860	1010.000	92.000	1.000	65.000	0.000	60.000
SS-217	49.200	12.400	1.220	0.327	0.730	350.000	86.000	0.000	66.000	2.000	460.000
SS-218	49.000	11.700	1.480	1.580	0.770	620.000	100.000	3.000	53.000	0.000	220.000
SS-229	49.800	10.200	1.630	1.770	0.720	700.000	98.000	1.000	40.000	0.000	90.000
SS-233	48.800	11.300	0.946	2.060	0.720	990.000	168.000	3.000	70.000	4.000	210.000
SS-255	44.500	9.650	1.230	1.130	0.750	1030.000	66.000	1.000	77.000	0.000	0.000
SS-257	47.100	10.300	1.580	1.220	0.720	550.000	76.000	0.000	79.000	4.000	120.000

TABLE 3

LITHOGEOCHEMISTRY OF FELSIC VOLCANIC ROCKS

SAMPLE POPULATION = 13

SAMPLE NO.	SIO2	MGO	NA2O	K2O	TIO2	BA	CU	PB	ZN	AU	AG
SS-003	78.300	0.034	3.960	3.520	0.050	50.000	1.000	26.000	23.000	42.000	120.000
SS-051	78.500	0.146	4.070	2.250	0.020	140.000	0.000	4.000	3.000	2.000	20.000
SS-053	77.400	0.033	4.880	2.950	0.030	60.000	0.000	36.000	26.000	14.000	130.000
SS-064	78.300	0.042	4.080	3.600	0.030	50.000	0.000	16.000	24.000	32.000	60.000
SS-066	77.900	0.030	3.810	3.930	0.030	40.000	0.000	17.000	27.000	44.000	70.000
SS-068	76.800	0.067	4.190	3.340	0.050	80.000	9.000	18.000	28.000	6.000	140.000
SS-104	73.600	0.065	3.990	2.860	0.020	110.000	4.000	6.000	4.000	12.000	180.000
SS-132	74.400	0.245	4.350	3.620	0.030	40.000	7.000	13.000	26.000	32.000	160.000
SS-134	73.800	0.015	4.720	3.890	0.030	140.000	22.000	26.000	38.000	36.000	260.000
SS-136	74.900	0.096	6.050	2.480	0.030	50.000	7.000	14.000	27.000	0.000	120.000
SS-139	75.900	0.028	4.220	4.120	0.030	50.000	4.000	82.000	22.000	48.000	130.000
SS-168	73.400	0.027	4.560	4.360	0.020	60.000	2.000	14.000	45.000	8.000	130.000
SS-170	73.200	0.046	4.540	4.190	0.030	90.000	3.000	50.000	58.000	4.000	230.000

LITHOGEOCHEMISTRY OF MAFIC VOLCANIC ROCKS

SAMPLE POPULATION = 205, FOLLOWING VALUES ARE CALCULATED MEANS:

SILICA = 52.61%

MAGNESIA = 4.84%

SODA = 2.94%

POTASH = 2.47%

TITANIA = 0.66%

NOTE: ALL VALUES IN TABLES ARE QUOTED AS FOLLOWS:

MAJOR OXIDES = WEIGHT PERCENT

TRACE ELEMENTS = PARTS PER MILLION

PRECIOUS METALS = PARTS PER BILLION

ALL ASSAYS PROVIDED BY TERRAMIN RESEARCH LABS, CALGARY, ALTA.

TABLE 4

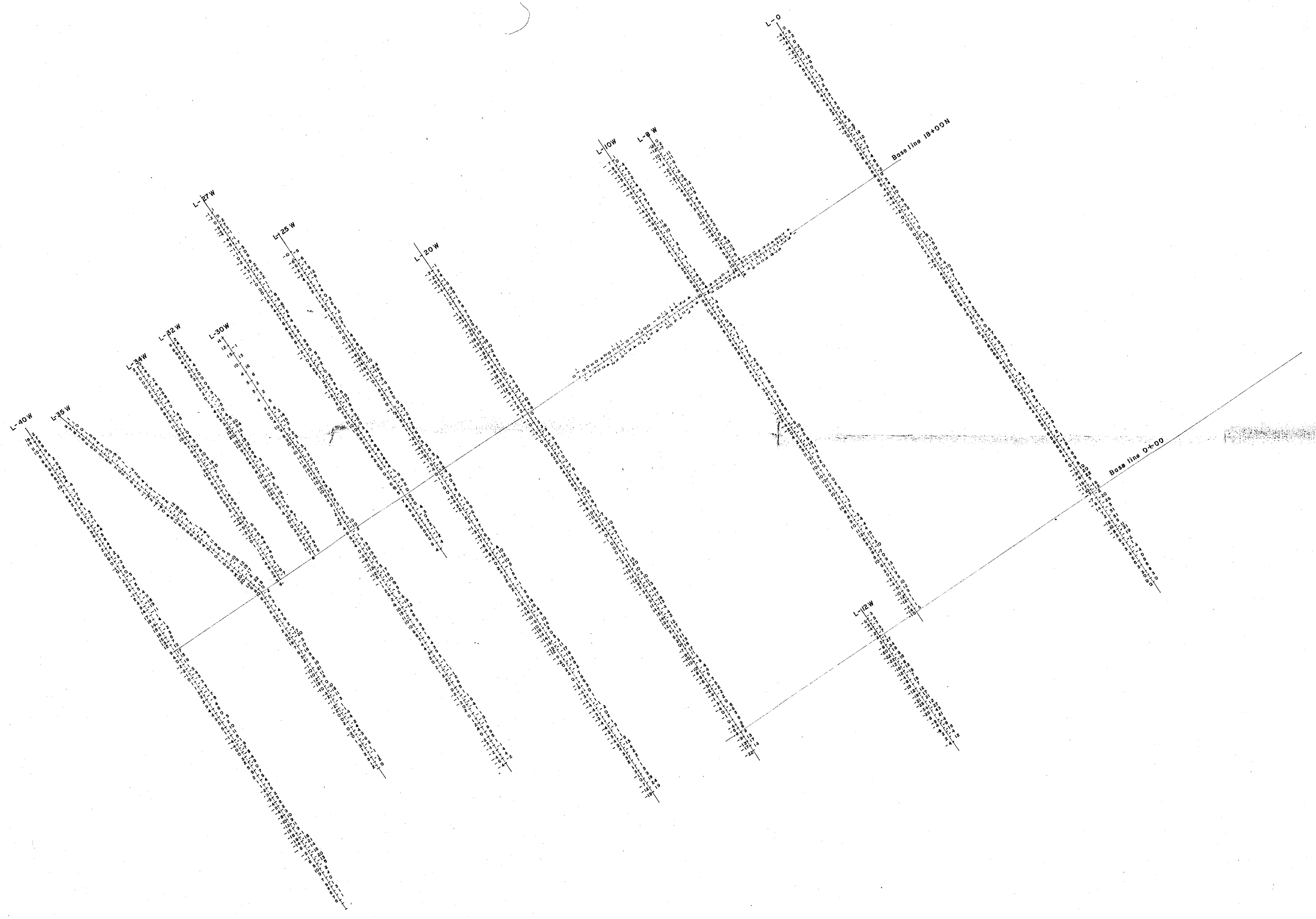
	(1) "Augite Porphyrite" War Eagle Mine Fresh	(2) Basalt from Beddoes-Stephens Recon., Fresh	(3) Ankaramite Beddoes-Stephens Recon., Fresh	(4) Typical Swift volcanic breccia Fresh, SS-89	(5) "Augite Porph." War Eagle Mine Altered	(6) Typical Swift volcanic Altered, SS-43
SiO2 (wt.%)	50.89	50.59	49.42	51.3	40.02	46.00
TiO2 (wt.%)	.80	1.14	.73	.77	.46	.80
MgO (wt.%)	5.41	6.77	11.32	5.31	12.90	8.97
Na2O (wt.%)	3.35	3.30	2.16	4.66	.67	.83
K2O (wt.%)	1.31	1.44	2.34	2.21	8.17	.84
Al2O3 (wt.%)	17.00	15.94	10.76	n.a.	16.13	n.a.
Ba (ppm)	n.a.	692	672	1220	n.a.	330
Cu (ppm)	n.a.	62	129	179	n.a.	90
Zn (ppm)	n.a.	100	84	91	n.a.	198

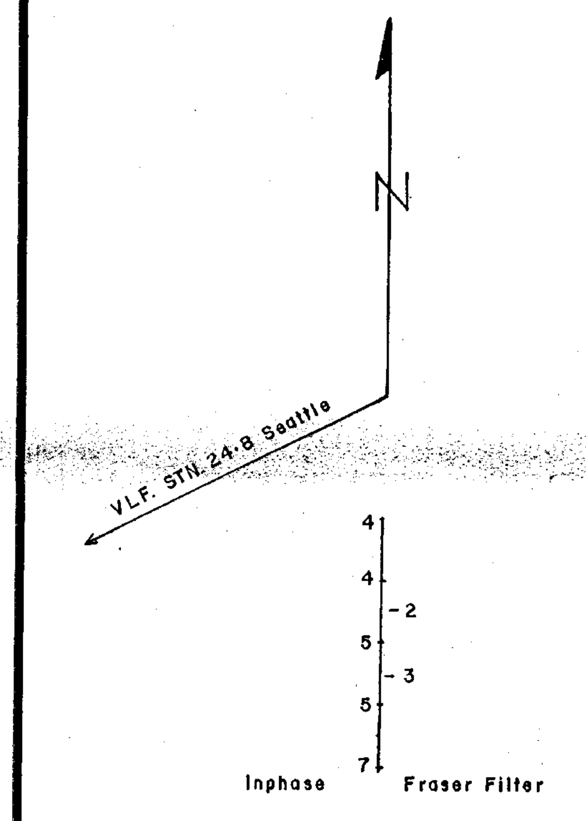
n.a. - element not assayed or not available

Rock 1 and 5 geochemistry taken from "Geology and Ore Deposits of Rossland, B.C.", G.S.C. Memoir 77, Drysdale, C.W. 1915, page 205.

Rock 2 and 3 geochemistry taken from "Petrology of Rossland Volcanic Rocks", G.S.A. Bulletin, v.93, p.585-594, 1982, by Beddoes-Stephens, B., page 588.

Rock 4 and 6 were collected as part of this study and assayed at Terramin Labs, Calgary.





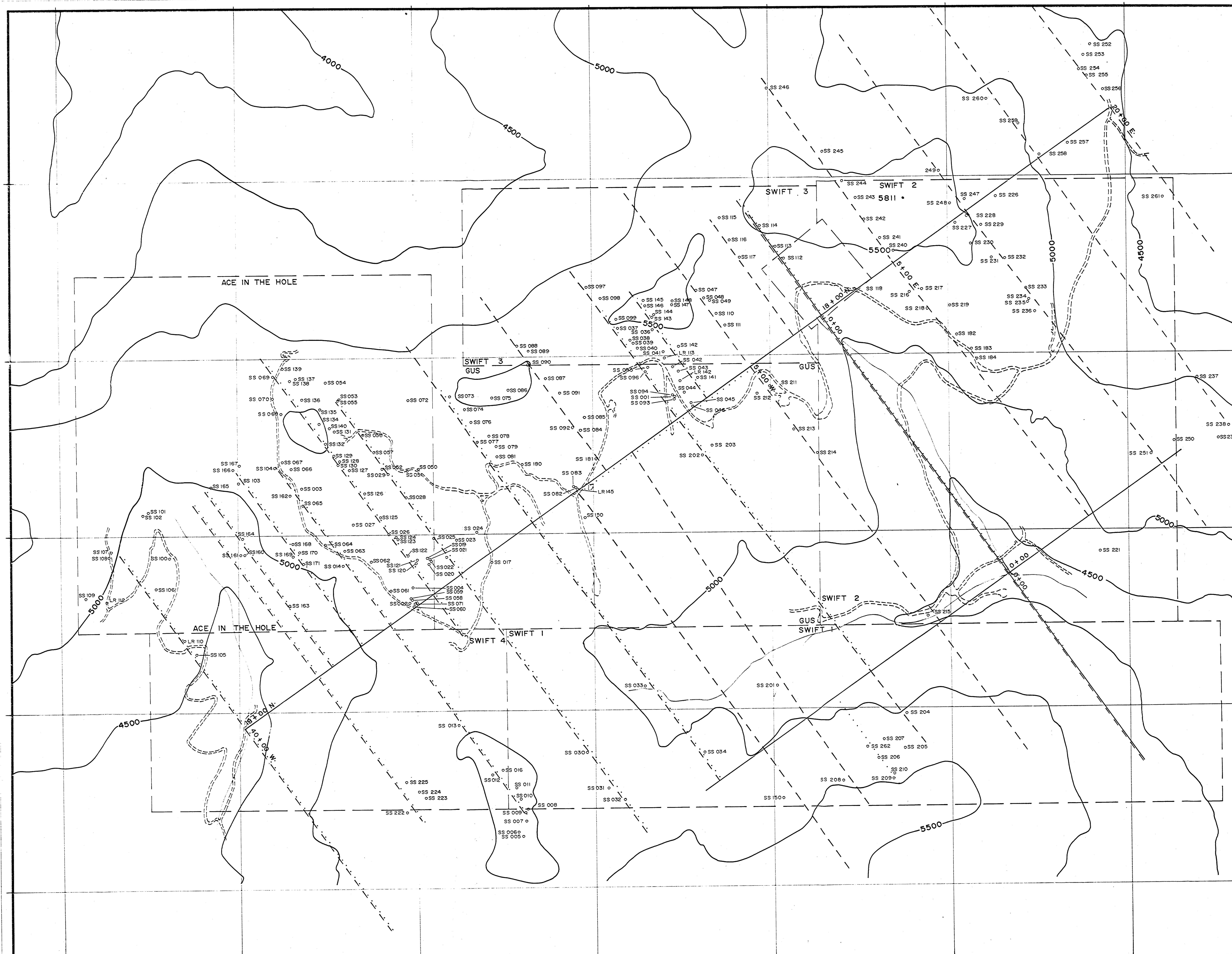
GEOLOGICAL BRANCH
ASSESSMENT REPORT

14,934

200 0 200 400 600 m

SCALE: 1:10 000

FALCONBRIDGE LTD.		
PROPERTY: Swift Claims		
LOCATION: Salmo Area B.C.		
TYPE OF MAP: Geophysical E.M (Sabre E.M Instrument)		
WORKING PLACE:		
BASED ON: Fieldwork by R. A.		
DATE OF WORK: Sept/Oct. 85	MAP REF. NO.:	FIG. NO.: 34
DRAWN BY: G. T.		
DATE: March 1986	N.T.S. NO.: 82F/3W	



GEOLOGICAL BRANCH ASSESSMENT REPORT

14,934

MAP REF. NO.:
N.T.S.: 82 F/3W

LEGEND

4500	Contour elevation in feet
• 5811	Spot elevation (feet)
	Road
	Creek
	Claim boundary
o SS 103	Rock sample location
o LR 110	1984 Rock sample location

Grid Layout

———	cut lines
— — —	geologically mapped lines
. . . .	geophysically surveyed lines

ONE THOUSAND METRE U·T·M· GRID

200 100 0 200 400 600 metres

SCALE: 1:10,000

FALCONBRIDGE LTD.

PROPERTY: SWIFT 1, 2, 3, 4 ACE IN THE HOLE

LOCATION: ROSSLAND — SALMO

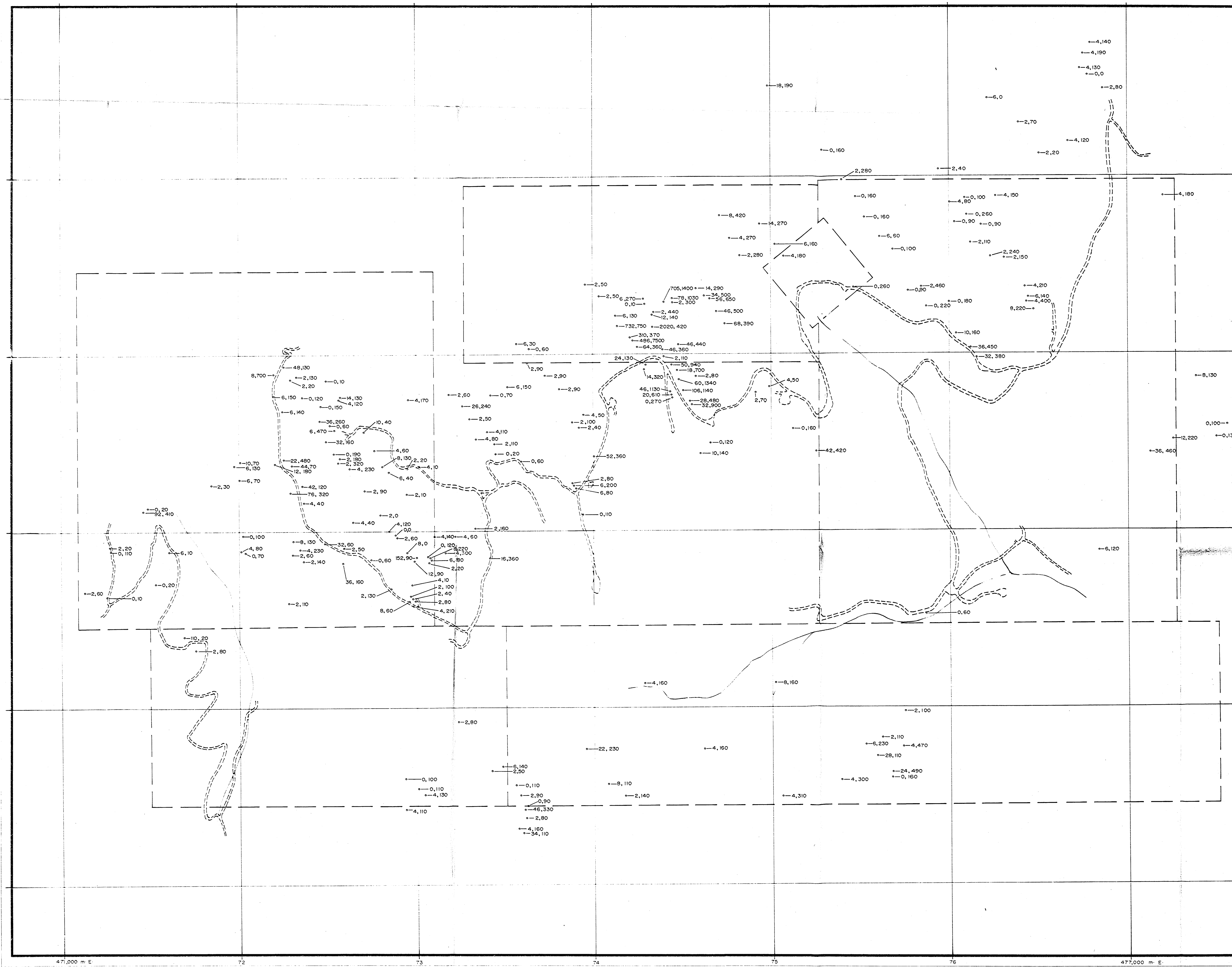
TYPE OF MAP: SAMPLE LOCATION & GRID LAYOUT

WORKING PLACE:

BASED ON:

DATE OF WORK: SEPT. 1985	MAP REF. NO.:	FIG. NO.:
DRAWN BY: J.L.		35
DATE: 25/02/86	N.T.S. NO.: 82 F/3W	

MAP REF. NO.:
N.T.S.: 82 F/3W
5,442,000 m N
41
40
5,439,000 m N
471,000 m E
72
73
74
75
76
LEGEND
Cu, Pb, Zn, Ba (ppm)
Road
Creek
Claim Boundary
GEOLOGICAL BRANCH
ASSESSMENT REPORT
14,934
ONE THOUSAND METRE
U.T.M. GRID
200 100 0 200 400 600 metres
SCALE: 1:10,000
FALCONBRIDGE LTD.
PROPERTY:
SWIFT 1, 2, 3, 4
ACE IN THE HOLE
LOCATION:
ROSSLAND — SALMO
TYPE OF MAP:
GEOCHEMISTRY Cu, Pb, Zn, Ba
WORKING PLACE:
BASED ON:
DATE OF WORK: SEPT 1985
DRAWN BY: J.L.
DATE: 10/02/86
MAP REF. NO.:
N.T.S. NO.: 82 F/3W
FIG. NO.:
32



MAP REF. NO.:
N.T.S.: 82 F/3W

14,934

GEOLOGICAL BRANCH
ASSESSMENT REPORT

LEGEND

——— Au, Ag (ppb)

Road

Creek

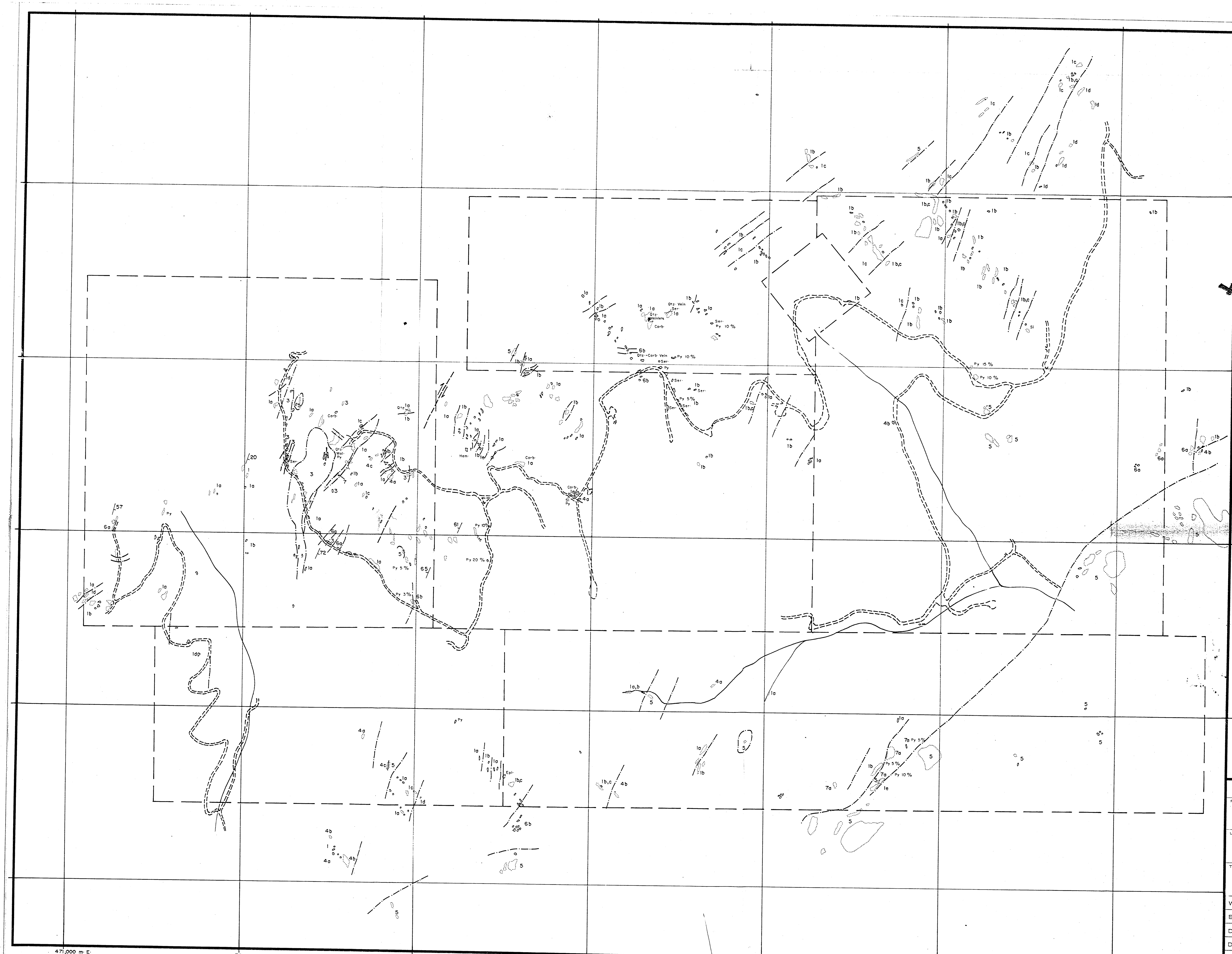
Claim Boundary

ONE THOUSAND METRE
U·T·M· GRID

200 100 0 200 400 600 metres

SCALE: 1:10,000

FALCONBRIDGE LTD.		
PROPERTY: SWIFT 1, 2, 3, 4 ACE IN THE HOLE		
LOCATION: ROSSLAND — SALMO		
TYPE OF MAP: GEOCHEMISTRY Au, Ag		
WORKING PLACE:		
BASED ON:		
DATE OF WORK: SEPT. 1985	MAP REF. NO.:	FIG. NO.:
DRAWN BY: J·L·		33
DATE: 06/02/86	N.T.S. NO.: 82 F/3W	



MAP REF. NO.:
N.T.S.: 82 F/3W

GEOLOGICAL BRANCH
ASSESSMENT REPORT

14,934

LEGEND

1 MAFIC VOLCANICS
- a Volcanic flow breccia, agglomerate
- b Crystal tuff, augite dominates including ankaramites
- c Crystal tuff, feldspar dominates
- d Lithic tuff
- e Olivine flow (amygdaloidal)

2 INTERMEDIATE VOLCANICS

3 FELSIC VOLCANICS
Rhyolite, quartz porphyritic

4 MAFIC INTRUSIONS
- a Gabbro
- b Diorite
- c Diabase

5 FELSIC INTRUSIONS
Granite, granodiorite, quartz monzonite

6 SEDIMENTS
- a Argillite / greywacke / ash
- b Pyritic chert / ash

7 VOLCANOSEDIMENTS
Argillite / ash / chert laminations

- Claim boundary
- Geological contact
- Fault
- Trench
- Shaft
- 27 Bedding attitude
- Rock outcrop

Abbreviations:

Carb. — Carbonate	Qtz. — Quartz
Hem. — Hematite	Ser. — Sericite
Mal. — Malachite	Si. — Silicified
Py — Pyrite	

ONE THOUSAND METRE
U.T.M. GRID

200 100 0 200 400 600 metres

SCALE: 1:10,000

FALCONBRIDGE LTD.

PROPERTY: SWIFT 1, 2, 3, 4
ACE IN THE HOLE

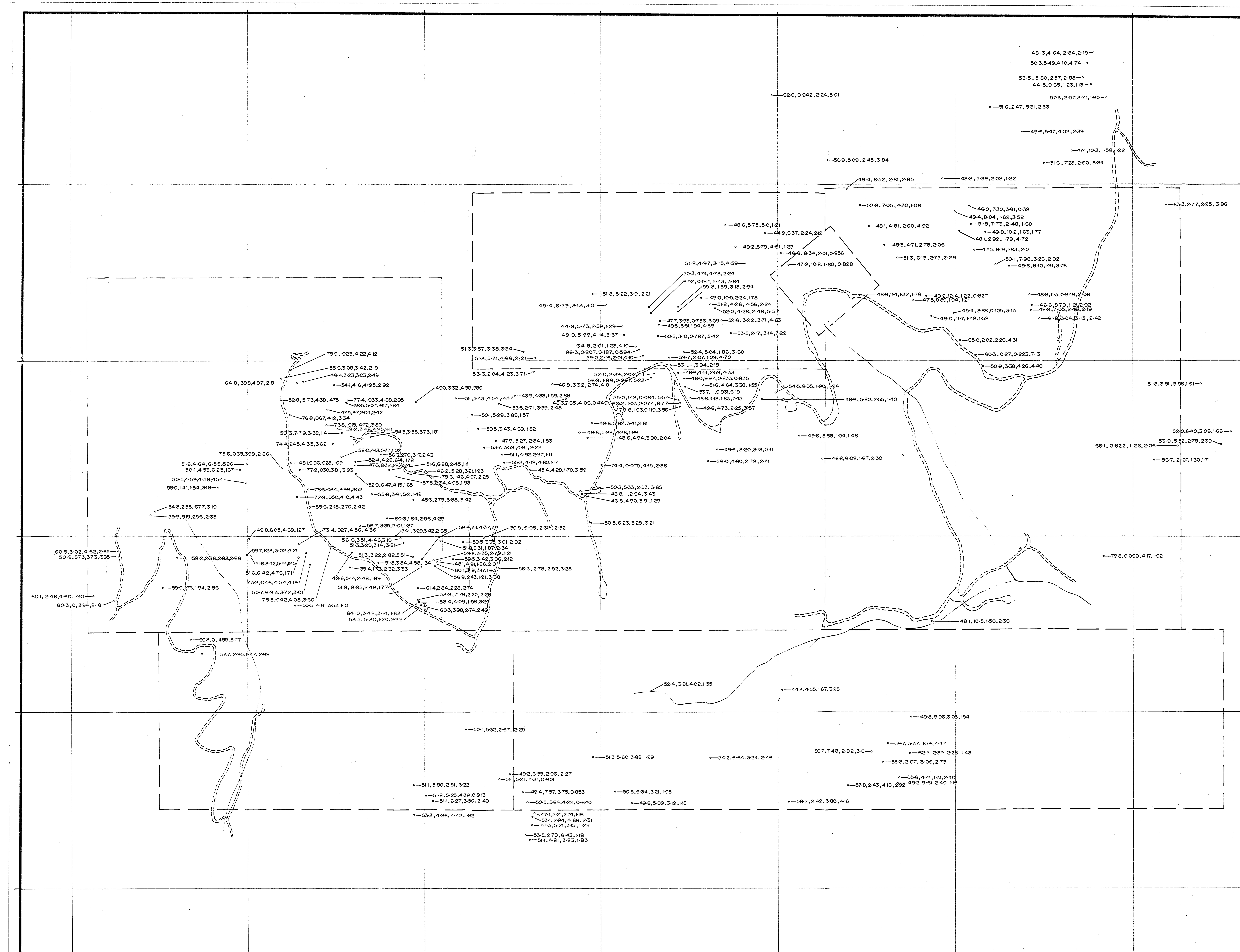
LOCATION: ROSSLAND — SALMO

TYPE OF MAP: GEOLOGY

WORKING PLACE:

BASED ON:

DATE OF WORK: SEPT. 1985	MAP REF. NO.:	FIG. NO.:
DRAWN BY: J.L.		
DATE: 21/02/86	N.T.S. NO.: 82 F/3W	30



MAP REF. NO.:
N.T.S.: 82 F/3W

LEGEND

SiO$_2$, MgO, Na$_2$O, K$_2$O (%)

Road

Creek

Claim Boundary

GEOLOGICAL BRANCH
ASSESSMENT REPORT

14,934

ONE THOUSAND METRE
U.T.M. GRID

200 100 0 200 400 600 metres

SCALE: 1:10,000

FALCONBRIDGE LTD.		
PROPERTY: SWIFT 1, 2, 3, 4 ACE IN THE HOLE		
LOCATION: ROSSLAND — SALMO		
TYPE OF MAP: GEOCHEMISTRY SiO$_2$, MgO, Na$_2$O, K$_2$O		
WORKING PLACE:		
BASED ON:		
DATE OF WORK: SEPT. 1985	MAP REF. NO.:	FIG. NO.: 31
DRAWN BY: JL		
DATE: 07/02/86	N.T.S. NO.: 82 F/3W	