SILVER STANDARD MINES LIMITED
(NON-PERSONAL LIABILITY)
808-602 WEST HASTINGS STREET
VANCOUVER 2, B.C.

1972 ASSESSMENT REPORT

on the

MINTO CREEK PROJECT

Yukon Territory

Latitude 62° 37' N
Longitude 137° 14' W

Office Of The Supervising Mining Recorder
MAY 25 1973
WHITEHORSE
Yukon Territory

by

Roy C. McMichael, P. Eng., Supervisor
Geological Engineer

Geology by

Steven Heim
Geologist

February 1973

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

Resident Geologist or
Resident Mining Engineer

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

Commissioner of Yukon Territory

RECEIVED
25 MAY 1973
MINING
RECORDERS OFFICE
WHITEHORSE, Y.T.

Affidavit

Canada
Yukon Territory
To Wit:

I Roy C. McMichael, P. Eng., do solemnly swear that the "Statement of Expenditures For 1972", page 41 of the attached report is true and correct to the best of my knowledge and belief.

Sworn before me
at Whitehorse in
the Yukon Territory
this 25th day of May 1973

Roy C. McMichael

R. C. McMichael

Notary Public

RECEIVED
SEP 26 1973
MINING
INSPECTORS OFFICE
WHITEHORSE, Y.T.

TABLE OF CONTENTS

SUMMARY . . . . . Page 1

INTRODUCTION. . . . . Page 2

LOCATION AND ACCESS . . . . . Page 3

GEOLOGY . . . . . Page 4

Rock Types . . . . . Page 5
Alteration . . . . . Page 13
Structure . . . . . Page 16
Mineralization. . . . . Page 19
Geologic History. . . . . Page 23

GEOCHEMISTRY. . . . . Page 27

GEOPHYSICS. . . . . Page 29

TRENCHING . . . . . Page 31

DIAMOND DRILLING. . . . . Page 33

SAMPLING AND ASSAYING . . . . . Page 35

STATEMENT OF EXPENDITURES . . . . . Page 37

Cost Summary - Minto Airstrip . . . . . Page 39
1972 Expenditures - Minto Claim Group . . . . . Page 41

STATEMENT OF QUALIFICATION. . . . . Page 42

BIBLIOGRAPHY. . . . . Page 43

ATTACHMENTS:

Appendix "A" - Time Sheet - R.C. McMichael

TABLE OF CONTENTS - cont'd

ILLUSTRATIONS:

Figure 1 - Ternary diagram of quartz, feldspars and mafics for granites and gneisses.

Figure 2 - Ternary diagram of quartz, orthoclase and plagioclase for granites and gneisses.

Figure 3 - Diagram illustrating lack of soil transport of copper values.

IN THE POCKETS:

Figure 4 - Location Map . . . . . 1" = 20 miles

Figure 5 - Geology Map (East and West halves) . . 1" = 100 feet

Figure 6 - Mineralization and Alteration Map (East and West halves) . . . . . 1" = 100 feet

Figure 7 - Structure Map (East and West halves) . 1" = 100 feet

Figure 8 - Rose diagrams (shears, foliation, and fractures) . . . . . .

Figure 9 - Soil Sample survey - copper (1971 and 1972 data) . . . . . 1" = 400 feet

SUMMARY

Silver Standard Mines Ltd. (N.P.L.) and American Smelting and Refining Co. of Canada Ltd. conducted an extensive geologic mapping program in conjunction with trenching and diamond drilling on the Minto Creek property during the period May 18, 1972 to September 9, 1972. The diamond drill program carried out during October of the 1971 season was continued in June and July, 1972. Extensive use was made of trenching with a bulldozer, to uncover zones of copper mineralization and to define diamond drill targets. Copper mineralization primarily occurs as disseminated grains of chalcopyrite in bands of gneissic material grading from granodiorite to granite in composition. The gneissic bands (one foot to 60 feet thick) alternate with barren bands of quartz diorite and granodiorite. The bands have a consistent N30°W strike, which is also the strike of the foliation. Intense shearing has two primary orientations: 1) wrench shearing N60°E, and 2) foliation plane shearing N50°W.

The following alteration facies have been identified: 1) potassium-silicate, 2) chloritic, 3) propylitic, 4) argillic, 5) sericitic, and 6) surficial. The potassium-silicate and a portion of the chloritic alteration may be deuteric in origin. The other alteration facies are superimposed on the earlier alteration and developed simultaneously with mineralization.

It is suggested that during Lower to Middle Triassic time a dioritic magma was emplaced syntectonically with the Tahltanian Orogeny. A strong northeast-southwest oriented compressional force, during late phase crystallization caused the still fluid residual portions of the magma to be squirted along planes of weakness within and between already crystallized blocks of quartz diorite and granodiorite.

As the bands crystallized, foliation developed normal to the stress in the residuals. Faulting and shearing followed shortly. In Upper Triassic time basaltic to andesitic copper-bearing volcanics were extruded along the Teslin lineament. The Minto area lies at the north end of the lineament. Copper-bearing hydrothermal solutions preferentially permeated the gneissic bands depositing copper. Continued uplift and erosion unroofed the intrusive by Lower Jurassic time. Carmacks volcanics and shallow water sediments were non-conformably deposited during Tertiary time on the old erosion surface of the granite and gneiss.

Geochemical sampling outlined the areal extent of copper mineralization in areas with little overburden. In areas of excessive overburden, it is doubtful whether a geochemical anomaly would develop, even if copper mineralization were exposed in sub-outcrops.

Geophysical methods to date have yielded little data which has been helpful in defining structure or areas of copper mineralization. The 1971 Radem survey delineated one major shear zone.

INTRODUCTION

This report summarizes the field work conducted from May 18 to September 9, 1972, on the Minto Creek copper prospect (Fig. 4). Following the significant copper find of 1971 (see reports on Minto Creek Project 1971), sufficient encouraging results were gained from the geochemical sampling and diamond drill program (3,626 feet) to warrant an extensive program of trenching and continued diamond drilling. A D-7 was walked in on a winter tote road in March of 1972. At the beginning of August a D-8 was walked in to aid in the completion of the trenching. Fifty-seven trenches, totalling 20,800 lineal feet, with an average depth

of six feet, were excavated (see Trenching, p. 31). Diamond drilling from June 7 to July 31, 1972 totalled 6,129.6 feet (see Drilling, p. 33).

Ownership, financing, and management of the property are set forth in the 1970 Dawson Range Agreement and supplemental agreements dated April 30, 1971, and April 30, 1972, between American Smelting and Refining Co. of Canada Ltd. and Silver Standard Mines Ltd. (N.P.L.).

The authors would like to express appreciation to the many people who visited the Minto property during the summer. Many ideas were generated which have proved most helpful. In particular, we would like to thank Mr. R.E. Gale, American Smelting and Refining Co., Mr. D. Tempelman-Kluit, G.S.C., and Dr. R.H. Seraphim, consultant to Silver Standard Mines Ltd.

LOCATION AND ACCESS

The Minto property, totalling 93 full-sized Yukon quartz claims, is located 12 air-miles west of Minto and 145 air-miles northwest of Whitehorse on the southwest side of the Yukon River, Yukon Territory (Fig. 4). For more information on the claims see Silver Standard Mines Ltd. (N.P.L.) 1971 Progress Report on Minto Creek Project, by R.C. McMichael. Access to the property can now be accomplished by either the tote road, fixed wing, or rotary wing aircraft.

A tote road was constructed during the month of March 1972. This road can be used only during the winter, as it is necessary to cross the Yukon River on an ice bridge at the Ingersoll Islands. Six thousand gallons of bulk fuel and eight tons of supplies were transported into camp via the tote road.

An airstrip was constructed in August (August 10-16) approximately one-half mile by trail southeast of camp (Fig. 5 - east half). The landing surface, oriented N18°W (magnetic), is 2300 feet long by 80 feet wide, slightly undulating, and compacted very firmly. The overall clearing dimensions are 3050 feet by 250 feet, providing a 350-foot cleared approach zone at each end of the packed runway surface, as well as 80 feet of clearance on either side of the runway surface.

Numerous helipads are located on the property for the rotary wing aircraft which were used for the majority of work prior to the construction of the airstrip.

GEOLOGY

INTRODUCTION:

Two nomenclature conventions are used throughout this report. Firstly, the term 'granite' (in text and on maps) refers to the "granite clan", a suite of rocks grading from a true granite to a quartz diorite. This has been done for the following reasons: 1) ease of reporting, as well as maintaining the conventions used in the field for all notes, maps, and drill logs and, 2) megascopic distinction in the field between the granodiorites and quartz diorites is not possible. Secondly, the term 'gneiss' refers only to structure. Therefore, biotite granite gneiss implies a rock with gneissic structure, and a composition within the "granite clan" suite of rocks. In particular, the white biotite granites range from quartz diorite to granodiorite, while the biotite granite gneisses range from granodiorite (borderline quartz monzonite) to true granites.

ROCK TYPES:

The following rock types are found on the property:

1. Granite clan: compositionally quartz diorites - granodiorite.
2. Gneisses: granodiorite - granite.
3. Aplites and pegmatite dikes: quartz-feldspar rich.
4. Volcanics: primarily andesitic.
5. Shallow water sediments: arkose, carbonaceous siltstones, tuffs, limestone.

1 - Granites:

(a) White biotite granite - The granies are a texturally varied but compositionally similar suite of rocks ranging from quartz diorite to granodiorite. They are typically white to light grey, holocrystalline, medium-grained, hypidiomorphic, and vary from equigranular to porphyritic, with inequigranular to porphyritic varieties dominating. The phenocrysts or the larger crystals in the inequigranular matrix are usually quartz and orthoclase. Orthoclase in places forms very large (up to 2 inches) pink phenocrysts. In some locations the granite is a true porphyry.

Mineralogically and modally the granites are composed of:

Major Constituents		Minor Constituents		Accessories	
Quartz	(20%)	Hornblende	(0-5%)	Black opaques	(3%)
Orthoclase	(12%)	Hematite	(7%)	Apatite	(<1%)
Plagioclase (andesine)	(46%)	Chlorite	(3%)	Sphene	(1%)
Biotite	(12%)				

Hematite and chlorite have been included as minor constituents because they are pervasive, though they are alteration products and will be treated more fully in the section on alteration.

A few of the more persistent features in the granites are:

(1) Very minor cataclasis, but a great deal of breakage in biotites plagioclase.
(2) Micrographic intergrowths of quartz and feldspar.
(3) Apparent different ages or generations of quartz and plagioclase.

(b) Red-tan granite - The so-called red-tan granite was mapped originally as a separate unit on the basis of color and lack of biotite. In thin-section the rock is quartz diorite to granodiorite in composition and represents an intensely weathered white biotite granite. The biotite has been converted entirely to limonite and hematite. The alteration associated with the formation of red-tan granite appears to be primarily a function of surface weathering, and is usually associated with shear and/or fault zones.

(c) Pink-tan granite - This rock has also been referred to as a quartz-feldspar porphyry where the matrix was too fine-grained to identify its composition. In composition it is very similar to the white biotite granites, and falls near the quartz monzonite-granodiorite boundary. It does have a lower biotite content than the white biotite granite. This lack of biotite is primary, rather than a function of alteration as in the case of the red-tan granite. The major occurrence of pink-tan granite is in Zone 19 (Fig. 6), and in particular, DDH 12-72. DDH 11-72 also has a large percentage of pink-tan granite. Most of the pink-tan granite occurs within areas of intense alteration and is associated with a major portion of the known mineralization. Minor amounts of chalcopyrite and pyrite occur as disseminated grains in the pink-tan granite.

2 - Biotite granite gneiss:

The gneisses are a structurally varied but compositionally similar suite of rocks ranging in composition from granodiorite to granite. They are typically well-foliated, medium-grained, with biotite laminations separated by quartz-feldspar trains from 1/8 inch to 1/4 inch thick and 3/4 inch long. Orthoclase phenocrysts were observed up to 1 1/2 inches long by 3/4 inch in diameter. Variation in texture is for the most part related to grain size differences, affecting foliation plane thicknesses. In some places the texture is also affected by shearing. The other major variation is in the occurrence of a very siliceous, mafic-poor, fine-grained, aplitic-looking gneiss.

Mineralogically and modally the gneisses are composed of:

Major Constituents		Minor Constituents		Accessories	
Quartz	(30%)	Hematite	(7%)	Black opaques	(5%)
Orthoclase	(19%)	Chlorite	(3%)	Apatite	(1%)
Plagioclase	(26%)			Sphene	(1%)
Biotite	(8%)				

The mineralogy of the gneisses and granites is very similar. Increased quartz and orthoclase content in the gneisses, accompanied by a reduction in the plagioclase content, are the main common features. Although megascopically the biotite content appears higher in the gneiss, in thin-section it is found to be very nearly the same.

The most outstanding feature in thin-section is the very well developed cataclastic texture. All of the minerals have been deformed, broken, and/or shattered. Biotite and hematite (after biotite) are shattered, warped, and exhibit flowage between grain boundaries. Quartz exhibits a great deal of strained extinction

in first generation quartz, as well as micrographic intergrowth. Plagioclase is well twinned and shattered, and commonly has an orthoclase rim. The plagioclase is slightly more sodic than in the granite (andesine-granite : oligoclase-gneiss). The degree of cataclasis would seem to indicate that we have a tectonically developed gneiss.

3 - Aplites and pegmatites:

The aplites and pegmatites are typically pink to white, except in a few localities where the aplites are light green. They are composed primarily of quartz and orthoclase, with less than 5% biotite (average 2%). In thin-section plagioclase (albite-oligoclase) occurs in amounts of up to 10%, making a true granite in the compositional sense. The pink and white pegmatites and aplites have the requisite textures for their respective classification. However, the green aplites develop a very definite lineation due to the alignment of very fine flakes of biotite, and possibly hornblende.

4 - Volcanics:

The volcanics in the area are for the most part andesitic clastics - lithic ash to lapilli tuffs. The airstrip exposure is comprised of brown lithic ash tuffs. It is fine-grained, heavily altered and contains decomposed fragments of granite. In DDH's 1-71, 14-72, 18-72, and 19-72, the clastic material is referred to as a hematite breccia. It consists of sand to pebble-size (with the odd cobble), angular to subrounded fragments of gneiss and granite in a matrix of deep-brown colored hematite. The hematite may be in part highly altered volcanic material. In the drill holes it can be seen that the clastics rest non-conformably on an older granite-gneiss erosion surface (R.E. Gale, personal communications). This suggests that the volcanics are much younger than the granite. The volcanics are considered to be post-Eocene Carmacks Volcanics.

5 - Shallow water sediments and interbedded pyroclastics:

A thick sequence of tuffs, thin-bedded siltstones and limestone, and arkoses were intersected in DDH 7-71. Interspersed with the tuffs and arkoses are minor coal seams from 1/16 inch to 1/2 inch thick, containing minor pyrite. The sediments were noted only in the one drill hole, and not in contact with the intrusive. It is felt, however, that these sediments are part of the Carmacks Volcanics (D.J. Tempelman-Kluit, personal communications). Further information as to lithology can be found in the 1971 Progress Report on the Minto Creek Project, and G.S.C. Memoir 189, by H.S. Bostock.

GRANITE-GNEISS RELATIONSHIP:

The rock types have been described above as discreet units. Some detail regarding the spacial, and genetic relationship between the granites and the gneisses follows. The important features to note are:

(1) Similarity in mineralogy and mode of occurrence.
(2) Apparent compatability with typical or classical differentiation or crystallization series.
(3) Sharp contacts with no chill margins.
(4) Textural similarity.
(5) The very intimate linear sill-like arrangement between the granites and gneisses.

First, the mineral composition, including the accessories, is very similar. Second, the QFM and QOP diagrams (Figs. 1 and 2) indicate that the variation in mineral percentage, i.e. quartz, orthoclase and plagioclase, represents a magmatic differentiation series (Turner and Verhoogen, 1960). The composition of the plagioclase also follows the differentiation trend, with initial crystallization of more calcic varieties grading into sodic-rich varieties.

Textural developments in the granite and gneiss have certain similarities. Both have what is an earlier phase of partially re-absorbed micrographic quartz-feldspar crystals, as well as an earlier phase of strained quartz. Both have well twinned plagioclases, all of which have been fractured. However, only the gneisses have the plagioclase with orthoclase rims. Biotite is well formed, and well fractured in the granites. Biotite in the gneiss is fractured and also bent and/or warped. Minor cataclastic pockets occur in the granite, but there is very extensive cataclasis in the gneiss. These features can all be explained by deformation at a time when the granite was nearly consolidated and the gneissic unit still plastic. The last feature to mention is the very intimate and consistent linear relationship between the granite and gneisses. Examination of the geologic map (Fig. 5) reveals that, regardless of the thickness of gneissic units, alternating bands of granites and gneiss occur with very consistent strike direction of N30°W (Fig. 8).

In view of the above features it is difficult to conceive of a granitization process or xenolithic absorption process which yields:

(1) A gneiss unit with an identical mineralogic composition to that of the granite.

(2) A granite and gneiss which represent a typical trend of differentiation from a quartz-diorite to a true granite.

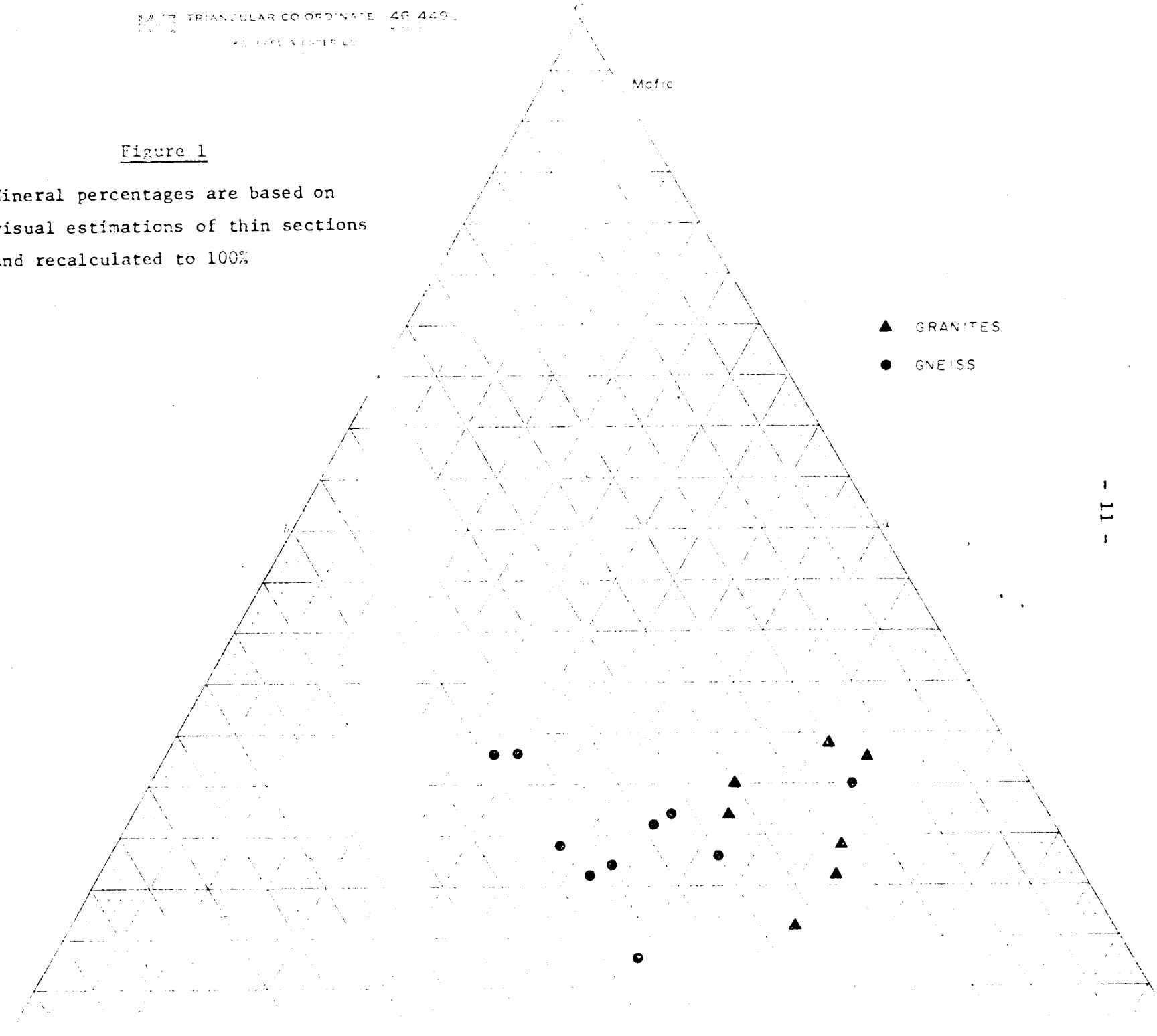
(3) Alternating bands (10 to 80 feet thick) of granite and gneiss with sharp contacts and a well developed, consistent linearity parallel to a long strike length (800 feet).

(4) A lack of chilled margins, though contacts are sharp.

TRIANGULAR COORDINATE 46 449

Figure 1

Mineral percentages are based on visual estimations of thin sections and recalculated to 100%



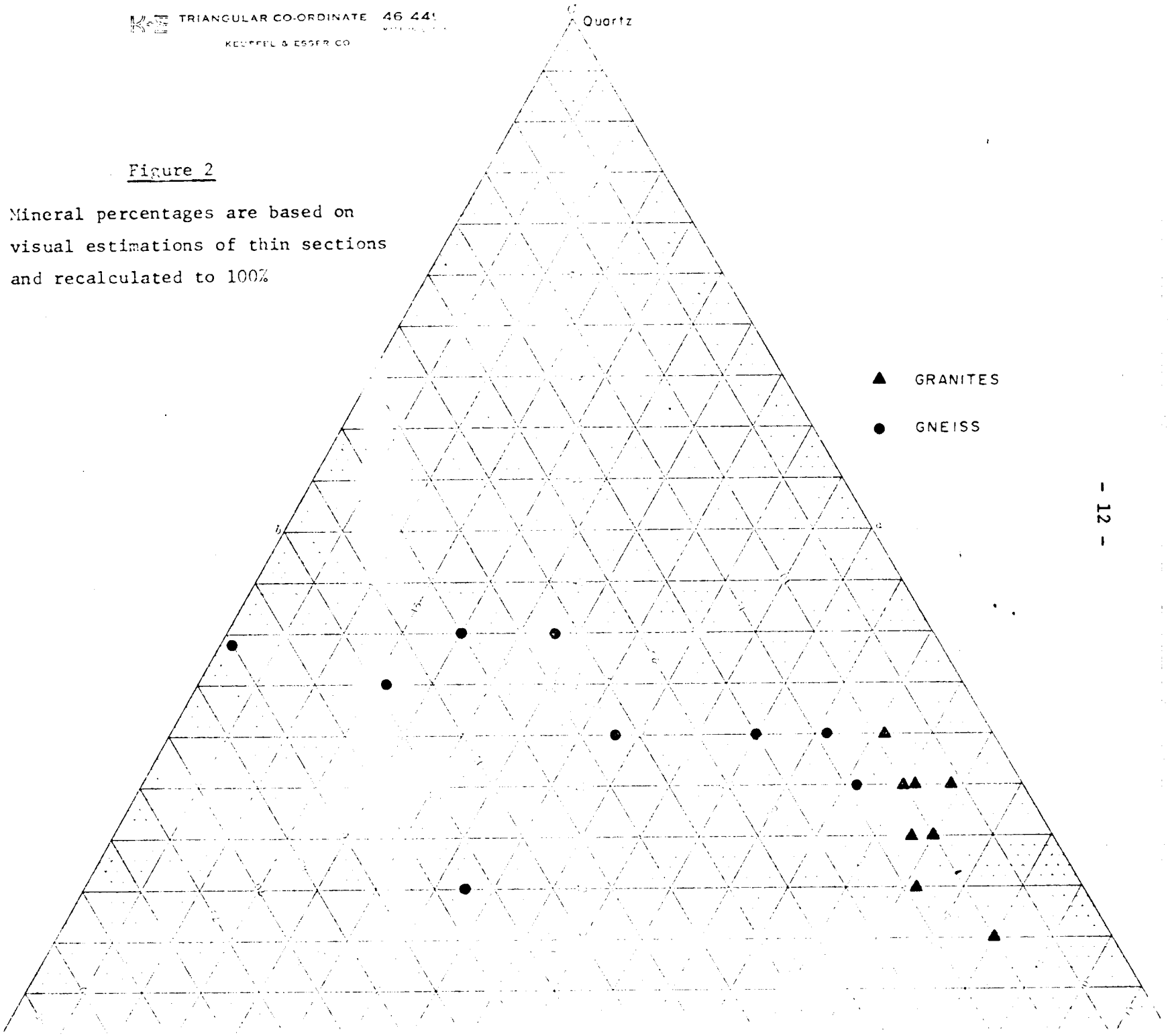


Figure 2

Mineral percentages are based on visual estimations of thin sections and recalculated to 100%

ALTERATION

The alteration minerals observed are listed in their respective alteration facies in the following table:

Potassium-silicate	Chloritic
Orthoclase	Chlorite
Quartz	
Anhydrite	
Argillic	**Propylitic**
Kaolin and Montmorillonite group clays	Epidote
	Chlorite
Biotite (?)	Calcite
Pyrite	Magnetite
Sericitic (?)	**Surficial**
Sericite	Limonite
Quartz	Hematite

As always, the classification on paper is more precise than it actually is in the field. In the field the overlap of alteration minerals and facies is difficult to determine. Even in thin-section many of the alteration products are too fine-grained to be identified. Regardless of these problems the alteration products are grouped into the above alteration facies but, the facies show no apparent horizontal or vertical zoning.

The following reasons support this idea:

(1) Irregularity in thicknesses and occurrence of gneiss and granite banding.

(2) Superimposed alteration.

(3) Post-alteration faulting.

A brief discussion of the alteration facies follows:

Potassium-silicate: This facies of alteration is for the most part restricted to the gneissic bands, except in No. 19 Zone and No. 21 Zone (Fig. 6). In the Nos. 19 and 21 Zones alteration is more intense and the granite as such is much more strongly affected. Anhydrite was noted in two sections of the gneiss bands. It is possible that there was at one time, more anhydrite which subsequently altered to gypsum and later was leached, leaving a porous vuggy type rock. A salmon to orangy-tan color is pervasive in the areas of most intense potassium-silicate alteration.

Chloritic: This facies of alteration is pervasive. In a few places the granite appears very fresh, but in some sections hematite and/or chlorite rim the biotite. The extreme end of chloritization occurs in the red-tan granite, where all of the biotite and hornblende have been altered to chlorite, hematite, and limonite. It would appear that further leaching occurred, removing part of the chlorite and iron oxides. Chloritization is approximately 10% effective in both the granites and gneisses (i.e. it forms at least 10% of the matrix).

Propylitic: This facies is much more restricted, occurring only in the granites. Epidote is the distinguishing mineral and is usually accompanied by calcite. Calcite, however, is not restricted to areas of propylization.

Argillic: This facies is widespread and is associated with the bulk of the mineralization. The rock is usually very white and the feldspars are soft and chalky. In a few places (Fig. 6) the argillic facies is in sharp contact with the sericite grade of alteration. The puzzling feature is the sharpness of the contact (i.e. in two feet the content changes from 2% to 30% sericite). Because of the abundance of sericite, it is listed as an individual facies, though the areas rich in sericite are small. Fresh-looking, fine-grained biotite occurs in highly altered sections, suggesting secondary development. Pyrite also is more strongly associated with intense argillization.

Sericitic: As noted previously, the sericite alteration facies has been included because of the sericite concentration in Trenches 21, 27, and 44. Sericite is well developed in small zones within these trenches. Pyrite, most commonly associated with the sericite alteration facies, also occurs in areas of intense argillization. Therefore, it appears that the sericite is a product of advanced argillization.

Surface alteration: Limonite and hematite form the bulk of the oxidation products generated by surface waters. The oxidation is very strong in the shear zones and in the red-tan granites associated with the shear zones.

The features of these alteration zones which are related to their origin are described below:

Naturally, the alteration is more intense in shear zones. However, it should be stressed that the higher degrees of alteration are related to hydrothermal solutions, as opposed to a straight weathering process. Therefore, it is apparent that the shears are pre-alteration. The zone called the "Marble Cake Zone" in Trench 42 consists entirely of alteration products (clay, chlorite, hematite, malachite) replacing a gneiss band with perfect preservation of foliation. The relic foliation is well preserved, therefore hydrothermal alteration apparently took place parallel to the foliation plane, rather than in a vertical shear zone in which disruption of foliation would be expected. In Trench 21 and in DDH 11-72 and 17-72, identical horizons in which a rich sericite zone occurs can be correlated. This again would indicate hydrothermal alteration parallel to foliation. Another feature peculiar to the gneisses and hybrid rocks is the vuggy texture, particularly well developed and suggestive of hydrothermal leaching. Calcite and very minor amounts of magnetite occur, but with seemingly little correlation with any other features observed to date.

STRUCTURE

Faulting and shearing are treated as one phenomenon, as there is no direct evidence of the amount of displacement in shear zones. Some minor folds in the gneissic bands are probably associated with, and provide the direction of fault movement. Two distinct types of shearing and/or faulting are observed, each represented by a distinct population (Figs. 7 & 8). The first type is vertical or nearly vertical, trending N60°E. The second is a foliation plane shearing, trending N50°W (approximately parallel to foliation plane strike and dip).

Wrench faults and/or shears result from a compressional force parallel to the median stress, making an acute angle bisected by the largest stress direction (DeSitter, 1964).

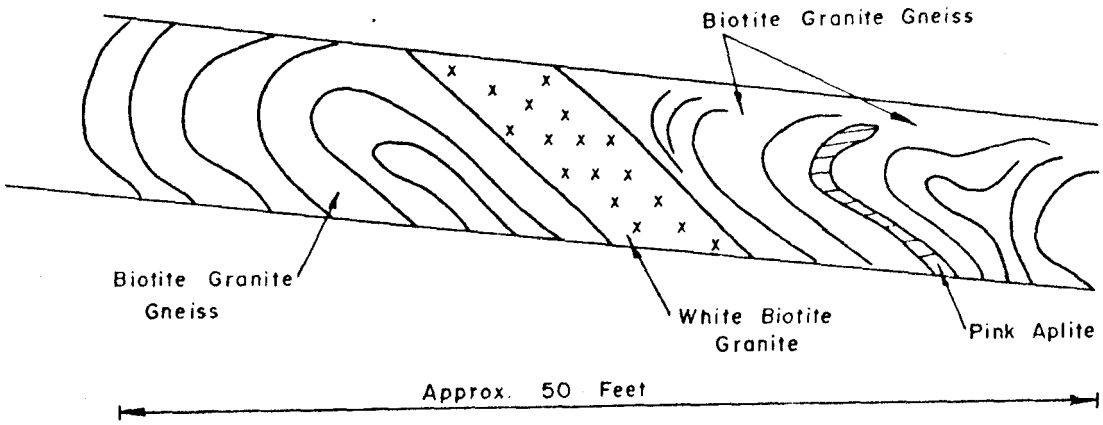
The following characteristics are expected under this definition:

(1) Shears widening at surface.
(2) Gash fractures at approximately 45° to shear.
(3) Vertical, or close to vertical orientation.

All of these characteristics are found on the property. Some shear zones exposed on the surface are intersected by diamond drill holes at depth. These shears exhibit thinning as well as a vertical to near vertical orientation. Gash fractures have developed at approximately 45° to the shear direction. Aplite and pegmatite dikes parallel the gash fracture orientation, suggesting that the fractures controlled their intrusion. As noted before, it is not possible to get a measurable displacement along shears, but the associated minor folding suggests that faulting occurred with a vertical as well as a horizontal component.

The second type of shearing is described as "foliation plane" because it is restricted to the gneiss bands and parallels or closely parallels the foliation. This type of shearing is particularly evident when observing the very strong cataclasis in thin-section. In some places it appears to be mylonitic.

Recumbent drag folding, as sketched below, occurs in a number of trench walls. It is generally low angle, paralleling both



Wall Profile - Trench 13

the strike and the dip of the gneissic bands. The few plunge angles that could be measured varied from zero to 15 degrees. General observations of the axial planes orientations, even where not measurable, confirmed a flat attitude. In areas of strongest folding, biotite content in the gneiss increased, particularly near the granite contacts. Shear folds generally are isoclinal, recumbent and asymmetric (DeSitter, 1964). Schistosity is generally flat-lying or horizontal. Though the folding on the property is poorly exposed, it would appear to fit the characteristics for shear folds. Shear folds would be expected in an area of compression which generated a well developed gneissosity and wrench faulting.

In cross-section, correlation is nearly impossible to make, and as a result the overall structure from southwest to northeast is difficult to determine. The large mineralized areas to the east and west of the baseline have not been correlated because a major north-south fault zone is approximately parallel to, and coincident with, the baseline. The western edge of the fault zone has been intersected at right angles by DDH 14-72. On the airphotos the fault zone appears as a major lineament crossing the property.

A major consideration in planning any further work on the property is that the foliated gneissic bands, which host most of the better grade mineralization, have a very consistent attitude, striking N30°W and dipping 20° to 40° NE.

MINERALIZATION

The following copper-bearing minerals have been identified:

Decreasing abundance	Primary	Secondary
↓	* (Cp) Chalcopyrite ($CuFeS_2$)	(Ml) Malachite ($Cu_2CO_3(OH)_2$)
	(Bn) Bornite (Cu_5FeS_4)	(Cc) Chalcocite (Cu_2S)
	(Cc) Chalcocite (Cu_2S)	(Tn) Tenorite (CuO)
		(Az) Azurite ($Cu_3(CO_3)_2(OH)_2$)
		(Cr) Cuprite (Cu_2O)
		(Cv) Covellite (CuS)
		(Cu) Native copper (Cu)

* For ease of reading, 2-letter codes have been listed for the minerals and will be used in the following discussion.

The relative abundance for primary mineralization is:

Cp : Bn : Cc ⟶ 10 : 3 : .05

The relative abundance for secondary mineralization is:

Ml : Cc : Tn : Az : Cr ⟶ 6 : 3 : .2 : .1 : .1

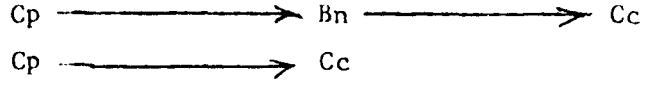
The relative abundance of primary to secondary mineralization is:

Primary Min. : Secondary Min. ⟶ 2 : 1

The only other metallic mineral identified is pyrite, and it occurs in relatively limited amounts. Minor gold and silver values were obtained only in the high grade sections, and occur as impurities in massive chalcopyrite and bornite.

PRIMARY MINERALIZATION:

As noted before, chalcopyrite, bornite and a small quantity of chalcocite form the primary mineralization. The occurrence of any one, or any combination thereof, is confined almost entirely to the gneiss units. The exceptions occur where the rock type is questionable (i.e. granite or gneiss), or where there is the occasional overlap of mineralization at contacts between the granite and gneiss. The mineralization within the gneiss bands is predominantly disseminated, ranging in size from very tiny grains (.1 mm) up to blebby masses, composed of multiple grains, up to 1 1/2 inches long. Although the mineralization is disseminated, it does show in many places a preferential alignment parallel to gneissosity, particularly in the more biotite-rich zones. The correlation between biotite concentrations and mineralization is not strong and may be more apparent, than real. Mineralization (i.e. the ratio of mineral types or internal relationships) within the various types of gneiss does not appear to vary to a noticeable degree. The major variation appears to be textural. The paragenetic sequence for primary mineralization appears in polished sections as follows:



The chalcopyrite is invariably subhedral to anhedral and contains many very fine inclusions of biotite, hematite, and small black non-magnetic opaques. It has bornite and/or chalcocite rims, and in some places, bornite on twin plane lamellae (exsolution?). The chalcopyrite in the more siliceous gneiss units is rimmed with bornite in a coloform fashion suggestive of rythmic colloidal precipitation and resemble a thunder egg, with a chalcopyrite core. The chalcopyrite in less siliceous and less altered sections tends to be more angular. It carries abundant gangue and is commonly twinned, but shows little deformation. Chalcopyrite

and bornite do occur together in massive pods and bedded veins up to one foot thick. A most impressive vein is located at the bottom of Trench 29. Chalcopyrite crystallization appears to be post-foliation in age, based on textural criteria.

Chalcocite usually is considered to be secondary, and most of the chalcocite at Minto Creek fits this concept. However, in DDH 10-72 the chalcocite appears to be primary. It has a metallic luster, and a crystalline structure. In polished section it shows good twinning and indications are that it is primary.

Thin and polished sections show copper mineralization crosscutting the primary foliation planes of the rocks. In particular, chalcopyrite, bornite and chalcocite crosscut micro-folded biotite and micro-faulted crystals, as well as other planar features. This again suggests both post-foliation and post-cataclasis emplacement of primary mineralization. The vuggy texture in much of the gneiss, coupled with the coloform structure of chalcopyrite and bornite, suggests pore space development prior to mineralization, as well as hydrothermal mineralization.

SECONDARY MINERALIZATION:

The major secondary minerals are malachite, chalcocite, tenorite, and azurite, with malachite and chalcocite being by far the most abundant. Malachite is the most extensive, occurring after chalcopyrite and bornite in the gneisses, and as botryoidal masses along with azurite on fracture and/or joint planes in the granite. Malachite and azurite in Trench 9 formed botryoidal fracture fillings 1/8 inch to 1/4 inch thick. Chalcocite is of importance to approximately 80 feet of depth, at which point the oxidation layer terminates and sulfides predominate. The secondary mineralization below 80 feet is associated with shear and/or fault zones. Azurite patches are very sparse. Tenorite, more commonly called copper pitch, forms black semi-lustrous coatings on chalcopyrite. Traces of cuprite, covellite, and native copper were also noted.

A zoning of copper-bearing minerals has not been observed either vertically or laterally, with the exception of the general transition at approximately 80 feet from secondary to primary mineralization.

The only other metallics associated with the copper-bearing minerals are pyrite, magnetite, and some hematite. Pyrite has a limited areal extent and is very sparse, except in No. 19 Zone (Fig. 6). Magnetite is even more limited in distribution and abundance. Hematite, with good crystal development and a steel-grey color is often mistaken for magnetite. The hematite is shown in thin and polished sections to be mixed with chalcocite. The approximate ratio of copper sulfides to pyrite outside of the No. 19 Zone is: 5-8 : 1, and within the No. 19 Zone it is: 1-2 : 2. Three important features of this latter group of metallics have a bearing on the petrogenesis of the gneisses and mineralization:

(1) The pyrite, though brittle by nature, is not crushed. Crushing would be expected if it had been deformed in a strong tectonic event.
(2) Pyrite is very sparse compared to the copper minerals and, more important to the vast quantity of iron oxides in the matrix.
(3) The pyrite in Zone 19 is associated with the most highly deformed, fractured, and altered hybrid rock.

MINERALIZATION DISTRIBUTION AND MODE:

Four strongly mineralized zones have been outlined in Fig. 6, and given a number corresponding to that of a prominent trench within the boundary or limits of the zone. The type and mode of mineralization

within these limits is consistent and is believed to be moderately continuous. The four zones have the following characteristics in common:

(1) The major part of the mineralization occurs in the gneiss bands. Only five percent of the mineralization occurs in a hybrid rock type or overlaps at contacts between the gneiss and granite. It forms fracture fillings in the granite in very few places.

(2) Chalcopyrite and bornite forms the bulk of primary mineralization, whereas malachite and chalcocite are the major secondary minerals.

(3) Chalcopyrite and bornite occur as disseminations, although the grains in most places form aggregates aprallel to foliation.

(4) The ratio of sulfide to oxide copper is 4 : 1.

Zones 1, 19, 21, and 52 are tentatively established with the idea of giving the mineralization some potential economic significance. With the exception of Zone 19, Zones 1, 21, and 52 are very similar in mineralization and alteration (i.e. fit the mineralization characteristics). Zone 19 is characterized by the highest pyrite concentrations on the property. This zone also has the greatest concentration of pink-tan granite (quartz-feldspar porphyry), especially in DDH 12-72. I would suggest that Zone 19 represents a major channelway or conduit for hydrothermal solutions, resulting in the development of the above features.

GEOLOGIC HISTORY

The geologic origin of the deposit will be broken down into two parts. The first will be a sequential phase development, and the second will be an attempt to date the events absolutely (i.e. place it in the geologic time scale), and tie it to specific dated events.

Deformation during the final stages of crystallization of a magma is proposed in which the residuals were concentrated along planes, and due to the stress, developed foliation. The proposed sequence of events is as follows: a dioritic magma was emplaced passively (?) at an intermediate depth. Initial cooling and crystallization yielded quartz diorites. Continued differentiation produced granodiorites. During granodiorite crystallization, with magma composition approaching that of quartz monzonite, the region was subjected to a strong northeast-southwest oriented compressional force. The deformational stress was such that minor cataclasis occurred along lines of weakness in the granite, but for the most part resulted only in extensive breakage of crystals. The crystal mush, richer in potash, sodium, silica, along with biotite, and some plagioclase, was injected along planes of weakness within and between blocks of already crystallized quartz diorite and granodiorite. Platey minerals (biotite in particular) oriented themselves in response to the compressional field. Differentiation continued in the still crystallizing mush, resulting in the gneisses with a granodiorite to granite composition range. Wrench faulting ($N60^{o}E$) developed parallel to the compression direction. The wrench faulting, with its conjugate shear system, produced shearing within the gneissic layering. This latest shearing resembled thrust faulting. The gneissic bands, with biotite concentrations along the contacts, greatly facilitated movement, as is shown by their well developed cataclastic to mylonitic texture. Recumbent drag folds also were developed in the gneissic bands as a result of this compressive movement. As noted earlier, a vertical movement is also suggested along faults. However, as there are no marker horizons or definite correlative units, it cannot be confirmed. The end member volatiles under the system of stress and varied movements, in this magmatic crystallization cycle deuterically altered the gneissic bands as well as some of the granite and produced the potassium-silicate facies of alteration and minor chloritization.

A time interval of unknown duration probably existed following the deuteric alteration and final crystallization stage and prior to the next major stage of alteration. The next development is the hydrothermal activity which resulted in mineralization and alteration. The gneissic bands and shears provided excellent channelways for the migration of solutions. The gneisses, being end members of a differentiated magma, contained a certain amount of water. The hydrothermal solutions travelled up the available channelways leaching minerals and leaving behind cavities for mineral deposition. The second stage of alteration took place during this period and produced the argillization, sericitization, propylization, and the bulk of chloritization. The good coincidence of mineralization and alteration, indicates that they are coeval. The pink-tan granite may be the source for these hydrothermal solutions. The pink-tan granite's dike-like structure may be a reflection of another intrusive at depth. The extensive alteration, deformation, pyrite concentration, and hybrid nature of the rock in Zone 19 would suggest it is a center of hydrothermal activity.

The aplite and pegmatite dikes, both of which are barren, have not yet been mentioned. There is little evidence on whether the dikes were emplaced before or after mineralization. The dikes, other than aplite and pegmatite, belong to the late-stage gneissic phase. The fact that the dikes apparently trend along the gash fracture system and are very slightly mineralized (i.e. less than 2.0% of the total dikes are mineralized) suggests pre-mineralization diking. A few aplite dikes were observed in the nose of folds suggesting development late in the initial crystallization sequence. Two facts regarding the relative ages of the dikes can be stated: 1) aplite dikes are cut and displaced by pegmatite dikes (visible in Trench 28), and 2) both aplite and pegmatite dikes have been faulted (visible in Trenches 15, 26, 28, 30, 39).

Further uplift and erosion continued following this period of hydrothermal activity with the subsequent exposure at surface of the granites and gneisses. The granites and gneisses were later surface-weathered.

Volcanic activity, following the period of erosion, non-conformably covered the old erosion surface, at least at the lower elevations. The group of volcanics and shallow water sediments are a part of the Carmacks volcanic sequence. The development of what has been referred to as a hematite breccia is peculiar. The breccia is composed of volcanic, granite and gneiss fragments, sub-rounded pebbles, and cobbles, surrounded by a matrix composed primarily of hematite. The hematite was derived from the alteration of an andesitic tuff. Characteristically, the Carmacks weathers to a very deep rust or burnt red color. Erosion has continued to the present, along with surface oxidation.

The actual timing of events is the last subject of discussion. D.J. Tempelman-Kluit (G.S.C.) is of the opinion that the granite is Triassic or older for the following reasons:

The white biotite granite found at Minto Creek is a very distinctive unit on a regional scale. Because it is distinctive, it has been identified as detrital material (pebbles to boulders) in the Lower Jurrasic Laberge Series. Therefore, it has to be pre-Lower Jurassic. In addition, a period of time was necessary to unroof the intrusive. The Tahltanian Orogeny is considered to be Middle Triassic and is a period of intrusion along the entire length of the Cordillera. The orogeny would also provide the deformative event to generate the gneissic banding. Therefore, a Lower to Middle Triassic age of intrusion is suggested Upper Triassic time is a period of abundant basaltic to andesitic vulcanism. An examination of a geologic map of the Yukon shows that the

only mineralization associated with, or occurring along the Teslin lineament, is associated with the Upper Triassic volcanics. The Minto property lies on the north end of the Teslin lineament. The emplacement of the pink-tan granite is suggested to be related to the Triassic vulcanism along the Teslin lineament. Intrusion along gneissic bands, the natural lines of weakness, caused the intense alteration and deposited the copper. Following alteration and mineralization, uplift and erosion continued, exposing at surface the granites and gneisses by Lower Jurassic time. Tertiary vulcanism and sedimentation is the last of the major events.

GEOCHEMISTRY

Three hundred forty-one soil samples were taken during the month of June on a new grid centered at 40N-88W, on the hill near the western boundary of the Minto claim group (Fig. 9). In addition, 21 samples were taken on the main grid between lines 0N and 40N from stations 40W to 50W. This sampling was restricted by muskeg to only 30% of the area.

All the samples were assayed for copper by Chemex Laboratories, using hot extraction, and an atomic absorption unit. Sampling was carried out on the west grid because malachite staining had been noted (Fall, 1971) in the granites and gneisses which crop out on the hillside. Unfortunately, only five soil samples exceeded 251 ppm copper, the lowest contoured value. The anomalous values when compared to last year's were unimpressive, in addition to being scattered. A day was spent prospecting the hill, but no copper was found aside from the odd malachite splash.

Trenching established several important factors about the geochemical values. First, and most important, the anomalous values are not transported. Trenching within the +500 ppm contour will show a copper source in bedrock in approximately 90% of the cases (100% at +1000 ppm). Second, soil creep is minimal, i.e. less than six inches observable in trench walls. Third, ground and surface water transport of copper has been minimal because of the lack of acid generated by the oxidation of sulfides. A good example of lack of mobility is shown in the diagram below:

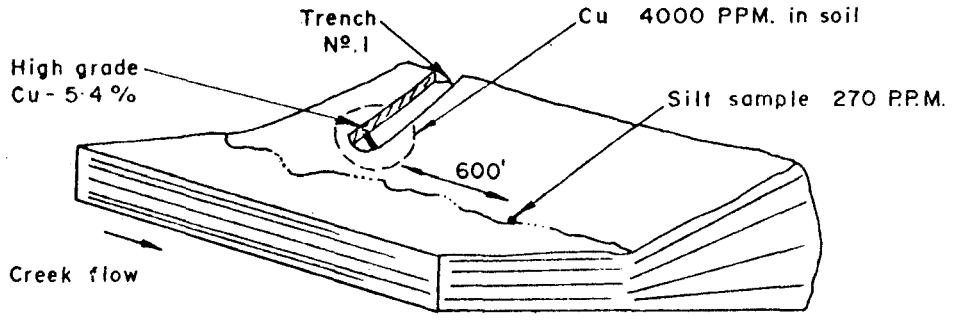


Figure 3

The lack of geochemical transport leaves very nice in situ anomalies. Unfortunately, approximately 40% of the property carries overburden too deep for bulldozer trenching. The excessive overburden would expectedly mask any mineralization, and as a result, an alternate method must be found to test this area.

A water sample was taken from the creek prior to breaking camp, to ascertain if contamination had taken place as a result of trenching. A standard water analysis as used by various governmental agencies was run. The results for this sample are as follows:

pH	Total Solids mg/L	Dissolved Solids mg/L
7.53	117	107

Analysis of Dissolved Solids

	Iron (ppm)	Copper (ppb)	Manganese (ppm)	Zinc (ppb)
	.10	14	.05	2
Department of Health minimum standards	30 ppm	100 ppb	,05 ppm	1 ppb

The Federal Fisheries pollution control specifications allow 1000 mg/L for total solids as well as a pH range of 6.5 to 8.3. Two facts become apparent: 1) contamination of water has not taken place, and 2) no oxidation of sulfides can occur with a pH of 7.53. A pH determination is necessary when silt sampling major drainages in this area to ascertain if the water will transport the copper.

GEOPHYSICS

No further geophysical work was carried out this season. The data from last year's work was re-evaluated in light of the extensive geologic information now available. Unfortunately, there was little success in this re-evaluation. A good geophysical tool is still lacking.

MAGNETICS:

No further information was gained, because of the small variation in gamma values over the property. This is understandable within the granites and gneisses, in light of the compositional similarity and layered nature. For more information see 1971 Progress Report on Minto Creek Project, by R.C. McMichael.

VLF-EM (Radem):

The following points can be made in comparing the Radem survey data with the geologic data at hand.

(1) Crossovers are not related to sulfide mineralization.

(2) The Radem anomalies west of the baseline are oriented parallel to the general foliation trend on a gross scale, but do not necessarily reflect gneissic bands. The cause of the anomalies is not determined. A Radem anomaly on Line 32N at Station 8W reflects a major shear zone which was trenched and drilled. Only a trace of copper was noted. The exploration of another Radem anomaly on Line 16N at Station 26W did not disclose a major shear zone, nor did it determine a gneissic layer with or without mineralization.

(3) The majority of the crossovers are located between the baseline and 24E, an area of deep overburden. It is impossible to determine whether the anomalies are from bedrock or overburden.

In conclusion, VLF-EM has proved of little use on the Minto property.

INDUCED POLARIZATION:

A re-evaluation of McPhar's I.P. survey results was attempted, utilizing the new geologic base. Several evaluations had been made during the winter of 1971 and spring of 1972. There was only minor correlation with the geology. The following points make interpretation difficult: 1) the very high resistivities encountered, and 2) the small quantity of total sulfides. As a consequence, exposed (trenched and drilled) sulfide mineralization has not been related to the specific induced polarization anomalies.

TRENCHING

The trenching completed between May 21, and August 29, totals 20,800 lineal feet. Fifty-seven trenches, averaging six feet in depth, were excavated. The length of the trenches varied from 150 feet to 1310 feet. The overburden depth varied from 4 to 22 feet. A D-7 caterpillar (with ripper) trenched from May 21 to August 15, and a D-8 caterpillar (with ripper) trenched from August 3 to August 29.

The D-7 was walked in on a winter tote road during March, at which time 6000 gallons of bulk fuel and 8 tons of equipment were hauled in. The D-8 was walked in from Williams Creek over a three-day period from July 31 to August 2. The Table on page 36 gives a breakdown of time distribution for both the D-7 and D-8, which, in addition to trenching, were used for drill support, camp maintenance, and airstrip construction. The amount of down-time for the D-7 was 22%, which is considerably in excess of the 10% normal maintenance down-time. Because of this, approximately two weeks extra were needed for trenching.

Problems were encountered with permafrost and muskeg, rendering trenching difficult and costly. The procedure used in the permafrost was to strip and work five to six trenches concurrently, taking out one to two feet every day. This procedure was necessary to utilize the operating hours of the D-7 most efficiently. It was also the most efficient method with the D-8. Muskeg presented the other major problem to trenching as well as general caterpillar movements. Ice layers within the muskeg immediately melted when the surface of the muskeg was broken, yielding a seemingly bottomless layer of thick mud which was impossible to trench. Many caterpillar trails, especially along the baseline, were useable only for one or two trips, after which they became too muddy. The limits of the muskeg zone are shown on Figure 5.

	Cat D-7 (hours)					Cat D-8 (hours)				
Period	Trenching	Drill Sup't	Air-strip	Maintenance	Camp	Trenching	Drill Sup't	Air-strip	Maintenance	Cat
May 20-31	71.5			27	12.5					
June 1-30	305.5	66		94	10					
July 1-31	207.5	67.5		87.5	18					
Aug. 1-29	128		106	23.5		200	11	75	56.5	4
TOTAL	712.5	133.5	106	228.5	40.5	200	11	75	56.5	4

Time Distribution (%)

Trenching	71.2
Drill support	11.3
Airstrip	14.1
Camp (misc.)	3.4

Cat cost - Trenching/lineal ft. $ 1.44

Cat cost - Drilling/ft. $ 0.73

Total Cat (D-7 & D-8) hrs. - 1282.5
Maintenance Down Time - 22%

DIAMOND DRILLING

The exploratory diamond drilling program initiated during the 1971 season was continued in 1972. This program continued to test the anomalous zones, and to expand the known zones. Canadian Longyear Ltd. supplied the camp and operated three 8-hour shifts from June 7, 1972 to July 31, 1972. This arrangement proved to be the most satisfactory in terms of morale and job continuity.

The total cost of the 1972 program was $67,000. When the 1971 drill cost is included a total of $112,679 has been spent on diamond drilling to date.

The 'junior' model drill with BQ wireline equipment was used for the 1972 program. This equipment had been left on the property at the end of the 1971 program.

A new contract for a minimum of 4000 feet was negotiated with Canadian Longyear Ltd. of Vancouver, at a direct cost of $8.00 per foot, for holes up to 750 feet deep. A total of 6129.6 feet was drilled in 13 holes, ranging in depth from 314 feet to 595 feet. All moves were made using the D-7 cat at the property. All roads and drill sites were prepared prior to making the moves. Moves required approximately one and one-half shifts to complete. A summary of the drill holes follows:

DRILL HOLE SUMMARY

Hole No.	Depth	Overburden depth (ft.)	Bearing	Inclination	Elevation (ft.)
8-72	530	15	East	-45°	2875
9-72	314	15	N65°W	-45°	2972
10-72	436	14	N75°W	-45°	2922
11-72	595	7	S75°E	-45°	2922
12-72	568	8	--	-90°	3075
13-72	458	18	--	-90°	2838
14-72	568	147	West	-45°	2790
15-72	531	13	--	-90°	2897
16A-72	184	184	West	-45°	2755
16B-72	363	21	West	-45°	2815
17-72	526.6	13	--	-90°	2855
18-72	538	72	--	-90°	2822
19-72	518	75	--	-90°	2822
	6129.6				

NOTE: See Figure 5 for the location of each drill hole.

Contractor, crew, and equipment performances were good. Penetration rates in bedrock were excellent, averaging approximately 110 feet per day. The bedrock is extremely competent and as a result diamond recovery was good. Core recovery approached 95 percent with the exception of the first 40 feet to 60 feet of each hole. The surface zone is intensely weathered and broken, resulting in a substantial loss of material. Recovery in the surface area averaged approximately 60 percent. The one major problem encountered during the program was overburden penetration. The overburden depth in DDH's 8-72 through 13-72, 15-72, 16B-72, and 17-72 averaged 13.8 feet, and in DDH's 14-72, 16A-72, 18-72, and 19-72 averaged 119.5 feet. The machine was equipped with a "screw feed" head and consequently all casing had to be drilled. The penetration rate with this machine was approximately 15 feet per shift in overburden. Resultant costs were exceptionally high, averaging $33.43 per foot of overburden.

The stream bisecting the showings at Minto Creek derives all its water from the permafrost, from a small spring at the head of the creek, and from annual rainfall. The water supply is erratic. Three sumps were blasted during the 1971 season to retain sufficient water for a drill program. These sumps, in conjunction with an exceptionally good runoff in 1972, provided a good consistent supply of water.

Six vertical and seven inclined holes were drilled during 1972 at Minto. A review of the geological data indicates that a -45° hole bearing from S45°W to west is the most efficient means of testing the ground. The gneissic bands generally strike northwest and dip 40° to the northeast. A -45° hole, bearing southwest, should provide an intercept approximately equal to its true thickness.

The 'junior' machine used is not suitable for penetrating the areas of deep overburden at Minto. Penetration rates are too low and costs are prohibitive. If further drilling is undertaken a larger machine, perhaps a Longyear 'model 38' with a hydraulic head, is recommended for the work.

At the completion of the job the machine was stored at Minto until mid-October, and then removed from the property.

SAMPLING AND ASSAYING

During the summer, 15,070 feet of trench and 4,873.1 feet of core were sampled. A 10-foot sample length was standard for all trenches. A 10-foot sample length was used also for core sampling but only within a given rock type.

STATEMENT OF EXPENDITURES

Silver Standard Mines personnel worked a total of 571 man-days at Minto, commencing on May 20, 1972 and terminating on September 9, 1972. The camp expenses during this period totalled $6,517.88, or $11.62 per man-day.

Bulldozer costs were derived from three phases of the project: trenching, drilling, and airstrip construction. The following Table outlines the specific costs pertaining to each phase:

	Cost/lineal foot			Cost/cubic yard			
Category	Contract	Fuel	TOTAL	Contract	Fuel	TOTAL	TOTAL feet or cu. yd.
Trenching	1.44	.19	1.63	.48	.06	.54	20,800 feet 60,930 cu. yds.
Drilling	.72	.10	.82				6,129 feet
Airstrip	2.38	.29	2.67				2,600 feet

A small airstrip, located on the east side of the property, approximately one-half mile from camp, was constructed during the latter stages of the 1972 program. This phase of the project required approximately 10 days and $8700 to complete.

The initial estimates for the airstrip were $5000. An application for "Airport Assistance", based on the $5000 figure, was submitted to the Airport Committee, Department of Indian Affairs and Northern Development, Ottawa. Subsequently, the application was approved and the project became eligible for assistance providing $2500. In addition

to the $2500 to be re-imbursed by the Federal Government, the following companies contributed $700.00 each towards the construction cost:

United Keno Hill Mines
Archer Cathro and Associates
Mr. T. Fekete (contractor)

Total assistance for the strip, from all sources, will amount to $4600.

The cost summary as shown on p. 39 formed a portion of the application for "Airport Assistance".

COST SUMMARY - MINTO AIRSTRIP - August 10-21, 1972

August 10 - 11 -

Equipment hours -				
D-7 - (33 hrs.) @ 30.00/hr.		990.00		$
D-8 - (13 hrs.) @ 40.00/hr.		520.00		
Fuel - (361 gals.) @ .461/gal.	166.42			
Transportation -				
Whse. - Minto @ .07/gal.	25.27			
Minto - Camp @ .88/gal.	318.08	509.77		
Wages -				
S. Heim @ 975.00/mo. (2 dys.)	62.90			
P. Newman @ 550.00/mo. (2 dys.)	35.48			
M. Ashford @ 500.00/mo. (2 dys.)	32.26	130.64		
Camp Cost -				
12 man-dys. @ 10.00/dy.		120.00	2,270.41	
(includes support cost for equipment operators and company personnel)				

August 12 - 17 and 21 -

Equipment hours -				
D-7 - (67 hrs.) @ 30.00/hr.		2,010.00		
D-8 - (62 hrs.) @ 40.00/hr.		2,480.00		
Fuel - (1089 gals.) @ .461/gal.	502.03			
Transportation -				
Whse. - Minto @ .07/gal.	76.23			
Minto - Camp @ .88/gal.	959.51	1,537.77		
Wages -				
S. Heim @ 975.00/mo. (1 dy.)	31.45			
P. Newman @ 550.00/mo. (4 dys)	70.97			
M. Ashford @ 500.00/mo. (4 dys)	64.52			
M. McMahon @ 500.00/mo. (1 dy.)	16.13	183.07		
Camp Cost -				
23 man-dys. @ 10.00/dy.		230.00	6,440.84	$ 8,711.7
(Company personnel - 10 man-dys.)				
(Equip. operators - 13 man-dys.)				

The drill costs for the 6129-foot program are considered satisfactory, with the exception of the overburden drilling cost. The contract allowed for 35 feet of overburden at the price of $8.00 per foot. Hole expenses where overburden exceeded 35 feet were charged at the rate of field cost plus 10 percent. Four holes were drilled in deep overburden, resulting in an average direct cost of $33.43 per foot to drill the additional 338 feet of overburden. The following table summarizes the costs incurred in the drilling program:

Overall Program Cost/ft. (6129 ft.)				
Direct	Variable	Overburden	Cat	TOTAL
$ 8.00	$ 1.27	$ 1.85	$ 0.82	$ 11.94

NOTE: The variable cost included board, waiting time, mobilization and demobilization, reaming, core boxes, and diamond credits. These costs total $7,792.39.

The cost summary includes all expenses from January 1, 1972. Several credits which have appeared on monthly statements throughout the course of the program are included. In addition to the $4600 credit for the airstrip, $5000 has been received for "Tote Trail Assistance". A re-imbursement of $1276 is expected when the empty fuel drums are returned to Texaco. The credits for the 1972 Minto Project will total $10,877.

The cost summary as shown on p. 41 includes all expenses at Minto for the calendar year 1972.

STATEMENT OF EXPENDITURES FOR 1972

MINTO CLAIM GROUP

Consulting fees & expense	$ 2,258.39
Engineering & supervision	19,077.43
Staking & filing	2,506.65
Geological mapping	3,917.25
Prospecting	145.00
Geochemical surveys	71.65
Sampling & assaying	11,280.22
Line cutting	581.99
Surveying	532.70
Diamond drilling	67,769.23
Percussion drilling	273.00
Fixed wing charters	1,184.27
Rotary wing charters	26,057.70
Truck expense	1,958.51
Communications	2,204.44
Camp & accommodations	9,333.84
Transportation - materials	5,459.98
- personnel	5,094.36
Stripping & trenching	50,206.04
Road construction	8,685.00
Road Grant - credit	(5,000.00)
Workmen's Compensation Board - Y.T.	713.71
	$ 214,311.36

DISTRIBUTION:

Silver Standard - 45%	$ 96,440.11
Asarco - 55%	$ 117,871.25
	$ 214,311.36

Respectfully submitted,

Roy C. McMichael, P. Eng.
Geological Engineer

CERTIFICATE OF QUALIFICATIONS

I, Roy C. McMichael, with business and residential addresses in Vancouver, B.C., do hereby certify that:

1. I am a geological engineer in the permanent employ of Silver Standard Mines Ltd. (N.P.L.), of 808-602 West Hastings Street, Vancouver 2, B.C.

2. I am a graduate of Colorado School of Mines (Geological Engineering 1966).

3. I am a registered Professional Engineer of the Province of British Columbia (Reg. No. 8093).

4. I have practiced and supervised in the field of geological engineering for 5 years.

5. I have personally supervised the geological, trenching, diamond drilling, and related jobs recently completed on the Minto 1-73, 75-93 mineral claims described in this report

Roy C. McMichael - P. Eng.
Geological Engineer

APPENDIX "A"

SUMMARY - TIME DISTRIBUTION

Roy C. McMichael, P. Eng.
Geological Engineer

ENGINEERING & SUPERVISION:

1972 -	August	1-31	31-day month	20	dys.
	September	1-30	25-day month	20	dys.
	October	1-31	22-day month	5 1/2	dys.
	November	1-30	22-day month	11	dys.
	December	1-31	22-day month	11	dys.
1973 -	January	1-30	22-day month	5 1/2	dys.
	February	1-28	22-day month	11	dys.
			TOTAL days from August 1/72 -	84	dys.

I CERTIFY that the above stated number of days were spent by me completing the work at Minto.

Roy C. McMichael, P. Eng.
Geological Engineer

BIBLIOGRAPHY

Barnes, H.L. (editor), 1967, Geochemistry of Hydrothermal Ore Deposits: Holt, Rinehart and Winston Inc., 670 p.

Bostock, H.S., 1936, Carmacks District, Yukon: Geological Survey of Canada Memoir 189, 67 p.

DeSitter, L.U., 1964, Structural Geology: Second edition, McGraw-Hill Book Company, 551 p.

Turner, F.J. and Verhoogen, J., 1960, Igneous and Metamorphic Petrology: Second edition, McGraw-Hill Book Company, 694 p.

115 I

MINTO DIAMOND DRILL HOLE DATA

HOLE NO.	BRG.	OB FEET	DIP	TOTAL DEPTH	NORTHING	EASTING	ELEVATION	DATE STARTED	DATE FINISHED	REMARKS
1	West	38	-45°	497	7,343.1	11,204.5	2,903.2	8 Sept/71	11 Sept/71	Average ground.
2		6	-90°	492	6,732.1	11,303.8	2,963.5	13 Sept/71	16 Sept/71	Average ground.
3	West	12	-45°	517	6,262.5	11,509.7	3,004.5	18 Sept/71	21 Sept/71	Average ground.
4	West	20	-45°	596	6,254	12,098.0	2,904.0*	23 Sept/71	25 Sept/71	Approx Co-ord & elev.
5	East	14	-45°	523	6,253.5	12,066.3	2,903.9	26 Sept/71	28 Sept/71	Average ground.
6	West	5	-45°	467	8,856.8	11,430.1	2,801.5	3 Oct/71	5 Oct/71	Average ground.
7		31	-90°	534	4,030.0	14,150.0	2,932.0	7 Oct/71	11 Oct.71	Approx. Co-ord.
8	East	15	-45°	530	6,253.7	12,233.0	2,869.9	10 June/72	15 June/72	Average ground.
9	N65°W	15	-45°	314	6,562.9	11,353.3	2,981.3	15 June/72	17 June/72	Average ground.
10	N75°W	14	-45°	436	7,022.1	11,287.5	2,927.9	18 June/72	20 June/72	Average ground.
11	S75°E	7	-45°	595	7,032.2	11,242.2	2,929.2	20 June/72	23 June/72	Average ground.
12		8	-90°	568	5,840.0	11,220.0	3,086.0	24 June/72	26 June/72	Approx. Co-ords.
13		18	-90°	458	6,055.0	12,545.0	2,782.0	27 June/72	29 June/72	Approx. Co-ords.
14	West	163	-45°	568	6,461.4	13,046.6	2,770.1	30 June/72	8 July/72	Average Ground.
15		13	-90°	531	6,253.8	12,083.1	2,897.8	2 July/72	4 July/72	Average ground.
16	West	21	-45°	363	8,656.2	11,297.8	2,825.5	17 July/72	19 July/72	Average ground.
17		13	-90°	526.6	6,914.2	11,844.2	2,856.3	19 July/72	21 July/72	Average ground.
18		72	-90°	538	7,316.9	11,824.0	2,825.9	21 July/72	23 July/72	Average ground.
19		75	-90°	518	7,503.7	11,641.9	2,831.4	14 July/72	29 July/72	Average ground.
20		65	-90°	418	11,090.7	9,903.3	2,742.3	5 Aug/73	8 Aug/73	Average ground.
21		62	-90°	434	11,093.3	10,006.8	2,733.2	10 Aug/73	12 Aug/73	Average ground.
22		22	-90°	355	11,095.4	10,106.3	2,731.1	14 Aug/73	15 Aug/73	Average ground.
23		11	-90°	303	10,994.4	10.205.5	2,691.0	16 Aug/73	17 Aug/73	Average grd. collar bent.
24		10	-90°	578	11,190.8	10,307.5	2,733.8	Aug/73	Aug/73	Keno-Asarco joint hole K-20
25		13	-90°	398	11,038.8	10,403.2	2,688.1	19 Aug/73	20 Aug/73	Average ground.
26		21	-90°	346	10,943.6	9,798.9	2,707.3	21 Aug/73	22 Aug/73	Average ground
27		20	-90°	448	10,889.7	9,711.1	2,711.6	22 Aug/73	24 Aug/73	Collar.
28		22	-90°	284	10,894.4	9,911.6	2,680.4	24 Aug/73	25 Aug/73	Average ground.
29		12	-90°	278	10,897.1	10,011.6	2,669.0	25 Aug/73	26 Aug/73	Collar.
30		16	-90°	378	10,899.7	10,109.3	2,663.6	26 Aug/73	28 Aug/73	Collar.
31		20	-90°	280	10,904.9	10,209.1	2,662.2	28 Aug/73	29 Aug/73	Collar.
32		22	-90°	338	10,904.3	10,310.8	2,661.3	30 Aug/73	31 Aug/73	Collar.
33		45	-90°	532	11,198.4	10,408.8	2,725.9	Aug/73	Aug/73	Keno-Asarco Joint Hole K-25
34		21	-90°	427.5	10,994.3	9,910.1	2,712.3	1 Sept/73	2 Sept/73	Average ground.
35		46	-90°	543	11,205.2	10,508.9	2,717.4	Aug/73	Aug/73	Keno-Asarco Joint Hole K-26
36		22	-90°	358	10,996.4	10,007.6	2,701.2	3 Sept/73	4 Sept/73	Average ground.

* - Collar lost, ± 5'.

MINTO DIAMOND DRILL HOLE DATA

HOLE NO.	BRG.	OB FEET	DIP	TOTAL DEPTH	NORTHING	EASTING	ELEVATION	DATE STARTED	DATE FINISHED	REMARKS
37		22	-90°	484	11,213.9	10,608.5	2,704.2	Sept/73	Sept/73	Keno-Asarco Joint Hole K-27
38		36	-90°	312	11,001.5	10,107.6	2,705.3	4 Sept/73	5 Sept/73	Average ground.
39		12.6	-90°	518	11,223.2	10,707.5	2,699.5	Sept/73	Sept/73	Keno-Asarco Joint Hole K-28
40		22	-90°	308	11,014.7	10,303.1	2,693.4	6 Sept/73	7 Sept/73	Average ground.
41		34	-90°	586	11,232.0	10,808.2	2,697.0	Sept/73	Sept/73	Keno-Asarco Joint Hole K-29
42		21	-90°	397	11,020.0	10,520.0	2,673.1	8 Sept/73	9 Sept/73	Approx. Co-ords.
43		31.6	-90°	592	11,239.5	10,907.3	2,682.8	Sept/73	Sept/73	Keno-Asarco Joint Hole K-30
44		30	-90°	423	11,010.4	10,606.0	2,659.1	10 Sept/73	12 Sept/73	Highest support log.
45		33	-90°	418	11,243.3	11,006.7	2,682.5	Sept/73	Sept/73	Keno-Asarco Joint Hole K-31
46		30	-90°	408	11,008.0	10,702.8	2,647.4	12 Sept/73	13 Sept/73	Average ground.
47		52.4	-90°	588	11,254.0	11,106.1	2,667.1	Sept/73	Sept/73	Keno-Asarco Joint Hole K-32
48		25	-90°	456	10,872.1	10,807.5	2,619.9	14 Sept/73	16 Sept/73	Average ground.
49		112	-90°	467	10,809.4	9,270.2	2,750.8	2 Oct/73	4 Oct/73	Average ground.
50		20	-90°	422	10,870.6	10,908.1	2,613.4	16 Sept/73	17 Sept/73	Average ground.
51		230	-90°	466	10,336.6	9,591.9	2,689.9	5 Oct/73	9 Oct/73	Average ground.
52		36	-90°	438	11,003.9	10,858.1	2,647.4	18 Sept/73	19 Sept/73	Average ground.
53		202	-90°	358	9,943.9	9,503.8	2,711.2	10 Oct/73	12 Oct/73	Average ground.
54		37.5	-90°	427	11,122.0	10,810.5	2,679.0	22 Sept/73	24 Sept/73	Average ground.
55		202	-90°	430	9,943.6	9,899.4	2,711.4	13 Oct/73	15 Oct/73	Average ground.
56		152	-90°	378	10,643.1	10,292.4	2,656.8	2 Oct/73	5 Oct/73	Highest support log.
57		42.7	-90°	450	11,153.71	9,848.86	2,763.2	Oct/73	Oct/73	Keno-Asarco Joint Hole K-36
58		25.5	-90°	464	11,138.41	9,677.67	2,771.5	Oct/73	Oct/73	Keno-Asarco Joint Hole K-37
59		35	-90°	570.9	11,107.84	9,297.65	2,796.8	Oct/73	Oct/73	Keno-Asarco Joint Hole K-38
60		99	-90°	279	10,544.6	9,985.5	2,655.4	21 Sept/73	24 Sept/73	Collar
61		50	-90°	426.6	10,737.8	9,695.8	2,697.5	25 Sept/73	27 Sept/73	Average ground.
62		228	-90°	445	10,345.5	9,998.4	2,685.3	24 Sept/73	27 Sept/73	Average ground.
63		20	-90°	428	10,524.6	8,421.6	2,790.0	27 Sept/73	29 Sept/73	Average ground.
64		231	-90°	366	10,343.0	10,299.2	2,675.51	28 Sept/73	5 Oct/73	Average ground.
65		139	-90°	428	10,822.5	8,859.2	2,787.0	29 Sept/73	1 Oct/73	Average ground.
66		29	-90°	328	10,742.8	10,003.3	2,652.1	6 Oct/73	7 Oct/73	Average ground.
67		151.5	-90°	379	9,936.0	10,309.4	2,705.8	17 Oct/73	19 Oct/73	Average ground.
68		33	-90°	378	10,817.6	10,518.3	2,625.3	7 Oct/73	10 Oct/73	Collar.
69		110	-90°	391	9,531.6	10,333.6	2,794.6	20 Oct/73	22 Oct/73	Average ground.
70		135	-90°	444	10,656.6	10.704.5	2,632.8	11 Oct/73	13 Oct/73	Average ground.
71		100	-90°	448	9,555.7	10,708.6	2,774.7	23 Oct/73	25 Oct/73	Average ground.
72		255	-90°	466	10,297.8	10,708.9	2,667.1	14 Oct/73	18 Oct/73	Average ground.
73		168.6	-90°	340	9,945.5	10,708.6	2,707.5	19 Oct/73	21 Oct/73	Average ground.
74		133	-90°	376	9,960.4	11,103.2	2,677.9	22 Oct/73	24 Oct/73	Highest support log.

MINTO DIAMOND DRILL HOLE DATA

HOLE NO.	BRG.	OB FEET	DIP	TOTAL DEPTH	NORTHING	EASTING	ELEVATION	DATE STARTED	DATE FINISHED	REMARKS
75		124	-90°	394	9,919.0	11,500.0	2,645.4	26 Oct/73	28 Oct/73	Drill Floor.
76		50	-90°	413	9,519.4	11,097.8	2,748.3	27 Oct/73	29 Oct/73	Average ground.
77		63	-90°	388	9,521.6	11,488.1	2,706.5	30 Oct/73	1 Nov/73	Drill Floor.
78		208	-90°	426	10,493.1	10,486.7	2,650.1	30 Oct/73	1 Nov/73	Average ground.
79		100	-90°	420	10,685.5	10,508.0	2,634.2	4 Nov/73	8 Nov/73	Average ground.
80		68	-90°	455	10,745.8	10,208.0	2,642.2	9 Nov/73	12 Nov/73	Drill floor.
81		176	-90°	448	10,478.0	10,157.3	2,674.6	13 Nov/73	16 Nov/73	Average grd. Proposed drillsite.
82		24	-90°	387	11,092.7	10,256.3	2,713.8	17 May/74	19 May/74	Average ground.
83		39	-90°	500	11,038.1	9,645.3	2,757.5	19 May/74	22 May/74	Average ground.
84		41	-90°	377	10,989.7	9,455.2	2,758.2	23 May/74	24 May/74	Average ground.
85		37	-90°	408	10,789.8	9,506.5	2,721.0	25 May/74	26 May/74	Average ground.
86		52	-90°	560	10,745.7	9,858.0	2,669.5	27 May/74	29 May/74	Average ground.
87		60	-90°	364.5	10,615.0	10,059.3	2,649.9	29 May/74	30 May/74	Average ground.
88		40	-90°	350	10,766.6	10,357.1	2,631.3	31 May/74	1 June/74	Average ground.
89		180	-90°	464	10,494.0	10,316.1	2,661.1	1 June/74	3 June/74	Average ground.
90		228	-90°	448	10,346.9	10,160.2	2,681.4	3 June/74	5 June/74	Average ground.
91		43	-90°	654	9,126.5	10,860.7	2,839.9	5 June/74	7 June/74	Collar
92		261	-90°	498	10,302.9	10,518.1	2,671.7	5 June/74	9 June/74	Average ground.
93		126	-90°	431	9,507.2	12,321.9	2,593.7	8 June/74	12 June/74	Average ground.
94		210	-90°	459	10,142.1	10,522.2	2,684.3	9 June/74	11 June/74	Average ground.
95		250	-90°	450	10,126.8	10,148.4	2,695.9	11 June/74	13 June/74	Average ground.
96		122	-90°	530	9,511.9	13,285.4	2,592.1	12 June/74	14 June/74	Average ground.
97		298	-90°	475	10,110.2	9,787.8	2,696.7	13 June/74	16 June/74	Average ground.
98		134	-90°	686	8,717.4	13,209.2	2,662.9	14 June/74	19 June/74	Average ground.
99		226	-90°	518	10,315.6	9,804.8	2,677.9	16 June/74	19 June/74	Average ground.
100		178	-90°	798	7,959.4	13,187.3	2,727.0	19 June/74	24 June/74	Average ground.
101		40	-90°	458	11,125.2	10,494.2	2,694.2	19 June/74	21 June/74	Average ground.
102		32	-90°	437.5	11,127.0	10,629.0	2,680.1	21 June/74	22 June/74	Average ground.
103		30	-90°	492	10,904.8	10,606.7	2,624.9	22 June/74	24 June/74	Average ground.
104		147	-90°	438	10,618.9	10,912.7	2,635.0	24 June/74	26 June/74	Average ground.
105		30	-90°	894	7,922.1	14,618.7	2,860.2	24 June/74	28 June/74	Average ground.
106		250	-90°	455	10,312.7	10,874.0	2,654.2	26 June/74	29 June/74	Average ground.
107		10	-90°	864	7,082.0	14,987.6	2,912.6	28 June/74	2 July/74	Average ground.
108		10	-90°	946	8,675.6	11,490.5	2,797.7	29 June/74	4 July/74	Collar
109		10	-90°	538	7,464.3	15,420.4	2,881.2	2 July/74	3 July/74	Average ground.
110		30	-90°	1088	7,885.7	11,128.8	2,874.5	4 July/74	7 July/74	110' Extended, 31 Aug/74-2 Sept/74

MINTO DIAMOND DRILL HOLE DATA

HOLE NO.	BRG.	OB FEET	DIP	TOTAL DEPTH	NORTHING	EASTING	ELEVATION	DATE STARTED	DATE FINISHED	REMARKS
111		10	-90°	678	8,439.8	15,431.8	2,867.4	3 July/74	5 July/74	Average ground.
112		40	-90°	810	7,841.2	10,344.7	3,007.8	7 July/74	10 July/74	Average ground.
113		56	-90°	798	7,193.3	13,819.9	2,824.4	5 July/74	7 July/74	Average ground.
114		49	-90°	738	6,381.4	13,849.4	2,863.0	7 July/74	9 July/74	Average ground.
115		10	-90°	278	5,494.0	14,691.9	2,941.6	9 July/74	10 July/74	Average ground.
116		10	-90°	698	7,197.2	9,950.2	3,117.6	10 July/74	12 July/74	Average ground.
117		20	-90°	594	6,264.1	14,775.4	2,926.7	10 July/74	12 July/74	Average ground.
118		10	-90°	732	8,597.2	9,665.0	2,932.8	12 July/74	14 July/74	Collar.
119		20	-90°	518	8,857.9	14,339.8	2,752.6	12 July/74	14 July/74	Average ground.
120		34	-90°	588	9,587.2	14,309.2	2,623.3	14 July/74	16 July/74	Average ground.
121		90	-90°	528	9,176.2	8,865.9	2,784.4	14 July/74	17 July/74	Average ground.
122		8	-90°	648	8,146.9	8,899.3	2,896.3	16 July/74	18 July/74	Average ground.
123		300	-90°	548	10,627.1	14,239.2	2,512.2	17 July/74	20 July/74	Average ground.
124		15	-90°	558	7,208.2	8,925.9	2,945.4	18 July/74	20 July/74	Average ground.
125		215	-90°	662	10,551.3	13,246.1	2,529.0	20 July/74	23 July/74	Average ground.
126		20	-90°	606	6,192.2	8,908.9	2,939.6	20 July/74	22 July/74	Average ground.
127		178	-90°	698	10,630.1	12,306.7	2,575.4	23 July/74	26 July/74	Average ground.
128		70	-90°	688	5,197.7	8,994.9	2,955.7	22 July/74	24 July/74	Average ground.
129		140	-90°	768	10,983.1	13,227.3	2,491.6	27 July/74	31 July/74	Average ground.
130		40	-90°	696	5,243.6	10,000.4	3,025.7	24 July/74	26 July/74	Average ground.
131		19	-90°	577	11,593.3	14,241.1	2,396.1	4 Aug/74	6 Aug/74	Average ground.
132		90	-90°	737	11,361.2	13,329.3	2,461.0	31 July/74	4 Aug/74	Average ground.
133		180	-90°	728	10,520.9	12,910.4	2,535.9	7 Aug/74	11 Aug/74	Average ground.
134		203	-90°	768	10,000.7	13,182.0	2,541.1	11 Aug/74	15 Aug/74	Average ground.
135		30	-90°	946	8,297.9	11,492.2	2,798.6	15 Aug/74	19 Aug/74	Collar
136		20	-90°	978	8,709.7	11,877.6	2,727.8	19 Aug/74	23 Aug/74	Average ground.
137		26	-90°	988	8,646.1	11,105.7	2,847.6	23 Aug/74	27 Aug/74	Average ground.
138		11	-90°	1098	9,059.9	11,480.0	2,786.6	27 Aug/74	30 Aug/74	Average ground.
139		17	-90°	1088	8,676.6	10,430.5	2,932.8	3 Sept/74	7 Sept/74	Collar.

CLAIM NO. ..... **DIAMOND DRILL RECORD** PROPERTY ..... HOLE NO. 42-73

LATITUDE 1102 0 N ELEVATION 2673.1 BEARING -90° DEPTH ..... STARTED ..... COMPLETED .....

DEPARTURE 1052 0 E SECTION ..... DIP ..... DRILLED BY ..... LOGGED BY .....

DEPTH FEET	FORMATION ALT	SAMPLE NO.	FROM	TO	WIDTH	ASSAYS Cu	oz. Ag	oz. Au	% Rec
0-21	Overburden	13706	44	54		0.36*	<0.01	<0.001	
21-143	21-22 Broken and ground core very well oxidized	13707	54	62		0.41*	0.01	0.001	
	leached and crumbly. Abundant limonite.	13708	67	77		0.39*	0.04	0.001	
	33-44 Rock fresher but still very weathered	13709	77	87		0.43*	<0.01	0.001	
	white biotite slightly porphyritic granite.	13710	87	93		0.46*	0.04	<0.001	
	44-62 Rock gneissic. Biotite foliation	13711	93	99		0.23*	<0.01	<0.001	
	80° to C.A. Minor malachite and cpy	13712	99	109		0.55*	0.06	0.004	
	62-67 Rock as 33-44. From 66-67 rock oxidized and	13713	109	119		0.36*	0.01	0.001	
	leached for one foot	13714	119	129		0.32*	0.01	0.001	
	67-93 Rock well foliated to gneissic	13715	129	141.5		0.29*	<0.01	<0.001	
	Minor malachite and cpy. From 78-80 rock broken	13716	141.5	143		0.06*	<0.01	<0.001	
	oxidized and leached. Gneissosity continues after								
	80'.								
	93-99 Fractured qtz-feld pegmatite 60° to C.A.								
	Malachite in fractures.								
	99-143 Rock is still gneissic. Biotite 15%								
	weakly mineralized with malachite and cpy @ 141.8'								
	a aplite dike 60° to C.H. with minor malachite in								
	fractures. Mineralization slightly improved with depth.								

CLAIM NO. .....

DIAMOND DRILL RECORD

PROPERTY ..... HOLE NO. 42-73

LATITUDE ..... ELEVATION ..... BEARING ..... DEPTH ..... STARTED ..... COMPLETED .....

DEPARTURE ..... SECTION ..... DIP ..... DRILLED BY ..... LOGGED BY .....

DEPTH FEET	FORMATION	ALT	SAMPLE NO.	FROM	TO	WIDTH	ASSAYS Cu	oz. Ag	oz. Au	% Rec
143-223.5	143-150 biotite 15% rock gneissic 80° to C.A.									
	150-168.5 Rock fresher, end of oxidation zone @		13717	143	153		0.29*	<0.01	<0.001	
	approx 150'. Mineralization slightly		13718	153	163		0.40	0.01	0.001	
	improved. Minor cpy and much lesser bn. Total		13719	163	168.5		0.54	0.03	0.002	
	sulfides 1%.		13720	168.5	179		0.72	0.06	0.002	
	168.5-184 Biotite increased to 20% and mineralization		13721	179	184		0.46	0.03	0.002	
	slightly improved. Sulfides fine grained and		13722	184	193		0.06	<0.01	<0.001	
	disseminated cpy and bn. Total 1%.		13723	193	203		0.39	<0.01	<0.001	
	184-193 Rock becomes more felsic. Biotite down to		13724	203	213		0.17	<0.01	<0.001	
	5-10%. Sulfides 1%. Not foliated except for a few		13725	213	223.5		0.16	<0.01	<0.001	
	6" sections.		13726	223.5	229		0.01	<0.01	<0.001	
	193-223.5 Rock begins to become more gneissic with									
	prominent biotite foliation starting at 195'. At 193' a									
	prominent fracture 45° to C.A. contains rock gouge.									
	Minor cpy and bn . Total 1%.									
	From 220' rock begins to contain increased									
	greenish plagioclase.									

CLAIM NO. ..... **DIAMOND DRILL RECORD** PROPERTY ..... HOLE NO. 42-73

LATITUDE ..... ELEVATION ..... BEARING ..... DEPTH ..... STARTED ..... COMPLETED .....

DEPARTURE ..... SECTION ..... DIP ..... DRILLED BY ..... LOGGED BY .....

DEPTH FEET	FORMATION	SAMPLE NO.	FROM	TO	WIDTH	ASSAYS % Cu	ASSAYS oz. Ag	ASSAYS oz. Au	% Rec
223.5-265	223.5-229 Rock Becomes non-foliated biotite hbl grano-	13727	229	232.5		0.32	0.01	0.001	
	diorite. Rock is slightly porphyritic and contains	13728	232.5	243		0.01			
	green plagioclase. Not mineralized.	13729	243	253		0.01			
	229 - 232.5 Gneissic rock well foliated 85° to C.A. with	13730	253	265		0.03			
	15-20% biotite. Lightly mineralized with minor pegmatite Pg								
	and cpy. sulfides .1%								
	232.5-253 Rock same as 223.5-229. Rock non-foliated lightly								
	chloritized and contains minor epidote and lesser calcaite.								
	Rock generally fresh but is bleached 1/2" either side Prop & Cal								
	of fractures 50° to C.A.								
	253-258.5 Rock more felsic with lumpy and sometimes								
	slightly foliated biotite. Trace cpy assoc. with the								
	better biotite.								
	258.5 -260 Qtz-feld pegmatite. Minor malachite in								
	fractures.								
	260-265 Rock as 253-258.5								
265-330	265-301.5 biotite 15-20% rock gneissic and contains	13731	265	275		0.20			
	minor cpy, py and lesser bornite. Total sulfides 1%. Peg	13732	275	285		0.19			
	Rock contains 30% greenish plagioclase, where	13733	285	295		0.27			
	plagioclase is increased rock is tougher and sulfides	13734	295	302		0.17			
		13735	302	303.5		0.01			

CLAIM NO.....

DIAMOND DRILL RECORD

PROPERTY..... HOLE NO. 42-73

LATITUDE..... ELEVATION..... BEARING..... DEPTH..... STARTED..... COMPLETED.....

DEPARTURE..... SECTION..... DIP..... DRILLED BY..... LOGGED BY.....

DEPTH FEET	FORMATION	ALT	SAMPLE NO.	FROM	TO	WIDTH	ASSAYS Cu	ASSAYS Oz. Ag	ASSAYS oz. Au	% Rec
	are reduced.		13736	303.5	308		0.14			
	301.5-302 Rock well altered and slightly brecciated		10737	308	309		0.01			
	1" of broken core, possible fault.		13738	309	319		0.22	<0.01	<0.001	
	302-303.5 Qtz - feld pegmatite									
	303.5 - 306 Rock well altered and slightly pegmatitic.									
	306-330 Rock same as 265-301.5. From Gr 308-309 a									
	qtz - feld pegmatite 50° to C.A.									
330-366	330-338 Section generally well altered, and west of section		13739	319	330		0.61	0.07	0.002	
	non-foliated. From 334-336 rock very porphyritic with		13740	330	338		0.25	0.01	0.001	
	1" laths of ortholcase. Minor cpy, bn.		13741	338	345		0.05			
	338-345 Rock gneissic from 338-339. Non foliated from		13742	345	350		0.06			
	339-345.		13743	350	356		0.23			
	345-356 Rock generally gneissic but some short sections		13744	356	360		0.03			
	not foliated.@ 347' a 3" pegmatite. For 1/2" on either		13745	360	366		0.31			
	side of this peg there is minor magnetite with minor									
	cpy and bn associated.									
	356-360 Rock altered non foliated and slightly pegmatitic									
	Not mineralized.									
	360-366 ROCK GNEISSIC. @ 361.5 2" of blebular cpy.									
	@ 363, a 6" qtz feld pegmatite 40° to C.A.									

CLAIM NO.

DIAMOND DRILL RECORD

PROPERTY

HOLE NO. 42-73

LATITUDE | ELEVATION | BEARING | DEPTH | STARTED | COMPLETED

DEPARTURE | SECTION | DIP | DRILLED BY | LOGGED BY

DEPTH FEET	FORMATION ALT	SAMPLE NO.	FROM	TO	WIDTH	ASSAYS Cu			% Rec
366-397	366-397 Rock slightly porphyritic and chloritized								
	hornblende biotite granite. Minor epidote. Not								
	mineralized. From 270 1/2 - 271 1/2 a qtz - feld								
	pegmatite 45° to C.A. From 384-386 a fine grained								
	dk green dacite dike 80° to C.A.								

DIAMOND DRILL RECORD

021335

CLAIM NO. ..... PROPERTY ..... HOLE NO. 44-73

LATITUDE 11,010.4N ELEVATION 2659.1 BEARING -90° DEPTH ..... STARTED ..... COMPLETED .....

DEPARTURE 10606.0E SECTION ..... DIP ..... DRILLED BY ..... LOGGED BY .....

DEPTH FEET	FORMATION	SAMPLE NO.	FROM	TO	WIDTH	ASSAYS Cu	oz. Ag	oz. Au	% Rec
0-30	Overburden								
30-135	30-50 Broken core. Weathered and leached white biotite granite.	13778	50	60		0.20*	0.01	<0.001	
	Minor limonite sericite, chlorite. From 48-50 biotite Chl	13779	60	70		0.29*	0.01	0.001	
	increases to 25% of rock								
	50 - 85.5 Rock same as 30-50 but better weathered								
	and containing more biotite which is sometimes foliated								
	80° to C.A. Trace malachite starts @ 51' but is Mag	13780	90	102		0.35*	<0.01	<0.001	
	not consistent. Minor magnetite and hematite. Biotite	13781	102	112		0.34*	0.01	<0.001	
	decreased to 10-15% after 72.5'	13782	112	122		0.56*	0.01	0.001	
	85.5 - 102 rock varies from foliated to non-foliated.	13783	122	130		0.23*	<0.01	<0.001	
	Biotite 10-15%. Not mineralized								
	102-135 biotite increases to 15-20% and rock is Bio								
	gneissic. Minor malachite throughout. Minor cpy starts								
	@ about 107'.								

CLAIM NO. ..... **DIAMOND DRILL RECORD** PROPERTY ..... HOLE NO. 44-73

LATITUDE ..... ELEVATION ..... BEARING ..... DEPTH ..... STARTED ..... COMPLETED .....

DEPARTURE ..... SECTION ..... DIP ..... DRILLED BY ..... LOGGED BY .....

DEPTH FEET	FORMATION	ALT	SAMPLE NO.	FROM	TO	WIDTH	ASSAYS Cu	ASSAYS oz. Ag	ASSAYS oz. Au	% Rec
135-228.5	135-186.5 Rock gneissic. Biotite 10-15%									
	Rock slightly oxidized. Minor malachite		13746	130	140		0.60*	<0.01	0.002	
	& cpy. After 145' only traces of malachite		13747	140	150		0.36*	<0.01	0.001	
	left and cpy improved. Also minor bornite.		13-48	150	160		0.46*	<0.01	<0.001	
	Gneissosity 65° to C.A.		13749	160	170		0.46*	0.03	0.002	
			13750	170	180		0.50*	0.04	0.001	
	136.5 -194 Non foliated granodiorite. Slightly		13751	180	186.5		0.33*	0.01	0.001	
	porphyritic. Minor epidote. Not mineralized	Ep	13752	186.5	194		0.01	<0.01	<0.001	
	at 192' a major fracture 40° to C.A. Rock well		13753	194	202		0.55	<0.01	0.001	
	altered 2" either side of fracture.		13754	202	211.5		0.29	<0.01	<0.001	
	194-211.5 ROCK GNEISSIC. Feldspars are bleached	Bio	13755	211.5	220		0.01			
	Biotite 10-15%. Minor cpy and lesser Bn. Total		13756	220	228.5		0.01			
	sulfides 1%. From 202-203 an aplite dike 50°									
	to C.A.									
	211.5 -228.5 From 211.5-212 a 6" qtz feld peg 40° to									
	C.A. and rock pegmatitic for 2'. Rock becomes chlor-									
	itized biotite hnblende non foliated barren grano-									
	diorite									

CLAIM NO. ..... **DIAMOND DRILL RECORD** PROPERTY ..... HOLE NO. 44-73

LATITUDE ..... ELEVATION ..... BEARING ..... DEPTH ..... STARTED ..... COMPLETED .....

DEPARTURE ..... SECTION ..... DIP ..... DRILLED BY ..... LOGGED BY .....

DEPTH FEET	FORMATION	ALT	SAMPLE NO.	FROM	TO	WIDTH	ASSAYS Cu	oz. Ag	oz. Au	% Rec
228.5-282	228.5 - 240 Rock gneissic. Biotite 10-15%	Mg	13757	228.5	240		0.12			
	Minor magnetite and hematite at start of section @ 232'		13758	240	252		0.01			
	with a 6" qtz flooded section with minor pyrite in the	Py	13759	252	258		0.12			
	foliated mafics. Gneissic sections contain minor		13760	258	265		0.01			
	py and cpy. From 236-238 silicified section containing		13761	265	275		0.01			
	fine grained magnetite and hematite. Biotite con-		13762	275	282		0.01			
	centrated in a few short intervals. Py : Cpy; 60:40.	Py	13763	282	292		0.35	<0.01	<0.001	
	Rock gneissic again up to 240.		13764	292	298		0.40	0.01	0.001	
	240-282 Non foliated slightly porphyritic and chlor-									
	itized biotite hbl. barren granodiorite. From 252-									
	255 rock foliated and gneissic and contains minor cpy									
	From 279-280 a qtz feld pegmatite									
282-329	282-298 Rock gneissic again. Biotite 10-15%		13765	298	303		0.25	<0.01	< 0.001	
	Minor cpy, bn Total 1%		13766	303	307		0.01	< 0.01	< 0.001	
	@ 286 an 8" qtz feld pegmatite		13767	307	311		0.31	< 0.01	< 0.001	
	298-303 Rock is orange-red orthoclase		13768	311	321		0.46	0.04	0.002	
	and gneissic with chlorite foliation	Chl	13769	321	333		0.23	0.03	< 0.001	
	Trace cpy	K	13770	333	343		0.15	< 0.01	< 0.001	
	303-307 Light green fine grained dike containing									

CLAIM NO. ..... **DIAMOND DRILL RECORD** PROPERTY ..... HOLE NO. 44-73

LATITUDE ..... ELEVATION ..... BEARING ..... DEPTH ..... STARTED ..... COMPLETED .....

DEPARTURE ..... SECTION ..... DIP ..... DRILLED BY ..... LOGGED BY .....

DEPTH FEET	FORMATION	ALT	SAMPLE NO.	FROM	TO	WIDTH	ASSAYS Cu	ASSAYS oz. Ag	ASSAYS oz. Au	% Rec
	phenocrysts of hornblende .									
	Dike is tough but lightly brecciated and altered.									
	Not mineralized.									
307-311	Rock as 298-303									
311 -325	Rock generally not foliated but very well altered.	Chl Ep								
	Chlorite, epidote K-feld. Fractured 45° to C.A.	K								
	Cpy and much lesser bn finely disseminated and blebular.									
	325-329 Rock less altered and lightly foliated.									
	Disseminated cpy and bn.									
329-412	329-369 Rock well foliated grading to gneissic.									
	Biotite 15-20%. Matrix essentially greenish		13771	343	353		0.35	0.03	0.001	
	plagioclase with lesser qtz. Finely disseminated	Qtz	13772	353	363		0.41	0.03	0.001	
	cpy and bn. Mineralization is not consistent		13773	363	369		0.49	0.10	0.003	
	Amount of qtz appears to be one control.		13774	369	382		0.17			
	Feldspars bleached from 340-344 and minor kaolinite		13775	382	395		0.01			
	present.		13776	395	405		0.01			
		Chl	13777	405	412		0.05			
	369-382 Rock grades to chloritized biotite hornblende									
	granodiorite. Not foliated and barren.									

CLAIM NO. .....

DIAMOND DRILL RECORD

PROPERTY ..... HOLE NO. 44-73

LATITUDE ..... ELEVATION ..... BEARING ..... DEPTH ..... STARTED ..... COMPLETED .....

DEPARTURE ..... SECTION ..... DIP ..... DRILLED BY ..... LOGGED BY .....

DEPTH FEET	FORMATION	ALT	SAMPLE NO.	FROM	TO	WIDTH	ASSAYS Cu			Rec
	382-412 rock very well altered. Chlorite, reddish	Ep								
	orange K-feld, epidote, calcite, Kaolinite	Cal								
	Pegmatitic section 390-391. From 395-412 rock contains very lightly disseminated sulfides.									
412-413	412-423 - rock grades to roughly equigranular hornblende biotite									
	barren white-grey granodiorite.									

DIAMOND DRILL RECORD

CLAIM NO. ..... PROPERTY ..... HOLE NO. 75-73

LATITUDE 9 + 919 N ELEVATION 2645 BEARING -90° DEPTH 394 STARTED ..... COMPLETED .....

DEPARTURE 11 + 499 E SECTION ..... DIP ..... DRILLED BY ..... LOGGED BY Hubbard

DEPTH FEET	FORMATION		SAMPLE NO.	FROM	TO	WIDTH	ASSAYS			
0-124	Overburden		93927	124	134	10	<0.01			95%
124-196	Biotite granite gneiss - B foliation parallel to C.A. (Weathered &		93928	134	144	10	<.01			90%
	broken up) Potassic altn along fractures, few secondary feldspars(K)		93929	144	154	10	<.01			95%
	125-126 silicified pegmatite -no contact recovered		93930	154	164	10				100%
	visually garren		93931	164	174	10	.01			60%
	149 - concentration of mafics - no economic mineralization		93932	174	184	10	.03			50%
	153.5 - Leached sulfides - likely chalcopyrite- chlorite altn		93933	184	196	12	.03			60%
	155 - pegmatite vein 3" - 60° to C.A.									
	164-177 potassic altn increasing to heavy									
	168 - quartz vein 1/4" 85° to C.A.									
	(Note: - areas of A foliated granite gneiss should be considered									
	foliated granite)									
	177.2 - fracture with C foliation above fracture, fracture and quartz									
	injection along fracture contains chalcopyrite, magnetite, malachite									
	178.2 - 191, intense chloritic altn, moderate potassic altn									
	181 - magnetite common in core now									
	187 - chalcopyrite increasing but still mostly leached out									
	- foliation now "C" at about 50° to C.A.									
	K-spar porphyroblasts increasing.									
196-257.6	Biotite hornblende granite porphyry - K-spar phenocrysts		93934	196	200	4	<.01			90%
	Potassic altn heavy, chlorite altn common			200	211					50%
	throughout core. Biotite ~ 12% hornblende ~ 3%			211	221					70%
	potassic altn greatest along fractures			221	231					100%
	197.5 - pegmatite vein 20° to C.A. 2"			231	241					100%
	221 - pegmatite fragments no contact recovered			241	251					95%
	231.3 peg 3", 45° to C.A.			251	257					100%
	243 - potassic and chloritic altn increasing		93935	257	263	6	<.01			100%
	251 - 252.5 peg vein 45° to C.A.									
	255 hematite on fracture parallel to C.A.									
	255.4 - 1" silicified peg ~ 30° to C.A.									
257.6 -263	Biotite granite gneiss - A foliation- K-spar porphyroblasts									
	Light potassic altn, med chloritic altn throughout core. No									
	economic mineralization, but sampled anyway. Foliation ~ 30° - 45°									
	to C.A. Barren									
263 -394	Biotite hornblende granite gneiss - K-spar phenocrysts -									
	chloritic altn common, potassic altn common along fractures.									
	Biotite ~ 12%.									
	268.5 - Hematitie stain along fracture & 5° to C.A.			263	273					100%
	~~269, 7" section 45° to C.A.~~			~~273~~	~~283~~					~~100%~~

CLAIM NO.

DIAMOND DRILL RECORD

PROPERTY

HOLE NO. 75-73

LATITUDE | ELEVATION | BEARING | DEPTH | STARTED | COMPLETED

DEPARTURE | SECTION | DIP | DRILLED BY | LOGGED BY

DEPTH FEET	FORMATION	ALT	SAMPLE NO.	FROM	TO	WIDTH	ASSAYS Cu			Rec
	275 - epidote on fracture - 45° to C.A.			283	293					100%
	277 - Increase in biotite to ~ 15% and few hornblende phenocrysts			293	303					100%
	285-288 peg vein, 50° to c.a.			303	313					95%
	292.8 - magnetite concentration in 4" of A foliated rock			313	323					100%
	294.5 - 2 1/2" peg vein - 45° to C.A.			323	333					100%
	303 - epidote on fracture altn (Potassic and chloritic) increasing			333	343					90%
	307 - Core well fractured, altd. Secondary quartz and feldspar									
	310 - minor shear 4" epidote, breccia 45° to C.A.									
	316 - 1" peg ~ 20° to C.A.									
	319 - 20.5, intense altn, then silicification									
	Quartz vein ~60° to C.A., Secondary quartz and K-spar									
	334 - Peg vein 45° to C.A.									
	343.5 - Peg vein 55° to C.A.									
	351, peg vein 45° to C.A. 2"			343	353					100%
	377 - peg vein 45° to C.A.			353	363					100%
	378 - intense potassic and chloritic and propylitic altn			363	373					100%
	SEcondary K-spars, Qtz and calcite injections and veins			373	383					90%
	382 - Minor shear - epidote breccia, 2", 45° to C.A.			383	394					95%
	392 - Silciified peg, 3" , 45° to C.A.									
	394- END OF HOLE									

NOTE 1: Number denotes relative abundance 10:1:5

NOTE 2: % by volume
* Specularite

NOTE 3: P - Pervasive
L - Localized strength
Tr - Trace
W - Weak
M - Moderate
S - Strong
Ex. P-S - Pervasive - Strong

NOTE 4: Key for rock type 4 letters max.

ASARCO — DDH LOG

MINTO PROJECT

NOTE 5: UC - Contact (Upper)
LC - Contact (Lower)
Dik - Dike
Flt - Fault
Frc - Fracture
Gge - Gouge
Shr - Shear
Stk - Stockwork
Vn - Vein
Vlt - Veinlet

NOTE 6: Type
W - Weak
M - Moderate
I - Intense
G - Gneissic

HOLE No. 96 Page 1 of 1

Lat. 9,511.9 Dep. 13,285.4

Ele 2,592.1 T.D. 530 Dip 90°

Logged by M.J. Whiticar Bearing ____ Date S. 12/6/74 Fin 14/6/74

FROM	TO	SAMPLE No.	(1) ECONOMIC MINERALS						(2) Fe MINERALS				(3) ALTERATION										(4) ROCK TYPE	ROCK COMPOSITION						(5) STRUCTURE			FOLIATION		REMARKS
			Cpy	Born	Native	Sph	Gal	Mo	Py	Mag	Hm	Lim	Ox	Orth	Qtz.	Ser	Biot	Chl	Ep	Carb	Anhy	Clay		Orth	Plag	Qtz	Pyx	Biot	Hbl	Type	Depth	∡ to CA	Degree	∡CA	
0	122																																		Overburden
122	125											M	SP	M		TR		W		S		M	C							FRC	124	35°			Volcanic conglomerate; sub-round-rounded grains ↑ 1/2" bio fresh
																																			grain crystals good condition, no orient pref, Si/Fe/Cal cement
125	138											M	SP	ML		W		TR		S		M	C												125-8 pebble conglom (orth, qtz); 128-30 ox KPG massive & chunks
		128.5-129	brown Ox vol material						with G rounded				pebbles		5" no				129-32 high Ox G (KPG)																(WFol) sericite probably still KPG chunks; 132-35.5 pebble conglom ↑ 2" rounded 135.5-38. Small 3/4" pebble conglom all rock types alligned 85° & Large boulders @ 150 and 168 ~ flat lineated.
138	168											M	MPSL	M				ML		M		M	C												Mainly KPG weathered and boulders ↑ 18" lying flat; sections of
168	223											W	ML	M				M		M		WL	KPG C	7	70	6		15							
		Pebble congl. @ 198-210 intermixed with KPG																																		finer grained green matrix conglo layer at 237-47 med cemented preferential
223	247										TR	WL	M	W				M	WL	M		WL	C							SLK	241.5	60			
		aligned @ 75-80° cut @ 242.5 by ortho fs peg - 45°																																		Unconformable layering high or in places, interlaced with conglom.
247	254.5												MW	M		TR	W	M	W	W		W	FKPG	8						FRC	253	40	W-M	80	
254.5	311	See note for description C/KPG																																		Biotite in large books ↑ 3/4" usually 3/8" & chloritized; Kspar pheno poorly defined & indurated, F.D. 45 pebble congl @ 327 in gouge zone. Fpd abundant with chl/bio pyroxenylite in gouges. hbl partly altered. Orth enrich @ 337 contact grad. FD = 0 Garnets assoc with bio/chl (almandine-dodecahedrons)
311	352											TR	TR	W				M-SP	MP	TRL			WFBKPG	8	73	6		12	1-2	FRC Gge	329 215,221,24,25	20 45	W	80	Texture becoming somewhat less distinct Orth feldspar banding in places. ~30 (not frac fill) qtz epid along frac; Kspar ↑ & peg enrich & banding ~30° bio/chl some bent.
352	353																	M	W				FG	4	75	3		18				F.Gr.	S	55	
353	396									TR				W				M	SL W	TR			FG(MG)	10	70	7		13		FRC	Common 397, 99,	25	W		
396	406	0251									TR	TR		W				M	M				MG	12	68	6		14		FRC	406	19	VW	85	
406	408	0252			1									W				MS	M SL				FG	5	74	5		16		FRC	407	70	S	85	fine lamination (foliature) ep in frac, native Cu in qtz/plag veinlet
408	416	0253								TR				W				MS	ML				FG	11	69	5		15		FRC Dik Ofs	406.5 411	20 55			Foliated VW in places bio/chl appear blotch and bent
416	486										TR			W				MS	ML				BKPG MG	9	72	5		14		FRC Dik Ofs	Common 451, 473-5	40 45			Shear large zone @ 458 SLK @ 30° local bio enrich @ 480' distinct deformed foliated zones in BKPG @ 436 ~ 85° alternate fine-grained qtz/plag non fol with foliated; braided cp at 484 ~ 50°.
486	494													M				M	MS	TR			MG	9	74	4		13		Dik Apl	490	50	W	85	Shear foliation at 490 below dike; aplite cut older Kspar Peg in G
494	503																						AND-Hfl	20	55	5-10		5-10	5-10	FRC(Cal)	503	40			Andesite compn → hornblende hornfels? cold implaced dike; MG frag (4") in dike.
503	530										W			W				M	SL	TR			MG	8	71	7		14		FRC FRC	Common Common	40 10			2" epid/hem zones high fract, shear foliation at 503 ortho feldspar dike at 518
																																			Light frac zone at 508-10, hbl hfs dike same as above at 504 @ 45°.

HOLE Nº. 96-74 Page 1 of 1

PROJECT Minto

Lat. 9,511.9 Dep. 13,295.4

Ele. 2592.1 T.D. 530' Dip 90°

Bearing _____ Date S. 12 Jun/74 Fin. 14 Jun/74

SAMPLE Nº.	INTER	TOTAL COPPER	NON SULPHIDE COPPER	Oz Ag	Oz Au			CORE RECOVERY %	SPECIFIC GRAVITY	REMARKS
0251M	396-406	.01		.01	<.003					
0252	406-408	.01		<.01	<.003					
0253	408-416	.01		<.01	<.003					

NOTE 1: Number denotes relative abundance 10:1:5

NOTE 2: % by volume
* Specularite

NOTE 3: P - Pervasive
L - Localized strength
Tr - Trace
W - Weak
M - Moderate
S - Strong
Ex. P-S - Pervasive - Strong

NOTE 4: Key for rock type 4 letters max.

ASARCO — DDH LOG

MINTO PROJECT

NOTE 5: UC - Contact (Upper)
LC - Contact (Lower)
Dik - Dike
Flt - Fault
Frc - Fracture
Gge - Gouge
Shr - Shear
Stk - Stockwork
Vn - Vein
Vlt - Veinlet

NOTE 6: Type
W - Weak
M - Moderate
I - Intense
G - Gneissic

HOLE Nº. 100 Page 1 of 2

Lat. 7,959.4 Dep. 13,187.3

Ele. 2,727.0 T.D. 798 Dip 90°

Logged by M.J. Whiticar

Bearing ____ Date S. 19/6/74 Fin. 24/6/74

FROM	TO	SAMPLE Nº.	(1) ECONOMIC MINERALS						(2) Fe MINERALS				(3) ALTERATION										(4) ROCK TYPE	ROCK COMPOSITION						(5) STRUCTURE			FOLIATION		REMARKS
			Cpy	Born	Mal	[illegible]	[illegible]	[illegible]	Py	Mag	Hm	Lim	Ox	Orth	Qtz.	Ser	Biot	Chl	Ep	Carb	Anhy	Clay		Orth	Plag	Qtz	Pyx	Biot	Hbl	Type	Depth	∠ to CA	Degree	∠ CA	
0	178																																		
178	236									W	TR	TR	S-M	TR		W		W	WL	W			KPG/FKPG	12	67	10		11		Dik Ofs	212	85			Overburden Hem breccia @ 188 (poor core) main rock KPG with lar-er book biot.
236	328									TR	W	TRL		W		TRL		MP	WP	TR			BKPG	14	65	7		12-14	0-2	FRC Dik Ofs Dik Apl	219 253,307,273 360	40 50 40	 Trend VWL	 85	FD = 0-3 FD = 1 Biot generally 1/2" books; Musc P. Hem assoc with bio/chl musc.
328	332										TR			W									Ortho Fs	60		35		3-5		UC LC	328 332	 50			Braided fractures of at 330 - Hem w/fracts musc.
332	342	0293									TR	TRL		TR				MP	TRP	TR			KPG	12	66	10		12		FRC	341	30			FD = 1 Lim in fract. biotite starting to get smaller
342	352	0294			1	1					MP	W		W				MP	WL				KPG(AG)	11	67	10		12		FRC	349	50	W	45	FD = 8 Cu primarily along fract; Kspar/ep/chl alternation. High frac may be movement.
352	362	0295								W	WL	WL		W				MP	TR	TR			(KP)G	12	70	8		10		FRC	Common	60			same fract. FD=3 lim in fract bio books smaller & chloritized; ortho/hem enrich along
362	372	0296						1			TR	TR		W				MP	TR				G	12	70	8		10		Dik Ofs Dik Apl	364 365	50 50			FD=1 @ 70° dike at 364 has crystalline aplite in center orthofeldspar margin
372	382	0297									TR			TR				M	TR				G	12	70	8		10		FRC	380	55			FD = 1
382	424									TR	W	ML		WL				M	TR	TR			(M)G/G	14	63	8		15		Dik Ofs FRC	402 399	 16			FD= 1 orthodike emplaced while host molten, mixed boundaries, fingers, etc.
424	434	0298								TR	W	ML		WL				M		TR			G	11	67	10		12		Dik Ofs FRC Ep	427 432	30 40	 WF	 10	Mottled qtz ep dike in orthofeldspar dike opposite direction. FD = 2 mottled, plag competent weak altn biot streaked, plag surrounded by
434	444	0299						1		TR	W	WL		WL				M	TR	WL			G	16	62	8		14		FRC Mt dz Ep	442 443	20 60	 W	 50	Kspar. FD = 5 Mottled; ortho enriched 442-3. Ca long fract.
444	454	0300								TR	ML	WL		MP				M	W-ML	WL			FG	18	62	9		11		Dik Ofs FRC	444.5 451	60 20	 I-W	 60	appearance. FD = 5, mottled, shear zone, hem in frac, marked K alt, auger gneissuidal
454	512										ML			WP				MP	TR	TR			G	11	69	7		13		Dik Ofs FRC	505 Common	 90	 VW	 60	FD = 1 epid in frac. low altn mod biot books
512	522	0401	1	1				1		W	ML	TRL		TR				MP	TR	MP			G	11	70	6		13		Slk FRC	Common Con (cnsd)	90 #)			@ 514.
522	543									TR	TRL	TR		TR				M-W	TR-WL	WL			G	11	68	7		14							FD=5-10 ep/hem/chl in frac faults. Mineralization restrict to 1 frac zone
543	555	0402	1	1							TRL	TRL						M-W	W	TR			KPG	19	62	10		14		Dik Opl Dik ofs/cp FRC	334 552 550	30 50 50	W	40	plag. FD = 1 local bio enrich @ 540, zones (4") tight foliated bands albite rich
553	578	68 78 0403									TRL			W				M	W	TR			KPG AG	24	50	13		13		Dik Ofs	553,64-5, 78 573	40			FD = 1 Cu along 1 frac @ 547 only. zone/indurated Kpheno (albite plag).
578	588	0404	5	1					2		W			W				W	TR				FAG G	9	70	7		14		Contact FAG/G	578 583.5	 50	 M	 50	FD = 2 zoned Kspar 1.5" pheno, hem/ep strong in fract. High K altn/enrich. FD = 4 strong foliated 78-83 high plag altn.; cpy in bio.
588	598	0405																W	TR				G	4	74	7		15		FRC FRC	593 593-98	50 0			FD = 1 equigranular G small bio/chl plates - odd pheno Kspar.
598	642								lovrib ntion @ 616					W				W					KPG	10	69	7		14		FRC Dik Apl	Common 637	85 35			FD = 1 ep/calcite in frac, 1.5" pheno, equigranular bio.
642	652	0406							"					W				W					KPG	10	69	7								
652	662	0407	4	2				1	1	M-SP	WP			TR				W					FG	10	70	6		14		FRC Dik	Common 652	20 80	 I M	 Varies	bio. foliates FD =3 mottled in spots, heavy plag altn bio flow around Fs grains, Cu along
662	672	0408	3	1						TR	TRP			TR				W	TR	TR			FG	11	71	6		12		FRC	Common	40	W	50	FD = 1 ortho enriched @ 663.
672	682	0409	3	1						TR	TR							W	W-TR	TR			FG	11	71	6		12		Dik	681		W	50	FD = 1 rock low altn, cpy tarnished.

NOTE 1: Number denotes relative abundance 10:1:5

NOTE 2: % by volume
* Specularite

NOTE 3: P - Pervasive
L - Localized strength
Tr - Trace
W - Weak
M - Moderate
S - Strong
Ex. P-S - Pervasive - Strong

NOTE 4: Key for rock type 4 letters max.

ASARCO -- DDH LOG

MINTO PROJECT

NOTE 5: UC - Contact (Upper)
LC - Contact (Lower)
Dik - Dike
Flt - Fault
Frc - Fracture
Gge - Gouge
Shr - Shear
Stk - Stockwork
Vn - Vein
Vlt - Veinlet

NOTE 6: Type
W - Weak
M - Moderate
I - Intense
G - Gneissic

HOLE Nº. 100 Page 2 of 2
Lat. 7,959.4 Dep. 13,187.3
Ele. 2,727.0 T.D. 798 Dip 90°
Logged by M.J. Whiticar
Bearing ____ Date S. 19/6/74 Fin. 24/6/74

FROM	TO	SAMPLE Nº.	(1) ECONOMIC MINERALS						(2) Fe MINERALS				(3) ALTERATION									(4) ROCK TYPE	ROCK COMPOSITION						(5) STRUCTURE			FOLIATION		REMARKS
			Cpy	Born		Sph	Gal	Mo	Py	Mag	Hm	Lim	Ox	Orth	Qtz.	Ser	Biot	Chl	Ep	Carb	Anhy	Clay		Orth	Plag	Qtz	Pyx	Biot	Hbl	Type	Depth	∡ to CA	Degree	∡CA	
682	692	0410	2	1							W			W-M				W	W	TR			FAG	9	68	8		16		Frc Dik	687 691,684.5	40 65	M	90	FD = 4 possible fault zone 687, mottled alt'd plag, bio concn zones.
692	702	0411	2	1						TR	TR			TR				TR	TR	TR			FAG	9	69	8		15		Frc/Stk Dik	693 696	20/90	W	45	FD = 2, heavy bio concn.
702	712	0412	2	1							TRL			W				TR	TR	TR			FG	12	59	9		20		Dik Dik	707,709	707,709	30	50	W	FD = 1 Kpheno rounded, eroded very weak mottle.
712	722	0413	1											W				W	TRP	TR			FG	10	66	9		15		Frc Dik Ofs	719 715	25 40	M	55	FD = 1 ep around bio/chl
722	732	0414	2	1										W				W	TR	TR			FAG	9	70	8		13		Frc	728	30	M	55	FD = 1 K enrich @ fract + lim bio lamella.
732	742	0415									TR			M				M	ML	W			KPG	10	67	10		13		Dik Qtz K	737	40			FD = 1 zone Kspar bio sm.ll books
742	798									TR				W				M	M	W			KPG (AG)	12	65	9		14		Dik Ofs	753,5	45			FD = 1/.5 heavy K enrich zones with chl (pink/green) along frac pyrophyllite fract. Confused fracture 1/4" bands of ca/ep/hem & qtz/ep in frac, zoned Kspar pheno 2" possible elongate horizontally.

PROJECT MINTO

HOLE Nº. 100 Page 1 of 2

Lat. 7,959.4 Dep. 13,187.3

Ele. 2,727.0 T.D. 798 Dip 90°

Bearing ____ Date S. 19 June Fin. 24 June/74

SAMPLE Nº.	INTER	TOTAL COPPER	NON SULPHIDE COPPER	Oz Ag	Oz Au			CORE RECOVERY %	SPECIFIC GRAVITY	REMARKS
0293M	332-342	.03		<.01	<.003					
0294	342-352	.07		<.01	<.003					
0295	352-362	.02		<.01	<.003					
0296	362-372	.02		<.01	<.003					
0297	372-382	.01		<.01	<.003					
0298	424-434	.01		<.01	<.003					
0299	434-444	.01		<.01	<.003					
0300	444-454	.01		.06	<.003					
0401	512-522	.03		<.01	<.003					
0402	543-553	.03		<.01	<.003					
0403	568-578	.01		<01	<.003					
0404	578-588	.23		.01	<.003					
0405	588-598	.01		.01	<.003					
0406	642-652	.01		<.01	<.003					
0407	652-662	.65		.04	.003					
0408	662-672	.13		.03	<.003					
0409	672-682	.32		.04	<.003					
0410	682-692	.25		.03	<.003					

HOLE Nº. 100 Page 2 of 2

PROJECT Minto

Lat. 7,959.4 Dep. 13,187.3

Ele. 2,727.0 T.D. 798 Dip 90°

Bearing _____ Date S. 19 June Fin. 24 June/74

SAMPLE Nº.	INTER	TOTAL COPPER	NON SULPHIDE COPPER	Oz Ag	Oz Au			CORE RECOVERY %	SPECIFIC GRAVITY	REMARKS
0411M	692-702	.41		.06	<.003					
0412	702-712	.25		.03	<.003					
0413	712-722	.27		.04	<.003					
0414	722-732	.11		<.01	<.003					
0415	732-742	.01		<.01	<.003					

ASARCO — DDH LOG

MINTO PROJECT

091335

HOLE No. 101 Page 1 of 2

Lat. 11,125.2 Dep. 10,494.2

Ele. 2,694.2 T.D. 458 Dip 90°

Logged by J.R. Petura Bearing ____ Date S. 19/6/74 Fin. 21/6/74

NOTE 1: Number denotes relative abundance 10:1:5

NOTE 2: % by volume
* Specularite

NOTE 3: P - Pervasive
L - Localized strength
Tr - Trace
W - Weak
M - Moderate
S - Strong
Ex. P-S - Pervasive - Strong

NOTE 4: Key for rock type 4 letters max.

NOTE 5: UC - Contact (Upper)
LC - Contact (Lower)
Dik - Dike
Flt - Fault
Frc - Fracture
Gge - Gouge
Shr - Shear
Stk - Stockwork
Vn - Vein
Vlt - Veinlet

NOTE 6: Type
W - Weak
M - Moderate
I - Intense
G - Gneissic

FROM	TO	SAMPLE No.	(1) ECONOMIC MINERALS						(2) Fe MINERALS				(3) ALTERATION										(4) ROCK TYPE	ROCK COMPOSITION						(5) STRUCTURE			FOLIATION		REMARKS
			Cpy	Born	Mal	Sph	Cuprite Cpt	Mo	Py	Mag	Hm	Lim	Ox	Orth	Qtz.	Ser	Biot	Chl	Ep	Carb	Anhy	Clay		Orth	Plag	Qtz	Pyx	Biot	Hbl	Type	Depth	∢ to CA	Degree	∢ CA	
0	48																																		Overburden
48	118											1	MP										G	9	68	11		10		FRC	110	45,0,85			Orthophenocrysts; stain 78; Ox is Sp till 70's; F.D. 2.5.
118	128	345			1							1	MP										G	9	68	11		10							F.D. = 3
128	138	346	1		5							TR	WP										FAG	20	55	14		10		FRC	133	45	M	50	Stain -129; F.D. = 3.5.
138	148	347	3		1		1					TR	WP										FG	12	67	8		12		FRC	141	85	M	80-60	F.D. = 3.5, cuprite & malachite in localized strongly oxidized 8" zone at 143'. Stain 145'.
148	158	348	16	1								TR	WP										KPFG	10	67	7		15					W	70	F.D. = 2; grades into Minto granodiorite 157-158; Small orthophenocrysts
158	168	349	20	1									WP										MG	18	61	7		13		Dik Plag Rich Frc	159-159.3	30	SL	85	70% Minto granodiorite; rest foliated locally; rocks break along foliation. F.D. = 2.
168	178	350	1								TR		WP										KPFG	16	63	7		13					W	75	F.D. = 2; Orthophenocrysts.
178	188	351	1																				FG	16	63	7		13		Dik 1 2	184 186-88	50 80	M	85	FD =2; Dik 1 (6")-v. fine grained 80% plag, 1 Orth, 10 Qtz, 10 Bio, Dik 2, fine grained.
188	198	352	20	1																			FG	14	65	7		13					M	60	FD = 1; Tends to be gneissic 190-191
198	208	353	1										WP										FG	12	67	7		13					WL	60	FD =1, tends to be gneissic locally; has 15% Minto granodiorite
208	218	354	1										WP										FG	10	67	9		13					M	65	FD = 3
218	222	355	1																				FG	17	60	9		13					M	35	FD = 3
222	228	356									TR													30	54	15		1							Coarse grained dike; barren, FD = 3
228	238	357	1		(CPY:Py=3:1)				1														FG	17	60	9		13		FRC		Follow Foliation	SL	50	Garnet crystals; FD = 3
238	248	358	1		(CPY:Py=1:2)				1										1				FG	20	60	7		10		FRC	242	35	ML	60	Stain 247, FD = 1.3
248	258	359	19		1							TR	ML						TR				FG	20	60	9		10					ML	90	Foliation stops at 250 except for a foliated 1' section centered 254, FD=2
258	268	360										TR		ML				4	1				KPG	10	62	16		6		FRC	263	50			Stain 250; orthophenocrysts, Qtz crystals have preferred orientation; Orth contains plag and bio, FD = .5
268	294										TR	TR		ML				5	1				KPG	10	62	16		5		FRC	284	40 & 55			FD = 2
294	304	361	1															5	1				KPG	6	62	20		5		FRC	298	40			Stain 304, FD = 2
304	314	362	1		(CPY:Py=1:1)				1									1	1				FG	9	60	18		10		FRC	307	60	ML	50-70	FD = 2
314	324	363	19	1															1				FG	16	59	9		14		FRC		Follow Foliation	M	70	FD = 3, somewhat gneissic with some contortins and augens
321	334	364	1									TR							1				FG	12	60	12		14		FRC		Follow Foliation	M	70	FD =2; around 324, 3 or 4 veinlets of v. fine grained, host rock compositic
334	344	365	19	1							TR			WL					1				FG	12	60	12		14		FRC		Follow Foliation	M	60	FD = 3
344	354	366	13	1															1				FG	12	60	12		14		FRC			M	60	FD =2, some looks like Minto Gr-Dio.

NOTE 1: Number denotes relative abundance 10:1:5

NOTE 2: % by volume
* Specularite

NOTE 3: P - Pervasive
L - Localized strength
Tr - Trace
W - Weak
M - Moderate
S - Strong
Ex. P-S - Pervasive - Strong

NOTE 4: Key for rock type 4 letters max.

ASARCO — DDH LOG

MINTO PROJECT

NOTE 5: UC - Contact (Upper)
LC - Contact (Lower)
Dik - Dike
Flt - Fault
Frc - Fracture
Gge - Gouge
Shr - Shear
Stk - Stockwork
Vn - Vein
Vlt - Veinlet

NOTE 6: Type
W - Weak
M - Moderate
I - Intense
G - Gneissic

HOLE Nº. 101 Page 2 of 2

Lat. 11,125.2 Dep. 10,494.2

Ele. 2,694.2 T.D. 458 Dip 90°

Logged by J.R. Petura Bearing ____ Date S. 19/6/74 Fin. 21/6/74

FROM	TO	SAMPLE Nº.	(1) ECONOMIC MINERALS						(2) Fe MINERALS				(3) ALTERATION										(4) ROCK TYPE	ROCK COMPOSITION						(5) STRUCTURE			FOLIATION		REMARKS
			Cpy	Born		Sph	Gal	Mo	Py	Mag	Hm	Lim	Ox	Orth	Qtz	Ser	Biot	Chl	Ep	Carb	Anhy	Clay		Orth	Plag	Qtz	Pyx	Biot	Hbl	Type	Depth	∢ to CA	Degree	∢ CA	
354	364	367									TR							2	1				KPG	9	65	12		10		Dik Plag Ortho	356-57	45			Ortho Phenocrysts; trace of muscovite in Dike; F.D. = 3
364	370	368	9	1														8					FG	6	62	12		11					W	80	Chlorite occurs in globs up to 3/4"; some Plag tends toward albite, F.D. = 2
370	380	369									TR							8	1				FG	6	62	12		11		FRC	388	50 & 15	W	85	F.D. = 2; very weakly foliated.
380	390	370	7	1						1								4					G	11	61	12		10		Dik Felds F. Gr.	389	40	W&S L	75	Mag band (1/2") 388; F.D. = 1, very localized strong foliation 87-89 with min
390	400	371	1															1					G	17	58	13		10		FRC	397	40			Stain 390; F.D. = 3, approahces a Minto granodiorite.
400	410	372	1		(CPY:Py=1:1)				1									7					G	6	64	16		6		FRC	408	45	WL	50	F.D. = 2, minaly follows foliation; plag tends towards albite, last 2' chl rich.
410	420	373																	2				G	13	56	18		10		FRC	415	60			F.D. = 2, qtz are bornite crystals, c-axis tend to be sub-parallel, stain 415
420	430	374																	2				G	13	56	18		10		FRC	426	40			FD = 2
430	433	375	1	1							TR							4	4				G	12	53	16		10		FRC	431	55			1 bleb bornite 7/16" long, FD = 2
433	440	376									TR							4	4				G	12	53	16		10		Dik Peg	435-7	60			FD = 2
440	458										TR							4	4				G	12	53	16		10		Dik Dik	441-43 448-53	60			FD = 2, Dike 441 = pegmatite, Dike 448, diorite.

HOLE Nº. 101 Page 1 of 2

Lat. 11,125.2 Dep. 10,494.2

PROJECT Minto

Ele. 2694.2 T.D. 458' Dip 90°

Bearing _____ Date S. 19 June Fin. 21 Jun/74

SAMPLE Nº.	INTER	TOTAL COPPER	NON SULPHIDE COPPER	Oz Ag	Oz Au			CORE RECOVERY %	SPECIFIC GRAVITY	REMARKS
0345M	118-128	.03		<.01	<.003					
0346	128-138	.30		<.01	<.003					
0347	138-148	.28		.04	<.003					
0348	148-158	.72		.04	<.003					
0349	158-168	2.48		.25	.005					
0350	168-178	.33		.04	<.003					
0351	178-188	.34		.09	<.003					
0352	188-198	.90		.07	<.003					
0353	198-208	.54		.09	<.003					
0354	208-218	.81		.11	<.003					
0355	218 -222	.61		.09	<.003					
0356	222-228	.01		<.01	<.003					
0357	228-238	.33		.06	<.003					
0358	238-248	.16		.03	<.003					
0359	248-258	.13		.01	<.003					
0360	258-268	.01		<.01	<.003					
0361	294-304	.04		<.01	<.003					
0362	304-314	.64		.06	<.003					
0363	314-324	.48		.04	<.003					
0364	324-334	.46		.07	<.003					
0365	334-344	.46		.11	<.003					
0366	344-354	.48		.12	<.003					
0367	354-364	.01		<.01	<.003					
0368	364-370	.29		.06	<.003					

HOLE Nº. 101 Page 2 of 2

PROJECT Minto

Lat. 11,125.2 Dep. 10,494.2

Ele. 2694.2 T.D. 458' Dip 90°

Bearing _____ Date S. 19 June Fin. 21 June/74

SAMPLE Nº.	INTER	TOTAL COPPER	NON SULPHIDE COPPER	Oz Ag	Oz Au			CORE RECOVERY %	SPECIFIC GRAVITY	REMARKS
0369	370-380	.02		<.01	<.003					
0370	380-390	.18		.06	<.003					
0371M	390-400	.21		.06	<.003					
0372	400-410	.19		.04	<.003					
0373	410-420	.01		<.01	<.003					
0374	420-430	.01		<.01	<.003					
0375	430-433	.15		.06	<.003					
0376	433-440	.04		<.01	<.003					

NOTE 1: Number denotes relative abundance 10:1:5

NOTE 2: % by volume
* Specularite

NOTE 3: P - Pervasive
L - Localized strength
Tr - Trace
W - Weak
M - Moderate
S - Strong
Ex. P-S - Pervasive - Strong

NOTE 4: Key for rock type 4 letters max.

ASARCO — DDH LOG

MINTO PROJECT

NOTE 5: UC - Contact (Upper)
LC - Contact (Lower)
Dik - Dike
Flt - Fault
Frc - Fracture
Gge - Gouge
Shr - Shear
Stk - Stockwork
Vn - Vein
Vlt - Veinlet

NOTE 6: Type
W - Weak
M - Moderate
I - Intense
G - Gneissic

HOLE Nº. 103 Page 1 of 2

Lat. 10,904.8 Dep. 10,606.7

Ele. 2,624.9 T.D. 492 Dip 90°

Logged by J.R. Petura Bearing ____ Date S. 22/6/74 Fin. 24/6/74

FROM	TO	SAMPLE Nº.	(1) ECONOMIC MINERALS						(2) Fe MINERALS				(3) ALTERATION										(4) ROCK TYPE	ROCK COMPOSITION						(5) STRUCTURE			FOLIATION		REMARKS
			Cpy	Born	Mal	Sph	Gal	Cpy/Py+Po	Py	Mag	Hm	Lim	Ox	Orth	Qtz.	Ser	Biot	Chl	Ep	Carb	Anhy	Clay		Orth	Plag	Qtz	Pyx	Biot	Hbl	Type	Depth	* to CA	Degree	* CA	
0	29				1																													Overburden
29	39	377			1			3			1	1	SP										FG	15	62	10		10		FRC	37	20	M	60	Hem after Cpy?; Trace garnet crystals F.D. =9
39	49	378			1			2			1	1	SP										FG	17	61	8		11		Dik M.Gr	47.5-49	10	M	85	FD = 6
49	59	379			1							1	SP										FG	19	60	5		14		FRC		Follow Foliation	M	90	FD = 4; Garnet crystals
59	69	380			1						1	1	SP										FG	19	60	5		14		FRC		Follow Foliation	M	75	FD = 5
69	79	381			1							1	SP										FG	19	60	5		14		FRC		Follow Foliation	M	85	FD = 5
79	89	382			1							2	SP										FG	18	58	4		18		FRC		Follow Foliation	W	75-85	Biotite accumulation at 86 w/Cpy which was subsequently removed. FD = 6
89	99	383			1							2	SP										FG	19	59	5		15		FRC	92	70	WL	80	FD = 5
99	109	384			1							2	SP	MP									FG	19	59	7		13		FRC	107	0	W	55	FD = 4
109	119	385			1							1	MP	SP									FAG	25	50	9		14		Dik Reg 6"	114-114.6	60	W	80	FD = 3, Biotite enriched till 114
119	129	386			1							1	MP			SP							FAG	25	50	9		14					M	85	Stain 120, FD = 3
129	139	387			1							1	WP	WP									FAG	25	50	9		14		Dik #1	140-141.5	60	M	80	FD = 2
139	149	388			1							TR		WL									G	19	61	9		10		Dik #2	148-150	45	WL	70-80	FD = 3, 2 zones of foliated rock divided by unfoliated rocks
149	247										TR			ML				5	1				KPG	10	63	15		5		FRC	172	45			FD = 2, Ortho Phenocrysts; stain 160; more chloritic at bottom.
																																		Strong localized Ortho enrichment 227-232.
247	257	389									1							8		1			KPG	10	63	15		2		FRC	249	0 & 55			Fractures filled with hem followed by $CaCO_3$; Last 3' no Ortho Phen FD = 2
257	267	390	21	1										ML				1	1				G	12	63	10		12					WL	70-85	FD = 2, last 5' foliated with a high grade 6" section 276; with qtz vein
267	277	391	1																				FG	14	61	9		14		FRC	272	5	W	80-60	FD = 2
277	287	392	1																				FG	14	61	8		16		FRC	278	25	W	60	Stain 282, FD = 2
287	297	393	1			(CPY:Py=3:1)				1													FG	14	61	8		16		FRC	282	50	M	85-60	FD = 2, High Cpy Conc 291 accompanied by med grained ortho concn (stained)
297	307	394	16	1																			FG	18	57	8		16		Vn Ortho & Qtz Rich	304	85	M	70	FD = 2, Stain 307.
307	311	395	7	1														6	3				G	19	55	10		17		FRC	308	70	M	60	FD = 2, screwed up, foliated gneissic-contorted-clots of chlorite & epidote
311	317	396									TR							6	2				KPG	7	67	10		7		Slk	314	70			Ortho Phenocrysts, FD = 1
317	327	397																6	2				KPQG	7	52	25		10		FRC	326	80			Ortho Phenocrysts, FD = 1, Stain 318
327	337	398	1											SL				SL 8					FAG	16	57	8		10		FRC	332	45	M	70	FD = 1, Chl & ortho alteration 333 with unaltered zenolyth; both mineralized.

NOTE 1: Number denotes relative abundance 10:1:5

NOTE 2: % by volume
* Specularite

NOTE 3: P - Pervasive
L - Localized strength
Tr - Trace
W - Weak
M - Moderate
S - Strong
Ex. P-S - Pervasive - Strong

NOTE 4: Key for rock type 4 letters max.

ASARCO — DDH LOG

MINTO PROJECT

NOTE 5: UC - Contact (Upper)
LC - Contact (Lower)
Dik - Dike
Flt - Fault
Frc - Fracture
Gge - Gouge
Shr - Shear
Stk - Stockwork
Vn - Vein
Vlt - Veinlet

NOTE 6: Type
W - Weak
M - Moderate
I - Intense
G - Gneissic

HOLE No. 103 Page 2 of 2
Lat. 10,904.8 Dep. 10,606.7
Ele. 2,624.9 T.D. 492 Dip 90°
Logged by J.R. Petura Bearing ____ Date S. 22/6/74 Fin. 24/6/74

FROM	TO	SAMPLE No.	(1) ECONOMIC MINERALS						(2) Fe MINERALS				(3) ALTERATION										(4) ROCK TYPE	ROCK COMPOSITION						(5) STRUCTURE			FOLIATION		REMARKS
			Cpy	Born		Sph	Gal	Mo	Py	Mag	Hm	Lim	Ox	Orth	Qtz.	Ser	Biot	Chl	Ep	Carb	Anhy	Clay		Orth	Plag	Qtz	Pyx	Biot	Hbl	Type	Depth	∡ to CA	Degree	∡ CA	
337	347	399									2			SL				SL 5	1				G	12	66	8		5		FRC	342-45	0			Strong Ortho and Chl altn. 341-46; FD = 1
347	351	501									2			ML				9					G	12	64	10		3		FRC	349	20			FD = 1
351	352	502	1	2							1			ML				7					AG	17	57	10		8		FRC	351.5	55			FD = 1, mineralization related to Frac 351.5
352	357	503									TR							1	1				QG	10	55	25		9		FRC	354	40			Plag appears to be within 15% (?) of albite; FD = 1.5
357	367	504	10	1							TR								1				QG	8	45	35		10		Dik Med Gr.	366-67	20			FD= 1, Stain 358, FD= 1.0; Cu assoc with epidote
367	377	505	6	1							TR							4	1				QG	8	45	35		6		FRC	373	40			mainly along Frac, ie. 373 FD = 1.5; Mineralization related to epidote either disseminated in rock or
377	387	506	6	1														8	1				G	14	59	75		3		Dik Med Gr.	384.7-385.2	40			FD = 1, Minralization as above
387	397	507	1						TR					SL				8	1				G	15	62	11		3		FRC	393	45			FD = 1, Pegmatite dike 395.5=96.5; Ortho alt. restricted 391.5-392.
397	407	508	1															3	1				G	16	64	8		8		Dik CSE Gr.	398-398.5	30			FD 1, Cpy doesn't necessarily need epidote now
407	417	509	3	1														2	1				G	16	64	8		9		Dik Peg	412-415	90			FD = 1, Higher grade zone around Frac at 409.5; stain 408
417	425	510	1															2	1				G	15	64	9		9		Dik Peg 3"	424	45	WL	85	Ortho phenocrysts, FD - 2
425	432	511	1	1														2	1				G	12	57	8		19		FRC	429	50			very slightly gneissic FD = 1.5, Biotite concn in ctr 2/3's, still odd ortho pheno,
432	437	512	1											ML				10	1				G	16	60	8		4		FRC	433	30			Localized chloritization, FD = 1
437	447	513	2	1										SP				SP 12	1	TR			AG	40	30	17				FRC	441	80			ured zone, i.e., wiederite. Carb in Frac, higher grade Cu 455-57, Stain 443, FD = 1), in a wierd text-
447	457	514	1		(CPY:PY=1:1)				1									10	1				AG	24	44	19		2		FRC	455	35 & 5	ML	70	Stain 451.5, FD = 2
457	467	515								TR	TR							12	1				AG	20	46	19		2		FRC	462	15			FD = 2
467	492																	3	1				KPG	8	62	18		7		Dik 2" Peg	485	25			Ortho Phenocrysts, FD = 1

Note = around 377 - interesting relationship of epidote and mineralization - appeared that it would not occur without epidote - farther down Cpy appeared sometimes by itself - but Bo still needed epidote to occur.

HOLE Nº. 103 Page 1 of 2

Lat. 10,904.8 Dep. 10,606.7

PROJECT Minto

Ele. 2624.9 T.D. 492' Dip 90°

Bearing ____ Date S. 22 June Fin. 24 June/74

SAMPLE Nº.	INTER	TOTAL COPPER	NON SULPHIDE COPPER	Oz Ag	Oz Au			CORE RECOVERY %	SPECIFIC GRAVITY	REMARKS
0377M	29-35	.46		.04	.004					
0378	39-49	.38		.03	<.003					
0379	49-59	.15		<.01	<.003					
0380	59-69	.12		<.01	<.003					
0381	69-79	.17		.01	<.003					
0382	79-89	.50		.06	<.003					
0383	89-99	.65		.09	<.003					
0384	99-109	.17		.03	<.003					
0385	109-119	.32		.03	<.003					
0386]	119-129	.20		.03	<.003					
0387	129-139	.05		<.01	<.003					
0388	139-149	.02		<.01	<.003					
0389	247-257	.01		<.01	<.003					
0390	257-267	.38		.04	<.003					
0391	267-277	.10		.01	<.003					
0392	277-287	.21		.03	<.003					
0393	287-297	.87		.06	<.003					
0394	297-307	.58		.07	<.003					
0395	307-311	.17		.04	<.003					
0396	311-317									
0397	317-327	.01		<.01	<.003					
0398	327-337	.08		.03	<.003					
0399	337-347	.01		<.01	<.003					

HOLE Nº. 103 Page 2 of 2

PROJECT Minto

Lat. 10,904.8 Dep. 10,606.7

Ele. 2624.9 T.D. 492' Dip 90°

Bearing _____ Date S. 22 June Fin. 24 June/74

SAMPLE Nº.	INTER	TOTAL COPPER	NON SULPHIDE COPPER	Oz Ag	Oz Au			CORE RECOVERY %	SPECIFIC GRAVITY	REMARKS
0501M	347-351	.01		<.01	<.003					
0502	351-352	.46		.15	.005					
0503	352-357	.01		<.01	<.003					
0504	357-367	.01		<.01	<.003					
0505	367-377	.04		<.01	<.003					
0506	377-387	.03		<.01	<.003					
0507	387-397	.03		<.01	<.003					
0508	397-407	.02		<.01	<.003					
0509	407-417	.02		<.01	<.003					
0510	417-425	.01		<.01	<.003					
0511	425-432	.48		.15	.003					
0512	432-437	.01		<.01	<.003					
0513	437-447	.89		.16	.005					
0514	447-457	.41		.04	.003					
0515	457-467	.01		<.01	<.003					

NOTE 1: Number denotes relative abundance 10:1:5

NOTE 2: % by volume
* Specularite

NOTE 3: P - Pervasive
L - Localized strength
Tr - Trace
W - Weak
M - Moderate
S - Strong
Ex. P-S - Pervasive - Strong

NOTE 4: Key for rock type 4 letters max.

ASARCO — DDH LOG

MINTO PROJECT

NOTE 5: UC - Contact (Upper)
LC - Contact (Lower)
Dik - Dike
Flt - Fault
Frc - Fracture
Gge - Gouge
Shr - Shear
Stk - Stockwork
Vn - Vein
Vlt - Veinlet

NOTE 6: Type
W - Weak
M - Moderate
I - Intense
G - Gneissic

HOLE Nº. 104 Page 1 of 1

Lat. 10,618.9 Dep. 10,912.7

Ele. 2,635.0 T.D. 438 Dip 90°

Logged by J.R. Petura Bearing ____ Date S. 24/6/74 Fin 26/6/74

FROM	TO	SAMPLE Nº.	(1) ECONOMIC MINERALS						(2) Fe MINERALS				(3) ALTERATION										(4) ROCK TYPE	ROCK COMPOSITION						(5) STRUCTURE			FOLIATION		REMARKS
			Cpy	Born	Mal	Sph	Gal	Mo	Py	Mag	Hm	Lim	Ox	Orth	Qtz.	Ser	Biot	Chl	Ep	Carb	Anhy	Clay		Orth	Plag	Qtz	Pyx	Biot	Hbl	Type	Depth	∠ to CA	Degree	∠ CA	
0	146																																		Overburden
146	234											1		SP-MP					1				KPG	10	66	5		16		Dik Peg	194-195	50			Felds dike 298 FD = 2.5, Ortho Phenocrysts, Stain 158, 6' ortho alt at 223; 8" fine-grained
234	244	516										1		MP		1			1				KPG	10	66	5		16		Vn Dik FGr. Felds	239 2"	25			FD = 4, limonite alt around Frac; frac ~ 80° to CA
244	254	517	4	1	4							1				1 Musc		7					AG	25	48	10		7		Dik Peg	246-47				FD = 4, same type limonite altn, some weiderite;
254	264	518																	1				QG	8	52	28		10		FRC	257	65			FD = 1, Ortho phenocryst seen
264	286											TR							1				QG	3	55	30		10		FRC	281	25			Stain 269, FD = 2, Ortho phenocrysts near bottom
286	296	519										TR											G	10	65	10		14		Dik F.Gr	295				Ortho phenocrysts; FD = 2, FRC 0° and 70° to CA
296	306	520	1	1																			G	3	71	7		18		FRC	300	90	WM	55	Stain 301; FD = 2
306	316	521	4	1		(CPY:Py 1:1)			1														FG	15	54	10		20		FRC	315	30 & 70	M	70	Stain 311, slightly gneissic locally; FD = 2 = garnet crystals
316	326	522																3	2				QG	11	59	17		7		FRC	325	70			Stain 323, Ortho alt along fractures c 325, FD = 3
326	388																		1				KPQG	11	44	33		11		FRC	345	20			Stain 357; ortho phenocrysts; 6" pegmatite Dikes at 356,372,375, FD=2
388	398	523																5					KPQG	11	57	19		7		FRC	397	45			FD = 2
398	408	524	1											SL				8					FKPG	16	57	10		8		Dik	404-405		M	65	Stain 401, FD = 3, K-feld elong or rotated parallel to foliation, FD = 4
408	418	525	1											SL				8					FAG	20	53	10		8		FRC	414	22	M	50	FD = 7, Rock is fairly broken up, strong ortho alt for 4'
418	428	526																6	2				FAG	23	52	8		8		FRC	423	70 & 45	W	40	FD = 3; stain 423, Ortho phenocrysts
428	438										TR			MP				10	3				AG	25	51	8		2		FRC	433;434	5; 20	WL	70-85	FD = 3 garnet crystals

HOLE Nº. 104 Page 1 of 1

Lat. 10,618.9 Dep. 10,912.7

Ele. 2635.0 T.D. 438' Dip 90°

Bearing _____ Date S. 26 June Fin. 26 June/74

PROJECT Minto

SAMPLE Nº.	INTER	TOTAL COPPER	NON SULPHIDE COPPER	Oz Ag	Oz Au			CORE RECOVERY %	SPECIFIC GRAVITY	REMARKS
0516M	234-244	.02		<.01	<.003					
0517	244-254	.32		.03	.003					
0518	254-264	.01		<.01	<.003					
0519	286-296	.01		<.01	<.003					
0520	296-306	.21		.04	.003					
0521	306-316	.19		.03	.003					
0522	316-326	.01		<.01	<.003					
0523	388-398	.01		<.01	<.003					
0524	398-408	.02		<.01	<.003					
0525	408-418	.01		<.01	<.003					
0526	418-428	.07		.03	.003					

NOTE 1: Number denotes relative abundance 10:1:5

NOTE 2: % by volume
* Specularite

NOTE 3: P - Pervasive
L - Localized strength
Tr - Trace
W - Weak
M - Moderate
S - Strong
Ex. P-S - Pervasive - Strong

NOTE 4: Key for rock type 4 letters max.

ASARCO -- DDH LOG

MINTO PROJECT

NOTE 5: UC - Contact (Upper)
LC - Contact (Lower)
Dik - Dike
Flt - Fault
Frc - Fracture
Gge - Gouge
Shr - Shear
Stk - Stockwork
Vn - Vein
Vlt - Veinlet

NOTE 6: Type
W - Weak
M - Moderate
I - Intense
G - Gneissic

HOLE Nº. 108 Page 1 of 3
Lat. 8,675.6 Dep. 11,490.5
Ele. 2,797.7 T.D. 946 Dip 90°
Logged by M.J. Whiticar Bearing ____ Date S. 29/6/74 Fin. 4/7/74

FROM	TO	SAMPLE Nº.	(1) ECONOMIC MINERALS						(2) Fe MINERALS				(3) ALTERATION										(4) ROCK TYPE	ROCK COMPOSITION						(5) STRUCTURE			FOLIATION		REMARKS
			Cpy	Born		Sph	Gal	Mo	Py	Mag	Hm	Lim	Ox	Orth	Qtz.	Ser	Biot	Chl	Ep	Carb	Anhy	Clay		Orth	Plag	Qtz	Pyx	Biot	Hbl	Type	Depth	∠ to CA	Degree	∠ CA	
0	26																																		Overburden
26	103												S-W					TR	TR	TR			KPG	12	59	19		10		FRC	Common	50			FD = 3 heavy Ox altn lim in fract
103	113	188-198									TR	TR	W	W				TR	TR	SL		WL	AG	18	52	15		15		Gge Slk FRC	110 103,110	90 15			FD = 4 (like light tan Gr) Ofs dik @ 110 -113'/30° fault zone cut thru dike
113	198	0459								TR	W	TRL	W	W				W	M	TR SL			AKPG	10	57	18		15		FRC Gge Dik Ofs	161,167 179-80	25,15 30			FD = 3 (RTG) in places, altn /staining varies with FD
198	208	0460	1							TR								W	TR				FG	10	66	9		15		FRC	Common	30	M	75	FD = 1, Cu in with biot.
208	218	0461								TR	WL	WL						W	W	TR			KPG	10	61	11		18		FRC	Common	10;25			FD 2-3 slight ortho enrich at fract with hem/ep/carb/lim
218	225	0462								TR	WL	WL						W	W	TR			KPG	10	61	11								
225	231	0463	1							TR								TR	TR				FG	8	62	12		18		UC LC	225,231	55	S	55	FD = 2-10, typical tight foliated pinkish xtln with fresh cpy dissem through out.
231	238	0464								TR	W		W					SL	SL	SL			G	14	46	35		15-18		Frc Ofs Dik	232-4	Splayed			FD = 10 → ? high ortho enrich chl/qtz/orth dik high fract
238	263.5									TR								TR	TR	25/35			KPG /G	8/3		25/35		15		FRC Dik ofs	Common 248	50	260 WL	50	FD = 2 mostly equigranular
263.5	273.5	0465								TR								TR	TR				KPG/G	8/3		25/35								Contact with FG at 60°
273.5	279	0466	10	1					.3									TR	TR				FG/KPG	11	39	20		30		FRC Slk/FRC	Common 278-80	50 50 10	G	50	FD = 10 → 1 wk ortho enrich, Cu/G zone 273.5-276
279	289	0467									TR							W	TR				G	7	58	20		15		FRC	292	10			FD = 1 wk ortho enrich along fract
289	299	0468																																	
299	304	0469	1						.3.4		TR			TR				TR					FG	30	50	8		12		FRC	Common	With foliation	I	45°	FD = 1 Cpy / py along fol biot
304	314	0470	See below																																
314	346										TRL							TR	TR				KPG	14	59	22		15		FRC	Common	50			FD = 1 low Kpheno (1.0") concn
346	356	0471	See above																														M		
356	366	0472	1						1%									TR	TR				KPG/FG	13	46	30		11		FRC	Common	20	360	45	FD=1 ortho enrich pyrophyllite/cal in fract. Cpy/py mostly in fol sections
366	376	0473	1						.5									TR	TR	TR			G	12	49	25		12		FRC Dik Ofs	Common 381	30 50			FD = 4 ortho enriched
376	386	0474	1						W					M				M	W	ML			AG	16	52	20		10		FRC	Common	60	W	60	FD = 5 cal/pyroph/cp in fract. Py/Cpy dissem.
386	396	0475	1						1%		TR			M				M	W	ML			(RTG) FAG	16	54	20		10		Gge	394	30	W	70	FD = 3 strong 1' zone cal/chl/pyrophyllite with rx frag.
396	406	0476	1						.8		TR		ML	M				M	W	M-SL		ML	(RTG) FAG	16	54	20		18		FRC	Common	30	W	60	FD = 5 Kspar 2° cal/chl/pyrophyllite in fract
406	416	0477	1						.5		TR			M				M	W	W			(RTG) FAG	16	54	12		14		FRC	Common	20			FD = 1 ortho enrich along fract
416	426	0478	1						.2		TR			M				M	M	TR			(RTG) FAG	16		19		16		FRC	Common	40	W	50	FD = 3 ortho generally as 2°
426	436	0479	1								TR			M				M	M	TR		TR	(RTG) FAG	15	56	14		15		FRC	Common	50	W	40	FD = 3 biot concn drop

ASARCO -- DDH LOG

MINTO PROJECT

NOTE 1: Number denotes relative abundance 10:1:5

NOTE 2: % by volume
* Specularite

NOTE 3: P - Pervasive
L - Localized strength
Tr - Trace
W - Weak
M - Moderate
S - Strong
Ex. P-S - Pervasive - Strong

NOTE 4: Key for rock type 4 letters max.

NOTE 5: UC - Contact (Upper)
LC - Contact (Lower)
Dik - Dike
Flt - Fault
Frc - Fracture
Gge - Gouge
Shr - Shear
Stk - Stockwork
Vn - Vein
Vlt - Veinlet

NOTE 6: Type
W - Weak
M - Moderate
I - Intense
G - Gneissic

HOLE Nº. 108 Page 2 of 3
Lat. 8,675.6 Dep. 11,490.5
Ele. 2,797.7 T.D. 946 Dip 90°
Bearing ____ Date S. 29/6/74 Fin. 4/7/74
Logged by M.J. Whiticar

FROM	TO	SAMPLE Nº.	(1) ECONOMIC MINERALS						(2) Fe MINERALS				(3) ALTERATION									(4) ROCK TYPE	ROCK COMPOSITION						(5) STRUCTURE			FOLIATION		REMARKS
			Cpy	Born	Chalc	Sph	Gal	Mo	Py	Mag	Hm	Lim	Ox	Orth	Qtz.	Ser	Biot	Chl	Ep	Carb	Anhy	Clay		Orth	Plag	Qtz	Pyx	Biot	Hbl	Type	Depth	x to CA	Degree	x CA	
436	446	0480	1						W		TR		W	M				M-S	M	ML			RTG FAG	10	71	7		12		FRC Dik Ofs	Common 436-7	60 60	WL	55	FD = 6 Heavy altn biot concn varies
446	456	0481	1						W		TR		M	M-S				S	M	M			RTG FAG	10	65	8		17		FRC Dik Ofs	Com 451 456	50; 0° 45	WL	45	FD = 5 heavy altn = calcic looking altn.
456	466	0482	1						W		TR		W	M				M	M	WL			RTG FAG/FG	11	63	8		18		FRC	Common	50	W	Varies	FD = 3, heavy altn, calcic fract fill
466	476	0488	1							TR	TR		W	M				M-S	SL	ML			AG	10	64	8		17		FRC FRC	Common 473	40 5			FD = 5, small dike cal/ep/RFG frag (consolidated) 50°
476	486	0484	1						TR	TR	W			M				M	M	TR			RTG GG	10	64	8		17		FRC	Common	45			FD = 2 Cpy assoc with ep in mafics, 2°
486	496	0485	1						W	TR	W			M				M	M	WL			RTG AG	12	60	8		20		FRC Cal	493	25			FD = 4 rock heavy altn with stretched biot/chl books
496	506	0486	1						TR		W			M				M	M-W	TRL			RTG AG	10	59	8		23		FRC	Common	25			FD = 3 biot as larger books 1/4"
506	516	0487	1						TR	TR	TR			M				M	M	TRL			RTG AG	10	59	8		23		FRC	Common	25			FD = 3 biot as larger books cpy in with mafics
516	526	0488	1						W	TR	TR			M				M	M	TRL			RTG AG	10	59	8		23		Dik Ofs FRC	525 Common	50 40			FD = 3 pyrophyllite in fract. magnetite zone 1" at 521'
526	536	0489	1						W		TR			M				M	M-SL	W			RTG AG	12	57	11		20		Dik Ofs	528-30	50			FD = 1-2-3" zone ep @ 530.5
536	546	0490	1						TR		TR			M				M	M	W			RTG (F) AG	10	58	10		22		FRC	531	30	W	80	FD = 2 pink calcic looking atln in fract, common since 450'
546	556	0491	1						TR	TR	TR		WL	M-S				M-S	M-SL	W			RTG (F) AG	8	60	12		20		FRC Slk FRC	Common 559	30 75 10	W	80	Rounded FD = 3, pyrophyllite in fract. Smaller Kpheno in spots. qtz xtls
556	566	0492	1						TR		W			M				M	M	ML			RTG AG	9	59	14		18		Gge FRC	564.5-2" Common	30 50			FD = 10 No vis Slk Chl/ep/cal/pyrophyllite in fract/gge, cpy dis with biot.
566	576	0493	1						W		W		ML	M				M-SL	M	M			RTG AG	10	58	14		18		Gge Rubble Dik Ofs	567-71 571-73.5				FD=20→0 Angular rubble of 1/2" Wk pyrophyllite accompanies.
576	586	0494	1						TR		W		W	M				M	W	W			RTG AG	8	61	11		20		FRC Slk Gge	584	30 80			Hem stain FD=3 rock more competent Proph in fract
586	596	0495	1						W		TR		TR	M				M	W-M	TR			RTG AG	8	64	9		19		FRC Gge	Common 593	75 50			FD = 10 Heavy altn pyrophyllite in fract, angular 2" frag for 1' at 593-4.
596	606	0496	1						TR		ML		TR	M				M	W	TR			RTG AG	12	58	16		14		FRC Dik Ofs	Common 598	40			FD = 4 KP, Qtz P in places 1/2" pheno. Hem in fract, pink stain plag.
606	656										M-SL			W-M														10 18		Dik Cal	631-640	Split Cpy			FD=high? no consistent fract pattern, heavy altn bleaching,
* 632	642	0496B*																																kaolinitized, pyrophyllite/he chl/cal in fract. Calcite veining, fract fill soft (4) felsic
656	666	0497									M-SP		W	M				M	ML	SL		W	KP) AG	10	58	14		18		FRC Gge	Common 660 661 564	30,50,5			rhyolitic looking green dk green dik 631-40 slight mottled text heavy gge/cal frtfed zone 325 Slk/frc 80/15
666	676	0498	4	1	½						M-SP		TR	M				M-S	ML	W			RTG AG	12	61	8		19		FRC	Common	30,5			FD=25 granulated in spots, hem/cal/chl in fract-heavy altn maj fault slip region
676	686	0499	2	1							M-SP			M				M	W	ML			RTG AG	8	69	14		9		FRC					FD=20-10 rock more cohesive-only thin frac no gge but gone angul frag, qtz as larger xtls/vn, banding of mafics/sulfides.
																																			FD=5 slight banding, Cu dissem/massive rock more competent
686	696	0500	3	2							M			TR				TR	TR	WL			(A) G	2	63	20		15		FRC	Common	20			FD=5 banding altn pink/white/blue zones
696	706	0601	1	1							M			TR				TR	TR	WL			(A) G	2	68	20		10		FRC	Common	50			

NOTE 1: Number denotes relative abundance 10:1:5

NOTE 2: % by volume
* Specularite

NOTE 3: P - Pervasive
L - Localized strength
Tr - Trace
W - Weak
M - Moderate
S - Strong
Ex. P-S - Pervasive - Strong

NOTE 4: Key for rock type 4 letters max.

ASARCO - DDH LOG

MINTO PROJECT

NOTE 5: UC - Contact (Upper)
LC - Contact (Lower)
Dik - Dike
Flt - Fault
Frc - Fracture
Gge - Gouge
Shr - Shear
Stk - Stockwork
Vn - Vein
Vlt - Veinlet

NOTE 6: Type
W - Weak
M - Moderate
I - Intense
G - Gneissic

HOLE Nº. 108 Page 3 of 3
Lat. 8,675.6 Dep. 11,490.5
Ele. 2,797.7 T.D. 946 Dip 90°
Logged by M.J. Whiticar Bearing ____ Date S. 29/6/74 Fin. 4/7/74

FROM	TO	SAMPLE Nº.	(1) ECONOMIC MINERALS						(2) Fe MINERALS				(3) ALTERATION										(4) ROCK TYPE	ROCK COMPOSITION						(5) STRUCTURE			FOLIATION		REMARKS
			Cpy	Born		Sph	Gal	Mo	Py	Mag	Hm	Lim	Ox	Orth	Qtz	Ser	Biot	Chl	Ep	Carb	Anhy	Clay		Orth	Plag	Qtz	Pyx	Biot	Hbl	Type	Depth	∢ to CA	Degree	∢ CA	
706	716	0602	1	1							WL		W	TR				SP	M	WP			RTG AG	3	67	20		10		FRC FRC	Common Common	45 5			FD =? Brecciated rock; calcite in fract/bleached with chl odd
716	726	0603									W		TR	W				SP	M	WL			KPAG	12	57	20		11		FRC	725.5	10			Fd =10-20 brecciated in spots, K pheno inundated & altd. Hem in K pheno fract
726	736	0604									W-M			W				M	M	WL			AKPG	11	56	23		10		FRC Slk Dik Ofs	727 731	40 30 60			FD =10-20 (Angular frags) Brecciated in spots. K pheno inundated kaolin in fract with hem.
736	746	0605	1								TR	TR	TR	W				M	M	WL			AQKPG	3	61	25		11		FRC	740	30			FD =20 bleached, qtz rich (pheno) slight hem stain plag; angular frag.
746	756	0606	1	1						1%	M			W				M	TR	M-SL			AQKPG/AG	10	54	25		11		FRC	754-59	5	W-M	50	FD=5 5° fract open 1/4 wide unfilled. Banded mag/cpy/born
756	766	0607	1	1						W-M	M-SP			W				M	TR	ML			AQ/Q Monz	23	45	22		10		FRC	764 556-9	40 5	W-M	50	FD=5 5° fract open 1/4 wide unfilled. Banded mag/cpy/born.
766	776	0608	1	1						0.5%	M-SP							W	W	SL			Q Monz AG	15	51	30-35		4		FRC	Common	30			FD=10 possible ofs dik (peg) 774-6 heavy altn prophyllite
776	786	0609	1	1							WP			M				W	W	W			Q Monz QM	25	40	30		5		FRC	Common	60			FD=4 open vugs, heavy calcic altn
786	796	0610	1	TR							MP			M				TR	TR	TRL			Q Monz	25	40	30		5		FRC	Common	45			FD=4 more consolidated rock (completion questionable) cal in frac
796	806	0611	1	1						W-M	SL/P			W				TR	TR	TRL			AG	15	55	20		10		FRC	Common	50	W	55	FD =3 banding of sulf/maf - hem cpy massive in places
806	816	0612	1	1						M	SL/P			W				W	TR	TRL			F) AG	16	51	18		15		FRC	Common	40	W	75	FD = 3 banding of sulf/kaolin in fract at 814.5
816	826	0613	1	1						TR	M			W				W	WL	ML			AG	12	61	16		11		FRC	817.5	5			FD = 8 heavy kaolin, pyrophyllite hem in fract & interstitial blebs bleached.
826	836	0614	1								W		W	M				M	W	MP			AG							FRC	833.4	20			FD=6-8 core is soft/calcic & heavily altd. Bleached, white, pale, kaolin, pyroph, cpy
836	846	0615									W		M-S	M				M	W-M	S			A							FRC FRC	Common Common	10 25			FD = ∾ Fault zone rock cataclastic, brecciated, heavy altd.
846	856	0616	1	1							SL/P							M	W	SP			A AG							FRC FRC	851 854	15 10			FD = ∾ heavy gge/altn zn of fault massive cpy/hem/born in more competent rock. Fault breccia for 5' from 846-51. Heavy altn denies comp & fault direction. Heavy calcite.
856	866	0617	1	1							ML/P			M-W				MP	WP	ML			AG QM	15	59	14		12		FRC Dik Ofs	Common 862	10			FD =2-10 high grade massive cpy 863-5.5 Heavy altn.
866	876	0618	1	1							ML/P			M				W	M	W			Q Monz	25	39	26		10		FRC	Common	15			FD = 4 some zones of high grade heavy altn graphic text in spots, heavy hem concn assoc with cpy/born. Calcite in frac.
876	886	0619									W			M				M	M	TR			FAG	18	48	16		18		FRC Dik Ofs	881 882	50 45	W	70	FD = 3 more even, competent rock less altd and fractured.
886	946										ML			W				M	M-W	TR			G(KPG)	14	50	16		20		Dik Apl	918	30	WL	70	FD = 3-2 heavy K pheno concn 918-927 heavy biot concn 937-8

HOLE Nº. 108 Page 1 of 3

Lat. 8,673.6 Dep. 11,490.5

PROJECT Minto

Ele. 2797.7 T.D. 946' Dip 90°

Bearing _____ Date S29 June Fin. 4 July/74

SAMPLE Nº.	INTER	TOTAL COPPER	NON SULPHIDE COPPER	Oz Ag	Oz Au			CORE RECOVERY %	SPECIFIC GRAVITY	REMARKS
0459	188-198	<0.01		<0.01	<0.003					
0460	198-208	0.13		0.01	<0.003					
0461	208-218	<0.01		<0.01	<0.003					
0462	218-225	<0.01		<0.01	<0.003					
0463	225-231	2.08		0.15	0.008					
0464	231-238	0.01		<0.01	<0.003					
0465	263-273	<0.01		<0.01	<0.003					
0466	273-279	0.70		0.06	0.003					
0467	279-289	0.01		<0.01	<0.003					
0468	289-299	<0.01		<0.01	<0.003					
0469	299-304	0.26		0.01	<0.003					
0470	304-314	<0.01		<0.01	<0.003					
0471	346-356	<0.01		<0.01	<0.003					
0472	356-366	0.36		0.01	<0.003					
0473	366-376	<0.01		<0.01	<0.003					
0474	376-386	<0.01		<0.01	<0.003					
0475	386-396	0.03		<0.01	<0.003					
0476	396-406	0.05		<0.01	<0.003					
0477	406-416	0.03		<0.01	<0.003					
0478	416-426	0.04		<0.01	<0.003					
0479	426-436	0.03		<0.01	<0.003					
0480	436-446	0.02		<0.01	<0.003					
0481	446-456	0.09		<0.01	<0.003					

HOLE Nº. 108 Page 2 of 3

PROJECT Minto

Lat. 8,673.6 Dep. 11,490.5

Ele. 2797.7 T.D. 946' Dip 90°

Bearing _____ Date S. 29 June Fin. 4 July/74

SAMPLE Nº.	INTER	TOTAL COPPER	NON SULPHIDE COPPER	Oz Ag	Oz Au			CORE RECOVERY %	SPECIFIC GRAVITY	REMARKS
0482	456-466	0.06		<0.01	<0.003					
0483	466-476	0.09		<0.01	<0.003					
0484	476-486	0.32		0.04	<0.003					
0485	486-496	0.28		0.03	<0.003					
0486	496-506	0.08		0.01	<0.003					
0487	506-516	0.04		<0.01	<0.003					
0488	516-526	0.07		<0.01	<0.003					
0489	526-536	0.08		0.01	<0.003					
0490	536-546	0.08		0.01	<0.003					
0491	546-556	0.23		0.03	<0.003					
0492	556-566	0.08		<0.01	<0.003					
0493	566-576	0.08		<0.01	<0.003					
0494	576-586	0.19		<0.01	<0.003					
0495	586-596	0.11		<0.01	<0.003					
0496	596-606	0.03		<0.01	<0.003					
0497	656-666	0.48		0.06	0.005					
0498	666-676	0.95		0.09	0.011					
0499	676-686	1.74		0.18	0.019					
0500	686-696	1.96		0.18	0.029					
0601	696-706	3.40		0.49	0.039					
0602	706-716	0.02		<0.01	<0.003					
0603	716-726	<0.01		<0.01	<0.003					
0604	726-736	0.02		<0.01	<0.003					
0605	736-746	0.05		<0.01	<0.003					

HOLE Nº. 108 Page 3 of 3

PROJECT MINTO

Lat. 8,673.6 Dep. 11,490.5

Ele. 2797.7 T.D. 946' Dip 90°

Bearing _____ Date S. 29 June Fin. 4 Jul

SAMPLE Nº.	INTER	TOTAL COPPER	NON SULPHIDE COPPER	Oz Ag	Oz Au			CORE RECOVERY %	SPECIFIC GRAVITY	REMARKS
0606	746-756	0.77		0.12	0.016					
0607	756-766	2.52		0.31	0.020					
0608	766-776	0.71		0.09	0.011					
0609	776-786	0.21		0.01	0.003					
0610	786-796	0.20		0.03	<0.003					
0611	796-806	1.48		0.18	0.008					
0612	806-816	3.85		0.64	0.080					
0613	816-826	0.09		0.03	<0.003					
0614	826-836	0.63		0.10	0.005					
0615	836-846	0.27		0.06	0.004					
0616	846-856	1.28		0.22	0.022					
0617	856-866	1.40		0.16	0.015					
0618	866-876	0.59		0.10	0.011					
0619	876-886	0.05		0.01	<0.003					

NOTE 1: Number denotes relative abundance 10:1:5

NOTE 2: % by volume
* Specularite

NOTE 3: P - Pervasive
L - Localized strength
Tr - Trace
W - Weak
M - Moderate
S - Strong
Ex. P-S - Pervasive - Strong

NOTE 4: Key for rock type 4 letters max.

ASARCO — DDH LOG

MINTO PROJECT

NOTE 5: UC - Contact (Upper)
LC - Contact (Lower)
Dik - Dike
Flt - Fault
Frc - Fracture
Gge - Gouge
Shr - Shear
Stk - Stockwork
Vn - Vein
Vlt - Veinlet

NOTE 6: Type
W - Weak
M - Moderate
I - Intense
G - Gneissic

HOLE Nº. 110 Page 1 of 3

Lat. 7,885.7 Dep. 11,128.8

Ele. 2,874.5 T.D. 1088 Dip 90°

Logged by J.R. Petura Bearing ____ Date S. 4/7/74 Fin. 7/7/74

FROM	TO	SAMPLE Nº.	(1) ECONOMIC MINERALS						(2) Fe MINERALS				(3) ALTERATION										(4) ROCK TYPE	ROCK COMPOSITION						(5) STRUCTURE			FOLIATION		REMARKS
			Cpy	Born	Mal	Chalc Cu	Bornite	Mo	Py	Mag	Hm	Lim	Ox	Orth	Qtz.	Ser	Biot	Chl	Ep	Carb	Anhy	Clay		Orth	Plag	Qtz	Pyx	Biot	Hbl	Type	Depth	% to CA	Degree	% CA	
0	15																																		Overburden
15	40											2	SP										KPG	16	62	9		10		FRC	24	85			FD = 5
40	50	718										2	SP										KPG	13	65	9		10		FRC	43	70			FD = 3, less orth phenocrysts
50	57	719	1		24	8	16				1	2	SP	SP									FKAG	46	35	9		9		FRC	54	Follow foliation	M	75-80	FD = 3, relatively sharp contact for foliation; stain 53.
57	60	720										2	MP			TR							KPG	12	66	9		10		FRC	58	35 & 80			FD = 4, 1C fol zone at 56.7
60	70	721										3	SP										KPG	12	66	7		10		FRC	67	20			FD = 3.5
70	93											4	MP										KPG	12	66	7		10		Gge	88	10			FD = 2.5, GGE breccia cemented with limonite; stain 83
93	103	722										2	WP										G	11	66	8		12		FRC	97	50			FD = 2
103	107	723	9		3		1					1	WP										G	10	63	9		13		Dik	105.5-106	30	ML	70	FD = 3, 3x 5" foliated zones separated by unfoliated zones
107	113	724										TR	WP										G	10	65	10		14		FRC	111	70			FD = 2
113	124											TR	WP										G	9	63	11		16		Dik Peg	113.5-115.5	60			FD = 2, ortho phenocrysts 119'
124	129	725										TR	WL										G	7	61	12		19		FRC	127	65			FD = 2; stain 128
129	130	726	1		1		1					1	ML										KAG	20	55	12		12		Dik Feld	129.5	60			FD = 3, Cpy and mal in dike or highly Kaltered zone
130	134	727										TR	WL										G	7	64	12		16		FRC	133	70			FD = 2.25, Ox mainly along fract
134	140	728										TR	WL					9						7	68	12		7		FRC	129.3		10		FD = 2
140	150	729	6		1				TR			TR	WL	ML									G	9	66	12		14		Dik FRC	147.5-715 145	50 60 & 5	WL		FD = 1.5, mineralization dissem & also in foliated zones which are K altered
150	160	730	6		1				TR		TR	TR	WL	ML					TR				G	9	66	12		14		FRC	154	35			FD = 1, FRC healed with hem.
160	186											TR		WL				1	TR				G	10	63	13		12		FRC	174	70			FD = 1; Tr of garnet xls.
186	196	731								TR		TR						1	TR				G	10	63	13		13		FRC	187	20	WL	80	FD = 1, foliation from 191 to 196. Garnet xyls
196	206	732	1							2	1	1	MP										FAG	23	45	15		12		FRC	202	20	MP	85	FD = 2.5; garnet xyls FD = 1.5; some Py in foliated zones, garnet xls
206	216	733								TR								5					G	8	64	10		12		FRC	216	20	WL	90	
216	260																	5					G	8	63	11		12		Dik Aph B And	237.5-240	50	WL	90	FD = 1.5, stains 214 &238, odd small foliated zones which are accompanied by ortho altern.
260	270	734	1									TR						1	1				QG	3	67	16		11		FRC	269	40	WL	90	FD = 1 foliation very localized & small; garnet xls, stain 261
270	353													WL				2					QG	3	66	18		9		FRC	320	70 & 15			FD = 2, 311-313 ortho enrichment around 6" felds dike; garnet xl
353	363	735	1															2					G	7	65	16		8		FRC	356	20	ML	65	FD = 1; garnet xls, 1%, foliated zones accompanied by increase i Ortho.

NOTE 1: Number denotes relative abundance 10:1:5

NOTE 2: % by volume
* Specularite

NOTE 3: P - Pervasive
L - Localized strength
Tr - Trace
W - Weak
M - Moderate
S - Strong
Ex. P-S - Pervasive - Strong

NOTE 4: Key for rock type 4 letters max.

ASARCO — DDH LOG

MINTO PROJECT

NOTE 5: UC - Contact (Upper)
LC - Contact (Lower)
Dik - Dike
Flt - Fault
Frc - Fracture
Gge - Gouge
Shr - Shear
Stk - Stockwork
Vn - Vein
Vlt - Veinlet

NOTE 6: Type
W - Weak
M - Moderate
I - Intense
G - Gneissic

HOLE Nº. 110 Page 2 of 3
Lat. 7,885.7 Dep. 11,128.8
Ele. 2,874.5 T.D. 1088 Dip 90°
Logged by J.R. Petura Bearing ____ Date S. 4/7/74 Fin. 7/7/74

FROM	TO	SAMPLE Nº.	(1) ECONOMIC MINERALS						(2) Fe MINERALS				(3) ALTERATION										(4) ROCK TYPE	ROCK COMPOSITION						(5) STRUCTURE			FOLIATION		REMARKS
			Cpy	Born		Sph	Gal	Chal xxx	Py	Mag	Hm	Lim	Ox	Orth	Qtz.	Ser	Biot	Chl	Ep	Carb	Anhy	Clay		Orth	Plag	Qtz	Pyx	Biot	Hbl	Type	Depth	∠ to CA	Degree	∠ CA	
363	373	736	1			(CPY:Py=1:2)			1									2					QG	2	62	20		12		Dik-Fine Gr.-Plag	370.3-371	90	WL	70	FD = 1; stain 368
373	383	737	1			(CPY:Py=1:7)			1									2					G	2	67	16		11		2" PegDik	376	50			FD = .25; blotches 3/8" of Py dissem.
383	393	738	1			(CPY:Py=1:2)			2									1					G	2	74	11		11		FRC	385	75	ML	40	FD = 1; 384 -stain; sulfides conc along foliation. Garnets
393	403	739							1		TR							1	1				G	2	72	11		11		FRC	401	65			FD = 1; garnets 1%
403	429																						G	5	70	14		10		FRC	414	45	WL	40	FD = 1.5
429	439	740							1														QG	4	63	23		9		FRC	433	65			FD = 1, Stain 433
439	449	741	15	1					2		2			MP									KAG	19	52	14		10		FRC	445	90			FD = 3, part of it close to Minto granodiorite or altered white plag.
449	459	742	1	1				1	TR		8	1		MP									KAG	37	40	9		5		FRC	454	5			FD = 2, mineralization concn in 2" band at 451 with blobs of mineralization, stains at 453 &449; more mineralization 455-59 although Chal is separated
459	469	743																					QG	6	66	18		13		FRC	460	85 & 0			FD = 1.5, stain 467
469	490																						G	8	68	13		10		FRC	478	55			FD = 1; crystal mush 482-483 of Ortho Phenocrysts
490	500	744																					G	8	68	13		10		FRC	498	80			FD = 2
500	510	745	1			(CPY:Py=1:3)			1														FKAG	16	61	11		10		FRC	504	Follow foliation	M	45	FD = 1.5; last 3' not foliated
510	520	746																					G	9	68	12		10		FRC	515	35			FD = 1, polished section of gray mineral 518; fine grained band 2" crossing 517 at 40° to CA
520	530	747	1			(CPY:Py=1:3)			1														FKAG	16	61	11		10		FRC	525	Follow foliation	S	60	FD = 3, few orthoclase gneissic bands
530	540	748	1			(CPY:Py=1:2)			1														FKAG	16	61	11		10		FRC	536	70	ML	45	FD = 2, Plag xls are altered
540	550	749																					G	8	69	13		13		FRC	546	50			FD = 1, last 2' ortho phenocrysts
550	591																		1	SL			KPG	10	68	11		9		Fault Zone	554-558 562&566				FD = 293, fault zones highly broken up & calcite filled; Peg dike 584-5, at 90° to CA
591	601	750	1							TR								2		ML			FG	14	62	8		13		FRC	595	Follow foliation	M	60	FD = 2, garnet xls.
601	606	751																					KPQG	12	60	16		11		FRC	603	40	WL	50	FD = 1
606	616	752																					KPQG	12	60	16		11		FRC	611	90 & 5			FD = 1; stain 614
616	626	753	5	1						2									TR				FKQAG	18	46	19		14		FRC	624	Follow foliation & 0	MS	65	FD = 2, tends towards gneissic banding, stain 625
626	628	754	5	1															TR				FKQAG	18	46	19		14		FRC	631	15	M	60	FD = 2, same as above with gneissic bands being mainly K-feldspar, minor qtz
628	634	755																					KPQG	12	60	16		11		FRC	631	15			FD = 2, KP xl mush 128.7-129.5; then KPQG to 133, then QG to 134, then sharp contact.

NOTE 1: Number denotes relative abundance 10:1:5

NOTE 2: % by volume
* Specularite

NOTE 3: P - Pervasive
L - Localized strength
Tr - Trace
W - Weak
M - Moderate
S - Strong
Ex. P-S - Pervasive - Strong

NOTE 4: Key for rock type 4 letters max.

ASARCO — DDH LOG

MINTO PROJECT

NOTE 5: UC - Contact (Upper)
LC - Contact (Lower)
Dik - Dike
Flt - Fault
Frc - Fracture
Gge - Gouge
Shr - Shear
Stk - Stockwork
Vn - Vein
Vlt - Veinlet

NOTE 6: Type
W - Weak
M - Moderate
I - Intense
G - Gneissic

HOLE Nº. 110 Page 3 of 3

Lat. 7,885.7 Dep 11,128.8

Ele. 2,874.5 T.D. 1088 Dip 90°

Logged by J.R. Petura

Bearing ____ Date S. 4/7/74 Fin. 7/7/74

FROM	TO	SAMPLE Nº.	(1) ECONOMIC MINERALS						(2) Fe MINERALS				(3) ALTERATION										(4) ROCK TYPE	ROCK COMPOSITION						(5) STRUCTURE			FOLIATION		REMARKS
			Cpy	Born		Sph	Gal	Mo	Py	Mag	Hm	Lim	Ox	Orth	Qtz.	Ser	Biot	Chl	Ep	Carb	Anhy	Clay		Orth	Plag	Qtz	Pyx	Biot	Hbl	Type	Depth	∢ to CA	Degree	∢ CA	
634	644	756	1							TR													FKAG	23	50	10		16		FRC	639	Follow Foliation	M	45	FD = 3; last 2' unfoliated and mineralized; stain 640.
644	651	757									TR								2				KPQG	12	59	16		10		FRC	647	70 & 20			Last 2' KPQG FD = 3
651	654	758	1								TR												FKAG	23	50	10		16		FRC	652.5	45° ± to Foliation	M	50	FD = 7
654	695																		2				KPQG	7	62	19		9		FRC	676	15 & 85			FD = 2
695	705	759	1																TR				KAG	19	54	11		14		FRC	701	80 & 20	VLW	90	FD = 3-5; foliated zone from 696-701.
705	763										TR								2				KPG	9	66	12		10		FRC	749	45			FD = 1; stain 718, major fracturing at 0-5°

HOLE Nº. 110 Page 1 of 3

PROJECT Minto

Lat. 7885.7 Dep. 11,128.8

Ele. 2874.5 T.D. 1088 Dip 90°

Bearing ____ Date S.4 July Fin. 7 July/74

SAMPLE Nº.	INTER	TOTAL COPPER	NON SULPHIDE COPPER	Oz Ag	Oz Au			CORE RECOVERY %	SPECIFIC GRAVITY	REMARKS
0718	40-50	<0.01		<0.01	<0.003					
0719	50-57	0.51		0.04	<0.003					
0720	57-60	0.01		<0.01	<0.003					
0721	60-70	<0.01		<0.01	<0.003					
0722	93-103	<0.01		<0.01	<0.003					
0723	103-107	0.31		0.06	<0.003					
0724	107-113	<0.01		<0.01	<0.003					
0725	124-129	0.01		<0.01	<0.003					
0726	129-130	0.10		<0.01	<0.003					
0727	130-134	0.01		<0.01	<0.003					
0728	134-140	0.03		0.01	<0.003					
0729	140-150	0.10		0.03	<0.003					
0730	150-160	0.09		0.03	<0.003					
0731	186-196	0.03		<0.01	<0.003					
0732	196-206	0.34		0.06	<0.003					
0733	206-216	0.03		<0.01	0.003					
0734	260-270	0.04		<0.01	0.003					
0735	353-363	0.04		<0.01	<0.003					
0736	363-373	0.05		<0.01	<0.003					

HOLE Nº. 110 Page 2 of 3

Lat. 7885.7 Dep. 11,128.8

Ele. 2874.5 T.D. 1088 Dip 90°

Bearing ____ Date S. 4 July Fin. 7 July/74

PROJECT Minto

SAMPLE Nº.	INTER	TOTAL COPPER	NON SULPHIDE COPPER	Oz Ag	Oz Au			CORE RECOVERY %	SPECIFIC GRAVITY	REMARKS
0737	373-383	0.04		<0.01	<0.003					
0738	383-393	0.06		<0.01	<0.003					
0739	393-403	0.04		<0.01	<0.003					
0740	429-439	0.04		<0.01	<0.003					
0741	439-449	1.35		0.04	<0.003					
0742	449-459	0.40		0.03	<0.003					
0743	459-469	<0.01		<0.01	<0.003					
0744	490-500	<0.01		<0.01	<0.003					
0745	500-510	0.47		0.03	<0.003					
0746	510-520	<0.01		<0.01	<0.003					
0747	520-530	0.41		0.03	<0.003					
0748	530-540	0.29		0.01	<0.003					
0749	540-550	<0.01		<0.01	<0.003					
0750	591-601	0.01		<0.01	<0.003					
0751	601-606	0.03		0.03	<0.003					
0752	606-616	0.01		<0.01	<0.003					
0753	616-626	1.42		0.14	0.019					
0754	626-628	1.28		0.15	0.020					
0755	628-634	0.09		<0.01	<0.003					
0756	634-644	0.38		0.03	0.003					
0757	644-651	<0.01		<0.01	<0.003					
0758	651-654	0.40		0.06	0.005					

HOLE Nº. 110 Page 3 of 3

PROJECT Minto

Lat. 7885.7 Dep. 11,128.8

Ele. 2874.5 T.D. 1088 Dip 90°

Bearing ____ Date S. 4 July Fin. 7 July/74

SAMPLE Nº.	INTER	TOTAL COPPER	NON SULPHIDE COPPER	Oz Ag	Oz Au	% Mo		CORE RECOVERY %	SPECIFIC GRAVITY	REMARKS
0759	695-705	0.01		<0.01	<0.003					
1018	837-847	0.13		<0.01	<0.003					
1019	847-857	0.17		<0.01	<0.003					
1020	883-893	0.04		<0.01	<0.003					
1021	923-933	0.31		0.03	<0.003					
1022	933-938	0.25		0.03	<0.003					
1023	978-988	0.84		0.15	0.011					
1024	988-999	1.56		0.32	0.033					
1025	1022-1032	0.44		0.04	0.031	0.013				
1026	1032-1042	0.08		<0.01	<0.003	<0.001				
1027	1082-1088	0.11		<0.01	<0.003					

NOTE 1: Number denotes relative abundance 10:1:.5

NOTE 2: % by volume
* Specularite

NOTE 3: P - Pervasive
L - Localized strength
Tr - Trace
W - Weak
M - Moderate
S - Strong
Ex. P-S - Pervasive - Strong

NOTE 4: Key for rock type 4 letters max.

ASARCO — DDH LOG

MINTO PROJECT

NOTE 5: UC - Contact (Upper)
LC - Contact (Lower)
Dik - Dike
Flt - Fault
Frc - Fracture
Gge - Gouge
Shr - Shear
Stk - Stockwork
Vn - Vein
Vlt - Veinlet

NOTE 6: Type
W - Weak
M - Moderate
I - Intense
G - Gneissic

HOLE Nº. 110 X Page 1 of 1

Lat. 7,885.7 Dep. 11,128.8

Ele. 2,874.5 T.D. 1088 Dip 90°

Logged by S.M. Hubbard Bearing ____ Date S 31/8/74 Fin 2/9/74

FROM	TO	SAMPLE Nº.	(1) ECONOMIC MINERALS						(2) Fe MINERALS				(3) ALTERATION										(4) ROCK TYPE	ROCK COMPOSITION						(5) STRUCTURE			FOLIATION		REMARKS
			Cpy	Born		Sph	Gal	Mo	Py	Mag	Hm	Lim	Ox	Orth	Qtz.	Ser	Biot	Chl	Ep	Carb	Anhy	Clay		Orth	Plag	Qtz	Pyx	Biot	Hbl	Type	Depth	∡ to CA	Degree	∡ CA	
0	763																																		REFER TO LOG DDH 110
763	780.5									TR	TR			L-M W				L-S M		L-S TR			KPG	15	60	15		10		FRC	Common	45°			FD = 2, Potassium phenocrysts, hematite in open fract, calcite potassic & chloritic along selected fractures
780.5	782									TR	TR												FG	5	60	15		20		FRC	Common	10°	M	10°	FD = 1, barren-rock types FG & KPG separated by calcite filled frac ~ 10° bottom and top
782	837										TR			L-S M				L-S P-M	L-S TR	L-S			KPG	15	60	15		10		FRC/Shr	Common 784, 786	70°			FD = 1, High angle frac, cal & hem, dissem hem, filling, potassic & chloritic. Intense along same.
837	847	1018	1					1%	TR	TR				L-S W				L-M TR	L-S	L-M			FG	5	60	15		20		FRC	Common FRC's	3-10°	M-S	0-45	FD = 2, Gypsum filling fract (satin spar) common throughout Chpy is dissem, while chpy & py occur together in silica-rich veins, ∥ to foliation.
847	857	1019	1					1%	TR	TR				L-M W				L-M TR	L-S	L-W			FG	5	60	15		20		FRC Shr	Common	15°-20°	M-S	15° 20°	FD = 2, orange & white satin spur occupy fract, Chpy & py dissem
857	883									TR	TR			L-S M				P-M	W	L-S			G	2	50	35		10-13		FRC/Shr	Common 879	45% 45%			and in QR rich 1/8" shears. FD=2, varied increase in qtz, stain ~ 365', cal, flourite, gypsum,
883	893	1020	1								TR			L-M W				L-M W		L-S		Tr	FG	5	60	20		15		FRC M-Shr	Common	25°	W-M	20-30	vein filling 2" at 874, cal filled shear at 879 along fract. Potassic & Chlor at 1
893	904										TR			L-M W				L-S M		L-S			KPG	2 10	50	35		10-15		FRC/Shr	Common 897	45° 45°			FD = 2, cal, satin spar filling fract; chpy dissem near qtz-rich small shears, potassic & chloritic altn along selected fracts.
904	923		TR								TR			L-M W				P-M L-S		L-S			FG	5	60	20		15		FRC	Common	45°	W-M	45°	FD = 2, cal gypsum filled shear at 897, Rotation of frags, a few K Spar phenocrysts
923	933	1021	1	1						M	TR			L-S				L-S W		L-S			FG	5	60	20		15		FRC	Common	45°	M-S	45°	FD = 2, K Spar phenocrysts aligned with foliation, 3 specks chpy ~ 10", Calcite gypsum in fract.
933	938	1022	3	1						M	TR			L-S				L-S W		L-S			FG	5	60	20		15		FRC	Common	45°	M-S	60°	FD = 7 Chpy & bornite in Qtz seams, also micro shears // to foliat.
938	978									W	TR			L-S				L-S M		L-S			G	10 0	50 70	30 25		10 5		FRC Shr	Common 942, 58	45°			FD = 2, Chpy & bornite in mafics, Qtz seams barren, section spar, calcite in fract veinfillings
978	988	1023	1	3						1%	TR			L-M				P-M		L-S			FG	0.5	65	20		10-15		FRC/Vn	Common FRC	45°	S	10°	FD=3, Qtz rich, Seg of light & dk mins, some weak foliation in spots, cal & gypsum in fracts, cal chl gypsum in breccia at 942
988	999	1024	1	6						1%				L-M				P-M	L-S	L-S			FG	0.5	65	20		10-15		FRC/Vn	Common	45°	S	10°	FD=3 Chpy & born near margins of Qtz seams & in seams parallel to foliation. Some chpy & bornite in fract containing gypsum on margins of fracts
999	1022													L-S W				P-W	L-S	L-S			G	0.5	65	20		10-15		FRC	Common	45°			FD = 1 Most chpy & bornite in seams parallel to foliation near
1022	1032	1025	5	1				1	1%	1%	TR			L-S M				P-M	P-M	L-S			FG/Bx	0.5	65	20		10-15		FRC/Shr	Common 1022-25	45°	S	45°	Qtz rich areas, some dissem gypsum & cal in fract. 986 = 1" born on upper contact of qtz seam.
1032	1042	1026	1					TR	1%	W				L-S W				P-M	L-S	L-S			FG	0.5	65	20		10-15		FRC/Shr	Common 1033, 36, 40	45°	S-W	45°	FD = 3 Calcite in fract FD = 10 - gypsum & cal separately flares to shear chpy and moly in qtz rich seams and dissem in mafics.
1042	1066.5										1%			L-M W				P-M	L-S	L-S			G	5	65	20		10		FRC	Common	45°			FD=3, Gypsum in fract, py & chpy in areas of strongest foliation and heavy mafics.
1066.5	1070			TR										L-S				P-M	L-M	L-S TR			FG	5	60	25		10-15		FRC/Shr	Common	45°	M-S	45°	FD = 2, calcite lines fract - some increase in SiO_2
1070	1072.5													M				S					And	20	30	25				FRC	Common	45°			FD = 2, 2 specks born noted in Qtz seam, strong foliation parallel to shear
1072.5	1082													L-M				L-M	W	L-S			G	5	60	25		10-13		FRC	Common	45°			FD - 2, Tops and bottom contact hairline with cal = 1/6 between andesite and foliated granite.
1082	1088	1027	1											L-M				L-M	W	L-S			G	5	60	25		15		FRC	Common	45°	L-S W	45°	FD = 2, hem and cal in fracts.
1088																																			FD = 2 Gradual increase in foliation, gypsum in fracts, Chpy mineralization spotty, assoc with Qtz rich areas of foliation.

END OF HOLE

ASARCO — DDH LOG

MINTO PROJECT

NOTE 1: Number denotes relative abundance 10:1:5

NOTE 2: % by volume
* Specularite

NOTE 3: P - Pervasive
L - Localized strength
Tr - Trace
W - Weak
M - Moderate
S - Strong
Ex. P-S - Pervasive - Strong

NOTE 4: Key for rock type 4 letters max.
H: Hematite
Q: Quartz
F: Foliated
A: Altered

NOTE 5: UC - Contact (Upper)
LC - Contact (Lower)
Dik - Dike
Flt - Fault
Frc - Fracture
Gge - Gouge
Shr - Shear
Stk - Stockwork
Vn - Vein
Vlt - Veinlet

NOTE 6: Type
W - Weak
M - Moderate
I - Intense
G - Gneissic

HOLE Nº. 113 Page 1 of 3
Lat. 7,193.3 Dep. 13,819.9
Ele 2,824.4 T.D. 798 Dip 90°
Logged by J.R. Petura Bearing ____ Date S. 5/7/74 Fin. 7/7/74

FROM	TO	SAMPLE Nº.	(1) ECONOMIC MINERALS						(2) Fe MINERALS				(3) ALTERATION									(4) ROCK TYPE	ROCK COMPOSITION						(5) STRUCTURE			FOLIATION		REMARKS
			Cpy	Chal	Mal	Opaque		Native Cu	Py	Mag	SPEC Hm	Lim	Ox	Orth	Qtz.	Ser	Biot	Chl	Ep	Carb	Anhy	Clay		Orth	Plag	Qtz	Pyx	Biot	Hbl	Type	Depth	∠ to CA	Degree	∠ CA	
0	56																																	Overburden
56	103										41	1	SP					TR		SP4		SL2	HAG	8	37	6				FLT	102-103	90°+15			Hematite enrich due to closeness of fault? FD = 5-10
103	111											40	SP							SP5			LAG	5	30	5		15					MVL	40	Fault zone? this type of rock similar to clasts in hem, breccia DDH 105-100?
111	122										8		SP		10					SP4			FAG		69	8				FRC	114	Follow F	M	55	FD = 1
122	131										41	TR	SP							SP8		1	HAG	7	37	5									Fault zone? brecciated and highly broken; FD = 20
131	159										4	4	MP							MP2			HKPAG	16	56	16		3		FRC	148	5			Stain 158.5; FD=2, rock on whole is pinkish looking, Ferromagn
159	169	578									4	4		MP						MP2			HKPAG	16	56	16		3		FRC	159.5	10			replaced by hem and lim FD=1
169	179	579				1	8	4			4	4	MP							MP2			HKPAG	16	56	16		2		Dik Peg K Spar Rich	174.5-176	90			Native dissem; 1 MM in size; FD =2, FRC at 20° to CA, Peg barren
179	189	580			1		1	1			4	4	MP							ML			HKPQG	12	55	18		5		FRC	188	15-20			FD = 3
189	199	581			1		1	1			7	2	MP							ML 1			HKPQG	9	55	19		7		Vn-Peg K Spar	190.5-191	20			Stain 193, rock is more whitish now, change from pink gradationa FD = 1.5
199	209	582			10		2	1			7	2	MP							ML			HKPQG	9	55	19		7		FRC	207	30			Cu in pitch in FRC - Mal dissem; Mal after native, FD = 2
209	219	583			10		1	2			7	2	MP							WL			HKPQG	9	55	19		7		FRC	212	40 & 0			FD = 2, native dissem.
219	229	584			10		2	1			7	2	MP							WL			HKPQG	9	55	19		7		FRC	223	30			FD = 3
229	239	585									10	TR	WP							WL			HQG	7	42	25		15		FRC	234	50			FD = 1; calcite only in fractures along with propyllitic mins.
239	249	586		0/10		1					1/10	TR	WP							WL			HQG	9	45	19		16		FRC	345.5	40	SL	40	FD =1.5; Gneissic & contorted (243-47); Mineralization contd 3" band at 244
249	259	587									TR/10		WP							WL			FHG	9	54	8		18		Dik 2-3'	251.5-254	90	M	10	FD = 1 Stain 256. Foliation is crenulated.
259	269	588		0 2		1					TR/10		WP							WL			FHG	9	54	8		18		FRC	263	75	M	5	FD =.6; Crenulated foliation - swings alot by disappearing (267)
269	279	589									10	TR	WP					1		WL			HG	9	54	8		18		FRC	274	15			FD = 2, chlorite along late fractures
279	287	590		0/1							2/10		WP							WL			HG	14	49	10		13		FRC	284	45			FD = 2.5; chalcocite dissem.
287	297	591						1		3	2/8		WP					TR		WL			HG	18	52	7		9		FRC	291	40			FD = 3; mag and specularite assoc & dissem. Native along Frc and dissem. Stain 293.
297	307	592									8	2	WP					TR		WL			HG	9	62	10		8		FRC	304-307	0-5			FD = 4, Aphanite basaltic? Dike 300.7 - 301.5 at 45° to CA
307	317	593		0/6	1		1				10	1	WP							WL				10	58	13		7		FRC	312	45			FD = 5; Cu mostly between 309 to 312, same type Dike as above 312-313
317	327	594									10	TR	WP							WL			HQG	11	55	16		7		FRC	321	10&45			FD = 5; stain 318
327	337	595		0/1	1		1				3/6	3	MP					TR		WL			HKAG	43	20	20		3		FRC	329	35			FD = 3; stain 634; Specularite and chalcocite dissem.
337	347	596	1	1/1	1		1				3/6	3	MP					TR		WL			HKAG	43	20	20		3		FRC	344	30&60			FD = 3, mineralization same as above.

NOTE 1: Number denotes relative abundance 10:1:5

NOTE 2: % by volume
* Specularite

NOTE 3: P - Pervasive
L - Localized strength
Tr - Trace
W - Weak
M - Moderate
S - Strong
Ex. P-S - Pervasive - Strong

NOTE 4: Key for rock type 4 letters max.

ASARCO — DDH LOG

MINTO PROJECT

NOTE 5: UC - Contact (Upper)
LC - Contact (Lower)
Dik - Dike
Flt - Fault
Frc - Fracture
Gge - Gouge
Shr - Shear
Stk - Stockwork
Vn - Vein
Vlt - Veinlet

NOTE 6: Type
W - Weak
M - Moderate
I - Intense
G - Gneissic

HOLE Nº. 113 Page 2 of 3
Lat. 7,193.3 Dep. 13,819.9
Ele 2,824.4 T.D. 798 Dip 90°
Logged by J.R. Petura Bearing ____ Date S 5/7/74 Fin 7/7/74

FROM	TO	SAMPLE Nº.	(1) ECONOMIC MINERALS						(2) Fe MINERALS				(3) ALTERATION										(4) ROCK TYPE	ROCK COMPOSITION						(5) STRUCTURE			FOLIATION		REMARKS
			Cpy	Bornite / Chal	Mal / Az	Qtz Vein Material	Cu Oxide Material	Native Cu	Py	Mag	*Spec Hem	Lim	Ox	Orth	Qtz.	Ser	Biot	Chl	Ep	Carb	Anhy	Clay		Orth	Plag	Qtz	Pyx	Biot	Hbl	Type	Depth	∠ to CA	Degree	∠ CA	
347	357	597	1	1/2	10/.3						3/6	3	MP							WL			HKAG	38	30	16		3		Dik-2" Plag Gr	351	15			FD = 3
357	367	598									1/4	1	WP							WL			HKAG	21	53	13		7		FRC	361	20			FD = 3; Dike 362-363 -composition? Appears to be folded
367	406										/4	TR	WL			TR		6		ML		TR	HKPG	9	60	16		4		FRC	304-309	0			FD = 4; stain 367.5, 7" ortho peg dikes at 393and 403
406	478										/2							8		ML			G	18	57	12		4		Dik F. Gr. Ca	441.5-442	40			FD = 1.5; stain 429
478	488	599						1			2							5		ML			G	14	56	12		10		Dik	482.3-483	20			FD = 1; native in dike (483); Dike comp -50% ortho, 28 plag 20 Qtz, Tr hem and native.
488	498	600						1			2							2		ML			G	13	56	13		16		FRC	489	20			FD = 1
498	508	701									2							5		ML			G	13	56	13		14		FRC	501-03	0			FD = fairly continuous
508	518	702						1			TR/2							9		ML			G	13	56	13		9		FRC	512	0 & 25			FD = 2, Native dissem and some assoc with chlorite at 510
518	548										1							8		M			G	13	60	12		7		FRC	541	5 & 20			FD = 1
548	558	703						1										7		ML			G	13	63	12		5		Dik Peg	552.5-54	45°			FD = 2, native along FRC IN PEG 553.3, < of Frc to CA is 40°
558	568	704						1										6		ML			G	12	63	12		4		FRC	559	40			Stain 567; FD = 1.5, native dissem.
568	603										TR							11	TR	ML			G	12	62	10		4		Shr	592	5-10			FD = 2
603	613	705	2	1/0							TR			ML				11	TR	ML			G	12	62	10		4		Coarse Gr Felds Dik	608.8-9.3	65			FD = 1; some Cpy and Bio assoc with ferromagn 607'.
613	642										TR	TR		ML				11	1	WL			G	13	61	9		4		FRC	632	20			FD = 1, stain 638
642	652	706									TR	TR		ML				11	1	WL			G	13	61	9		4		FRC	643	10			FD = 3
652	655	707		0/1							TR	TR		ML				11	1	WL			G	13	61	9		4		FRC	652.5	30			FD = 2, Cu dissem
655	665	708	13	1/0						1	TR	TR						1		WL			FQG	13	56	18		10		FRC	662	FollowF	S	40	FD = 2; One set of fractures at 15°, i.e., 125° to foliation
665	675	709												SL						WL			G	13	64	10		12		FRC	673	0			FD = 1; Plag appears to be close to albite; Qtz vein at 670' spotty orthopheno
675	680													SL						WL			G	13	64	10		12		FRC	677	Follow F	M	60	FD = 1 Plag appears to be close to albite; stain 678; pseudo gneissic
680	721										TR/0			SL				6		WL			KPQG	16	58	17		2		Dik-F Gr Felds Q	703-04	45			FD = 2, at 70 & 40; stain 708, 3" gouge at 721.5
721	731	710									0/1			WL				2	1	WL			G	16	52	13		15		Dik	722-23	40			FD = 1
731	741	711	1		(CPY:Py=1:1)				1		TR/0			WL				2		WL			FKAG	50	25	10		11		FRC	737	Follow F	M	50	FD = 1; tends towards gneissic; stain 732
741	751	712	1		(CPY:Py=1:1)				1					WL						WL			FKAG	17	57	12		12		FRC	741	5	M	40	FD = 1.5, tends towards gneissic; stain 747
751	753.5	713	7	1					TR					WL						WL			FKAG	17	57	12		12		FRC	751.5	20	M	35	FD = 1, Bo after Cpy
753.5	761	714												WL						SL			FKAG	17	57	12		12		FRC	760	0	ML	35	FD = 1

NOTE 1: Number denotes relative abundance 10:1:5

NOTE 2: % by volume
✱ Specularite

NOTE 3: P ~ Pervasive
L ~ Localized strength
Tr ~ Trace
W ~ Weak
M ~ Moderate
S ~ Strong
Ex. P-S ~ Pervasive - Strong

NOTE 4: Key for rock type 4 letters max.

ASARCO — DDH LOG

MINTO PROJECT

NOTE 5: UC - Contact (Upper)
LC - Contact (Lower)
Dik - Dike
Flt - Fault
Frc - Fracture
Gge - Gouge
Shr - Shear
Stk - Stockwork
Vn - Vein
Vlt - Veinlet

NOTE 6: Type
W - Weak
M - Moderate
I - Intense
G - Gneissic

HOLE Nº. 113 Page 3 of 3
Lat. 7,193.3 Dep. 13,819.9
Ele. 2,824.4 T.D. 798 Dip 90°
Logged by J.R. Petura Bearing ____ Date S. 5/7/74 Fin. 7/7/74

FROM	TO	SAMPLE Nº.	(1) ECONOMIC MINERALS						(2) Fe MINERALS				(3) ALTERATION										(4) ROCK TYPE	ROCK COMPOSITION						(5) STRUCTURE			FOLIATION		REMARKS
			Cpy	Born		Sph	Gal	Mo	Py	Mag	Hm	Lim	Ox	Orth	Qtz.	Ser	Biot	Chl	Ep	Carb	Anhy	Clay		Orth	Plag	Qtz	Pyx	Biot	Hbl	Type	Depth	∡ to CA	Degree	∡ CA	
761	766	715																		WL			G	13	62	12		12		FRC	762	45			FD = 1, last 1/2 close to normal granodiorite
766	772	716	1	3						1	TR			SP				8		WL			KAG	20	49	15		6		FRC	771	60			FD - ; mineralization dissem.
772	781	717												WL				3	1	WL			KPQG	11	60	17		7		FRC	775	45			FD = .7, stain
781	798										TR							3	1	WL			KPQG	11	60	17		7		FRC	793	20			FD = 3

HOLE Nº. 113 Page 1 of 3

Lat. 7,193.3 Dep. 13,819.9

Ele. 824.4 T.D. 798 Dip 90°

Bearing _____ Date S. 5 July Fin. 7 July/74

PROJECT Minto

SAMPLE Nº.	INTER	TOTAL COPPER	NON SULPHIDE COPPER	Oz Ag	Oz Au			CORE RECOVERY %	SPECIFIC GRAVITY	REMARKS
0578	159-169	0.03		<0.01	<0.003					
0579	169-179	0.06		<0.01	<0.003					
0580	179-189	0.16		<0.01	<0.003					
0581	189-199	0.13		<0.01	<0.003					
0582	199-209	0.18		<0.01	<0.003					
0583	209-219	0.12		<0.01	<0.003					
0584	219-229	0.02		<0.01	<0.003					
0585	229-239	0.02		<0.01	<0.003					
0586	239-249	0.36		0.01	<0.003					
0587	249-259	0.02		0.01	<0.003					
0588	259-269	0.11		0.03	<0.003					
0589	269-279	0.01		<0.01	<0.003					
0590	279-287	0.01		<0.01	<0.003					
0591	287-297	0.06		0.01	<0.003					
0592	297-307	<0.01		<0.01	<0.003					
0593	307-317	1.50		0.20	0.016					
0594	317-327	0.01		<0.01	<0.003					
0595	327-337	1.00		0.09	0.005					
0596	337-347	1.38		0.18	0.024					
0597	347-357	0.75		0.09	0.005					
0598	357-367	0.02		<0.01	<0.003					
0599	478-488	0.05		<0.01	<0.003					
0600	488-498	0.13		0.01	<0.003					
0701	498-508	0.08		0.01	<0.003					

HOLE Nº. 113 Page 2 of 3

PROJECT Minto

Lat. 7,193.3 Dep. 13,819.9

Ele. 2,824.4 T.D. 798 Dip 90°

Bearing _____ Date S. 5 July Fin. 7 July/74

MPLE Nº.	INTER	TOTAL COPPER	NON SULPHIDE COPPER	Oz Ag	Oz Au			CORE RECOVERY %	SPECIFIC GRAVITY	REMARKS
2	508-518	0.07		<0.01	<0.003					
3	548-558	0.02		<0.01	<0.003					
4	558-568	0.07		<0.01	<0.003					
5	603-613	0.11		<0.01	<0.003					
6	642-652	0.07		<0.01	<0.003					
7	652-655	0.25		0.04	<0.003					
8	655-665	0.84		0.10	0.008					
9	665-675	0.15		0.03	<0.003					
0	721-731	<0.01		<0.01	<0.003					
1	731-741	0.61		0.04	0.003					
2	741-751	0.36		0.03	<0.003					
3	751-753.5	0.64		0.07	<0.003					
4	753.5-761	0.21		0.04	<0.003					
5	761-766	0.02		<0.01	<0.003					
6	766-772	1.02		0.22	0.020					
7	772-781	<0.01		<0.01	<0.003					

ASARCO — DDH LOG

MINTO PROJECT

NOTE 1: Number denotes relative abundance 10:1:5

NOTE 2: % by volume
* Specularite

NOTE 3: P - Pervasive
L - Localized strength
Tr - Trace
W - Weak
M - Moderate
S - Strong
Ex. P-S - Pervasive - Strong

NOTE 4: Key for rock type 4 letters max.

QD: Quartz Diorite

NOTE 5: UC - Contact (Upper)
LC - Contact (Lower)
Dik - Dike
Flt - Fault
Frc - Fracture
Gge - Gouge
Shr - Shear
Stk - Stockwork
Vn - Vein
Vlt - Veinlet

NOTE 6: Type
W - Weak
M - Moderate
I - Intense
G - Gneissic

HOLE No. 116 Page 1 of 2

Lat. 7,197.2 Dep. 9,950.2

Ele. 3,117.6 T.D. 698 Dip 90°

Logged by M.J. Whiticar Bearing ____ Date S. 10/7/74 Fin. 12/7/74

FROM	TO	SAMPLE No.	(1) ECONOMIC MINERALS						(2) Fe MINERALS				(3) ALTERATION										(4) ROCK TYPE	ROCK COMPOSITION						(5) STRUCTURE			FOLIATION		REMARKS
			Cpy	Born	Mal	Sph	Gal	Mo	Py	Mag	Hm	Lim	Ox	Orth	Qtz.	Ser	Biot	Chl	Ep	Carb	Anhy	Clay		Orth	Plag	Qtz	Pyx	Biot	Hbl	Type	Depth	∡ to CA	Degree	∡ CA	
0	11																																		Overburden
11	50										TRL	ML	M	M		TR		M	M-W	ML			G/AG	10	63	12		15		FRC	Common	5			~~FD = 2-10 lim/Mn in fract with chlor sections of high qtz content/chlorite~~
50	60	0652									TR	M	M-W	M		TR		M-S	W	ML			(RTG)AG	11	63	14		12		FRC	50-2	5			FD = 4-20 Lim/Cal in fract pink/green qtz altn
60	70	0653	8	1	1					MP	TR	ML	W	M		W		M-S	W	ML			(A)G	15	58	14		13		FRC FRC	61 Common	5 35			FD = 5-10 Cu is dissem blotchy chl/biot lineated mafics no set orient
70	80	0654	8	2	1					SP	TR	WL	W	M-W		TR		M	TR	WL			AG	14	60	10		16		FRC	Common	70			FD = 4 banded mag with massive cpy assoc with mafics and plag
80	90	0655	8	2	1					SP		TRL		W				M	W	TRL			AG QD	14	2 60	10		16		FRC	Common	50			FD = 4-2 no mineralization in QD (Tonalite) 86' → no contact vis.
90	100	0656								WP		TRL	TR					M	W	TRL			Q D	2	64	25		7		FRC FRC	Common 94	50 10			FD = 3 small book biot Kspar 2° lim/cal in fract
100	156								TRL	TR	WL	WL	TRL	M				W-ML		TRL			A KPG	12	59	14		15		FRC FRC	Common Common	40 5			FD= 4 biot concn at 145-7 rock is altd (RTG) ahead of fault? zone 152-6
156	166	0657								TR	W	WL		M		TR		W		TRL			KPG	10	56	20		14		FRC	Common	40			FD = 4-5 fault breccia and zone @ 156-7 heavy altn by fault rest fresh
166	176	0658	1								TR	TRL	TRL	W				W-M		TRL			AG	7-5	63	23		7		FRC	Common	50			FD = 3 high qtz (xtls subhedral) mottled text. Cpy dissem. Vuggy.
176	186	0659									W	TRL		W				W	TR				KPG	12	61	14		13		FRC FRC	Common 182	40 20			FD = 3 1' ortho enrich at 178' minor lim in fract with carb
186	230										W	TRL		W				W	TR-W				KPG	12	61	14		13		FRC	Common	70			FD = 2 Kpheno ↑ 1.5" local ortho enrich (fract) /mottling -plag altn
230	240	0660	TR in Frac	Same as above																															
240	250	0661	1											W				W	TR				FG	13	53	16		18		FRC	245	20	W-M	Swirly	FD=1 mottled mod-high altn; biot concn varies; cpy dissem throughout
250	260	0662	1								TR			W				W					FG	14	54	16		16		FRC	Common	60	W	45	FD = 2 biot concn varies local ortho enrich
260	270	0663	1									TRL		W				W		TRL			FG	14		15		14		FRC	Common	70	W	Swirly	FD = 2 biot concn varies local ortho enrich
270	280	0664		Same as below																															
280	313																						KPQD	6	58	22		14		FRC Dik And	Common 302	45 45			FD = 2-3 only 1% orth in grains, 5% Kpheno high altd fract zone 282. Frc/SLK 20/70
313	323	0665		Same as above																															
323	333	0666	3	1						W/ML	TR	TRL		W				W					FG	16	53	18		13		UC	323	40	ML	45	FD = 2 contorted/foliated zones with varing mafic concn
333	343	0667	3	1						W	TR	TRL		W-M				TR		TRL			FG	18	51	19		12		Dik	337-9 340-2	40	M	45	FD = 2 contorted foliated zones with uniform dike
343	355	0668	3	1						W	TR			W-M				TR		TRL			(F) G	18	51	19		12		FRC	349	25	W	Swirly	FD = 2 contorted foliated zones banding qtz/mafics ortho eyes
353	363	0669	5	1							TR			W				TR	TR	TRL			(F) G	15	53	18		14		Dik	358	10	WL	45	FD = 3 local biot concn
363	373	0670		Same as below																															
373	410										W	TRL						TR	W-M	TRL			KPG	14	56	12		18		Dik	386,389,90	30			FD = 1-2 equigranular, 5" altn zone in fract.

NOTE 1: Number denotes relative abundance 10:1:5

NOTE 2: % by volume
* Specularite

NOTE 3: P - Pervasive
L - Localized strength
Tr - Trace
W - Weak
M - Moderate
S - Strong
Ex. P-S - Pervasive - Strong

NOTE 4: Key for rock type 4 letters max.

ASARCO — DDH LOG

MINTO PROJECT

NOTE 5: UC - Contact (Upper)
LC - Contact (Lower)
Dik - Dike
Flt - Fault
Frc - Fracture
Gge - Gouge
Shr - Shear
Stk - Stockwork
Vn - Vein
Vlt - Veinlet

NOTE 6: Type
W - Weak
M - Moderate
I - Intense
G - Gneissic

HOLE Nº. 116 Page 2 of 2

Lat. 7,197.2 Dep. 9,950.2

Ele. 3,117.6 T.D. 698 Dip 90°

Logged by M.J. Whiticar Bearing ____ Date S. 10/7/74 Fin 12/7/74

FROM	TO	SAMPLE Nº.	(1) ECONOMIC MINERALS						(2) Fe MINERALS				(3) ALTERATION										(4) ROCK TYPE	ROCK COMPOSITION						(5) STRUCTURE			FOLIATION		REMARKS
			Cpy	Born		Sph	Gal	Mo	Py	Mag	Hm	Lim	Ox	Orth	Qtz.	Ser	Biot	Chl	Ep	Carb	Anhy	Clay		Orth	Plag	Qtz	Pyx	Biot	Hbl	Type	Depth	∡ to CA	Degree	∡ CA	
410	420	0671	1						1		M-W			W				W	TR	TRL			FG	12	63	13		12		FRC	Common	30	W	75	FD = 2 biot concn varies, mod foliation size garnetized
420	430	0672	1						1		TR-W			W				W	TR				FG	12	63	13		12		FRC	Common	40	W	45	FD = 3 finely f-liated; disseminated py, massive biot at 420 garnetized
430	440	0673	1						1		TR			W				W	TR				FG	14	59	14		13		FRC	Common	40	W	50	FD =3 Kpheno form augers, mod foliation size banded orth (wide spacing)
440	450	0674	1						1		TR			W				TR-W	TR	TR			FG/G	14	58	15		13		FRC	Common	45	WL	50	FD = 2 mottled in places
450	460	0675							1		W			TR				W-M	W	TRL			G	12	60	13		15		FRC	455	45			FD = 2 -25 - high fract 456-7 → (possible fault) orth/chl/hem enriched
460	544										W-M			TR				M	W	WL		WL	AG	8	58	18		16		FRC Slk	Common	5 40	WL	40	FD = ? Altd (RTG) fault Zn high frac, ang frag heavy altn L along fract
544	554	0676	544-550 as above 550-4:								TR			TR				M	W				KPG	12	61	13		14		UC	550				FD = < 1 mod fresh KPG Kpheno ↑ 1"
554	564	0677	1						1		W			W				M	W				(A) G	14	57	15		14		FRC	Common	10	WL	50	FD = 3 fault related fract orth/hem stained/enriched. Cpy/py intimate assoc.
564	574	0678									W			W				M-W	W				KPG	13	56	15		16		FRC	Common	45			FD = 3 mod fresh Tr lim/Chl in fract
574	600								TR		W			TR				W	W				KPG	13	56	15		16		Dik Ortho Dik Ofs	589 593	45 35			FD = 1-2 local ortho enrich in fract
600	610	0679	1						1									W	TR				KP/FG	11	56	15		18		FRC	Common	40	WL	40	FD = 3 Cpy/py restricted to 2' foliated section
610	698										W			TR				W	TR				KPG	8	64	13		15		FRC	Common	60	WL	40	FD = 3 lim in fract small 2' mineralized zone
636	646	0680	1	Description above					1																									

HOLE Nº. 116 Page 1 of 2

PROJECT Minto

Lat. 7,197.2 Dep. 9,950.2

Ele. 3117.6 T.D. 698 Dip 90°

Bearing _____ Date S. 10 July Fin. 12 July/74

SAMPLE Nº.	INTER	TOTAL COPPER	NON SULPHIDE COPPER	Oz Ag	Oz Au			CORE RECOVERY %	SPECIFIC GRAVITY	REMARKS
0652	50-60	0.02		<0.01	<0.003					
0653	60-70	1.20		0.11	0.015					
0654	70-80	1.86		0.16	0.020					
0655	80-90	1.74		0.16	0.020					
0656	90-100	0.02		<0.01	<0.003					
0657	156-166	0.01		<0.01	<0.003					
0658	166-176	0.67		0.07	<0.003					
0659	176-186	<0.01		<0.01	<0.003					
0660	230-240	0.02		<0.01	<0.003					
0661	240-250	0.57		0.04	<0.003					
0662	250-260	0.52		0.04	<0.003					
0663	260-270	0.45		0.03	<0.003					
0664	270÷280	<0.01		<0.01	<0.003					
0665	313-323	0.11		<0.01	<0.003					
0666	323-333	1.68		0.19	0.024					
0667	333-343	0.41		0.06	0.005					
0668	343-353	1.74		0.16	0.037					
0669	353-363	1.02		0.14	0.020					
0670	363-373	<0.01		<0.01	<0.003					
0671	410-420	0.01		<0.01	<0.003					
0672	420-430	0.06		<0.01	<0.003					

HOLE Nº. 116 Page 2 of 2

Lat. 7,197.2 Dep. 9,950.2

PROJECT Minto

Ele. 3117.6 T.D. 698 Dip 90°

Bearing _____ Date S. 10 July Fin. 12 July/74

SAMPLE Nº.	INTER	TOTAL COPPER	NON SULPHIDE COPPER	Oz Ag	Oz Au			CORE RECOVERY %	SPECIFIC GRAVITY	REMARKS
0673	430-440	0.03		<0.01	<0.003					
0674	440-450	0.04		<0.01	<0.003					
0675	450-460	0.09		0.01	<0.003					
0676	544-554	<0.01		<0.01	<0.003					
0677	554-564	0.33		0.04	<0.003					
0678	564-574	<0.01		<0.01	<0.003					
0679	600-610	0.05		<0.01	<0.003					
0680	636-646	0.05		<0.01	<0.003					

NOTE 1: Number denotes relative abundance 10:1:5

NOTE 2: % by volume
* Specularite

NOTE 3: P - Pervasive
L - Localized strength
Tr - Trace
W - Weak
M - Moderate
S - Strong
Ex. P-S - Pervasive - Strong

NOTE 4: Key for rock type 4 letters max.
QM: Quartz Monzonite

ASARCO — DDH LOG

MINTO PROJECT

NOTE 5: UC - Contact (Upper)
LC - Contact (Lower)
Dik - Dike
Flt - Fault
Frc - Fracture
Gge - Gouge
Shr - Shear
Stk - Stockwork
Vn - Vein
Vlt - Veinlet

NOTE 6: Type
W - Weak
M - Moderate
I - Intense
G - Gneissic

HOLE Nº. 117 Page 1 of 2

Lat. 6,264.1 Dep. 14,775.4

Ele 2,926.7 T.D. 594 Dip 90°

Logged by J.R. Petura Bearing ____ Date S. 10/7/74 Fin 12/7/74

FROM	TO	SAMPLE Nº.	(1) ECONOMIC MINERALS						(2) Fe MINERALS				(3) ALTERATION										(4) ROCK TYPE	ROCK COMPOSITION						(5) STRUCTURE			FOLIATION		REMARKS
			Cpy	Born	Mal	Nat Cu	Chal	Cubnt	Py	Mag	* Fm	Lim	Ox	Orth	Qtz	Musc Ser	Biot	Chl	Ep	Carb	Anhy	Clay		Orth	Plag	Qtz	Pyx	Biot	Hbl	Type	Depth	∠ to CA	Degree	∠ CA	
0	21																																		Overburden
21	28										7 (SP)	1	SP										HG	10	64	8		9		FRC	27	20	WL	50	FD = 3
28	38	908									6 (SP)	1	SP										HFG.	10	65	8		9		FRC	33	35	W	50	FD = 3
38	39	909	TR	TR	1		TR				6 (SP)	1	SP										HFG	10	62	8		9		FRC	38.7	65	W	60	FD = 3, 3% specularites malachite & Cu minerals assoc with it.
39	48	910									5	TR	MP										HG	10	66	8		9		Dik And	44	50			FD = 2, 1% specularite
48	118												WP						1				G	16	58	12		12		Dik	72-73	25	MVL	45	FD = 2; hematite staining ends at 58', (of any consequence), stain 68
																																			Foliated zones up to 6" - abnormal increase in orthoclase up to 65% (Stain 93') - No Cu mineralization - dike 72-73', CSE grained ortho-Qtz-Plag.
118	178										1			ML					1				G	15	63	9		11		FRC	163	30&10			FD = 2; stain 128, ortho alt along some Frc
178	188	911									2		ML										QG	7	67	17		8		Dik M.Gr O.Q.Pleg	182.3-.9	80			FD = 3, 186-188 highly altd & hematite stained, stain 179
188	198	912				1	8				1/4		MP			1							HAG	10	70	9		4		FRC	193.5	5&30	WL	50	FD = 6, 196.5-198 start of foliation - 196.6 native Cu & CHal, Chal dissem through section
198	208	913	1	3			3				2			ML		TR							FG	8	70	8		11		FRC	204	Follow Foliation	M	40	FD = 2 - plag altn white
208	218	914					1				1/	TR		ML		2							FG	8	70	8		11		FRC	213	1/ Foliation	M	35	FD = 2, plag altn white, mineral chalc? too small for positive identification.
218	228	915	3	1							1/			SL		TR							FG	18	61	8		11		Vn-Feld	219-19.3	45	M	45	FD = 2.5
228	238	916	1	6			2		TR		TR/	1	WP	SP		1				SL			QM	34	39	20		6		FRC	234	5			FD = 5; Stain 233, Plag - white
238	248	917	1	1					1		2/	1	WP	SP		TR				SL			QM	33	38	20		6		FLT	233.3-240				FD = 5, Fault breccia 45% Plag - 3 Qtz & Ortho - rest? stain 239'
248	258	918	1	1							TR			SL		TR				SL			QM	26	50	13		9		FRC	256	0-5	WL	45	FD = 1; Cu mineralization hard to identify - GDI
258	268	919	1	1							1/			SP									QM	40	38	14		5		FRC	267.5	5	WL		FD = 2, stain 263, A few blebs of clearly identifiable Cu
268	278	920	17	4		1	4	.5			/TR			SP		1		2					QM	26	50	13		5		FRC	277	0			FD = 2, a few 8" sections of ctry rock - rest altd; Chal, Na, Cu and Cup 277.8
278	288	921												SL		TR				SL			KPG	14	66	9		10		Dik-Feld F. GR.	279-280	45			FD = 2, Odd K Phenocrysts; propyllitic Altn.
288	308								TRL					SL		TR				SL			KPG	17	63	9		10		FRC	302.6	45			FD= 2, 90% of Frc have strong ortho altn along them
308	318	922	1						4					SLF						SL			G	19	57	8		10		FRC	312	20			FD = 2, Stain 313
318	408								TRL					WL				3	1				QKPG	9	60	18		8		Dik Peg. Ortho Qtz	372	45			FD = 2, Chlorite starts ~ 366, stain 358', epidote dissem & in frc
408	418	923	1								TR	TR						8					FG	9	64	10		8		FRC	411	5 & 55	W	80	FD = 2, Cpy very fine grained; mainly assoc with ferromag
418	436																	13	2				KPG	9	60	13		2		FRC	425	10			FD = 2
436	493										TR							7					G	21	56	8		7		FRC	452	15 & 0			FD = 2, stain 488, propyllitic fracture filling

NOTE 1: Number denotes relative abundance 10:1:5

NOTE 2: % by volume
* Specularite

NOTE 3: P - Pervasive
L - Localized strength
Tr - Trace
W - Weak
M - Moderate
S - Strong
Ex. P-S - Pervasive - Strong

NOTE 4: Key for rock type 4 letters max.

ASARCO — DDH LOG

MINTO PROJECT

NOTE 5: UC - Contact (Upper)
LC - Contact (Lower)
Dik - Dike
Flt - Fault
Frc - Fracture
Gge - Gouge
Shr - Shear
Stk - Stockwork
Vn - Vein
Vlt - Veinlet

NOTE 6: Type
W - Weak
M - Moderate
I - Intense
G - Gneissic

HOLE Nº. 117 Page 2 of 2
Lat. 6,264.1 Dep. 14,775.4
Ele. 2,926.7 T.D. 594 Dip 90°
Logged by J.R. Petura Bearing ____ Date S. 10/7/74 Fin. 12/7/74

FROM	TO	SAMPLE Nº.	(1) ECONOMIC MINERALS						(2) Fe MINERALS				(3) ALTERATION										(4) ROCK TYPE	ROCK COMPOSITION						(5) STRUCTURE			FOLIATION		REMARKS
			Cpy	Born		Sph	Gal	Mo	Py	Mag	Hm	Lim	Ox	Orth	Qtz.	Ser	Biot	Chl	Ep	Carb	Anhy	Clay		Orth	Plag	Qtz	Pyx	Biot	Hbl	Type	Depth	∡ to CA	Degree	∡ CA	
493	503	924		1														7					FG	21	56	8		7		Bk-Peg	502	15	W	80	FD = 2 Bleb of born w/chl 495
503	530										TR			SL				7					(F) G	21	56	8		7		FRC	519	15	WL	85	FD = 2
530	540	925	1																				FG	22	57	8		12		FRC	535	45	W	70	FD = 2, Cu w/ferro-mags stain 538
540	550	926																2	1				M	25	53	9		9		Dik F.GR Qtz-Ortho	555-6	60	WL	75	FD = 3 One spot of Cr Cu @ 548.4 Stain 549
550	568										TR			ML									G	24	53	9		13		FRC	566	15-45			FD = 2 strong orth altn @ 567-69
568	580													ML					1				KPQG	9	60	16		13		Dik O-Q	578-79	35			FD = 3-4 stain 573
580	585																						Fault Zone												
585	594											1		SL									G	24	50	12		13		FRC	592	20			FD = 5

HOLE Nº. 117 Page 1 of 2

PROJECT Minto

Lat. 6,264.1 Dep. 14,775.4

Ele. 2926.7 T.D. 594 Dip 90°

Bearing _____ Date S10 July Fin. 12 July/74

SAMPLE Nº.	INTER	TOTAL COPPER	NON SULPHIDE COPPER	Oz Ag	Oz Au			CORE RECOVERY %	SPECIFIC GRAVITY	REMARKS
0908	28-38	0.01		<0.01	<0.003					
0910	38-48	1.69		0.06	<0.003					
0911	178-188	0.03		<0.01	<0.003					
0912	188-198	0.20		<0.01	<0.003					
0913	198-208	0.38		0.01	<0.003					
0914	208-218	0.23		<0.01	<0.003					
0915	218-228	0.38		<0.01	<0.003					
0916	228-238	0.24		<0.01	<0.003					
0917	238-248	0.52		0.01	<0.003					
0918	248-258	0.65		0.03	<0.003					
0919	258-268	0.61		0.01	<0.003					
0920	268-278	0.20		<0.01	<0.003					
0921	278-288	<0.01		<0.01	<0.003					
0922	308-318	0.13		<0.01	<0.003					
0923	408-418	0.05		<0.01	<0.003					
0924	493-508	0.05		<0.01	<0.003					
0925	530-540	0.09		<0.01	<0.003					
0926	540-550	0.08		<0.01	<0.003					

ASARCO — DDH LOG

MINTO PROJECT

NOTE 1: Number denotes relative abundance 10:1:5

NOTE 2: % by volume
✱ Specularite

NOTE 3: P - Pervasive
L - Localized strength
Tr - Trace
W - Weak
M - Moderate
S - Strong
Ex. P-S - Pervasive - Strong

NOTE 4: Key for rock type 4 letters max.

NOTE 5: UC - Contact (Upper)
LC - Contact (Lower)
Dik - Dike
Flt - Fault
Frc - Fracture
Gge - Gouge
Shr - Shear
Stk - Stockwork
Vn - Vein
Vlt - Veinlet

NOTE 6: Type
W - Weak
M - Moderate
I - Intense
G - Gneissic

HOLE Nº. 123 Page 1 of 1
Lat. 10,627.1 Dep. 14,239.2
Ele. 2,512.2 T.D. 548 Dip 90°
Logged by S.M. Hubbard Bearing ____ Date S. 17/7/74 Fin. 20 7/74

FROM	TO	SAMPLE Nº.	(1) ECONOMIC MINERALS						(2) Fe MINERALS				(3) ALTERATION									(4) ROCK TYPE	ROCK COMPOSITION						(5) STRUCTURE			FOLIATION		REMARKS
			Cpy	Born	Mal (Native)	Spk	Gal	Mo	Py	Mag	Hm	Lim	Ox	Orth	Qtz.	Ser	Biot	Chl	Ep	Carb	Anhy	Clay		Orth	Plag	Qtz	Pyx	Biot	Hbl	Type	Depth	∢ to CA	Degree	∢CA	
0	300																																	Overburden
300	317										1%		M	W LM				W					FG	15	65	5		15		FRC	Common	30-45°	W	45°	FD = 4, hematite on fractures, some calcite-hematite
317	327	0981			TR						TR		W	W LM				W					FG	15	65	5		15		FRC	Common	10°	W-M	5-10°	FD = 4, oxidation decreasing, foliation increasing, trace mal on fractures
327	337	0982	5	1	TR	TR			TR	1%				LM W				W	TR	TR			FG	10	65	5		20		FRC/Vlt	Common	10°	W-S	5-10°	FD = 4, veins of Chpy and Py, dissem Chpy and bornite
337	339	0983	1	TR						1%				LM W				W	TR				FG	10	65	5		20		FRC	Common	10°	W-M	10°	FD = 2, Hematite on fractures, potassic altn moderate around some fractures
339	347	0983								TR	TR			L-S				S	TR	L-M			(An) V	TR	30	30		20	20	FRC/Gge	Common	10°-40°			FD = 2, calcite in fractures, top contact of dark volcanics is apothesis in pegmatite, bottom contact is 1/2" chlorite gouge
347	357	0984	1	3	TR					M	TR			LS W				LS W	TR	TR			FG	20	50	10		20		FRC	Common	45°	I-GN	45°	FD = 5, cumulus texture, potassic and chloritic intense above Pg dike at 35 malachite on fractures
357	367	0985	1	2	TR					M	TR			LS M				LS M	TR	TR		TR	FG	20	50	10		20		FRC/Gge	Common 362-64	45°	I-GN	45°	FD = 5, malachite and hematite in gouge -garnets in sa-ll quantity
367	377	0986	1	2						M	TR			LS W				LS W	TR	TR			FG	20	50	10		20		FRC Gge	Common 375'	5°	M-I	5°	FD = 4, potassic and chloritic altn - strong adjacent to gouge
377	387	0987	1	1	TR					W	TR			LM W				LS M	TR	TR			FG	20	50	10		20		FRC Gge	Common 380.5	10°	M	5°	FD = 3, Altn foliation, mineralization decreasing chlorite altn increase
387	428		TR							W	TR			LM W				LS M	TR	TR			FG	10	60	15		15		FRC Vn	Common 381,82,86 400	45°	M	10°	FD =2, potassic altn along frcs, foliation interupted by QR gouge veins
428	489									TR	TR			LM W				LS M	TR	TR			KPG	10	65	15		10		FRC/Gge	428,435	45°-30°			mineralization barren 409 fine grained equivalent of above section into peg dike-Chill zone? &
489	493									W	TR			P-S				P-S	M	TR			KPG	30	45	15		Chl 10		FRC/Gge	482,487 489	45°			potassic altn moderate near selected fractures. FD = 1 FD = 2 calcite, hematite or fractures top contact is gouge
493	508									W	TR			LM W				LM W	TR				BPG	10	60	10		20		FRC	Common	20°			FD = 2, bottom 5' of section is peg dike top contact hairline ~ 45°, bottom gradual.
508	523									W	TR			VW				M	M	TR			G	2	75	8	Garn 15			FRC	Common	20°			FD = 1 Fresh granodiorite tending to Qtz diorite 523 stain
523	537		TR						TR	M	TR			LS W				LM W	TR				GNG PG KBPG	50 10 50	10 60 10	5 10 5	25	10 20 10		FRC	Common	45°	M-I	45°	FD = 1 - gneissic arcus are 50% garnet - barren, transition from G to PG gradual, transition from PG to G same.
537	540									L-M				LS PM				M	TR	TR			GNG	20	60	5		15		FRC	Common 539,41	45°	/S	45°	FD = 1, gneissic arcus are zones of stress - mylonic at center of garnet red. Garnet schist 548 stain.
548																																		END OF HOLE

HOLE Nº. 123 Page 1 of 1

Lat. 10,627.1 Dep. 14,239.2

PROJECT Minto

Ele. 2512.2 T.D. 548 Dip 90°

Bearing ____ Date S. 17 July Fin. 20 July/74

SAMPLE Nº.	INTER	TOTAL COPPER	NON SULPHIDE COPPER	Oz Ag	Oz Au			CORE RECOVERY %	SPECIFIC GRAVITY	REMARKS
0981M	317-327	<0.01		<0.01	<0.003					
0982	327-337	0.41		0.04	0.003					
0983	337-347	0.02		<0.01	<0.003					
0984	347-357	0.68		0.12	0.008					
0985	357-367	0.35		0.09	0.005					
0986	367-377	0.47		0.09	0.011					
0987	377-388	0.16		0.04	0.016					

NOTE 1: Number denotes relative abundance 10:1:5

NOTE 2: % by volume
* Specularite

NOTE 3: P - Pervasive
L - Localized strength
Tr - Trace
W - Weak
M - Moderate
S - Strong
Ex. P-S - Pervasive - Strong

NOTE 4: Key for rock type 4 letters max.

ASARCO — DDH LOG

MINTO PROJECT

NOTE 5: UC - Contact (Upper)
LC - Contact (Lower)
Dik - Dike
Flt - Fault
Frc - Fracture
Gge - Gouge
Shr - Shear
Stk - Stockwork
Vn - Vein
Vlt - Veinlet

NOTE 6: Type
W - Weak
M - Moderate
I - Intense
G - Gneissic

HOLE Nº. 126 Page 1 of 2
Lat. 6,192.2 Dep. 8,908.9
Ele. 2,939.6 T.D. 606 Dip 90°
Logged by J.R. Petura ~~M.H. Hubbard~~ Bearing ____ Date S20/7/74 Fin. 22/7/74

FROM	TO	SAMPLE Nº.	(1) ECONOMIC MINERALS						(2) Fe MINERALS				(3) ALTERATION										(4) ROCK TYPE	ROCK COMPOSITION						(5) STRUCTURE			FOLIATION		REMARKS
			Cpy	Born	Nat	Mal >Sgk	Gal	Mo	Py	Mag	Hm	Lim	Ox	Orth	Qtz	Ser	Biot	Chl	Ep	Carb	Anhy	Clay		Orth	Plag	Qtz	Pyx	Biot	Hbl	Type	Depth	∢ to CA	Degree	∢ CA	
0	20																																		Overburden
20	38				TR	TR					5%	1%	P-S	P-S								M	GNG	10%	20%	20%		50%		FRC	Common	0-90	G	45°	Well oxidized crumbles at touch, some native Cu plating biotite
38	48	0971	TR		TR	TR			1%	3%	1%	1%	L-S / P-W	L-S	TR								GNG	10%	20%	20%		50%		FRC	Common	45°	G	5°	FD = 5, malachite and native Cu plating biotite, rock crumbly
48	58	0972								TR	2%	2%	M	P-S		W		P-S				L-S	FG	5%	70%	20%		5%		FRC	Dommon	0-80°	W	45°	FD = , Hematite, limonite on fractures, rock is well altd crumbly
58	68	0973	TR			TR			TR	TR	1%	1%	M	P-S		TR		P-S				L-S	GNG	10%	20%	30%		40%		FRC	Common	5-20°	GN	20°	FD = 7, Chpy increases as altn decreases at 66
68	78	0974	1			TR				TR	TR	TR		L-S		TR		L-S					FG	10%	40%	30%		20%		FRC	Common	5-15%	S	5°	~~FD = 4, Chpy increase, py decreases, limonite, Tr mal on slected frcs.~~
78	88	0975	10	1		TR				M	TR			L-S				L-S					FG	10%	30%	30%		30%		FRC	Common	45%	S	45°	FD = 5, Chpy w/born at 75°, Py fades, Potassic & chloritic altn ground frc.
88	98	0976	1			TR				W	TR			L-S				L-M					FG	10	30	30		30		FRC	Common	55%	S	45°	FD = 4, no bornite, no py, altn increases at 97,97-98, completely leached.
98	108	0977	TR							TR				L-M				P-M					FG	5	60	30		5		FRC	Common	30'/45°	W	45°	FD = 3, potassic altn 1/4" on fractures 45° to CA
108	131									TR		TR		L-M				P-M	TR				FG	5	60	30		5		FRC	Common	30'/45°	W	45°	FD = 1 - limonite and hematite on some fractures.
131	148										TR		L-M / L-S	W				P-S	TR				GNG/FG	1	60	24		15		FRC	Common	45°	L-G / W	45°	FD = 2, gneissic sections 90° bio/chlorite 12" average cumulus to barren.
148	198									W	TR			W				P-M	W	L-S / TR			FG	3	60	22		15		FRC Vn	Common 158.3	45°/5°	W	30°	FD =3, potassic altn intense 6" each side from gge & frc at 164,168,173 Potassic altn mod 1/2" along frac throughout section. Pag vein 186-193.50/CA
198	198.4		TR						TR	W				W				P-M	W				FG	3	50	20		22		Gge	198-98.4	30°	S	30°	Chpy in mafics below small calcite filled shear, breccia 3" below < 1.
198.4	203								TR	W	TR			L-S / W				P-M	W	L-S / TR			FG	3	60	22		15		FRC	Common	45°	W	45°	Potassic altn strong along selected fractures, some frcs slk sided
203	215.5								TR	W	TR			L-S / W				P-M	W	L-M / TR			FG	3	60	30		15		FRC	Common	45°	W	45°	Potassic altn moderate along fractures, some slikenside.
215.5	225	0840	TR						1%	5%/W	TR			L-S / W				W	TR	L-M / TR			FG	3	50	30		15		BX/Vn	216,221 225	45°	S	45°	Pyrite & Chpy assoc with breccia, calcite matrix 216,221,225 (Also veins) Trace Chpy here and there. No bornite - mag in breccia.
225	235	0841	1						1%	M	TR			L-M / TR				L-M / W	L-S / W	W			FG	3	50	25		20		FRC	Common	45°	S	45°	Chpy occurs mostly interstitial w/biot & some traces w/epidote. Also Py & Chpy occur w/calcite in small shear at 231.
235	243	0842	TR						TR	W	TR			L-M / TR				L-W	W	W			FG	3	50	25		20		FRC	Common	45°	M	45°	FD = 1 hem on frc, potassic altn moderate along selected fractures.
245	250																																		Pegmatite vein (258 stain)
250	260	0843	TR						TR	W	TR			L-M / TR				W	L-M / W	M			FG	3	50	23		20		Plastic Flow	251-258	0-90	Gn	0-10°	Foliation interrupted & displaced by Qtz plag med grained mass, mag dominant sulfide, (biotites smaller to larger xtls as distance from center of light minerals (Possible movement of xtal mush)
260	328									W	TR			L-M / W				P-M	M	L-W			FG	1	65	25		10		FRC	Common	30°	W	30°	Top contact of weakly foliated section. 1s1/4" gouge, Potassic altn along
328	338	0978			TR	1					TR	TR		L-M / W				P-S	W				FG	15	60	25		10		FRC	Common	30°	W/M	30°	some fractures. FD = 2, spotty potassic altn along fractures w/epidote FD = 5, malachite and limonite plating mafics and on fractures.
338	348	0979	1	TR		2				M	TR	TR		L-M / W				P-S	W				FG	3	60	25		10		FRC	Common	30°	M	30°	FD = 6, mineralization increasing, 11m, hem on fractures
348	358	0980	3	1		1				M	TR	TR		L-M / W				P-S	W				FG	3	60	23		10		FRC	Common	30°	M	30°	FD =5, hem on frac, pieces of white and black segregation 3-55-5
358	392					TR				W	1%			L-M / W				P-S	W	W			FG	3	60	23		10		FRC	Common	30°	W	30°	FD = ~ Hem on all PVC, mal on a few, slikenside on Frc some

NOTE 1: Number denotes relative abundance 10:1:5

NOTE 2: % by volume
* Specularite

NOTE 3: P - Pervasive
L - Localized strength
Tr - Trace
W - Weak
M - Moderate
S - Strong
Ex. P-S - Pervasive - Strong

NOTE 4: Key for rock type 4 letters max.

ASARCO — DDH LOG

MINTO PROJECT

NOTE 5: UC - Contact (Upper)
LC - Contact (Lower)
Dik - Dike
Flt - Fault
Frc - Fracture
Gge - Gouge
Shr - Shear
Stk - Stockwork
Vn - Vein
Vlt - Veinlet

NOTE 6: Type
W - Weak
M - Moderate
I - Intense
G - Gneissic

HOLE Nº. 126 Page 2 of 2
Lat. 6,192.2 Dep. 8,908.9
Ele. 2,939.6 T.D. 606 Dip 90°
Logged by S.M. Hubbard Bearing ____ Date S. 20/7/74 Fin. 22/7/74

FROM	TO	SAMPLE Nº.	(1) ECONOMIC MINERALS						(2) Fe MINERALS				(3) ALTERATION									(4) ROCK TYPE	ROCK COMPOSITION						(5) STRUCTURE			FOLIATION		REMARKS
			Cpy	Born	Mal	Sph	Chalcocite	Mx	Py	Mag	Hm	Lim	Ox	Orth	Qtz	Ser	Biot	Chl	Ep	Carb	Anhy	Clay		Orth	Plag	Qtz	Pyx	Biot	Hbl	Type	Depth	∠ to CA	Degree	∠ CA	
392	402	0844	7	1	1						TR	TR		L-M W				P-M	M				FG	5	60	15		20		FRC	Common	45°	S	45°	FD = 5, malachite and hematite on fractures, Chpy & bornite in porous frc
402	407	0845	6	1	1					M	TR	TR		L-M W				P-S	W				FG	5	60	15		20		FRC	Common	45°	S	45°	FD = 5 malachite & hematite on fractures, Chpy & bornite in shears parallel to foliation.
407	475									W	TR			L-M W				P-S	L-S W	L-M TR			FG	10	60	20		10		FRC	Common 475-76	60°	W	30°	FD =10, hem & slikenside frc, potassic altn near 60° frc
475	479										TR			L-S W				P-S	L-M W				FG	10	60	20		10		Gge	477-78	45°	W	30°	FD = 8 Chlorite, calcite, gouge, slikenside in ctr of shear
479	506									W	TR	TR		L-S M				P-S	L-M W	TR			KPG	15	60	15		10		FRC	Common	45°			FD =3 Potassic altn continued to frc. K spar phenocrysts near frct.
506	540									W	TR	TR		L-S M		TR		P-S	L-M W	TR			FG	10	60	20		10		FRC/Gge	Common	45?	W M	45°	FD = 4, Top and contact is gouge, 1/4" 45° to CA, Calcite, chlorite altn intense.
540	590										1%	1%		P-S		L-M		P-S	L-S	W		TR	RTG (F) (A)	35	20	20		Chl 25		FRC/Gge	Common 539,542,544 584,588	45°	W	20°	FD = 3, biotite completely altd to chlorite, hematite, clay minerals on frcs
590	600	0846					Tr	Tr			1%	1%		P-S		L-M		P-S	L-S	TR		TR	RTG (F) (A)	35	20	20		25		Flt/Gge	593-600	45°-60°	W	5-45°	FD = 8, core shows brecciation, breccia frag microscopic to 1/2" chunks, specular, hematite.
600	606	0847					Tr	Tr			1%	1%		P-S				P-S	W	TR		TR	RTG (G) (A)	35	20	20		25		Flt/Gge	600-606	45°-60°	W	5-45°	FD=6 & covellite between planes of shear, limonite and hematite coating breccia and frcs.
606																																			END OF HOLE

HOLE Nº. 126 Page 1 of 2

PROJECT Minto

Lat. 6,192.2 Dep. 8,908.9

Ele. 2939.6 T.D. 606 Dip 90°

Bearing _____ Date S. 20 July Fin. 22 July/74

SAMPLE Nº.	INTER	TOTAL COPPER	NON SULPHIDE COPPER	Oz Ag	Oz Au			CORE RECOVERY %	SPECIFIC GRAVITY	REMARKS
0971	38-48	0.29		0.03	<0.003					
0972	48-58	<0.01		<0.01	<0.003					
0973	58-68	0.36		0.04	<0.003					
0974	68-78	0.43		0.04	<0.003					
0975	78-88	0.67		0.06	<0.003					
0976	88-98	0.23		0.03	<0.003					
0977	98-108	0.07		<0.01	<0.003					
0978	328-338	0.46		0.10	0.008					
0979	338-348	0.46		0.10	0.008					
0980	348-358	0.13		0.03	<0.003					
0844	392-402	0.52		0.12	0.016					
0845	402-407	0.32		0.09	0.004					
0846	590-600	0.06		<0.01	<0.003					
0847	600-606	<0.01		<0.01	<0.003					

ASARCO — DDH LOG

MINTO PROJECT

NOTE 1: Number denotes relative abundance 10:1:5

NOTE 2: % by volume
* Specularite

NOTE 3: P - Pervasive
L - Localized strength
Tr - Trace
W - Weak
M - Moderate
S - Strong
Ex. P-S - Pervasive - Strong

NOTE 4: Key for rock type 4 letters max.

MS = mudstone

NOTE 5: UC - Contact (Upper)
LC - Contact (Lower)
Dik - Dike
Flt - Fault
Frc - Fracture
Gge - Gouge
Shr - Shear
Stk - Stockwork
Vn - Vein
Vlt - Veinlet

NOTE 6: Type
W - Weak
M - Moderate
I - Intense
G - Gneissic

HOLE Nº. 128 Page 1 of 1

Lat. 5,197.7 Dep. 8,994.9

Ele. 2,955.7 T.D. 688 Dip 90°

Logged by S.M. Hubbard Bearing ____ Date S. 22/7/74 Fin. 24/7/74

FROM	TO	SAMPLE Nº.	(1) ECONOMIC MINERALS						(2) Fe MINERALS				(3) ALTERATION									(4) ROCK TYPE	ROCK COMPOSITION						(5) STRUCTURE			FOLIATION		REMARKS
			Cpy	Born	Covell	Sphx Chalc	Gal	Mo	Py	Mag	Hm	Lim	Ox	Orth	Qtz.	Ser	Biot	Chl	Ep	Carb	Anhy	Clay		Orth	Plag	Qtz	Pyx	Biot	Hbl	Type	Depth	∡ to CA	Degree	∡ CA	
0	65																																	Overburden
65	170												L-S										Conglomerate						Chl	FRC Gge	Common 84-86				Crumbly, broken possible gouge at 84-86, conglomerate -sub-angular fragments mudstone, coal seams and fragments, hem, clay mafics
170	235										1%			L-S P-M				L-S P-M		TR			FG (A) 5-10	65	10		15		FRC	Common	45°	W	45°	Granodiorite, volcanic, gneiss frag, or pebbles -2" oxidation, clay soil at contact at 175, no oxidation below contact at 170", altn strongest along fractures.
235	245										1%	1%		P-S				P-S		TR		S	G			50		10		FRC	Common	5°			FD = 00 Core crumbles at touch, but not obviously skewed, top & bottom is fine grained silica rich FG
245	289										TR			L-S P-M				L-S P-M		TR			G	3	65	20		10		FRC	Common	45°&5°			FD = 1 Potassic strong along frcs, hematite on frcs, bio content variable
289	318										1%	1%	L-M	P-M L-S				P-M L-S					FG	5	55	25		20		FRC/ Shr	Common	313 for 6"	M-S	45°	FD=3, hematite stained qtz, some apparent leaching, Shr Oxidation and altn strong.
318	333										1%	1%		P-M L-S				P-M L-S					G	3	65	20		10		FRC	Common	45°			FD=6, Ilm & hem on frcs
333	415		TR						TR		2%	1%		P-M L-S				P-M L-S		TR			FG	5	55	25		20		FRC/ Shr	Common 335,45,47	5°	M-S	10° 90°	FD=00 Hem stained qtz & on frcs, strong potassic & chloritic & oxidation reduced to shears, foliation shear at 346-48, also 393 to shear. Sulfides leached except for fresher zones where traces were noted.
415	425	1028	TR		1	1	1	1	2%		2%	1%		P-M L-S		L-S		P-M L-S		TR			FG/Bx	15	55	25		10		FRC/ Gge Shr	415-424	45°	M-S	45°	FD=00 moly, galena, possible chalcocite, hem (specular) pyrite with traces of chpy in qtz rich breccia - secondary enrichment, altn very strong.
425	435	1029	1		2	1	2	1	1%		1%	1%		P-M L-S		L-S		P-M L-S		TR			FG/Bx	15	53	23		10		FRC/ Shr	Common 431.5-433	45°	M-S	45°	FD = 00, fine grained Gn, xtals surround Py & Chpy, possible galena gray streak. traces of Mo, Pb, Cu_2S, hem, 431.5-433, garnets intergr to biotite
435	445	1030	1	1			TR	TR	1%		1%			P-M L-S				P-M L-S		TR			FG Bx	15	55	25		10		FRC Shr	Common 440-445	45°	M-S	45°	FD = 00, py, chalcopyrite, bornite, qtz rich areas interrupted foliation garn
445	455	1031	1	TR	TR				2%		1%			P-M L-S		L-S		P-M L-S		TR			FG/Bx	15	55	25		10		FRC Shr	Common 447,48,51,52	45°	M-S	45°	FD =00, Pyrite, Chalcopyrite, bornite, Tr covellite in QR rich areas partly foliated, garnets
455	465	1032	1	TR	TR				2%		1%			P-M L-S				P-M L-S	TR	L-S			FG	15	55	25		10		FRC Shr	Common 461,62,67	45° 50°	M-S	45°	FD = 2, pyrite and chalcopyrite in mafics.
465	475	1033	2	TR	1	TR		TR	1%					P-M L-S				P-M L-S	L-S	TR			FG	10	55	25		10		FRC/ Shr	Common 478,79	45°	M-S	45°	FD = 00, Chpy, Py, Chpy with covellite, rims at 468, trace moly 468, Qtz rich breccia, garnets intergr in biotite xtals.
475	485	1034	2	TR	1	TR			1%		1%			P-M L-S				P-M L-S	TR	L-S			FG/Bx	10	55	25		10		FRC/ Shr	Common 488	45°	M-S	45°	FD=00 - Chalcopyrite with covellite rims in QR rich breccia, also gypsum?
485	495	1035	2		1						1%			P-M L-S				P-M L-S	TR	L-S			FG	10	50	25		15		FRC/ Shr	Common 488	45°	M-S	45°	FD=00 Chalcopyrite noted with covellite, rims 2 in QR rich breccia, pyrite with hematite rims, otherwise mostly pyrite.
495	514		TR						1%		1%			P-M L-S				P-M L-S	L-S	L-S			FG	10	55	20		15		FRC	Common	20-45°	W	20°	FD = 00 = Hematite on fractures
514	524	1036	2		1	TR			1%		1%			P-M L-S				P-M L-S	TR	L-S			FG	10	55	20		15		FRC Shr	Common 516-18-23	45°	M-S	45°	FD =00 - Chpy with covellite, chalcocite rims, pyrite w/hem creates Qtz rich breccia.
524	534	1037	2		1	TR			1%		1%			P-M L-S				P-M L-S	L-S	L-S			FG	10	55	20		15		FRC/ Shr	Common 526	35°	M-S	30°	FD=00 Chpy with covellite rims, Py in Qtz rich breccia in thin 2" sections throughout
534	548		TR						1%					P-M L-S				P-M L-S	L-S	L-S			FG	15	55	20		10		FRC	Common	30°	M-S	30°	FD = 00 Core crumbles at touch, thin shears 1/2" pyrite, trace Chpy
548	564		TR						TR		1%			P-M L-S				P-M L-S	L-S	L-S			FG	10	60	20		10		FRC	Common	35°	W	30°	FD - 2 Trace Chpy and Py in foliated mafics
564	598										1%			L-S				P-W L-S	L-M	L-S			G	0-2	65	25		10		FRC	Common	20°-30°			FD = 2, chlorite hematite on fractures, Potassic & chloritic altn along select fractures.
598	664		TR						1%		1%			P-M L-S				P-M L-S	L-S	P-M			FG	10	60	20		10		FRC/ Shr	Common Every few ft	20°-30°	W	45°	FD=00, Shears every few feet, core crumbles at touch, garnets and pyrite in foliated areas.
664	668								TR		1%			P-M L-S				P-M L-S	L-S	L-M			G	2	65	25		10		FRC/ Shr	Common 672,68	45°			FD=00 , Core crumbly in areas, getting fresher with depth
668																																		END OF HOLE

HOLE Nº. 128 Page 1 of 1

PROJECT Minto

Lat. 5,197.7 Dep. 8,994.9

Ele. 2955.7 T.D. 688 Dip 90°

Bearing _____ Date S. 22 July Fin. 24 July/74

SAMPLE Nº.	INTER	TOTAL COPPER	NON SULPHIDE COPPER	Oz Ag	Oz Au	% Mo	% Pb	CORE RECOVERY %	SPECIFIC GRAVITY	REMARKS
1028	413-425	0.43		0.19	<0.003	< .001	< .01			
1029	425-435	0.29		0.01	<0.003	< .001	< .01			
1030	435-445	0.15		<0.01	<0.003	<.001	< .01			
1031	445-455	0.13		<0.01	<0.003					
1032	455-465	0.04		<0.01	<0.003					
1033	465-475	0.06		<0.01	<0.003					
1034	475-485	0.10		<0.01	<0.003					
1035	485-495	0.05		< 0.01	<0.003					
1036	514-524	0.20		0.03	<0.003					
1037	524-534	0.08		<0.01	<0.003					

NOTE 1: Number denotes relative abundance 10:1:5

NOTE 2: % by volume
* Specularite

NOTE 3: P - Pervasive
L - Localized strength
Tr - Trace
W - Weak
M - Moderate
S - Strong
Ex. P-S - Pervasive - Strong

NOTE 4: Key for rock type 4 letters max.

ASARCO — DDH LOG

MINTO PROJECT

NOTE 5: UC - Contact (Upper)
LC - Contact (Lower)
Dik - Dike
Flt - Fault
Frc - Fracture
Gge - Gouge
Shr - Shear
Stk - Stockwork
Vn - Vein
Vlt - Veinlet

NOTE 6: Type
W - Weak
M - Moderate
I - Intense
G - Gneissic

HOLE No. 134 Page 1 of 1
Lat. 10,000.7 Dep. 13,182.0
Ele. 2,541.1 T.D. 768 Dip 90°
Logged by _____ Bearing _____ Date S. 11/7/74 Fin. 15/7/74

FROM	TO	SAMPLE No.	(1) ECONOMIC MINERALS						(2) Fe MINERALS				(3) ALTERATION										(4) ROCK TYPE	ROCK COMPOSITION						(5) STRUCTURE			FOLIATION		REMARKS
			Cpy	Born	Native	Sph	Gal	Mo	Py	Mag	Hm	Lim	Ox	Orth	Qtz.	Ser	Biot	Chl	Ep	Carb	Anhy	Clay		Orth	Plag	Qtz	Pyx	Biot	Hbl	Type	Depth	∢ to CA	Degree	∢ CA	
0	208																																		Overburden
208	260									W	W	M	S-M	W				M	W	W			(F) G	12	61	11		16		FRC	Common	60	M-W	60	FD=2, Zone of heavy ox, bigger biot books, Lim in fractures
260	270	1013								TR	W	WL	WL	W				M-V	TR	WL			FG	12	61	11		16		FRC	Common	50	M	60	FD=2, Native speck and lim in fracts
270	280	1014			1					TR	W	WL	W	TR				W		WL			FG	11	63	10		16		FRC	Common	45	M	60	FD=2, Native Cu assoc w/mafics and orthofs
280	290	1015			1					TR	W	WL	W	TR				M-W		WL			FG	11	60	13		16		FRC	Common	45	M	60	FD=2, Native Cu assoc w/mafics and orthoclase
290	300	1016								TR	W	M	W	TR				M	TR	WL			FG	11	60	13		16		FRC	Common	35	M	60	FD=4, possible native, MnO, Lim in fract, orthofs dike 299
300	310	1017								TR	M-SL	M	W					M		WL			FG	13	61	12		14		Gge/ FRC	306.9,12 319-20 Common	45	M-L	60	FD = ∽ Probable fault zone, no S/K, heavy lim in gge, possible Na Cu
310	352									TR	SL	M	W					M		W			FG	13	61	12		14		Gge/ FRC	Common	45	M-L	60	FD = ∽ Probable shear zone, heavy lim in gge, native Cu spotty
352	364									TR	TR							P-W	TR				KPG	10	65	15		10		FRC	Common	45			FD=1, Ep in fine grained foliated section at 360.5=2"
364	465									W	TR			L-W		TR		P-M	L-S	L-M			FG	15	60	10		15		FRC	Common	40/5°	W	30	FD=2, Hem, Ep, Aplite, 428-429.4, sericite localized to fractures, Peg 382.8 383.5
465	473									W	TR			L-W				P-M	L-S				KPG	10	65	15		10		FRC	Common	30/5°			FD=2, Hem, Calcite in fractures 5° to CA
473	534									P-W	L-TR			L-M		TR		P-M	L-S	L-M			FG	15	60	10		15		FRC	Common	30°	W	30	FD=2, Samll 2" zones of intense foliation w/increase in biot content
534	577									P-M	L-W			P-M		TR		P-M	L-M	L-M			FG	15	60	10		15		FRC	Common	45	W	45	FD=2, Orthoclase strongest (alt) near fracts, calcite in fracts at 568
577	598									W	L-TR			L-M		TR		P-W	TR	TR			KPG	10	65	20		5		FRC	Common	45°			FD=1, Peg dikes common 45-50 to CA. Stain at 591
598	602									P-W	TR							P-W	TR				FG	5	60	25		10		FRC	Common	30°	W	45	FD=3, Fine grained Kspar altn on Fractures 1/4" each side
602	621									P-W	TR			W				P-M	TR	L-W			FG	10	65	10		15		FRC	Common	45°	W	40-60	FD=2, interstitial or in mafic areas
621	647									W	W			P-S		TR		P-S	P-M	L-S			FG	15	45	15		15		Gge/ FRC	618-18.5	45°	W	45	FD= ∽ Top contact is 1/2 foot gge, leading into well altd zone, Peg dike 627-629.5
647	679									W				P-W		TR		P-M	P-M	L-W			FG	15	60	10		15		FRC	Common	30°	W	30	FD=1, altn decreases as fracts decrease, Calcite & Ep on some frcts
679	689									W	TR		L-M	P-M		TR		P-S	P-M	L-W			FG	15	60	10		15		Gge/ FRC	Common Common	30°	W	30	FD= ∽ Mylonite, gge, garnet in 1' zones (shear) separated by 1' of altd rock
689	712									W				P-W				P-M	L-M	L-W			FG	10	65	10		15		FRC	Common	45°	W	30	FD=1 Ep mainly in frcts at 45° to CA, rock becoming fresher
712	753									P-W	L-S		L-S	P-M		TR		P-S	L-M	L-W			FG	10	65	10		15		Gge/ FRC	712,13,18 Common	40°	W	25	FD=3, oxidation & strong altn. Crumbly-chlorite gge, above and below gge is contact (FG)
753	768									P-W	TR			P-W L-S		TR		P-S	W	L-W			FG	10	65	10		15		FRC	Common	45°	W	25	FD=2, Potassic altn strong around selected frct, likewise Ep
768																																			END OF HOLE

HOLE Nº. 134 Page 1 of 1

PROJECT Minto

Lat. 10,000.7 Dep. 13,182.0

Ele. 2541.1 T.D. 768 Dip 90°

Bearing _____ Date S. _____ Fin. _____

SAMPLE Nº.	INTER	TOTAL COPPER	NON SULPHIDE COPPER	Oz Ag	Oz Au			CORE RECOVERY %	SPECIFIC GRAVITY	REMARKS
1013	260-270	0.11		0.01	<0.003					
1014	270-280	0.01		<0.01	<0.003					
1015	280-290	0.03		<0.01	<0.003					
1016	290-300	0.05		<0.01	<0.003					
1017	300-310	0.02		<0.01	<0.003					

NOTE 1: Number denotes relative abundance 10:1:5

NOTE 2: % by volume
* Specularite

NOTE 3: P - Pervasive
L - Localized strength
Tr - Trace
W - Weak
M - Moderate
S - Strong
Ex. P-S - Pervasive - Strong

NOTE 4: Key for rock type 4 letters max.

ASARCO — DDH LOG

MINTO PROJECT

NOTE 5: UC - Contact (Upper)
LC - Contact (Lower)
Dik - Dike
Flt - Fault
Frc - Fracture
Gge - Gouge
Shr - Shear
Stk - Stockwork
Vn - Vein
Vlt - Veinlet

NOTE 6: Type
W - Weak
M - Moderate
I - Intense
G - Gneissic

HOLE Nº. 135 Page 1 of 3
Lat. 8,297.9 Dep. 11,492.2
Ele 2,798.6 T.D. 946 Dip 90°
Logged by J.R. Petura Bearing ____ Date S 15/8/74 Fin 19/8/74

FROM	TO	SAMPLE Nº.	(1) ECONOMIC MINERALS						(2) Fe MINERALS				(3) ALTERATION										(4) ROCK TYPE	ROCK COMPOSITION						(5) STRUCTURE			FOLIATION		REMARKS
			Cpy	Born	Mal	Chalc Cu Sulf	Cov Cu Sulf	Mo	Py	Mag	*Hm	Lim	Ox	Orth	Qtz.	Ser	Biot	Chl	Ep	Carb	Anhy	Clay		Orth	Plag	Qtz	Pyx	Biot	Hbl	Type	Depth	∠ to CA	Degree	∠ CA	
0	30																																		Overburden
30	36																																		Hematic clay, very fragile
36	56																																		Hematite conglomerate
56	66	988			1																														Hematite conglomerate
66	134																																		Hematite conglomerate, quite a few occurrences of specularite
134	147										S-10	TR	SP										WFG	10	59	10		15					W	55	FD=3, hematite will stain biot 1st, then other rock forming minerals
147	157	989									7	TR	SP										FG	12	57	10		15		FRC	154	65 & 0	M	55	FD=3, localized hem conc at 150
157	167	990			1	3					3	1	MP										GR	57	22	15		4		FRC	159	30			FD=5, stain 158, Cpy may have been replaced
167	170	991				1					3		MP										GR	57	22	15		14		FRC	169.5	60,10,			FD=5
170	177	992									7	TR	SP										G	12	57	10		15		FRC	173	60			FD=3, 2" clay and hem filled gge at 175
177	218										TR/3	3	SP										KPG	14	50	12		17		Dik-Peg	188 3-.9	45			FD=4, stain 187; still highly stained by iron oxides
218	228	993	1		10		10				TR/1	3	MP										KPG	11	58	14		13		FRC	223	80 & 15			FD=3; stain 225; still stained somewhat; felds dikes at 224 & 226
228	276									TR	/TR	2	ML WP					14	3				G	12	59	10		1		Dik-Frc Q.O.P.	274-75	30			FD= 350, some severely crumbled zones 240-41, 242-43, 248-49, Stain 256
276	288		1						TR	TR	/TR							6	4				G	20	45	16		8		FRC	278	45			FD= 1.5, Frc 278, filled 1st by hem, then calcite; stain 285
288	298	994	1		(CPY: Py=1:20)				3									1	3				G	10	58	15		9		FRC	291	35	ML	90	FD=2, foliation 294.5 to 296; foliation has garnet xtls; 296-298
298	308	995	1		(CPY: Py=1:20)				1		/1							7	2				G	10	59	14		7		FRC	306-308	0	ML	90	unloading fractures. FD=2, foliation 206-208, med gr dike OQP (4") at 303.
308	328								TR		/1							7	2	SL			G	10	60	14		7		FRC	324	0 & 60			FD= 2.5
328	338	996	1		(CPY: Py=1/20)				1	TR	/TR							2	2	SL			G	10	58	14		12		Peg Dik	336-336.3	50	ML		FD=2; foliated zone 328.5-330
338	348	997	1		(CPY: Py=1/20)				1		TR			WP				1	2				WFG	18	50	12		15		FRC	343	0	ML-WP	70	FD=2, M foliation zone 338-340
348	358	998	2		(CPY: Py=1/20)			1	TR														G	16	56	13		14		FRC	354	45	WL	50	FD=1, Moly in foliated zone 356.5
358	368	999	1		(CPY: Py=1/20)				TR										TR				G	10	64	10		15		FRC	363	40	ML	70-35	FD=2, down to 363 foliated
368	378	1000	1						1										1				G	9	63	13		14		FRC	374	30	ML	75	FD=2, possible Bo, light, is insufficient today
378	388	1101	3	1	(CPY: Py=1:1)				1	1													G	9	62	15		13		FRC	382	70 & 20	ML	75	FD=2, Bo, Cpy, Py all occur together, foliated zones 379-91, 388.5-84.9
388	398	1102	1		(C/P=1:9)				2	TR				ML					TR				G	9	64	15		8		FRC	391-393	0 & 10	WL	65	FD=3, Real gar at 390 & 396 stain 388, dolomite in frcs 392', fol 396-398
398	408	1103	1		(C/P=1:10)				1		TR			ML					WL 1				G	11	56	14		16		FRC	402	15	WP	80	FD=2, dissem Py with conc of it 407.

NOTE 1: Number denotes relative abundance 10:1:5

NOTE 2: % by volume
* Specularite

NOTE 3: P - Pervasive
L - Localized strength
Tr - Trace
W - Weak
M - Moderate
S - Strong
Ex. P-S - Pervasive - Strong

NOTE 4: Key for rock type 4 letters max.

ASARCO — DDH LOG

MINTO PROJECT

NOTE 5: UC - Contact (Upper)
LC - Contact (Lower)
Dik - Dike
Flt - Fault
Frc - Fracture
Gge - Gouge
Shr - Shear
Stk - Stockwork
Vn - Vein
Vlt - Veinlet

NOTE 6: Type
W - Weak
M - Moderate
I - Intense
G - Gneissic

HOLE Nº. 135 Page 2 of 3
Lat. 8,297.9 Dep. 11,492.2
Ele. 2,798.6 T.D. 946 Dip 90°
Logged by J.R. Petura Bearing ____ Date S. 15/8/74 Fin 19/8/74

FROM	TO	SAMPLE Nº.	(1) ECONOMIC MINERALS						(2) Fe MINERALS				(3) ALTERATION										(4) ROCK TYPE	ROCK COMPOSITION						(5) STRUCTURE			FOLIATION		REMARKS
			Cpy	Born		Sph	Gal	Mo	Py	Mag	Hm*	Lim	Ox	Orth	Qtz.	Ser	Biot	Chl	Ep	Carb	Anhy	Clay		Orth	Plag	Qtz	Pyx	Biot	Hbl	Type	Depth	∢ to CA	Degree	∢ CA	
408	418	1104	1								TR/1			SL									G	16	53	13		17		FRC	411	20			FD=1, Peg 444.5 to contorted 446, also contorted 442.5
418	428	1105	1		C P=1:7				TR					ML					1				G	16	53	13		16		PEG DIK	419.8-21.4	55	MVL	70	FD=1
428	438	1106	1						TR		/TR			ML				2	1				G	14	56	13		14		FRC	431	30	WML	85	FD=1, Cu dissem and in foliated zones; fol zone 435-436.9
438	448	1107	1		C P=1:10				TR		.TR			ML				9	1				G	10	59	14		6		FRC	445	60	WL	90	FD=2, tends to be pegmatitic, 450-451, fol zones 2" at 448.3, 6" approx 449.7, 8" 453; stain 454
448	458	1108	1		C P=1 8				TR									4					G	10	60	14		11		FRC	451.6	35	WL	90	FD=2
458	468	1109	7	1							/TR			ML				1					G	7	59	15		17		FRC	463	80 & 5			FD=2.5, Cpy and Bo dissem in a dioritic 2-3' section starting 461; Pag gr
468	508										/1			ML				7	3				QKPG	16	49	15		9		FRC	493	85, 65, 45			FD=2, contact with unit below at 508.5, stain 478
508	518	1110	1		C P=7/1				TR									1					FAD	17	62	6		12		FRC	515	60	M	80	FD=1; plag = white (altd); Cpy dissem, stain 518
518	528	1111	1								/TR												FAG	15	61	10		13		FRC	522	45 & 5	M	60	FD=2, plag = white; cpy dissem
528	538	1112	1								TR/												FAG	10	64	12		13		PEG DIK	527-29.3	45	W	65	FD=2, specularite in peg, plag altd white, Cpy dissem, stain 535
538	548	1113	1		C P=1/1				1														FAG	10	64	12		13		FRC	541	70	M	80	FD=1.5, Py and some Cpy, carried in 2 small veins at 544 &545, rest Cpy dissem
548	558	1114	1											ML				2					FAG	11	60	13		13		FRC	550	45	M	90	FD=2; chlorite accompanying ortho altn around frc's, Plag = white
558	568	1115	1		C P=1/1				TR									6					FAG	14	57	14		8		FRC	563	Follow Foliation	M	65	FD=1; Plag = white, stain 558
568	578	1116	1															2					G	10	63	16		8		FRC	564	60	ML	45	FD=1 stain 573, goes from foliated to very coarse grained contorted 563 t (560) unfoliated, Cpy in foliation
578	588	1117	6	1					TR	1													AG	8	54	15		20		FRC	587	70	ML	55	FD=.5, stain 583, plag is white, pseudo-gneissic & contorted & dissem massive
588	593	1118	6	1						2													AG	8	58	15		16		FRC	592	45	ML	70	FD=1, still contorted, plag is white
593	598	1119																	2				G	11	61	15		10		QQP	Dik-Peg 597.6-.9	50			FD=1, stain 593
598	608	1120	1								/TR												FG	14	63	10		12		FRC	606	85	M	65	FD= .5, Plag is clear
608	618	1121	1								/TR							2					FG	14	63	10		10		FRC	610	60 & 30	MW	60	FD= .5, garnet xtls
618	628	1122									/TR			ML				6	1				KP WFG	19	58	10		6		FRC	624	75 & 30	W	70	FD=1 garnet xtls, ortho phenocrysts, stain 623
628	648										/1							6	2				KPG	15	59	10		6		FLT	633-35	45			FD=750, altn around FLT, plus fine grained feldspathic dikes (6") at 648 644,642.
648	693																	2	2				KPG	13	54	18		10		FRC	668	60			FD=2.5 - Peg 4" at 686 (45° to CA); stain 688 and 650, locally dioritic
693	703	1123																9	2				KPG	21	45	21		1		FRC	699	55			FD=2, different texture than above, everything much more coarse grained, stain 698
703	707	1124	6	1						1										SL			QM	23	25	22		28		FRC	704.5	60			FD=1.5; contorted appearance, stain 704, some mineral segregation, spar calcite in frct.
707	713	1125									/TR							3	10				G	15	51	20				FRC	709	5 & 45	ML	75	FD=3, 711-713 is FD, FD has a little Cpy, stain 712.

NOTE 1: Number denotes relative abundance 10:1:5

NOTE 2: % by volume
* Specularite

NOTE 3: P - Pervasive
L - Localized strength
Tr - Trace
W - Weak
M - Moderate
S - Strong
Ex. P-S - Pervasive - Strong

NOTE 4: Key for rock type 4 letters max.

ASARCO — DDH LOG

MINTO PROJECT

NOTE 5: UC - Contact (Upper)
LC - Contact (Lower)
Dik - Dike
Flt - Fault
Frc - Fracture
Gge - Gouge
Shr - Shear
Stk - Stockwork
Vn - Vein
Vlt - Veinlet

NOTE 6: Type
W - Weak
M - Moderate
I - Intense
G - Gneissic

HOLE Nº. 135 Page 3 of 3

Lat. 8,297.9 Dep. 11,492.2

Ele 2,793.6 T.D. 946 Dip 90°

Logged by J.R. Petura Bearing ____ Date S. 15/8/74 Fin. 19/8/74

FROM	TO	SAMPLE Nº.	(1) ECONOMIC MINERALS						(2) Fe MINERALS				(3) ALTERATION									(4) ROCK TYPE	ROCK COMPOSITION						(5) STRUCTURE			FOLIATION		REMARKS
			Cpy	Born		Sph	Gal	Mo	Py	Mag	*Hm	Lim	Ox	Orth	Qtz.	Ser	Biot	Chl	Ep	Carb	Anhy	Clay		Orth	Plag	Qtz	Pyx	Biot	Hbl	Type	Depth	∠ to CA	Degree	∠CA	
713	723	1126	9	1														8	2				QKPG	11	54	20		4		Dik-P=s And	713.7-716.5	55	WL	55	FD=2, foliation minralized zones 713-713.7, 709-712.
723	733	1127	1	3							/TR							2	1	SL			KPG	11	56	18		11		FRC	727	60 & 0	ML	60	FD=2, foliated from 725-729; Bo at 728, $CaCO_3$ in Frcs
733	818										/1			ML				4	1	SL			KPG	11	51	20		12		FRC	780	45			FD=2, stains 808 & 758, ortho altn 750-770, hem in Frc, 3 x 2" Peg dikes
818	828	1128									/1			WL				4	1	SL			KPG	11	51	20		12		FRC	823	60			FD=2 Hem in Frc and dissem
828	838	1129	1								/TR							3					FOM	26	51	10		9		FRC	833	45	MS	85	FD=2, garnet xtls, stain 837
838	848	1130	1								/TR			ML				1	TR	ML			FOM	45	30	10		13		DIK 1" GSEGR	840	15	M	60	FD=2.5, stain 837, some plag altn white, epidote in frc
848	858	1131	3	1														4	3	SL			ACM	30	43	10		9		FRC	856	15	W4	90	FD=2.5, mineralized zones appear to be darker in color, Frc 1" with $CaCO_3$
858	868	1132	1	3							/1							4	2	SL			CM	27	46	10		9		Dik	858.5 & 860	80	M4	70	FD=2.5; most Cu from 861-864, 864-868 KPG, Dike fine grained
868	878	1133	3	2										WL					1	SL			CM	30	41	10		13		FRC	871	65	M	Swings	FD=3, KPG 868 to 869.8, Cu dissem in Monz; stain 870
878	883	1134	3	2						TR				WL					1	SL			CM	30	41	10		13		FRC	880	80			FD=3, contorted, few gneissic bands, Cu dissem
883	888	1135																3	1				KPG	17	54	15		6	4	FRC	883.5	15			FD=1
888	906										/TR							9	1				G	20	50	14		6		FRC	904	55	W	65	FD-2, spotty plag altn
906	912	1136																10	2	SL			G	23	47	13		4		FRC	910.5	5	W	50	FD=1, spotty plag altn
911	912	1137	1	1						2								14					AG	10	60	10		1		FRC	911.5	Follow Foliate	M-S	65	FD=2, flourite present in this highly altd zone
912	916	1138																4	1				G	13	63	12		6		FRC	918	60			FD= 2.5; Hem then $CaCO_3$ in fretures
916	946																	4	1	SL			KPG	17	51	15		8	3	FRC	928.5	10 & 55			FD=3, Cumulophyric texture 6" at 926.5 and 929.8

HOLE Nº. 135 Page 1 of 3

PROJECT Minto

Lat. 8,297.9 Dep. 11,492.2

Ele. 2798.6 T.D. 946 Dip 90°

Bearing _____ Date S. 15 Aug Fin. 19 Aug/74

SAMPLE Nº.	INTER	TOTAL COPPER	NON SULPHIDE COPPER	Oz Ag	Oz Au			CORE RECOVERY %	SPECIFIC GRAVITY	REMARKS
0988	56-66	0.25		0.06	.033					
0989	147-157	0.02		<.01	<.003					
0990	157-167	0.90		.01	<.003					
0991	167-170	0.02		<.01	<.003					
0992	170-177	0.01		<.01	<.003					
0993	218-228	0.06		<.01	<.003					
0994	288-298	0.03		.01	<.003					
0995	298-308	0.01		.03	<.003					
0996	328-338	0.03		.06	<.003					
0997	338-348	0.12		.03	<.003					
0998	348-358	0.08		.01	<.003					
0999	358-368	0.08		.01	<.003					
1000	368-378	0.05		.01	<.003					
1101	378-388	0.10		.03	<.003					
1102	388-398	0.09		.01	<.003					
1103	398-408	0.03		<.01	<.003					
1104	408-418	0.11		.03	<.003					
1105	418-428	0.03		<.01	<.003					
1106	428-438	0.05		<.01	<.003					
1107	438-448	0.02		<.01	<.003					
1108	448-458	0.09		.01	<.003					

HOLE Nº. 135 Page 2 of 3

PROJECT Minto

Lat. 8,297.9 Dep. 11,492.2

Ele. 2798.6 T.D. 946 Dip 90°

Bearing _____ Date S. 15 Aug Fin. 19 Aug/74

SAMPLE Nº.	INTER	TOTAL COPPER	NON SULPHIDE COPPER	Oz Ag	Oz Au			CORE RECOVERY %	SPECIFIC GRAVITY	REMARKS
1109	458-468	0.04		.01	<.003					
1110	508-518	0.11		.01	<.003					
1111	518-528	0.10		<0.01	<0.003					
1112	528-538	0.19		0.01	<0.003					
1113	538-548	0.13		0.01	<0.003					
1114	548-558	0.16		<0.01	<0.003					
1115	558-568	0.17		<0.01	<0.003					
1116	568-578	0.07		<0.01	<0.003					
1117	578-588	1.26		0.18	0.016					
1118	588-593	0.59		0.10	0.005					
1119	593-598	0.01		<0.01	<0.003					
1120	598-608	0.03		<0.01	<0.003					
1121	608-618	0.11		0.04	<0.003					
1122	618-628	0.03		<0.01	<0.003					
1123	693-703	0.01		<0.01	<0.003					
1124	703-707	1.22		0.22	0.016					
1125	707-713	0.02		<0.01	<0.003					
1126	713-723	0.04		<0.01	<0.003					
1127	723-733	0.03		<0.01	<0.003					
1128	818-828	0.01		<0.01	<0.003					
1129	828-838	0.06		0.01	<0.003					
1130	838-848	0.06		<0.01	<0.003					
1131	848-858	0.07		0.01	<0.003					

HOLE Nº. 135 Page 1 of 3

PROJECT Minto

Lat. 8,297.9 Dep. 11,492.2

Ele. 2798.6 T.D. 946 Dip 90°

Bearing _____ Date S. 15 Aug Fin. 19 Aug/74

SAMPLE Nº.	INTER	TOTAL COPPER	NON SULPHIDE COPPER	Oz Ag	Oz Au			CORE RECOVERY %	SPECIFIC GRAVITY	REMARKS
0988	56-66	0.25		0.06	.033					
0989	147-157	0.02		<.01	<.003					
0990	157-167	0.90		.01	<.003					
0991	167-170	0.02		<.01	<.003					
0992	170-177	0.01		<.01	<.003					
0993	218-228	0.06		<.01	<.003					
0994	288-298	0.03		.01	<.003					
0995	298-308	0.01		.03	<.003					
0996	328-338	0.03		.06	<.003					
0997	338-348	0.12		.03	<.003					
0998	348-358	0.08		.01	<.003					
0999	358-368	0.08		.01	<.003					
1000	368-378	0.05		.01	<.003					
1101	378-388	0.10		.03	<.003					
1102	388-398	0.09		.01	<.003					
1103	398-408	0.03		<.01	<.003					
1104	408-418	0.11		.03	<.003					
1105	418-428	0.03		<.01	<.003					
1106	428-438	0.05		<.01	<.003					
1107	438-448	0.02		<.01	<.003					
1108	448-458	0.09		.01	<.003					

HOLE Nº. 135 Page 2 of 3

PROJECT Minto

Lat. 8,297.9 Dep. 11,492.2

Ele. 2798.6 T.D. 946 Dip 90°

Bearing ____ Date S. 15 Aug Fin. 19 Aug/74

SAMPLE Nº.	INTER	TOTAL COPPER	NON SULPHIDE COPPER	Oz Ag	Oz Au			CORE RECOVERY %	SPECIFIC GRAVITY	REMARKS
1109	458-468	0.04		.01	<.003					
1110	508-518	0.11		.01	<.003					
1111	518-528	0.10		<0.01	<0.003					
1112	528-538	0.19		0.01	<0.003					
1113	538-548	0.13		0.01	<0.003					
1114	548-558	0.16		<0.01	<0.003					
1115	558-568	0.17		<0.01	<0.003					
1116	568-578	0.07		<0.01	<0.003					
1117	578-588	1.26		0.18	0.016					
1118	588-593	0.59		0.10	0.005					
1119	593-598	0.01		<0.01	<0.003					
1120	598-608	0.03		<0.01	<0.003					
1121	608-618	0.11		0.04	<0.003					
1122	618-628	0.03		<0.01	<0.003					
1123	693-703	0.01		<0.01	<0.003					
1124	703-707	1.22		0.22	0.016					
1125	707-713	0.02		<0.01	<0.003					
1126	713-723	0.04		<0.01	<0.003					
1127	723-733	0.03		<0.01	<0.003					
1128	818-828	0.01		<0.01	<0.003					
1129	828-838	0.06		0.01	<0.003					
1130	838-848	0.06		<0.01	<0.003					
1131	848-858	0.07		0.01	<0.003					

HOLE Nº. 135 Page 3 of 3

PROJECT Minto

Lat. 8,297.9 Dep. 11,492.2

Ele. 2798.6 T.D. 946 Dip 90°

Bearing _____ Date S. 15 Aug Fin. 19 Aug/74

SAMPLE Nº.	INTER	TOTAL COPPER	NON SULPHIDE COPPER	Oz Ag	Oz Au			CORE RECOVERY %	SPECIFIC GRAVITY	REMARKS
1132	858-868	0.44		0.10	<0.003					
1133	868-878	1.05		0.20	0.015					
1134	878-883	0.79		0.16	0.005					
1135	883-888	0.01		<0.01	<0.003					
1136	906-912	0.14		0.04	<0.003					
1138	912-916	0.01		<0.01	<0.003					

NOTE 1: Number denotes relative abundance 10:1:5

NOTE 2: % by volume
* Specularite

NOTE 3: P - Pervasive
L - Localized strength
Tr - Trace
W - Weak
M - Moderate
S - Strong
Ex. P-S - Pervasive - Strong

NOTE 4: Key for rock type 4 letters max.

ASARCO — DDH LOG

MINTO PROJECT

NOTE 5: UC - Contact (Upper)
LC - Contact (Lower)
Dik - Dike
Flt - Fault
Frc - Fracture
Gge - Gouge
Shr - Shear
Stk - Stockwork
Vn - Vein
Vlt - Veinlet

NOTE 6: Type
W - Weak
M - Moderate
I - Intense
G - Gneissic

091335

HOLE No. 136 Page 1 of 3

Lat. 8,709.7 Dep. 11,877.6

Ele. 2,727.8 T.D. 478 Dip 90°

Logged by J.R. Petura Bearing ____ Date S. 19/8/74 Fin. 23/8/74

FROM	TO	SAMPLE No.	(1) ECONOMIC MINERALS						(2) Fe MINERALS				(3) ALTERATION										(4) ROCK TYPE	ROCK COMPOSITION						(5) STRUCTURE			FOLIATION		REMARKS
			Cpy	Born	Mal	Cv Pitch	Gal	Mo	Py	Mag	Hm	Lim	Ox	Orth	Qtz	Ser	Biot	Chl	Ep	Carb	Anhy	Clay		Orth	Plag	Qtz	Pyx	Biot	Hbl	Type	Depth	∠ to CA	Degree	∠ CA	
0	17																																	
17	33											4	USP										G											FD=720; too weathered for analysis; basalt dike frags
33	43	1142			1	1					1	5	USP										KPG											FD=720; too weathered for analysis
43	53	1143			1	1					1	4	SP										KPG	12	58	11		13		FRC	52.5	0-5			FD=720, sulfides replaced by Hem and Mal, majority of Cu at 51-52.
53	63	1144									TR	2	SP										KPG	9	60	15		13		FRC	58	10			FD=9, stain 63
63	105											3	SP										G	9	61	10		16		FRC	83	45			FD=3, brecciated zone (FLT?) 89-90; fine grained feldspathic dike 96-99
105	125											1	MP										KPG	16	52	15		14		FRC	116	20			FD=3, stain 110
125	151											TR	MP										FG	12	65	10		12		FRC	137.5	60 + 30	WL	85	FD=2, Stain 139, biotite accumulation 80% 139.5-141; stain 128
151	161	1145	3		1							TR	MP	WP						TR			AG	10	55	20		13		FRC	169	90			FD=3, ortho all interstitial, stain 153, Mag altn weak
161	171	1146	3		1	(Cp=10/1)			TR			2	MP	SP	WP					TR			FAG	25	50	12		10		Dik PEG	165		W	50	FD=5) stain 171, rocks weakly genissic in places
171	181	1147	1		TR				TR			1-2	MP / SL	SP	WP					TR			FAG	15	55	15		13		FRC PEG	Common 170-1	30/30 40	W	50	FD=5) faults several minor Plag slightly altd.
181	191	1148	1		TR							TR -1	WL	WP	WP					TR			G	12	60	15		12		FRC	Common	60 30 10			FD=6) Carb tr on fract
191	216.5	1149										TR -1	WL					TR		WL			G	8	58	20		14		FRC FRC	Common 208-210	60 30 90 0-30			FD=4, stain 198, minor fault 208-210 at 15°
216.5	226.5	1150										TR	ML	WP				TR					FG	18	47	20		15		FRC	210-221 223-224	30 50	W	40	FD=5, contact 216.5, 40°, stain 221
226.5	236.5	1151										TR	ML	MP				S-P		WL			FG (N)	15	42	25		18		FRC	227-228 230/234	30 40 60	M	50	FD=3, tending to gneiss in few spots
236.5	246.5	1152	1	TR					1			TR	WL	MP				TR					FG	68	62	20		14		FRC P-Dik	241-244 237-8	65/30	W		FD=3, Highly contorted at end (244) just above 6" peg dike. Stain 240'.
246.5	270	1153	TR							TR		1	SL	WP				SL					AG	10	60	30				Faults FRC	259-267 Common	30 30 60			FD
270	304		TR									1	ML	WP				WP					AG G	10	60 10 65	20 15		10 /12		Fault Peg UC-LC	287-8 283-345	30 45°45°45°			=5-6, high silica, plag to ?Ab?, K-spar, little effected. Stain 253-268. FD=3, 8" qtz vein @ 290' up side Cpy to 1/8" both at 40° to CA. 2' sections of G at end.
304	312	1154												ML				WP					G	8	65	12		15		FRC	306-308	35/55	C		FD=2, slight pinking along frc. stain 312
312	322	1155	10	1							TR			SP				WP					FG	25	40	20		15		UC FRC	312 317	60° 35°	S	40-60	FD=5, UC slight undulation, sharp; T.S.
322	327	1156	8	1							1							WP					FG/G	25/5	40	20		15/15		LC FRC	325 Common	40° 60-70	S		FD=4, last 1' FG highly contorted & breccia-like, L.C. sharp, last 2' G
327	332	1157																TR					G	5	65	15		15		Peg UC-LC Felcite-Vlt	336-39 356+357	25° 25°			FD=1-2 frc common @ 30° - 45° - 60° felsite veinlets 1/8-1/2" very fine grained sharp. but irregular boundaries, included sub-round qtz grains slight pinking on frcts.
332	388																	TR						5	65	15		15		FRC Flt	Common 363	30 45 60 35			FD=1, very slight allignment of Bio which is almost porphyritic stain 409
388	403		TR															WP					G	12	55	15		18		FRC	Common	60-70			~~FD=1, pinked zone to 418'~~
403	413	1158	TR						1-2					WP				MP					AG	15	55	15		15		Fault FRC	405-409 Common	25-20 0-30			

NOTE 1: Number denotes relative abundance 10:1:5

NOTE 2: % by volume
* Specularite

NOTE 3: P - Pervasive
L - Localized strength
Tr - Trace
W - Weak
M - Moderate
S - Strong
Ex. P-S - Pervasive - Strong

NOTE 4: Key for rock type 4 letters max.

ASARCO — DDH LOG

MINTO PROJECT

NOTE 5: UC - Contact (Upper)
LC - Contact (Lower)
Dik - Dike
Flt - Fault
Frc - Fracture
Gge - Gouge
Shr - Shear
Stk - Stockwork
Vn - Vein
Vlt - Veinlet

NOTE 6: Type
W - Weak
M - Moderate
I - Intense
G - Gneissic

HOLE No. 136 Page 2 of 3

Lat. 8,709.7 Dep. 11,877.6

Ele. 2,727.8 T.D. 478 Dip 90°

Logged by A. Courtney Bearing _____ Date S. 19/8/74 Fin. 23/8/74

FROM	TO	SAMPLE No.	(1) ECONOMIC MINERALS						(2) Fe MINERALS				(3) ALTERATION									(4) ROCK TYPE	ROCK COMPOSITION						(5) STRUCTURE			FOLIATION		REMARKS
			Cpy	Born		Sph	Gal	Mo	Py	Mag	Hm	Lim	Ox	Orth	Qtz.	Ser	Biot	Chl	Ep	Carb	Anhy	Clay		Orth	Plag	Qtz	Pyx	Biot	Hbl	Type	Depth	∡ to CA	Degree	∡ CA	
413	423	1159	TR	TR					1-2					WP				SP SL		S-I			AG	15	55	15		15		Fault FRC	415-417 422	0-20 25			FD = Pinked fault dominate; 418-23 is lightly altd G
423	433	1160	TR						1					WP				MP		S-I			(A)G	16	55	15		15		Dik UC/LC FRC	430-32 431	10-40 45-55			FD=1-2, dike fine grained darker G w/bio in smaller platlets, distributed at random - stain 436
433	443	1161	TR						1					WP				MP		W-I			(A)G	18	55	12		15		FRC	Common	75-80	W	30	FD=1-2, fine grained felsic section w/Py @ 434-5 (Plag subeuhedral, random and separated.
443	453	1162	TR						1					WP				MP		W-I			(A)G	15	55	12		18		PEG Dik	4515-454	30° 35°	W	35	FD=3, sulfide concn (Py) in narrow fine gr equivalent rocks 1"-2" 30° to CA
453	463	1163	TR						1		TR			WP				MP		W-I			(A)G	15	55	12		18		FRC	Common 449	75-80° 15°	W	30	FD=1-2 sulfide disseminated throughout associated w/bio/chl
463	473	1164	TR						TR-1		TR			WP				MP		WL			(A)G	15	55	12		18		FRC Dik UC/LC	464 464-468.5	35° 35° 35°	W	35	Stain 483 FD=1-2, Dike Plag 75 Qtz]0, Bio/Chl-15. Few pinked areas, strong Chl-Pg
473	483	1165	TR						TR-1					WP				SL		SL			(A)G	15	55	12		18		FRC	Common	35 70			FD=1-2, Pinking around 478
483	493	1166	TR						TR-1					WP				MP		SL			AG	18	56	10		16		FRC PEG UC/LC	486 Com 100 486-487	50° 35 40°	W	45	FD=1-2, pinking more general. Sulfide still in narrow bands, some dissem.
493	503	1167	TR	(CPY:Py)					1					WP				MP		SL			(RT)AG	18	54	10		18		Dik UC/LC	499	40 45	W	50	FD=1-2 dike very fine grained G 4"
503	513	1168	TR						TR-1					WP				MP SL		SL			(RT)AG	18	54	10		18		Fault	506-7	0-10°			FD=4 Fault Chl and Cal filled - semi-bx 502-505
513	523	1169	TR		1:10				TR-1					WP	WP			WP		SL			(A)G	20	45	20		15		FRC FRC	517-521 521	35-60	W	45	FD=1, stain 518
523	533	1170	TR						TR-1					MP	WP			WP		SL			(A)G	25	40	20		15		FRC	529-532 535	0-10° 0-10° 40	W	45	FD=4, fine grained equivalent rocks to Peg @ 528-530, stain 528
533	543	1171	TR						TR-1					WP	WP			WP		WL			(A)G	17	50	15		18		FRC	533+36	0-15°	W	40	FD=3, Slightly pinked also. Sulfide occurence same as above 100'
543	553	1172	TR						TR-1					WP	WP			WP		WL			(A)G	15	55	15		15		FRC	544	10+50	W	40	FD=2, 545 Frc slightly vuggy, w/pg and qtz filling
553	563	1173	TR						TR-1					WP				WP		WL			(A)G	15	55	15		15		FRC	Common	70-90	W	40	FD=1 altn weakening sulfides decreasing
563	573	1174	TR						TR					WP						WL			(A)G/G	15	55	15		15		FRC	Common	70-90			FD=1 altn patchy to none, stain 575
573	585																		WP	WL			G-KPG	8	67	15		10		FRC	Common	30÷50			FD=2, No altn but patchy E.. Contact w/FAG U.C.- 50°
585	595	1175	1											WP				WP		WL			F-AG	15	60	10		15		FRC	Common	30+50	W	30	FD=4, weakly mineralized though more pervasive
595	605	1176	1	TR										WP				WL		WL			AG	15	60	10		15		PEG FRC	599 Common	35 15÷45÷60			FD=5, foliation just barely present Cpy patchy disseminated
605	615	1177	1	TR										MP				MP	WL	WL			F-AG	20	50	15		15		FRC	Common	10 35 55	W	60	FD= 2-3, Ep filling low angle fractures
615	625	1178	1											WP				MP		WL			F-AG	20	50	15		15		FRC	Common	45°+60°	M	50	FD=2, foliation strong, @ 690 almost gneissic
625	630	1179	TR											WP				SP		WL			F-AG	20	50	15		15		FRC	Common	45°	M		FD=2, L.C. @ 628 is almost flat = 0-10° to CA
630	650																	MP	SL	SL			(A)KPG	10	65	15		10		PEG Fault	642-44.5 644-48	47° 0-10			FD = ~ Ep in fract @ 638 1/4" fault w/gge crumbly
650	675																			SL			(A)KPG	10	65	15		10		FRC Vn	Common 669	80 14			FD=1 Vein filled w/? T.S. 668, carbon low ∡ fractures stain 667
675	680	1180	1						1		TR			WP						SL			(A)KPG	13	60	15		12		Vn	Common 678	10-35 10°			FD=1 vein filled w/cal 1/2" (pure)

ASARCO – DDH LOG

MINTO PROJECT

NOTE 1: Number denotes relative abundance 10:1:5

NOTE 2: % by volume
✱ Specularite

NOTE 3: P – Pervasive
L – Localized strength
Tr – Trace
W – Weak
M – Moderate
S – Strong
Ex. P-S – Pervasive-Strong

NOTE 4: Key for rock type 4 letters max.

NOTE 5: UC – Contact (Upper)
LC – Contact (Lower)
Dik – Dike
Flt – Fault
Frc – Fracture
Gge – Gouge
Shr – Shear
Stk – Stockwork
Vn – Vein
Vlt – Veinlet

NOTE 6: Type
W – Weak
M – Moderate
I – Intense
G – Gneissic

HOLE Nº. 136 Page 3 of 3
Lat. 8,709.7 Dep. 11,877.6
Ele. 2,727.8 T.D. 478 Dip 90°
Logged by A. Courtney Bearing ____ Date S. 19/8/74 Fin. 23/8/74

FROM	TO	SAMPLE Nº.	(1) ECONOMIC MINERALS						(2) Fe MINERALS				(3) ALTERATION										(4) ROCK TYPE	ROCK COMPOSITION						(5) STRUCTURE			FOLIATION		REMARKS
			Cpy	Born		Sph	Gal	Mo	Py	Mag	Hm	Lim	Ox	Orth	Qtz	Ser	Biot	Chl	Ep	Carb	Anhy	Clay		Orth	Plag	Qtz	Pyx	Biot	Hbl	Type	Depth	✱ to CA	Degree	✱ CA	
680	690	1181	1	TR		(CPY: Py=1:10)			1-2					WP				WP		SL			AG	20	45	18		12		FRC PEG	Common 683	0-30 60			FD – 1-2, Frc filled w/cal pinked. Peg blotches of Py & Cpy; (1) Py after plag.
690	700	1182	2	1							TR			SP				WP SL	WL	ML			AG	30	45	15		10		FRC Vn Qtz	Common 691	70-80 60	M	40	FD = 1-2 Cpy Bn assoc w/qtz vein, Rocks 694-699 v.f.g. Peg/G mixture, Stain 698.
700	705	1183	TR											WP					WL				KPG	10	62	15		13		FRC	Common	60-80			FD=4, Horizontal slickenslides on 20° fracture at 703
705	744													WP				MP	WP	SL			AKPG	15	52	18		15		FRC	Common	50 10-30	W	50	FD=5, high density of low ✱ fracts; Cpy-Bn-Qtz = 4" .2 Cu @ 727 Mod pinking.
744	754	1184	TR						TR					WP				MP	SL	SL			AG	25	45	15		15		Dik	744-746	?	W	50	FD=5, andesite-like w/pink Plag phenos 1/8 – 1/4". Tr Cu
754	764	1185	1						TR									SP	SL	SL			AG	25	45	15		15		LC	763	?	W	55	FD=3, L.C. diffused in Peg
764	807													WL				WP	WP	SL			KPG	8	55	23		14		FRC	Common	55-10			FD=2, some K-P to 1 1/2", slight pinking and altn. 775 + 782 + 800 + 806
807	817	1186	1						TR					SP				12		SL			(RT) AG	20	53	15				FRC	Common	10-15 45			FD=3, sulfides coarse and disseminated, low ✱ fracts – carb and Chl.
817	827	1187	1						TR					SP				12		SL			(RT) AG	22	51	15				FRC	Common	45-60	W	60	FD=4, Rocks heavy K-altn, all mafics to Chl , stain 819
827	837	1188	1						TR									WP	WP	SL			AG	8	65	12		15		Dik And FRC	833-36 832	LC-70° 0-10	W	55	FD=3, Andesite dike w/$CaCo_3$ pure fracts fillings; Fract ✱ 55 & 25 -35° CA
837	847	1189	1	TR					TR	TR				WP				MP		SL			AG	8	65	12		15		FRC	845 (2) Common	25 45-60	W	55	FD=3 Mg rimed by Bio → Chl Rocks dragfolded by 55° fract. Stain 839
847	857	1190	1	TR					TR					WP				WP		SL			AG	8	65	12		15		FRC	Common 856	60 30	W	60	FD=2
857	867	1191	5	1										WP				WP	WP	SL			AG	10	60	15		15		FRC	860 (3)	25-30			FD=2, Many small 1" K-Fs & Qtz veinlets @ ~ 60°, Main Min 859-60
867	877	1192	5	1										SP				15	–	SL			(RT) AG	20	53	15				FRC	869	25	(W)		FD=2, Low angle fault carb-chl gouge
877	887	1193	1			(CPY: Py=1.5)			1					MP				MP	WL	SL			AG	15	54	16		15		FRC	Common	60-74	(W)		FD= < 1 Min mainly Py w/Cpy in pinked area. Foliation = crinkle
887	897	1194	TR						1					WP				WP		SP			AG	12	56	16		15		FRC	Common	60-70			FD=1 Rocks grades into (K) P G
897	929													TR				WP	TR				KPG	8	55	25		12		FRC	Common	30 35 45			FD=1 Slight pinking at 925
929	934	1195												WP				WP		WL			AKPG	8	55	25		12		FRC	Common	30 35 45			FD=1
934	948	1196	5	1					TR	1-2				SP				SP		WL			vAKPG	40	30	10		15		FRC Dik And	Common 936-937	60 51°/46°	S	50	FD=2, Several at 30° to CA at 945'
948	953	1197												WP				WP		WL			AKPG	8	55	25		12		FRC	951-52 (4)	35-40			FD=2
953	978													TR				WP		ML			(A) KPG	8	55	25		12		FRC	Common	30 45 70			FD=3
End Hole																																		

HOLE Nº. 136 Page 1 of 3

PROJECT Minto

Lat. 8,709.7 Dep. 11,877.6

Ele. 2727.8 T.D. 978 Dip 90°

Bearing _____ Date S. 19 Aug Fin. 23 Aug/74

SAMPLE Nº.	INTER	TOTAL COPPER	NON SULPHIDE COPPER	Oz Ag	Oz Au			CORE RECOVERY %	SPECIFIC GRAVITY	REMARKS
1142	33-43	0.35		<0.01	<0.003					
1143	43-53	0.36		<0.01	<0.003					
1144	53-63	<0.01		<0.01	<0.003					
1145	151-161	0.41		<0.01	<0.003					
1146	161-171	0.23		<0.01	<0.003					
1147	171-181	0.41		0.02	<0.003					
1148	181-191	0.01		<0.01	<0.003					
1149	211.5-216.5	<0.01		<0.01	<0.003					
1150	216.5-226.5	0.31		0.02	<0.003					
1151	226.5-236.5	0.63		0.04	<0.003					
1152	236.5-246.5	0.13		<0.01	<0.003					
1153	246.5-251.5	<0.01		<0.01	<0.003					
1154	304-312	<0.01		<0.01	<0.003					
1155	312-322	2.61		0.22	0.015					
1156	322-327	1.56		0.20	0.019					
1157	327-332	<0.01		<0.01	<0.003					
1158	403-413	0.03		<0.01	<0.003					
1159	413-423	0.05		<0.01	<0.003					
1160	423-433	0.11		<0.01	<0.003					
1161	433-443	-.14		<0.01	<0.003					

HOLE Nº. 136 Page 2 of 3

Lat. 8,709.7 Dep. 11,877.6

Ele. 2727.8 T.D. 978 Dip 90°

Bearing _____ Date S. _____ Fin. _____

PROJECT Minto

SAMPLE Nº	INTER	TOTAL COPPER	NON SULPHIDE COPPER	Oz Ag	Oz Au			CORE RECOVERY %	SPECIFIC GRAVITY	REMARKS
1162	443-453	0.07		<0.01	<0.003					
1163	453-463	0.09		<0.01	<0.003					
1164	463-473	0.07		<0.01	<0.003					
1165	473-483	0.21		0.03	<0.003					
1166	483-493	0.07		<0.01	<0.003					
1167	493-503	0.09		<0.01	<0.003					
1168	503-513	0.07		<0.01	<0.003					
1169	513-523	0.06		<0.01	<0.003					
1170	523-533	0.15		<0.01	<0.003					
1171	533-543	0.20		<0.01	<0.003					
1172	543-553	0.15		<0.01	<0.003					
1173	553-563	0.09		<0.01	<0.003					
1174	563-573	0.14		<0.01	<0.003					
1175	585-595	0.61		0.06	0.004					
1176	595-605	0.46		0.06	0.004					
1177	605-615	0.84		0.10	0.004					
1178	615-625	0.90		0.09	0.003					
1179	625-630	0.43		0.09	0.003					
1180	675-680	0.08		0.01	<0.003					
1181	680-690	0.43		0.03	<0.003					
1182	690-700	0.26		0.06	<0.003					
1183	700-705	<0.01		<0.01	<0.003					

HOLE Nº. 136 Page 3 of 3

PROJECT Minto

Lat. 8,709.7 Dep. 11,877.6

Ele. 2727.8 T.D. 978 Dip 90°

Bearing _____ Date S. 19 Aug Fin. 23 Aug/74

SAMPLE Nº	INTER	TOTAL COPPER	NON SULPHIDE COPPER	Oz Ag	Oz Au			CORE RECOVERY %	SPECIFIC GRAVITY	REMARKS
1184	744-754	0.15		0.15	<0.003					
1185	754-764	0.08		0.08	<0.003					
1186	807-817	0.20		0.03	<0.003					
1187	817-827	0.33		0.01	<0.003					
1188	827-837	0.09		<0.01	<0.003					
1189	837-847	0.25		0.03	<0.003					
1190	847-857	0.48		0.06	<0.003					
1191	857-867	1.54		0.32	0.029					
1192	867-877	0.01		<0.01	<0.003					
1193	877-887	0.05		<0.01	<0.003					
1194	887-897	0.04		<0.01	<0.003					
1195	929-934	<0.01		<0.01	<0.003					
1196	934-948	1.12		0.15	0.011					
1197	948-953	0.05		<0.01	<0.003					

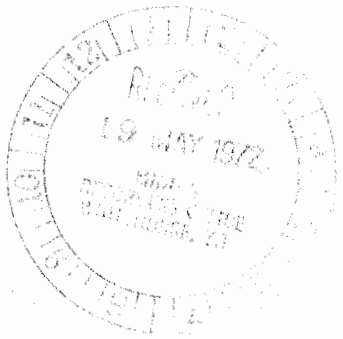
CMR. V/6/620 MINTO 1

Q59412 - Q59450

Silver Standard Mines Ltd.

SILVER STANDARD MINES

"HINTO"
W.H.D.
115-I-11



SCHEDULE B

MINTO CREEK PROJECT

DRILL HOLE #1

Sample No.	From - To	Footage	% Cu	Oz./ton Ag	Oz./ton Au	Averages
7830	40-50	10	< 0.01			
7831	91.5-94.5	3	< 0.01			
7832	100-110	10	0.01			
7833	165-168	3	< 0.01			
7834	178-183	5	< 0.01			
7835	183-188	5	1.36	.10	< .003	)10' of
7836	188-193	5	1.84	.22	< .003	)1.6% Cu
7837	193-198	5	0.01			
7838	198-208	10	< 0.01			
9263	208-218	10	< 0.01			
9264	218-228	10	< 0.01			
9265	228-238	10	< 0.01			
9266	238-245	7	< 0.01			
7839	245-255	10	0.26			)
7840	255-262	7	1.34			)
7841	262-266	4	0.01			)38' of
7842	266-276	10	0.36			)0.68% Cu
7843	276-283	7	1.44			)
7844	491.5-494.5	3	0.89			

DRILL HOLE #2

Sample No.	From - To	Footage	% Cu	Oz./ton Ag	Oz./ton Au	Averages		
7845	6-7	1	2.70	.05	.003	)	)	)
7846	7-10	3	4.10	.25	.008	)	)	)
7847	10-12	2	2.60	.19	.008	)14' of	)	)
7848	12-14	2	1.05	.05	< .003	)2.43% Cu	)	)
7849	16-18	2	3.90	.30	.026	)	)	)
7850	18-20	2	2.82	.13	.005	)	)36' of	)
							)1.81% Cu	)
7901	20-22	2	0.52	.05	< .003	) 8' of	)	)
7902	22-24	2	0.02	.01	< .003	)0.26% Cu	)	)
7903	24-28	4	0.26	.05	< .003	)	)	)
							)	)
7904	28-38	10	1.36	.09	< .003	)14' of	)	)
7905	38-42	5	2.16	.07	< .003	)1.59% Cu	)	)
								)
7906	42-50	8	0.03	.01	< .003			)133.5' of
7907	50-52	2	3.05	.12	.008			)0.92% Cu
7913	52-61.5	9.5	0.01	.09	< .003			)
								)
7908	61.5-63.5	3	3.55	.32	.022	)		)
7912	63.5-73.5	10	0.07	.03	< .003	)		)
7909	73.5-76.0	12.5	2.20	.28	.011	)		)
7910	76-82	6	0.24	.03	< .003	)		)
7911	82-92	10	0.60	.10	< .003	)78' of		)
7914	92-102	10	1.08	.01	.008	)0.67% Cu		)
7915	102-112	10	0.96	.01	.008	)		)
7916	112-122	10	0.48	.13	< .003	)		)
7917	122-127	10	0.18	.03	< .003	)		)
7918	127-132	10	0.20	.03	< .003	)		)
7919	132-139.5	7.5	0.54	.05	< .003	)		)
7922	139.5-150	10.5	< 0.01					
7923	150-160	10	< 0.01					
7924	160-170	10	< 0.01					
7925	170-180	10	0.02					
7926	180-190	10	0.01					
7927	190-200	10	< 0.01					
7928	200-210	10	< 0.01					
7929	210-220	10	< 0.01					
7930	220-230	10	< 0.01					
7931	230-240	10	< 0.01					
7932	240-250	10	< 0.01					

NOTE: A value of 2.43% Cu is assumed for the interval 14'-16' since no core was recovered.

DRILL HOLE #2 - cont'd

Sample No	From - To	Footage	% Cu	Oz./ton Ag	Oz./ton Au	Averages
7933	250-260	10	< 0.01			
7934	260-270	10	0.28			)
7935	270-274	4	0.50			)
7936	274-283	9	0.02			)
7937	283-290	7	0.21			)
7938	290-295	5	0.08			)60' of
7920	295-300	5	0.12			)0.19% Cu
7921	300-305	5	0.31			)
7939	305-310	5	0.19			)
7940	310-315	5	0.16			)
7941	315-320	5	0.12			)
7947	320-330	10	< 0.01			
7948	330-340	10	< 0.01			
7977	340-350	10	< 0.01			
7978	350-360	10	< 0.01			
7979	360-370	10	0.01			
7980	370-380	10	0.03			
7981	380-890	10	< 0.01			
7982	390-400	10	< 0.01			
7983	400-410	10	< 0.01			
7984	410-420	10	< 0.01			
7985	420-430	10	< 0.01			
7986	430-440	10	< 0.01			
7987	440-450	10	< 0.01			
7988	450-452	2	< 0.01			
7989	453-463	10	0.03			
7990	463-473	10	0.01			
7991	473-480	7	< 0.01			
7992	480-485	5	< 0.01			
7993	485-492	7	< 0.01			

DRILL HOLE #3

Sample No.	From - To	Footage	% Cu	Oz./ton Ag	Oz./ton Au	Averages
7949	12-17	5	< 0.01			
7950	17-20	3	< 0.01			
7951	20-22.5	2.5	< 0.01			
7952	22.5-25	2.5	< 0.01			
7953	25-27	2	< 0.01			
7954	27-30.5	2.5	< 0.01			
7955	30.5-40	9.5	< 0.01			
7956	40-45	5	0.16			)
7957	45-50	5	0.44			)
7958	50-55	5	0.55			)
7959	55-60	5	0.31			)
7960	60-65	5	0.38			)
7961	65-70	5	0.68			)
7962	70-75	5	0.28			)
7963	75-80	5	0.17			)
7964	80-85	5	0.11			)
7965	85-90	5	0.16			)
7966	90-94.5	4.5	0.16			)105' of
	94.5-98	3.5				)0.28% Cu
7967	98-100	2	0.28			)
	100-103	3				)
7968	103-110	7	0.24			)
7969	110-115	5	0.45			)
7970	115-120	5	0.36			)
7971	120-125	5	0.17			)
7972	125-130	5	0.01			)
7973	130-135	5	0.09			)
7974	135-140	5	0.93			)
7975	140-145	5	0.16			)
7976	145-155	10	0.01			
7994	155-165	10	< 0.01			
7995	165-175	10	< 0.01			
7996	175-185	10	0.01			
7997	185-195	10	0.05			
7998	195-205	10	< 0.01			
7999	205-215	10	< 0.01			
8000	215-225	10	0.01			
7720	225-230	5	0.01			
7721	230-240	10	< 0.01			
7722	240-246	6	0.03			

DRILL HOLE #3 - cont'd

Sample No.	From - To	Footage	% Cu	Oz./ton Ag	Oz./ton Au	Averages
7723	246-251	5	0.38			)
7724	251-256	5	1.05			)
7725	256-261	5	0.63			)
7726	261-266	5	0.66			)
7727	266-271	5	0.47			)
7728	271-276	5	0.42			)
7729	276-281	5	0.39			)
7730	281-286	5	0.33			)100' of
7731	286-290	4	0.14			)0.31% Cu
7732	290-295	5	0.10			)
7733	295-305	10	0.01			)
7734	305-315	10	0.23			)
7735	315-325	10	0.05			)
7736	325-335	10	0.01			)
7737	335-338	3	0.22			)
7738	388-344	6	0.35			)
7739	344-346	2	0.59			)
7740	346-356	10	0.06			
7741	356-366	10	0.01			
7742	366-376	10	< 0.01			
7743	376-386	10	< 0.01			
7744	386-396	10	< 0.01			
7745	396-406	10	< 0.01			
7746	406-416	10	< 0.01			
7747	416-426	10	< 0.01			
7748	426-431	5	0.09			
7749	431-436	5	< 0.01			
7750	436-446	10	< 0.01			
9256	446-456	10	0.02			
9257	456-466	10	< 0.01			
9258	466-476	10	< 0.01			
9259	476-486	10	< 0.01			
9260	486-496	10	< 0.01			
9261	496-508	12	< 0.01			
9262	508-517	9	< 0.01			

DRILL HOLE #4

Sample No.	From - To	Footage	% Cu	Oz./ton Ag	Oz./ton Au	Averages
9268	27-32	5	0.35			)
9269	32-37	5	0.15			)
9270	37-42	5	0.16			)30' of
9271	42-47	5	0.84			)0.41% Cu
9272	47-52	5	0.81			)
9273	52-57	5	0.17			)
9274	57-62	5	< 0.01			
9275	62-68	6	0.11			
9276	68-77	9	< 0.01			
9277	77-88	11	< 0.01			
9278	88-98	10	< 0.01			
9279	98-108	10	< 0.01			
9280	108-116	8	0.08			
9281	116-122	6	0.09			
9282	122-128	6	0.09			
9283	128-138	10	< 0.01			
0284	138-148	10	< 0.01			
9285	148-153	5	0.03			
9286	153-158	5	0.31			)
9287	158-163	5	0.34			)
9288	163-168	5	0.31			)
9289	168-173	5	0.33			)
9290	173-178	5	0.26			)
9291	178-183	5	0.18			)
9292	183-188	5	0.17			)
9293	188-193	5	0.17			)
9294	193-198	5	0.22			)97' of
9295	198-203	5	0.27			)0.22% Cu
9296	203-208	5	0.29			)
9297	208-213	5	0.16			)
9298	213-218	5	0.26			)
9299	218-223	5	0.16			)
9300	223-228	5	0.24			)
9302	228-233	5	0.12			)
9303	233-238	5	0.21			)
9304	238-245	7	0.26			)
9305	245-250	5	0.11			)

DRILL HOLE #4 - cont'd

Sample No.	From - To	Footage	% Cu	Oz./ton Ag	Oz./ton Au	Averages
9306	250-260	10	< 0.01			
9307	260-270	10	< 0.01			
9308	270-280	10	< 0.01			
9312	280-290	10	< 0.01			
9313	290-300	10	< 0.01			
9314	300-310	10	< 0.01			
9315	310-320	10	< 0.01			
9320	320-330	10	< 0.01			
9335	330-340	10	< 0.01			
9336	340-350	10	0.07			
9337	350-357.5	7.5	< 0.01			
9316	357.5-362.5	5	1.56	.19	.020	)
9317	362.5-367.5	5	4.10	.24	.140	)20' of
9318	367.5-372.5	5	1.56	.19	.020	)1.98% Cu
9319	372.5-377.5	5	0.68	.11	.011	)
9338	377.5-385	7.5	0.07			
9339	385-395	10	< 0.01			
9340	395-405	10	< 0.01			
9341	405-415	10	0.21			)
9342	415-425	10	0.30			)
9343	425-435	10	0.17			)
9344	435-445	10	0.22			)
9345	445-455	10	0.28			)90' of
9346	455-465	10	0.11			)0.20% Cu
9347	465-475	10	0.14			)
9348	475-485	10	0.11			)
9349	485-495	10	0.22			)
9350	495-505	10	0.08			
9451	505-515	10	0.02			
9452	515-525	10	0.03			
9453	525-535	10	0.01			
9454	535-545	10	< 0.01			
9455	545-555	10	0.06			
9456	555-565	10	0.09			
9457	565-575	10	0.05			

DRILL HOLE #5

Sample No.	From - To	Footage	% Cu	Oz./ton Ag	Oz./ton Au	Averages
9458	14-25	11	0.52			)
9459	25-35	10	0.06			)41' of
9460	35-45	10	0.25			)0.26% Cu
9461	45-55	10	0.21			)
9462	55-65	10	0.01			
9463	65-75	10	0.03			
9464	75-85	10	< 0.01			
9465	85-95	10	< 0.01			
9466	95-105	10	< 0.01			
9467	105-115	10	0.01			
9468	115-125	10	0.14			
9469	125-135	10	0.06			
9470	135-145	10	0.07			
9471	145-155	10	0.05			
9472	155-165	10	0.15			
9473	165-175	10	0.11			
9474	175-185	10	0.03			
9475	185-195	10	0.05			
9476	195-205	10	0.07			
9477	205-215	10	0.05			
9478	215-225	10	0.11			
9479	225-233	8	0.11			
9480	233-246	13	< 0.01			
9481	246-256	10	0.32			)
9482	256-266	10	0.42			)35' of
9483	266-276	10	0.37			)0.38% Cu
9484	276-281	5	0.47			)
9485	281-291	10	0.05			
9486	291-301	10	0.07			
9487	301-311	10	0.16			
9488	311-321	10	< 0.01			
9489	321-331	10	0.02			
9490	331-341	10	0.02			
9491	341-351	10	0.01			
9492	351-361	10	< 0.01			
9493	361-371	10	< 0.01			
9494	371-377	6	< 0.01			
9309	377-384	7	< 0.01			
9321	384-387	3	< 0.01			
9322	387-393	6	0.27	.07	.008	

DRILL HOLE #5 - cont'd

Sample No.	From - To	Footage	% Cu	Oz./ton Ag	Oz./ton Au	Averages	
9323	393-397	4	2.32	.44	.037	)	)
9324	397-398.5	1.5	2.00	.50	.047	)	)
9325	398.5-403	4.5	5.70	.85	.057	)	)
9326	403-406	3	2.78	.52	.045	)	)
9327	406-408	2	1.92	.32	.029	)	)
9328	408-412.5	4.5	4.30	.76	.120	)51.5' of	)
9329	412.5-418	5.5	2.72	.50	.045	)3.16% Cu	)
9330	418-424	6	3.36	.58	.052	)	)96' of
9331	424-428	4	2.48	.28	.024	)	)1.86% Cu
9332	428-434.5	6.5	1.00	.16	.009	)	)
9333	434.5-440	5.5	3.56	.62	.050	)	)
9334	440-444.5	4.5	4.90	.93	.067	)	)
							)
9495	444.5-455	10.5	< 0.01				)
9496	455-465	10	< 0.01				)
9497	465-475	10	0.11				)
9498	475-483	8	1.70				)
9499	483-493	10	0.03				
9500	493-503	10	0.09				
9351	503-513	10	0.09				
9352	513-523	10	0.05				

DRILL HOLE #6

Sample No.	From - To	Footage	% Cu	Oz./ton Ag	Oz./ton Au	Averages
9353	45.5-50	4.5	<0.01			
9354	50-55	5	0.14			
9355	55-57	2	0.08			
9356	57-64.5	7.5	0.12	.04	<.003	
9357	64.5-68	3.5	2.15	.12	.003	)
9358	68-76	8	1.16	.50	.019	)20.5' of
9359	76-83	7	5.50	.58	.016	)2.9% Cu
9360	83-85	2	1.72	.02	<.003	)
9361	85-94	9	0.06			
9365	122-127	5	0.17			
9366	127-135.5	8.5	0.06			
9367	135.5-145.7	10.2	< 0.01			
9362	232-240	8	0.58			)
9363	240-250	10	0.58			)27' of
9364	250-259	9	0.22			)0.46% Cu
9373	387-396	9	< 0.01			
9374	396-398	2	2.12			
9375	398-407	9	< 0.01			

DRILL HOLE #7

Sample No.	From - To	Footage	% Cu	Oz./ton Ag	Oz./ton Au	Averages
9380	150-160	10	< 0.01			
9379	305-310	5	< 0.01			
9381	417-422	5	< 0.01			
9382	484-489	5	< 0.01			

SILVER STANDARD MINES

SCHEDULE C

DIAMOND DRILL LOG

D.D. Hole 1 - 71

Property: Minto Creek **Bearing:** West

Location: 18+00N 16+00W **Inclination:** -45°

Footage	Description
0-38	Overburden.
38-55.6	Whitish biotite granite porphyry, breccia fragments, cemented by heavily hematite and hematite-stained crushed (?) granite. Biotite mostly fresh - weathered but no alteration.
55.6-59	Whitish biotite granite porphyry, massive biotite altered to chlorite. Slight hematite staining.
59-82	Same as 38-55.6', except biotite alteration to chlorite in some sections.
82-85	Fine-grained purple to red granite (?) dike (?) - individual feldspar and quartz grains surrounded by hematite - feldspars slightly altered. Very heavy hematite - no visual mineralization.
85-91.5	Same as 38-55.6'.
91.5-94.5	Biotite granite gneiss dike (?) or granitized inclusion (??). Biotite altered to chlorite. Light specks of limonite throughout - probably after ferromags.
94.5-158	Same as 38-55.5'.
158-172	White to gray - massive biotite granite porphyry. Very very faintly gneissic. Specks of limonite - probably after ferromag. Fresh biotite.
172-173.5	Same as 38-55.5'.
173.5-183	Same as 158-172'. 2" hematite (noted at 179.5') Few trace chalcocite and malachite.

D.D. Hole 1 - 71 - cont'd

Footage	Description
183-193	Biotite granite gneiss dike (?) or inclusion (?) Chilled contact, but can't tell which side of contact chill zone on - chill zone approximately 2". Fresh biotite - disseminated coarse chalcocite.
193-245	White to gray biotite granite porphyry - strongly porphyritic. 6" quartz at 218' - fresh biotite.
245-262	Biotite granite gneiss - linearity becoming better developed and finer grained toward center of section - granitized inclusion (?) or dike (?) - similar but not the same as section 183-193'. Biotite somewhat altered to chlorite - mineralized with pyrite, chalcopyrite, secondary chalcocite, malachite, cuprite - limonite stained - traces native copper and cinnabar.
262-266	Grey to white biotite granite porphyry, biotite, largely fresh - 10" quartz (pegmatite) at 263'. No visual mineralization.
266-283	Biotite granite gneiss, limonite stained - biotite, fresh narrow inclusions of granite porphyry. Well mineralized with chalcopyrite and bornite - some malachite and chalcopyrite - traces cinnabar and native copper.
283-288	Biotite granite porphyry - no visual mineralization. Grading to:
288-463	Biotite hornblende granite porphyry. Heavily chloritized - more coarse-grained than biotite granite porphyry. No visual mineralization. Pink feldspar - 335-345' - 358-390' - 412-420' Fine-grained granite dike - 393-397' - no mineralization.
463-491.5	Same as 288-463' - heavily chloritized - probably from hematite - quartz feldspar pegmatite - 464-467'. No mineralization - large books of biotite. Some hematite on limonite - staining on fractures.

D.D. Hole 1 - 71 - cont'd

Footage	Description
491.5-494.5	Biotite granite gneiss, some limonite alteration, also chloritic alteration. Good copper, disseminated chalcopyrite, bornite, malachite.
494.5-497	Same as 463-491.5. No mineralization.

D.D. Hole 2 - 71

Property: Minto Creek Bearing:

Location: 12+20N 14+30W Inclination: -90°

Footage	Description
0-6	Overburden.
6-22	Intensely altered bedrock. Chalcocite, chalcopyrite, malachite. Excellent copper - some hematite and limonite alteration plus kaolinization, argillic alteration (?) - Cu >5%. Ground badly broken, poor recovery. No recovery - 14-16'.
22-65	Whitish biotite granite porphyry. Areas of mineralization - 50-52' and 61.5-63.5'. Converted to gneissic texture - pink, coarse feldspars - 44-46'. Poor copper - 42-62'. Coarse-grained feldspar porphyry dike - 58-59'.
65-82	Coarse-grained granite porphyry. Some hematite and limonite staining. Chloritic alteration throughout. Coarse, pink feldspars - pink to reddish color. Good copper chalcopyrite, lesser chalcocite, malachite.
82-139.5	Biotite granite gneiss, pink feldspars, heavily chloritized. Coarse-grained quartz feldspar dike at 102.6' (1 foot) and 107' (1 foot). Pink minor amount biotite and chloritized biotite. Finely disseminated chalcopyrite and bornite. Gneissosity angle - 35°. Medium-grained biotite granite porphyry dike - 128-131'. Biotite altered tochlorite, finely speckled sericite noted. Feldspars slightly altered - 132-136'. Some hematite showing. More fresh biotite - 136-139.5'.
139.5-162	White biotite granite, biotites - fresh, becoming chloritized at 155', some limonite specks. Also some epidote on and around the altered biotites.
162-270	Reddish-tan to tan coarse-grained granite porphyry. Feldspars slightly altered, biotite altered to chlorite and limonite. No visible mineralization. Fault 182-183.5 - clay and sericite alteration, talc on slip surfaces, also hematite and limonite.

D.D. Hole 2 - 71 - cont'd

Footage	Description
162-270 - cont'd:	
	Fault - 185-186.5' - banded chloritic (1/4") alteration. Argillic alteration footwall - angle 25°. 2" quartz vein - 196.5'. Hematite coating fractures - 216'. Fault 225-241 - pale green colored gange, small sand size fragments to 1/2", angular fragments of feldspar altered to clay sericite. Increase in amount of quartz - 252'. Also more chlorite changing color to green side feldspars bleached white. No apparent mineralization throughout section.
270-274	Gray to white hornblende granite gneiss - gray color dominant. Slightly folded. Contact angle - 35°. Moderate amounts disseminated chalcopyrite, with noticeable bornite generally found in gray zones.
274-283	Reddish felsite dike contains fine biotite and sericite altered to chlorite and limonite. Some very fine-grained purple metallic specks possibly bornite (?). Slightly fractured filled with quartz and sericite.
283-320	Grayish-white biotite granite gneiss. Feldspars slightly altered and pinkish to 295'. Has relic porphyritic texture with size of phenocrysts decreasing with depth. Pink quartz feldspar porphyry dike (?) or inclusions (?) - 292-294', 304-305', 317-319' slight amount of chloritic alteration of biotites. Finely disseminated bornite and chalcopyrite - 283-320'. Bornite rimming chalcopyrite. Weak limonite and hematite stain.
320-337	Medium-grained biotite granite porphyry. Feldspars slightly altered and stained with hematite to finely speckled with hematite. Biotite altered to chlorite, fresh biotite - lower half section.
337-339	Same as 162-270'.

D.D. Hole 2 - 71 - cont'd

Footage	Description
339-452	Medium-grained biotite hornblende granite porphyry. Pink feldspar phenocrysts up to 1" wide - 1 1/2" long. Quartz somewhat larger than ground-mass 360-370'. Some bornite on fracture surface. 1" pegmatite seam - 370'. 6" pink feldspar pegmatite - 390'. Minor amounts of epidote in and around ferromags. Finely disseminated bornite - 447-448'. Also associated crystaline epidote.
452-453	Dike, dark-green, predominantly hornblende.
453-485	Biotite granite gneiss. Feldspars slightly altered - pink. Hematitic alteration - 462-464'. Core badly broken - 462-481'. Heavily chloritized throughout section. Trace amounts of chalcopyrite and pyrite - 453-463'.
485-492	Same as 339-452'.

D.D. Hole 3 - 71

Property: Minto Creek **Bearing:** West

Location: 8+00N 12+00W **Inclination:** -45°

Footage	Description
0-12	Overburden.
12-58	Reddish-tan to tan coarse-grained granite porphyry, slightly brecciated. Intensely weathered to 49' - possibly altered also (?). Large quantities noticeable sulfides - 50-55', 55-60'. Py/Cpy ratio approximately 55/45. Trace bornite and chalcocite, malachite mineralization banded approximately perpendicular to core. Limonite and hematite stain.
58-119	Medium-grained gray granite porphyry, feldspars - white and slightly altered. Biotite granite dike - 81.5-84.5'. Pink feldspar pegmatite - 94.5-98' and 100-103'. No visible mineralization. Finely disseminated chalcopyrite - high grade sections - 65-70', 98-100', 112-119'. Chalcopyrite rimmed by dark-gray halo, possibly chalcocite. Dark-red blebs with chalcopyrite - possibly hematite, becoming finer grained and less porphyritic. Biotites completely altered to chlorite, changing to weak gneissosity.
119-185	Whitish biotite granite porphyry. Fine-grained chloritized - 119-122', 131-132', 134-140' - approximately 1% - slightly gneissic and heavily mineralized. Granite has been completely altered, feldspars - argillic, biotites chloritized, pink feldspar, with light-gray to tan background. Shear zones - 175-180', ground badly broken and granulated. Zone chloritized and limonitized. Possible argillic alteration (?).
185-187	Biotite granite gneiss dike (?). Weakly to moderately gneissic. Gneissosity perpendicular to core. Some malachite stain between biotite laminations. Biotite fresh.
187-246	Biotite-hornblende granite porphyry (Macro Poprhyry). 6" feldspar porphyry dike - 193'. Weak chloritization to 206', becoming moderate to strong. Pink orthoclase phenocrysts up to 1 1/3" x 3/4". No visible mineralization. 3/8" chlorite vein at 216' parallel to core.

D.D. Hole 3 - 71 - cont'd

Footage	Description
246-290	Fine-grained biotite granite gneiss, alternating light-green to gray. Randomly oriented thin (up to 1/2") quartz feldspar stringers cross-cutting gneissosity and each other. Light-greenish layers resulting from chloritic alteration. Fine-grained disseminated chalcopyrite - trace bornite. Biotites mostly fresh - somewhat chloritized, becoming coarse-grained at 281'. Rock becoming pink to tan colored with noticeably more limonitic staining. Entire section dotted with red metallic specks giving rusty-red streak - hematite.
290-334	Medium to coarse-grained biotite granite porphyry. Large pink feldspar (orthoclase) phenocrysts. Biotite altered to chlorite. 1" quartz pegmatite at 302', becoming altered, turning gray then red (hematite stain) at 307-317'. 1' finely-grained trachyte porphyry dike - 320-321.5' (angle 60°) and 324-325 (angle 45°), pale-green to tan color, slightly chloritized.
334-379	Intensely altered and broken shear zones. Fair copper mineralization. Feldspar altered to clay minerals - 2" gouge at 334'. Cu minerals - malachite, chalcopyrite, chalcocite (?). Hematite and limonite alteration and staining. Cinnabar at 334' on shear. Chloritic alterations around relic biotites. Shear zones from 344-379' - unmineralized. Intense alterations of feldspars on ferromags to limonite, chlorite, hematite and clay minerals. (Hydrothermal alteration (?)). Evidence of faulting - numerous shear planes exhibiting slikensides, chloritization of shears. Feldspars have been bleached and decomposed to clay. Also appear to have been streaked (gneissic fabric).
379-383	Fine-grained purple to red granite dike. Feldspars slightly altered. Rock heavily stained with hematite.
383-390	Same as 334-379 (shear zone).
390-393	Dark-green granite dike, ferromags intensely altered to chlorite. Feldspars have absorbed chlorite color.

D.D. Hole 3 - 71 - cont'd

Footage	Description
393-423 (414)	Reddish tan-green coarse-grained granite porphyry quartz and pink feldspars - phenocrysts. No visible mineralization. Biotite altered to chlorite, feldspars to sericite. Fault from 401-403' intensely altered to limonite, kaolinite, hematite - badly broken. Feldspars bleached from 407-409' - rock finer grained. 6" quartz-feldspar, pegmatite at 409'.
423-452 (442)	Biotite granite gneiss chloritized. Feldspars intensely altered - 423-429'. Altered to grayish tan color and feldspars bleached. Rock breaks readily along shear planes. Weakly mineralized, traces of chalco and bornite, also noticeable pyrite. Biotites altered to chlorite. Feldspars - pink to red. Hematic stain (?) exhibits a relative weak gneissic texture. 2-6" pegmatite stringers at 464' and 467.5'.
452-517 (493)	Medium to coarse-grained granite (weakly porphyritic). A few large pink feldspar crystals. Pegmatite dike from 496-498'. Hematite on fractures from 507-508'. Weak hematite staining from small hematite crystals disseminated through sections. Biotite has been weak to moderately chloritized.

D.D. Hole 4 - 71

Property: Minto Creek Bearing: West

Location: 8+00N 6+70W Inclination: -45°

Footage	Description
0-20	Overburden.
20-42	Whitish biotite granite rock, heavily weathered. Rock is rusty colored with intense hematite and limonite staining of feldspars and also as fracture coatings. No visible mineralization - biotites fresh.
42-51.5	Fine-grained white biotite granite gneiss. Biotite layers altered to chlorite. Limonite staining to 45.5'. Moderate mineralization, primarily chalcopyrite, some malachite on fractures and platy surfaces. Trace pyrite. Approximately 0.4% copper.
51.5-153	Biotite granite, slightly porphyritic. Badly weathered and decomposed. Heavy hematitic staining to 109', limonite staining - 109-125'. Slightly gneissic - 123-125', weakly mineralized with malachite. Trace pyrite and oxidized chalcopyrite. Feldspars altered to sericite - 144-153'. Biotites to chlorite. Also contains large feldspar phenocrysts. Contact 65" to core.
153-250	Biotite granite gneiss - white. 199-200' intensely bleached and sericitized. Feldspars bleached white and have a chalky feel. Limonite stain. 6" quartz-feldspar pegmatite at 216'. 16" quartz-feldspar pegmatite - 219.5-221'. 2' fine-grained purple granite dike. Intense sericite alteration and bleaching of feldspars - 236-242'. Some feldspars slightly pink. Continuous sulfide mineralization throughout section - no visible oxide minerals - significant amount of pyrite throughout section - Py/Cu approximately 40/60. Approximately 0.2% copper.
250-345	White biotite-hornblende granite porphyry. Biotites fresh but weakly chloritized around grain boundaries, noticeable amount of epidote. Moderate limonite as coating on fracture surfaces. No visible mineralization

D.D. Hole 4 - 71 - cont'd

Footage	Description
345-348	Fine-grained granite gneiss dike (?). Biotite completely chloritized. Moderate oxide mineralization (malachite). Trace chalcopyrite. Malachite occurring as staining between biotite laminations.
348-357	Same as 250-345'.
357-377.5	Same as 345-348'. Moderately high grade - 357-370' (1-2% Cu), then weakly mineralized - .5%. Principally chalcopyrite - trace bornite. Black sooty coating - possibly chalcocite (?).
377.5-405.5	Same as 250-345'. No visible mineralization. Only visible chalcopyrite at 405' in quartz stringer.
405.5-501	White biotite granite gneiss - mostly medium to coarse-grained. Moderate to heavy chlorite alteration to 440'. More oxide minerals occur in this section (malachite, some limonite coating on fracture planes and between biotite plates). Mineralization mostly chalcopyrite with minor amounts of pyrite. 2' white biotite granite dike - 478-480'. Considerably less mafics in this dike. No bornite observed.
501-545	White biotite granite porphyry. Feldspars very large and slightly pink (macroporphyry). Intensely chloritized - 507-517'. Chlorite and hematite on fracture surfaces - angle 25°. Remainder of section biotite fresh, weakly gneissic and also slightly mineralized - 521-526'.
545-566	Biotite granite gneiss. Biotite granite porphyry dike - 550-552'. Very weakly mineralized with chalcopyrite. Trace bornite. Most abundant mineral occurring in altered section - 560-566'. Biotites have been chloritized and feldspars slightly argillized.
566-596	Same as 250-345'. 1/16" chlorite on fractures. At 570' and 580' fracture angle - 10°. Minor epidote. Biotite and hornblende weakly chloritized. No visible mineralization.

D.D. Hole 5 - 71

Property: Minto Creek — Bearing: East

Location: 8+00N 7+00W — Inclination: -45°

Footage	Description
0-14	Overburden.
14-37	Biotite granite, intensely weathered. Moderate limonite staining, probably from breakdown of biotite. Biotite slightly chloritized. Rock is chunky from weathering. Individual crystals cemented with clay minerals. Core badly broken - recovery >50%. Feldspars bleached white - 39-41'. Very weakly mineralized pyrite gave to limonite. Trace chalcopyrite only on fresh surfaces. No visible oxide copper minerals.
37-53	Biotite granite gneiss weakly mineralized with chalcopyrite and pyrite. Trace malachite. No recognizable bornite or chalcocite. This section biotite gone to chlorite, pyrites to limonite. Miscroscopic limonitic boxwork on fracture surfaces.
53-136.5	Biotite granite porphyry intensely weathered and decomposed. Good limonite and chlorite alterations. In almost all cases biotite altered to chlorite. Intense limonite and hematite - 116-125'. Fault zone - 115-125' - 10% recovery. Chlorite-stained calcite at 98'. Sparsely mineralized with chalcopyrite - nothing continuous. Sericite altered from feldspars.
(130-136.5)	Altered biotite granite porphyry. Biotite completely gone to chlorite, heavy limonite alteration. No visible mineralization. Sericite from feldspars.
136.5-145	Biotite granite gneiss. Intensely altered. Feldspar bleached and partially altered to clay. 138-141' - fairly fresh biotites partially altered to chlorite. Weakly disseminated mineralization - chalcopyrite and pyrite - trace bornite.
145-164	Same as 53-136.5.

D.D. Hole 5 - 71 - cont'd

Footage	Description
164-233	Biotite granite gneiss. Heavy chloritic and limonitic zones: 229-233', 216-218', 207-208'. Remainder of section weakly chloritized, mostly fresh biotite. Some limonitic alteration on gneissosity surfaces. Gneissosity angle - 10-30°. Quartz, feldspar pegmatite - 221-223, rock becoming more quartzose and schistosity becoming finer - 223-233'. Feldspar bleached and pink colored. Weakly mineralized with chalcopyrite. Trace bornite and pyrite. Silver-looking chalcocite - 224-226'. Approximately 0.1-0.3% copper.
233-246	Whitish biotite granite porphyry. Large pink orthoclase phenocryst. 2" at 236.5 - altered biotite. Some hematite staining - 237-246'. Some limonite on fracture surfaces. No visible mineralization. Grading to:
246-284	Biotite granite gneiss, biotite and feldspar oriented 30° to core, becoming altered at 247.5'. Feldspar altered to kaolinite and sericite and bleached biotite altered to chlorite - approximately .2-.4. Weakly mineralized with disseminated chalcopyrite and minor malachite, also noticeable pyrite. Numerous small (> 1/2") quartz feldspar stringers crosscutting gneissosity. Limonitic alteration, moderate to heavy, associated with increase in copper mineralization. Fault - 268-269' - 1' wide medium seam.
284-300	Same as 233-246'.
300-306'	Biotite granite gneiss dike (?). Biotite altered to chlorite - some limonite staining. Weakly mineralized (approximately .1) with chalcopyrite, pyrite and malachite. Trace bornite. Sericite present.
306-321	Same as 284-300'. Fine to medium-grained - 306-308 - 10 to 20% biotite, possible sheared zone. Minor limonitic stain.
321-346	Same as 246-284 (gneiss). Pegmatite - 341-342', slightly altered and limonitic biotite altered, sericite present, hematite rims around biotite.

D.D. Hole 5 - 71 - cont'd

Footage	Description
346-393	Whitish biotite-hornblende granite porphyry. Large white to pink orthoclase phenocrysts, weakly chloritized. No visible mineralization. Minor epidote.
393-444.5	Intensely mineralized zone. Has relic gneissic texture Original rock type completely destroyed. (Approx. 5-10% copper). Large quantities of disseminated chalcopyrite, bornite and chalcocite. Lessor amounts of malachite. Mineralization in bands - 10-20% to core. Gangue minerals - quartz, feldspar, limonite, hematite. Malachite exhibits colloform texture - 426'. Entire section vuggy.
444.5-465	White biotite granite porphyry, biotite mostly fresh, only weakly chloritized. Pink rim on feldspars becoming slightly hematized at 458'. No visible mineralization.
465-523	Biotite granite gneiss weakly chloritized. Low grade mineralization (.1 - .2), finely disseminated chalcopyrite and bornite, trace chalcocite. 473-483' - good grade mineralization. 475' native copper - 0.5 - 1.0%. Gneissosity - 30°.

Mineralized sections:

246-284'	-	38
300-306'	-	6
321-346'	-	25
393-444.5'	-	51.5
465-503'	-	38

D.D. Hole 6 - 71

Property: Minto Creek

Location:

Bearing: East

Inclination: -45°

Footage	Description
0-5	Overburden
5-38.5	Whitish biotite granite, intensely weathered and decomposed, very crumbly to touch. Recovery very poor, no visible mineralization. Biotite intensely chloritized - 22-35.5 - >5% recovery. 27-34 - 0% recovery. Moderate hematite staining.
38.5-235	Biotite granite porphyry. Biotite altered to chlorite, moderate hematite and limonite staining. Feldspar moderately altered to clay. Minerals result of alteration and weathering. Most likely weathering. Weakly mineralized at 52' with malachite, some black sooty specks, possibly chalcocite. 6" quartz feldspar pegmatite at 60'. 55-57' - hematite and calcite coating on fracture 1/2" thick. Trace malachite and chalcopyrite, becoming moderately mineralized at 64.5'. Feldspars have soaked up some malachite, also malachite on fracture surfaces. Sericite present. 65-83' - rock identity completely destroyed. Large quantities malachite and azurite, fair chalcopyrite. No bornite observed. Black sooty coating, possibly chalcocite. Lots of limonite and hematite. Good oxide zone. Numerous tiny vugs where sulfides once were, but since removed leaving limonite crust. Rock becoming fresher at 122' before feldspar stained pink from hematite. Chlorite staining heavy to 122'. Biotites becoming fresher. Weak chalcopyrite mineral starting at 124' (approximately .1 - .2% copper). Considerable sericite to 122' in some cases feldspars rimmed by sericite. Coarse-grained pink quartz feldspar dike at 160.5-165'. Intense sericite, hematitic and argillic alterations - 176-181'. Fault zone - 176-189'. Limonite - 181-183', thin hematite again to 189'. Most intense alteration and decomposition - 181-183'. Almost gange, crumbles on touch. Remainder of section heavily seritized pink orthoclase feldspars. 204-205' - pink quartz feldspar porphyry dike. Hematite stain - 214-224'. Approximately .5 to 1% copper.

D.D. Hole 6 - 71 - cont'd

Footage	Description
235-255	Biotite granite gneiss. Moderately altered chlorite and limonite alterations. Weakly mineralized.
255-265	Whitish biotite granite porphyry, weakly altered biotite altered to chlorite.
265-271	Pink quartz-feldspar porphyry dike.
271-328	Same as 255-265'. Moderate to heavy chloritization to 300'. Some weak hematite stain. Minor amount of epidote.
328-335	Quartz-feldspar porphyry dike. Minor biotite, weakly altered to chlorite.
335-374	Same as 255-265'.
374-396	Reddish-green biotite granite porphyry. All feldspars heavily stained with hematite. Biotite completely altered to chlorite. Epidote and calcite on fractures at 374.5'. Sericite present.
396-398.5	Biotite gneiss, moderately mineralized. Heavy chloritization of biotite. Feldspar altered and stained with hematite.
398.5-467	Same as 374-396'. Heavily hematized and chloritized. Crumbly to touch - 438-439'. Fault - 441-444'. Heavily chloritic and limonitic alterations in shear - 448.5-449.5, angle 15°. Crumble on touch, calcite and talc along contact. Increase in epidote - 425' - large pod.

D.D. Hole 7 - 71

Property: Minto Creek **Bearing:**

Location: 16+00S 14+00E **Inclination:** -90°

Footage	Description
0-31	Overburden - 36N Casing - 66B Casing
31-86	Fine-grained whitish tuff. 31-40' possibly still overburden. 6" whitish biotite granite fragment, probably boulder. Weakly chloritized to 76' becoming finer-grained to 81'. Disseminated pyrite at 31'. Heavily oxidized - 31-40'. Core badly broken, no recovery - 40-46'. Carboniferous bands at 81' - angle 55°, finely disseminated pyrite in and around charcoal.
86-95	Gray siltstone - soft. Shear - 1' at 94-95'.
95-195	Same as 31-86'. Bedding angle 63°. Carbonaceous lenses from 7 1/32 to 1/8" parallel to bedding, also contain disseminated pyrite and some larger blebs of pyrite. Some oxidation on bedding surfaces - 158-160'. 1' mudstone - 125-216', 134-135'.
195-220	Light-tan arkose, very soft and gritty to 198', turning black and becoming finer-grained to 213'. Large bleb pyrite at 209.5'. Sparsely disseminated pyrite 218-220'. No core - 201-203'.
220-224	Siltstone same as angle of contact with previous unit 53°.
224-236	Black to gray siltstone. Black color from high carbon content. Bedding becoming slightly drag folded at 235-236'.
236-240	Badly sheared siltstone, weak green chloritic coloration. Some calcite stringers.
240-243	Grayish-tan siltstone - banded angle 45°.
243-245	Black very, very fine-grained (?) arkose - very soft.
245-257	Light to dark gray massive limestone.

D.D. Hole 7 - 71 - cont'd

Footage	Description
257-307.5	Gray to light-brown arkose (tuff), very, very fine-grained. 284-285' - granite dike. Small blebs of pyrite at 286'. Banded angle 35°. Fault gouge - 291-293'.
307.5-318	Conglomerate - fine disseminated pyrite, pebbles up to 1" - mostly >1/2". Poorly sorted.
318-345	Gray to black arkose, very poorly sorted, alternating fine and coarse beds. Large calcite bleb at 342'. Alternating fine and coarse-grained layers. Some clay seams - 319-320'. 1/2" coal seam - 322'.
345-350	Same as 307-318'.
350-369.5	Dark-red medium-grained andesite fragments up to 1/2" feldspar (white) agglomerate.
369.5-382	Same as 307.5-318'. Intensely altered and decomposed (shear zone ?). Minor chloritic alteration, mostly altered to clay minerals. Fragments mostly sub-rounded to rounded - poorly sorted.
382-426	Same as 350-369.5 - more porphyritic. 387-388' - large fragmental inclusions of altered biotite granite porphyry. 8" granite porphyry dike on inclusion (?). 405.5-407.5 - same biotite granite porphyry inclusion or dike (?). Phenocrysts to 1/3" alternating to feldspar (orthoclase, white). 1" inclusion of granite porphyry - 425'.
426-489	Fine to medium-grained thin bedded agglomeratic tuff. Fragments sub-rounded to angular. 2' siltstone - 435.5-437.5, 439-440'. Weakly banded silty units at 442' - angle 55°. Weakly chloritic.
489-492	Same as 382-426'. Small lenses of charcoal randomly scattered.
492-499	Same as 489-492'. Dark seams with calcite - angle 50°
499-504	Same as 492-499'.

D.D. Hole 7 - 71 - cont'd

Footage	Description
504-520	Large pebble conglomerate, most fragments well rounded. Fragments vary in composition from granite to granite gneiss. All pebbles moderately chloritized. Large pebble with considerable hematite - <20% - 6" at 513.5-514'.
520-529	Andesite - 521' again 1/2" coal seam with abundant pyrite.
529-534	Same as 426-489'.

140°
138°
136°
134°
65°
64°
63°
62°
61°
60°
N
DAWSON
Sterling
Lucky Joe
Elsa
Mayo Landing
"DAWSON PROJECT"
ALASKA
Scroggie Creek
Casino Silver Mines
White River
Dorsey
Minto Creek
Minto
Carmacks
Yukon River
Aishihik
Haines Junction
WHITEHORSE
Carcross
YUKON
BRITISH COLUMBIA

Figure 4

SILVER STANDARD MINES LTD

Location Map
"Dawson Project"
Yukon

Date: 17 November 1971
Scale 1" = 20 Miles Drawn by: R. M.

SILVER STANDARD MINES LTD.

MINTO AREA, Y.T.

GEOLOGICAL MAP (EAST HALF)
FIGURE 5

MAP SCALE

FEET 100 50 0 100 200 300 FEET

CONTOUR INTERVAL 20 FEET

NOTE:-
HORIZONTAL AND VERTICAL CONTROL SUPPLIED BY WHITE, HOSFORD & IMPEY LTD.

LEGEND

- OB — Overburden
- HB — Hematite Breccia
- Andesitic volcanics - Tuffs
- PTG — Pink Tan Granite
- PEG — Pegmatite
- APLT — Aplite — DIKES
- BGG — Biotite Granite Gneiss
- RTG — Red Tan Granite
- WBG — White Biotite Granite

STRUCTURAL SYMBOLS

- Fault &/or shears — vertical; definite, approximate, inferred; inclined
- Contact - definite (with orientation), definite, approximate, inferred
- Foliation, vertical
- Joints &/or fractures, vertical
- Structural trend in gneiss
- Structural trends in trench wall
- Plunge
- ALRD Altered
- Wthrd Weathered
- BOTT Biotite
- Yellow Zone - hematite & limonite rich
- Claim post (with airphoto control, approximate)
- Diamond Drill Hole — Vertical, Depth; inclined (angle from horizontal, depth) direction
- Approximate limit of muskeg
- Trench & survey station
- Trail
- Clearing

SILVER STANDARD MINES LTD.

MINTO AREA, Y.T.

GEOLOGICAL MAP (WEST HALF)
FIGURE 5

MAP SCALE
FEET 100 50 0 100 200 300 FEET

CONTOUR INTERVAL 20 FEET

LEGEND

- OB Overburden
- HB Hematite Breccia
- Andesitic volcanics - Tuffs
- PTG Pink Tan Granite
- PEG Pegmatite
- APLT Aplite
- DIKES
- BGG Biotite Granite Gneiss
- RTG Red Tan Granite
- WBG White Biotite Granite

STRUCTURAL SYMBOLS

- Fault &/or shears — vertical; definite, approximate, inferred; inclined
- Contact - definite (with orientation), definite, approximate, inferred.
- Foliation, vertical
- Joints &/or fractures, vertical
- Structural trend in gneiss
- Structural trends in trench wall
- Plunge
- ALRD Altered
- Wthrd Weathered
- BOTT Biotite
- Yellow Zone - hematite & limonite rich
- Claim post (with airphoto control, approximated.)
- Diamond Drill Hole — Vertical, Depth; Inclined (angle from horizontal, depth) direction
- Approximate limit of muskeg
- Trench & survey station
- Trail
- Clearing

NOTE:-
HORIZONTAL AND VERTICAL CONTROL SUPPLIED BY WHITE, HOSFORD & IMPEY LTD.

SILVER STANDARD MINES LTD.

MINTO AREA, Y.T.

MINERALIZATION-ALTERATION MAP (EAST HALF)
FIGURE 6

MAP SCALE
FEET 100 50 0 100 200 300 FEET

CONTOUR INTERVAL 20 FEET

NOTE:-
HORIZONTAL AND VERTICAL CONTROL SUPPLIED BY WHITE, HOSFORD & IMPEY LTD.

Compiled by
NORTH WEST SURVEY CORP. LTD.
Edmonton, Grande Prairie, Yellowknife, Whitehorse, Penrith

LEGEND

ALTERATION
- SRCT – Sericitization
- CLRZ – Chloritization
- ARGL – Argillization
- Ox. – Oxidation
- PROP – Propylization
- K-Sil – Potassium-silicate
- Yellow Zn – Hematite & limonite rich
- Marble Cake Zn – Rock entirely gone to alteration products
- ALRD – Altered
- Wthrd – Weathered

MINERALIZATION
- Cp – Chalcopyrite
- Ch – Chalcocite
- Bn – Bornite
- Az – Azurite
- ML – Malchite
- Tn – Tenorite
- Py – Pyrite
- Tr – Trace

- Claim post (with airphoto control, approximated)
- Diamond drill hole: △V, TO 495' (Vertical, depth); -45°, TO 503' (inclined (angle from horizontal, Depth) direction)
- Approximate limit of muskeg
- Trench & survey station
- Trails
- Clearing

N

22,791,000 N
22,790,500 N
22,790,000 N
22,789,500 N
22,789,000 N
22,788,500 N
22,788,000 N
22,787,500 N
22,787,000 N
22,786,500 N
22,786,000 N
22,785,500 N

375,500 E
375,000 E
374,500 E
374,000 E
373,500 E
373,000 E
372,500 E
372,000 E

L-40 N
L-32 N
L-24 N
L-16 N
L-8 N
L-00

Minto 7
Minto 5
Minto 52
Minto 51
Minto 50
Minto 49
Minto 48
Minto 47
Minto 46
Minto 45
Minto 44
Minto 43
Minto 3
Minto 1
Minto 36

Tr. 26
Heavily Wthrd
Cp
Tr. 41
Hem. rich
Tr. 30
Hem rich (Oxidation)
Tr. 44
SRCT
ML, Cp, Ch, Tr Bn
ARGL, Ox, Very ALRD
Cp, Ch, ML
SRCT Zone
ARGL, Ox, Very ALRD
Tr. 27
Ch
ML, Az
Tr. 42
Yellow Zone
SRCT Zone
No Bedrock
Marble Cake Zone
Yellow Zone
Tr. 28
Heavily Wthrd
Tr. 33
Cp, Ch
Yellow Oxide Zone
Cp
Cp, Bn, Az, ML
Strong CLRZ
Tr. 29
High grade zone Massive Cp & Bn
No Bedrock
Tr. 43

AIRSTRIP

DDH 14-72
-45° TD 568
E
E'

CAT ROAD
CAT ROAD

2900
2915
2920
2927
0092
0093
0094
0095

SILVER STANDARD MINES LTD.

MINTO AREA, Y.T.

MINERALIZATION-ALTERATION MAP (WEST HALF)
FIGURE 6

MAP SCALE

FEET 100 50 0 100 200 300 FEET

CONTOUR INTERVAL 20 FEET

LEGEND

ALTERATION

- SRCT – Sericitization
- CLRZ – Chloritization
- ARGL – Argillization
- Ox – Oxidation
- PROP – Propylization
- K-Sil – Potassium-silicate
- Yellow Zn – Hematite & limonite rich
- Marble Cake Zn. – Rock entirely gone to alteration products
- ALRD – Altered
- Wthrd – Weathered

MINERALIZATION

- Cp – Chalcopyrite
- Ch – Chalcocite
- Bn – Bornite
- Az – Azurite
- ML – Malchite
- Tn – Tenorite
- Py – Pyrite
- Tr. – Trace

- Claim post (with airphoto control, approximated)
- Diamond drill hole: Vertical, depth; inclined (angle from horizontal, Depth direction)
- Approximate limit of muskeg
- Trench & survey station
- Trails
- Clearing

Compiled by

NORTH WEST SURVEY CORP. LTD.

Edmonton, Grande Prairie, Yellowknife, Whitehorse, Inuvik

NOTE:-
HORIZONTAL AND VERTICAL CONTROL SUPPLIED BY WHITE, HOSFORD & IMPEY LTD.

SILVER STANDARD MINES LTD.

MINTO AREA, Y.T.

STRUCTURAL MAP (EAST HALF)
FIGURE 7

MAP SCALE

FEET 100 50 0 100 200 300 FEET

CONTOUR INTERVAL 20 FEET

LEGEND

- Faults B/or shears — vertical; definite, approximate, inferred; inclined
- Contact - definite (with orientation), definite, approximate, inferred
- Foliation, vertical
- Joints B/or fractures, vertical
- Structural trend in gneiss
- Structural trends in trench wall
- Plunge
- Claim post (with airphoto control, approximated)
- Diamond Drill Hole — Vertical, Depth; inclined (angle from horizontal, depth) direction
- Approximate limit of muskeg
- Trench & survey station
- Trail
- Clearing

Compiled by
NORTH WEST SURVEY CORP. LTD.
Edmonton, Grande Prairie, Yellowknife, Whitehorse, Inuvik

NOTE:-
HORIZONTAL AND VERTICAL CONTROL SUPPLIED BY WHITE, HOSFORD & IMPEY LTD.

SILVER STANDARD MINES LTD.

MINTO AREA, Y.T.

STRUCTURAL MAP (WEST HALF)
FIGURE 7

MAP SCALE

FEET 100 50 0 100 200 300 FEET

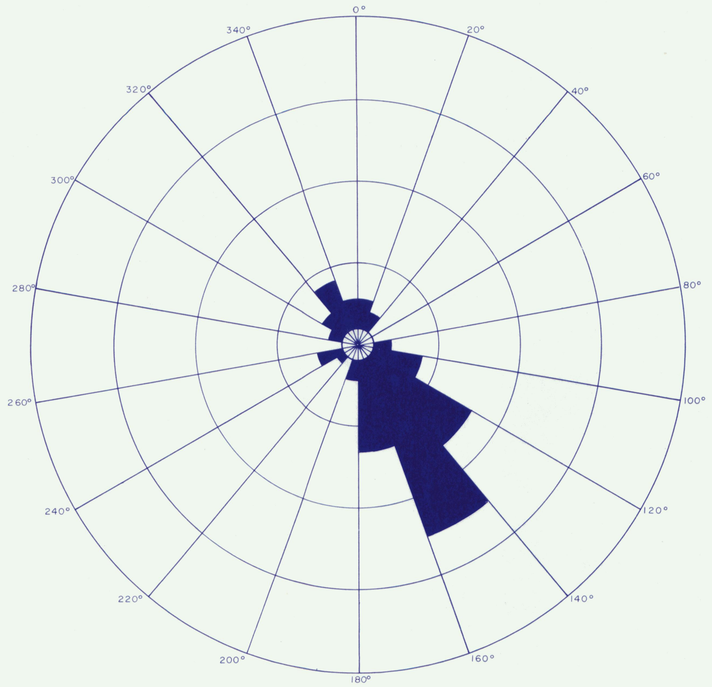
CONTOUR INTERVAL 20 FEET

LEGEND

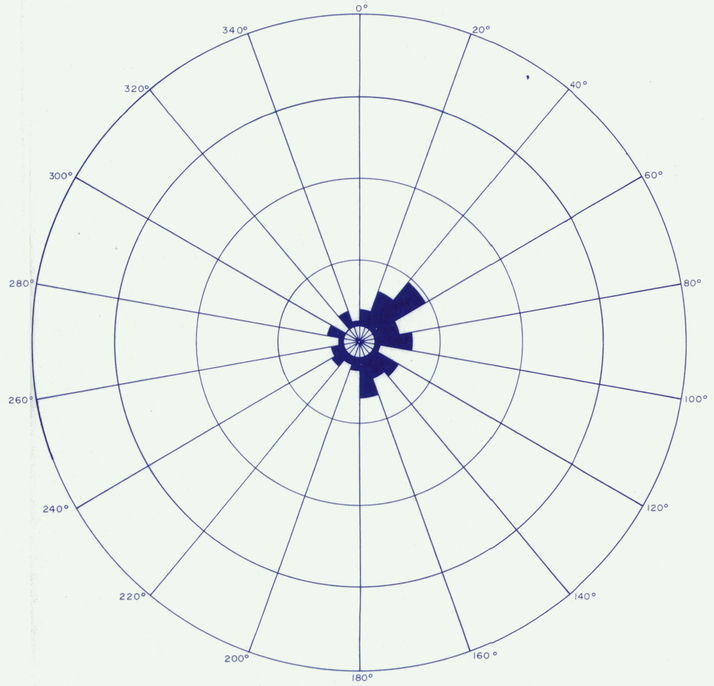
- Faults B/or shears — vertical; definite, approximate, inferred; inclined
- Contact - definite(with orientation), definite, approximate, inferred
- Foliation, vertical
- Joints B/or fractures, vertical
- Structural trend in gneiss
- Structural trends in trench wall
- Plunge
- Claim post (with airphoto control, approximated)
- Diamond Drill Hole — Vertical, Depth; inclined (angle from horizontal, depth) direction
- Approximate limit of muskeg
- Trench & survey station
- Trail
- Clearing

Compiled by
NORTH WEST SURVEY CORP. LTD.
Edmonton, Grande Prairie, Yellowknife, Whitehorse, Inuvik

NOTE:-
HORIZONTAL AND VERTICAL CONTROL SUPPLIED BY WHITE, HOSFORD & IMPEY LTD.

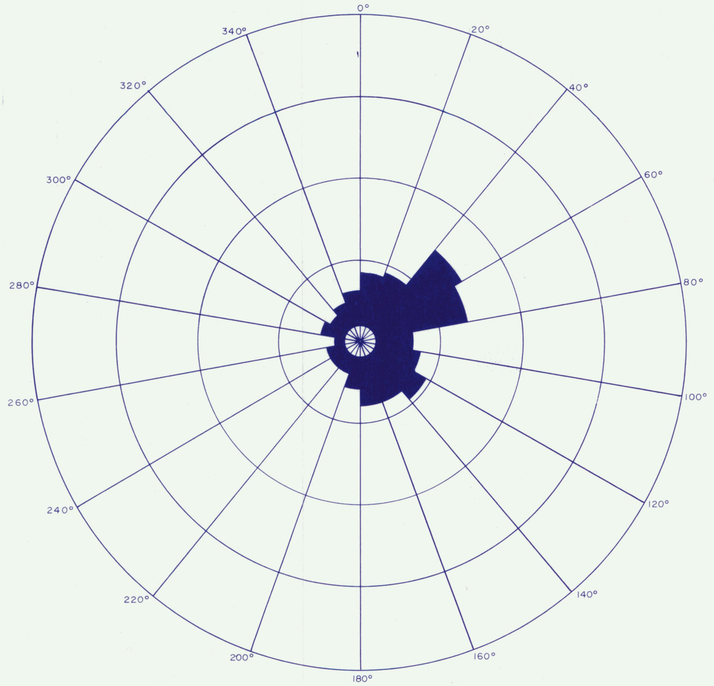


FOLIATION



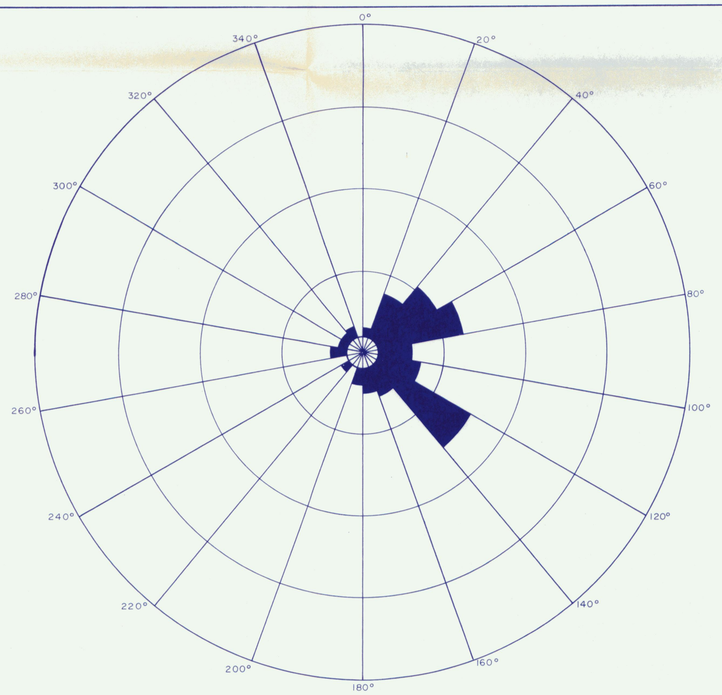
JOINTS & FRACTURES

Biotite Granite Gneiss

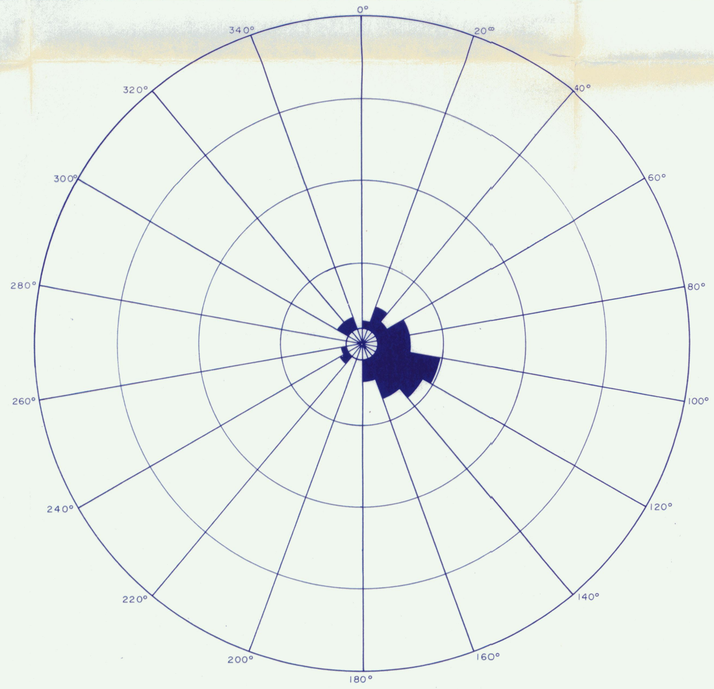


JOINTS & FRACTURES

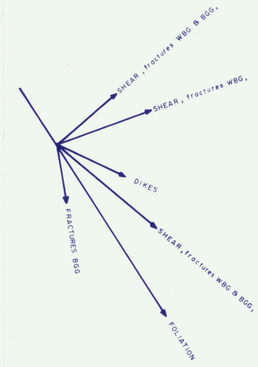
White Biotite Granite



SHEARS



DIKES



NOTE Coincidental peaks - SHEAR, fracture WBG & BGG,

NOTE

Each 1/10" = 2 readings at 20° intervals

Those plotted 0°-180° represent NE or SE dips

180°-360° " NW or SW dips

SILVER STANDARD MINES LTD (NPL.)

MINTO PROJECT

ROSE DIAGRAMS

NOV, 72 | SLH / rwr | FIG. 8

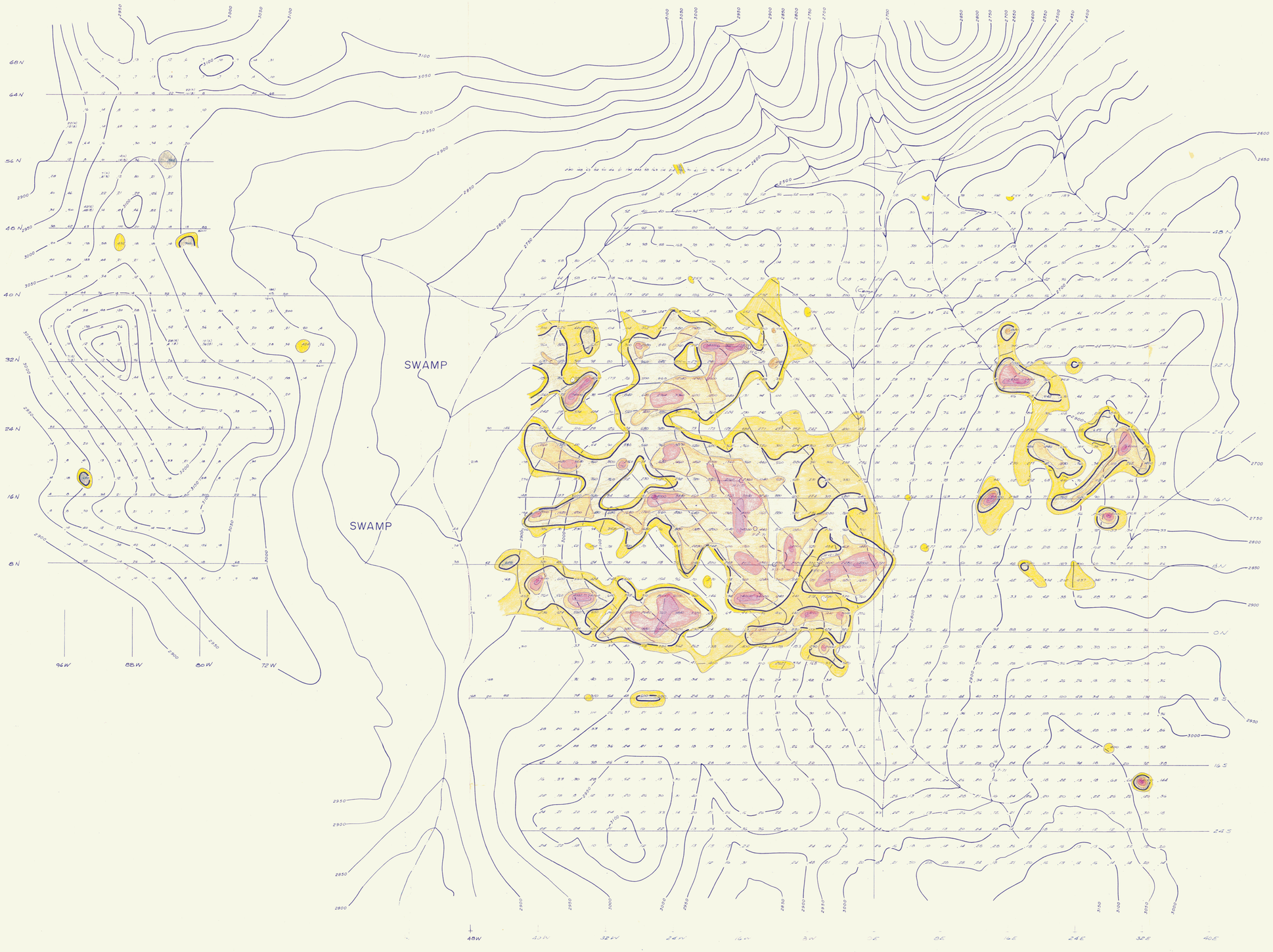


FIGURE 9

SILVER STANDARD MINES LTD

GEOCHEMICAL SURVEY

Minto Creek Property

Scale	Contours	Date
1" = 400'	250, 500, 1000, 2000, 4000	18 Nov 1977
		Drawn by R.M.R.

8,500 E
9,000 E
9,500 E
10,000 E
10,500 E
11,000 E
11,500 E
12,000 E

12,000 N
11,500 N
11,000 N
10,500N
10,000N
9,500 N
9,000 N

KENO HILL
ASARCO

K-41

K-39
53°-10°-1·23
188°- 5°-1·25
255°-68°-1·93
354°-99°-0·80

K-40 v. 157·5°-10·5°-0·73
K-1
112·2°-7·2°-1·48
K-12 v
8·6°-21°-1·62
406·0-15·0°-0·69
K-6
590·5°-15°-3·30
K-2 N.S.M.
K-84
50·2·24°-1·35
1022°-18°-5·33
391·0°-34·0°-1·82
K-5 N.S.M.
K-3
K-80
394·8°-11·2°0·98
415·6°-10·0°-0·68
K-78
389·6°-59·5°-1·81
K-7
367·0°-12°-2·19
K-90
N.S.M.
K-89
175·0°-15·0°-0·53
K-85
269·2°-15°-1·08
310°-14·3°-1·83
336·5°-37·0°-3·90
K-83
316·5°-16·7°-0·08
K-81
376°-42°-4·08
K-75
198·3°-29·7°-1·62
319·8°-10·6°-2·43
345·0°-11·7°-2·32
K-71
269·4°-10·0°-0·92
377°-11·5°-2·13
K-82
N.S.M.
K-8
83·5°-50°-1·18
K-79
58°-18·0°-0·80
361·0°-24·0°-0·80
452·0°-0·0°-0·72
628°-22·0°-0·55
K-19
337·2°-63·8°-0·58
K-18
N.S.M.
K-35
253·0°-8·3°-0·84
K-24
455·0°-23·0°-0·96
677·5°-8·3°-4·62
K-11 v
353°-100·0°-1·18
832·0°-45·0°-0·42
K-17
359°-46·0°-2·59
K-10
K-9
K-4
K-16
346·0°-64·0°
4·90
K-23
253·0°-143·7°-0·91
K-46
280·0°-50·0°-0·57
K-72
268·0°-88·0°-0·84
K-74
290·0°-50·0°-0·68
K-76
326·0°-47·0°-0·36
K-77
N.S.M.
K-34
375·0°-23·0°-0·91
530·7°-11·1°-3·87
83·8°-10·6°-2·44
K-15
290·7°-92·5°
-2·23
K-79
256·7°-53°-1·48
K-22
223·7°-17·1°-8°-1·04
K-60
277·0°-30·0°-0·82
K-62
220·0°-40·0°-0·83
253·0°-88·0°-0·59
K-64
270·33·0·93
K-66
10·0°-63·0°-0·40
K-68
336·0°-23·0°-1·23
330·5°-82·5°-1·88
K-33
339·7°-29·3°-1·60
498·0°-21·0°-0·47
K-14
186·0°-4·5°-1·05
248·0°-85·0°-2·41
363·0°-2·0°-5·55
K-82
356·0°-7·5°-1·53
525·4°-22·5°-2·86
745·2°-34·8°-2·05
K-21
204·6°-208·4°-1·20
K-48
234·0°-120°-1·22
K-50
203°-144·5°-0·73
K-52
243·0°-57·0°-0·69
K-54
224·0°-21·2°-1·00
K-58
198·6°-89·2·88
K-87
096·12·0°-0·61
K-63
254·2°-15·0°-0·70
K-61
383·0°-42·0°-2·82
K-59
262·9°-77°-1·94
300·0°-0·8°-2·91
K-58
109·2°-60°-1·90
834·5°-0·3°-3·50
328·5°-74·5°-5·10
K-93
N.S.M.
K-57
173·0°-20·0°-0·87
276°-11°-1·0·91
288°-12·5°-0·89
K-55
105·0°-20·0°-0·48
274°-11°-1·0·91
288°-12·5°-0·89
K-53
253·4°-7·9°-0·62
331·0°-22·6°-2·73
K-51
324·2°-3·4°-3·02
K-49
213·5°-88°-3·50
K-45
500·6°-2·5°-1·38
198·0°-82·5°-2·45
284·0°-53·0°-4·73
K-43
227·0°-46·0°-2·04
K-42
220°-1·4°-1·79°-2·42
K-13
122·0°-18·6°-2·06
183·5°-4·1°-1·60
277·6°-19·4°-3·83
429·0°-5·0°-2·20
K-47
K-44
314·6°-0·3°
299·0°-59·0°
-5·26
-2·18
-4·99
85·0°-32·7°-1·02
360·8°-14·2°-1·93
191·0°-30·5°-0·90
234·0°-69°-0·56
342·5°-40·5°-2·25
213·0°-21·4°-5·35
177·0°-156·0°-0·98
388·0°-76·0°-0·96
K-17
178·4°-89·6°-0·61
379·0°-37·2°-0·44
K-39
43·7°-81·1°-0·63
180·0°-18·0°-1·01
K-41
189°-14·3°-0·85
280·5°-12·5°-1·95
K-43
283·3°-27·0°-2·78
K-45
354·1°-10·7°-2·06
K-47
179·6°-102·9°-0·66
329·5°-5·4°-1·50
374·0°-10·0°-0·51
K-49
448·0°-74·0°-0·86
304·0°-50·0°-0·50
K-51
1700°-70·0°-0·88
333·0°-60·0°-0·44
K-53
356·0°-30·0°-1·27
208·0°-6·0°-1·00
K-55
K-57
K-59
K-61
K-63
K-65
K-67
K-69
K-87
K-93
K-83
K-85
K-89
K-90
K-41
K-39
K-40 v.
K-1
K-12 v
K-6
K-2 N.S.M.
K-84
K-5 N.S.M.
K-3
K-80
K-78
K-7
K-82
N.S.M.
K-8
K-79
K-19
K-18
N.S.M.
K-35
K-24
K-11 v
K-17
K-10
K-9
K-4
K-16
K-23
K-46
K-72
K-74
K-76
K-77
N.S.M.
K-34
K-15
K-79
K-22
K-60
K-62
K-64
K-66
K-68
K-33
K-14
K-82
K-21
K-48
K-50
K-52
K-54
K-58
K-43
K-42
K-13
K-47
K-44
K-17
K-45
K-49
K-51
K-53
K-55
K-57
K-59
K-61
K-63
K-65
K-67
K-69
K-87
K-93
K-83
K-85
K-89
K-90

1 — 263°-23°-8·13
2 — 205°-90°-2·75
3 — 137°-108°-3·14
4 — 157°-120°-1·69
5 — 141°-140°-1·85
6 — 27·5°-10·5°-2·01
240°-56°-1·88
7 — 28°-21°-0·69
222°-60°-5·64
8 — 42°-17°-0·74
207°-51°-3·04
9 — 231°-75°-0·82
323°-1°-1·08
10 — 36°-12°-0·44
336°-2°-1·48
11 — 45°-7°-3·06
115°-8°-0·44
195°-72°-4·13
12 — 181°-50°-3·46
13 — 155°-103°-3·61
14 — 102°-121°-5·2·10
15 — 97°-115°-1·28
271°-11°-2·07
16 — 216°-54·4°-1·94
17 — 90°-0°-140°-1·30
243°-0°-7·0°-2·52
267°-0°-49·0°-2·08
345°-5°-9·5°-2·44
18 — 40°-130°-0·93
230°-30·0°-1·44
19 — 71°-30·0°-0·62
191°-74·0°-1·80
211°-54·0°-2·33
20 — 166°-60°-1·12
21 — 189°-80·0°-2·20
(210°-60·0°-2·83)
22 — 216°-45°-1·61
23 — 245°-72·0°-1·68
24 — 285°-20·0°-1·06
355°-24·0°-0·44
25 — 247°-10·0°-7·53
318°-50·0°-0·43
433°-30·0°-0·45
26 — 228°-61·0°-0·78
27 — 228·0°-50·0°-0·77
28 — 231°-36·5°-3·89
29 — 92
N.S.M.
30 — 275°-30·0°-0·47
31 — 256·0°-52·0°-0·35
32 — 97
N.S.M.
33 — 250·0°-51·0°-0·41
289°-12·0°-0·92
34 — 252°-10·0°-0·23
35 — 334°-7·0°-0·48
36 — 335°-25·0°-0·53
37 — 159°-10·0°-0·39
290°-30·0°-0·29
38 — 267°-30·0°-0·67
39 — 230°-20·0°-0·66
40 — 75
N.S.M.
41 — 69
131°-10·0°-0·70
269°-30·0°-0·18
42 — 71
118°-10·0°-0·23
351°-40·0°-0·23
400°-32·0°-0·25
43 — 76
60°-36·0°-0·90
300°-35·0°-1·17
44 — 77
69°-40·0°-0·45
157·5°-14·5°-1·18
336°-30·0°-1·74
45 — 91
148°-10·0°-0·48
172°-10·0°-0·58
390°-12·0°-1·43
46 — 138
86·0°-30·0°-0·40
170·0·70·0°-1·16
352·0°-40·0°-0·90
692·0°-40·0°-0·30
840·0°-30·0°-0·67
965·0°-30·0°-0·50
47 — 6-71
64·5°-20·5°-2·90

LEGEND:

Diamond drill hole number
78
216·0° - 45·0° - 1·61
Depth of intercept
Length of intercept
% Copper

NOTE: Drill holes prefixed with the letter "K" were drilled by Keno Hill.

AMERICAN SMELTING & REFINING Co.
VANCOUVER B.C.

MINTO PROJECT
YUKON TERRITORY

DIAMOND DRILL HOLE PLAN
SHOWING ASSAY RESULTS

SCALE 1"=100'
JAN., 1975
FILE NR.

10,000 E

15,000 E

10,000 N

5,000 N

KENO HILL ASARCO

Cat Trail

Jeep Road

Access Road

CAMP

AIRSTRIP

Vertical Section N45°E

Vertical Section N45°W

For 1974 drill data within this outline, see accompanying 100' scale map.

ASARCO DAWSON RANGE JOINT VENTURE

N

LEGEND:

- Cleared ground
- Claim post
- Drill hole
- 45·0'-10·0'-1·52 / TD. 491' — Depth - Interval - % Copper / Total Depth.
- NSM — No significant mineralization
- Cgl. — Conglomerate
- Seds. — Sediments

AMERICAN SMELTING AND REFINING Co.
VANCOUVER, B.C.
ASARCO

MINTO PROJECT
Y.T.

DRILL HOLE LOCATIONS & RESULTS

SCALE	DRAWN	DATE	FILE NO.
1" = 400'	AC / rwr	JAN/75	

FILE
PROVINCE
DISTRICT
TWP.
N.T.S.

ATTACHMENT

CANADA LANDS SURVEYS RECORDS
59648
DATE 5 MAY 1975

PLAN AND FIELD NOTES OF SURVEY OF MINTO NOS 1 TO 18 INCLUSIVE, 32, 34 TO 36 INCLUSIVE, 45 TO 52 INCLUSIVE, 65 TO 68 INCLUSIVE, 70 AND 71 MINERAL CLAIMS LOTS 94 TO 129 INCLUSIVE, GROUP 953 NEAR MINTO, YUKON TERRITORY LATITUDE 62° 36', LONGITUDE 137° 14' (APPROX.) WHITEHORSE MINING DISTRICT.

SURVEYED FOR

AMERICAN SMELTING AND REFINING COMPANY AND SILVER STANDARD MINES LIMITED (N.P.L.)

THIS SURVEY WAS EXECUTED DURING THE PERIOD JULY 15th TO SEPTEMBER 8th 1974 BY J.W.P. MATTHEWS, D.L.S.

SCALE : 1 INCH=400 FEET

LOCATION POST INFORMATION

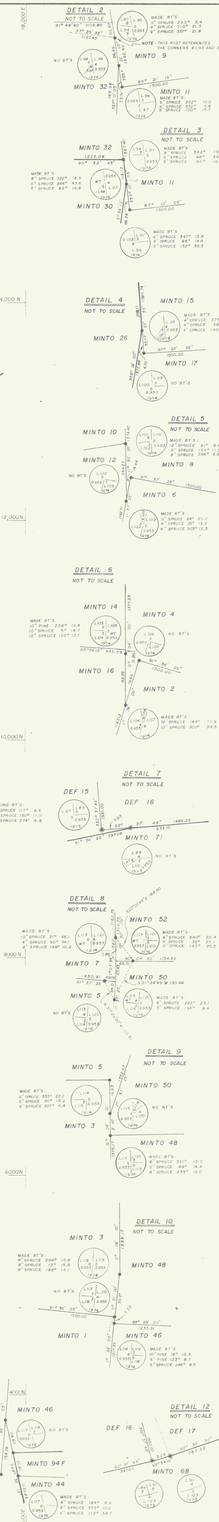
LOCATION POST	POST INSCRIPTION	TAG NUMBER
L.P. N°1 MINTO 72 L.P. N°2 MINTO 33 & 34	L.P.1 MINTO 72 G. STRINGER SEPT. 3rd 1971 N°2 POST N. 1500' L. ILLEGIBLE N°2 2 MINTO 33 & 34 ILLEGIBLE	Y 62303 Y 61923 Y 61922
L.P. N°1 MINTO 33 & 34 L.P. N°2 MINTO 31 & 32	L.P.1 MINTO 33 ILLEGIBLE L.P.2 MINTO 34 ILLEGIBLE	Y 61930 Y 61923
L.P. N°1 MINTO 31 & 32 L.P. N°2 MINTO 29 & 30	L.P.1 2 MINTO 31 ILLEGIBLE L.P.2 2 MINTO 32 ILLEGIBLE	Y 61910 Y 61931
L.P. N°1 MINTO 31 & 32 L.P. N°2 MINTO 29 & 30	L.P.1 MINTO 31 ILLEGIBLE L.P.1 MINTO 32 ILLEGIBLE L.P.2 MINTO 29 ILLEGIBLE L.P.2 MINTO 30 ILLEGIBLE	Y 61920 Y 61921 Y 61932 Y 61933
L.P. N°1 MINTO 9 & 10	L.P.1 MINTO 9 R.M.MICHAEL 16th JULY 1971 P.L.S. 1500 W. L.P.2 MINTO 10 16th JULY 1971 L.P. N. 1500'W.	Y 61628 Y 61629
L.P. N°1 MINTO 11 & 12 L.P. N°2 MINTO 9 & 10	L.P.1 MINTO 11 R.McMICHAEL 16th JULY 1971 L.P. N. 1500'W. L.P.1 MINTO 12 R.McMICHAEL 16th JULY 1971 L.P. N. 1500'L. L.P.2 MINTO 9 R.McMICHAEL 16th JULY 1971 L.P.2 MINTO 10 R.McMICHAEL 16th JULY 1971	Y 61630 Y 61631 Y 61678 Y 61629
L.P. N°1 MINTO 13 & 14 L.P. N°2 MINTO 11 & 12	L.P.1 MINTO 13 R. McMICHAEL 16th JULY 1971 P.L.P. N. 1500'E. L.P.1 MINTO 14 R.McMICHAEL 16th JULY 1971 P.L.P. N. 1500'L. L.P.2 MINTO 11 R.McMICHAEL 16th JULY 1971 L.P.2 MINTO 12 R.McMICHAEL 16th JULY 1971	Y 61633 Y 61632 Y 61630 Y 61631
L.P. N°1 MINTO 15 & 16 L.P. N°2 MINTO 13 & 14	L.P.1 MINTO 15 R.McMICHAEL 16th JULY 1971 P.L.P. N. 1500'E. L.P.1 MINTO 16 R.McMICHAEL 16th JULY 1971 P.L.P. N. 1500'L. L.P.2 MINTO 13 L.P.2 MINTO 14	Y 61634 Y 61635 Y 61633 Y 61682
L.P. N°1 MINTO 17 & 18 L.P. N°2 MINTO 15 & 16	L.P.1 MINTO 17 N. BURNETTE 7th AUGUST 1971 P.L.P. S. 1500' N. L.P.1 MINTO 18 N. BURNETTE 7th AUGUST 1971 P.L.P. S. 1500' L. L.P.2 MINTO 15 R.McMICHAEL 16th JULY 1971 L.P.2 MINTO 16 R.McMICHAEL 16th JULY 1971	Y 61904 Y 61905 Y 61634 Y 61635
L.P. N°1 MINTO 19 & 20 L.P. N°2 MINTO 17 & 18	L.P.1 MINTO 19 N. BURMEISTER 7th AUGUST 1971 P.L.P. S. 1500' N. L.P.1 MINTO 20 N. BURMEISTER 7th AUGUST 1971 P.L.P. S. 1500' L. L.P.2 MINTO 17 N. BURMEISTER 17th AUGUST 1971 L.P.2 MINTO 18 N. BURMEISTER AUGUST, 1971	Y 61906 Y 61907 Y 61904 Y 61905
L.P. N°1 MINTO 70 & 71 L.P. N°2 MINTO 7 & 8	L.P.1 MINTO 70 G. STRINGER SEPT. 3rd 1971 P.L.P. N. 1500'L. L.P.1 MINTO 71 G. STRINGER SEPT. 3rd 1971 P.L.P. N. 1500'R. L.P.2 MINTO 7 CLT'SIBLE L.P.2 MINTO 8 16th JULY 1971	Y 62302 Y 62302 Y 61626 Y 61627
L.P. N°1 MINTO 7 & 8 L.P. N°2 MINTO 5 & 6	L.P.1 MINTO 7 ILLEGIBLE L.P.1 MINTO 8 ILLEGIBLE L.P.2 MINTO 5 ILLEGIBLE L.P.2 MINTO 6 ILLEGIBLE	Y 61626 Y 61627 Y 61624 Y 61625
L.P. N°1 MINTO 5 & 6 L.P. N°2 MINTO 3 & 4	L.P.1 MINTO 5 ILLEGIBLE L.P.1 MINTO 6 ILLEGIBLE L.P.2 MINTO 3 ILLEGIBLE 16 JULY 1971 L.P.2 MINTO 4 ILLEGIBLE	Y 61624 Y 61625 Y 61622 Y 61623
L.P. N°1 MINTO 3 & 4 L.P. N°2 MINTO 1 & 2	L.P.1 MINTO 3 ILLEGIBLE L.P.1 MINTO 4 ILLEGIBLE L.P.2 MINTO 1 ILLEGIBLE L.P.2 MINTO 2 16th JULY 1971	Y 61622 Y 61623 Y 61620 Y 61621
L.P. N°1 MINTO 1 & 2 L.P. N°1 MINTO 35 & 36	L.P.1 MINTO 1 J. KOZIC 16 th JULY 1971 NORTH 'A' 1500' L.P.1 MINTO 2 J. KOZIC JULY 16th 1971 NORTH 'L' 1500' L.P.1 MINTO 35 ILLEGIBLE L.P.1 MINTO 36 ILLEGIBLE	Y 61620 Y 61621 Y 61908 Y 61909
L.P. N°1 MINTO 67 & 68 L.P. N°2 MINTO 65 & 66	L.P.1 MINTO 67 G. STRINGER SEPT. 3rd 1971 NORTH R. 1500' L.P.1 MINTO 68 G. STRINGER SEPT. 3rd 1971 NORTH L. 1500' L.P.2 MINTO 65 G. STRINGER SEPT. 3rd 1971 L.P.2 MINTO 66 G. STRINGER SEPT. 3rd 1971 NORTH L. 1500'	Y 62298 Y 62299 Y 62296 Y 62297
L.P. N°1 MINTO 69 & 70 L.P. N°2 MINTO 51 & 52	L.P.1 MINTO 69 T.JOHANSSON AUG. 7, 1971 L.P.1 MINTO 70 T.JOHANSSON AUG. 7, 1971 NORTH R. 1500' L.P.2 MINTO 51 T.JOHANSSON AUG. 7, 1971 L.P.2 MINTO 52 T.JOHANSSON AUG. 7, 1971 NORTH R. 1500'	Y 62938 Y 62939 Y 61938 Y 61939
L.P. N°1 MINTO 49 & 50 L.P. N°2 MINTO 47 & 48	L.P.1 MINTO 49 T.JOHANSSON AUG. 7, 1971 NORTH L. 1500' L.P.1 MINTO 50 T.JOHANSSON AUG. 7, 1971 L.P.2 MINTO 47 T.JOHANSSON AUG. 7, 1971 L.P.2 MINTO 48 T.JOHANSSON AUG. 7, 1971	Y 61936 Y 61937 Y 61934 Y 61935
L.P. N°1 MINTO 47 & 48 L.P. N°2 MINTO 45 & 46	L.P.1 MINTO 47 B.SINCLAIR T.JOHANSSON AUG. 7, 1971 R. 1500' L.P.1 MINTO 48 B.SINCLAIR T.JOHANSSON AUG. 7, 1971 L.P.2 MINTO 45 B.SINCLAIR AUG. 7, 1971 L.P.2 MINTO 46 B.SINCLAIR AUG. 7, 1971	Y 61934 Y 61935 Y 61950 Y 61951
L.P. N°1 MINTO 45 & 46 L.P. N°2 MINTO 43 & 44	L.P.1 MINTO 45 B.SINCLAIR AUG. 7, 1971 NORTH R. 1500' L.P.1 MINTO 46 B. SINCLAIR AUG. 7, 1971 NORTH L. 1500' L.P.2 MINTO 43 B.SINCLAIR AUG. 7, 1971 L.P.2 MINTO 44 B.SINCLAIR AUG. 7, 1971	Y 61930 Y 61931 Y 61928 Y 61929

LOCATION LINE TRAVERSE TABLE

STATION	BEARING	DISTANCE	REMARKS
C.L.S. POST	3°27'35"	417.45	N°1 MINTO 9 & 10
TM. 1403	266°30'35"	264.49	
C.L.S. POST	244°58'35"	255.43	N°1 DEF. 80 F.
TM. 938	244°58'50"	296.28	
TM. 1404	244°49'10"	281.80	
TM. 997	243°11'30"	444.50	
TM. 996	243°17'55"	218.76	
C.L.S. POST	243°46'35"	416.82	N°2 DEF. 31
C.L.S. POST	24°17'30"	945.80	BEND N. BDY. L.95
TM. 826	181°31'56"	385.92	
TM. 825	135°58'40"	219.48	
N°1 MINTO 59 & 60 N°2 MINTO 57 & 58	186°20'00"	1234.04	C.L.S. POST
TM. 1425	146°17'50"	166.34	
N°1 MINTO 51 & 52 N°2 MINTO 49 & 50	91°49'15"	851.85	C.L.S. POST
TM. 1426	91°55'45"	800.01	
TM. 1427	92°50'45"	316.40	
TM. 1428	93°29'10"	271.92	
TM. 1429	98°12'05"	171.60	
TM. 1430	95°46'30"	323.66	
C.L.S. POST 1431	340°59'00"	173.55	N°1 MINTO 13 & 14 N°2 MINTO 11 & 12
TM. 1432	4°47'20"	261.25	
TM. 1433	355°21'30"	269.83	
TM. 1434	4°18'50"	338.61	
TM. 1435	353°35'05"	340.10	C.L.S. POST
N°1 MINTO 17 & 18 N°2 MINTO 15 & 16	350°25'30"	202.04	C.L.S. POST
TM. 1002	2° 44'00"	1283.9	
N°1 MINTO 94 & 10			
C.L.S. POST 1431	88°01'55"	238.67	N°1 MINTO 19 & 20 N°2 MINTO 17 & 18
TM. 1438	88°28'50"	443.12	
TM. 1439	88°14'10"	283.97	
TM. 1440	88°20'00"	314.17	
TM. 1441	160°48'05"	321.74	N°1 MINTO 5 & 6 N°2 MINTO 3 & 4
C.L.S. POST 1463	91°34'55"	439.09	
TM. 1464	6° 27'30"	517.00	
TM. 1465	349°18'30"	284.02	
TM. 1466	3°59'05"	259.94	C.L.S. POST
N°1 MINTO 5 & 6 N°2 MINTO 3 & 4	1°20'30"	320.68	
TM. 1467	334°36'30"	273.72	
TM. 1468	8° 19'25"	284.59	
TM. 963	358°55'15"	184.32	
TM. 964	354°46'50"	221.16	
TM. 965	359°25'40"	350.93	
TM. 966	358°44'10"	145.25	
N°1 MINTO 13 & 14 N°2 MINTO 11 & 12	45° 35'50"	466.60	C.L.S. POST
TM. 968	12° 11'20"	349.94	
TM. 969	158°19'50"	176.50	S.W. COR. DEF. 16
C.L.S. POST			N°1 MINTO 5 & 6 N°2 MINTO 3 & 4
C.L.S. POST 1463	180°25' 05"	931.78	N°1 MINTO 3 & 4 N°2 MINTO 1 & 2
TM. 1468	178°07'30"	545.72	
C.L.S. POST 1469	178°15'20"	489.56	
TM. 1470	180°09'50"	506.02	
TM. 1471	180° 41' 35"	388.72	
C.L.S. POST 1472	183°52'50"	528.59	
TM. 1473	186°04'40"	508.80	
TM. 1474	135°04'20"	160.88	
TM. 1475	140°29'35"	121.11	
C.L.S. POST 1476	260°31'50"	490.75	
TM. 1477	270°06'40"	507.80	
TM. 1478	260° 35' 20"	534.96	
TM. 1479	260°14'30"	274.96	
TM. 1480	270°00'25"	323.47	
TM. 1481	288°34'05"	264.68	
TM. 1482	289°18'55"	319.24	
C.L.S. POST 1483	01°15'05"	323.12	
TM. 1484	359°00'10"	339.70	
TM. 1485	359°50'40"	394.02	
C.L.S. POST 1487	353°46'15"	326.74	N°2 MINTO 17 & 18 N°3 MINTO 15 & 16
TM. 1488	9° 36'30"	253.45	
TM. 1489	354°39'25"	278.82	
TM. 1490	356°16'30"	243.94	
TM. 1491	359°59'15"	357.83	
C.L.S. POST 1492	359°49'15"	267.00	N°2 MINTO 13 & 14 N°3 MINTO 11 & 12
TM. 1493	3°58'35"	314.58	
TM. 1494	0°50'10"	349.94	
TM. 1495	91°34'00"	685.75	
C.L.S. POST 1431	3°55'00"	120.16	N°1 MINTO 13 & 14 N°2 MINTO 11 & 12
TM. 1496	90°54'20"	745.91	
TM. 1497	90°28'40"	253.90	
TM. 1498	90°04'05"	374.38	
TM. 1499	91°03'35"	496.65	
TM. 1499	91°19' 15"	245.96	
TM. 1500	91°09'50"	367.96	
C.L.S. POST 1501	354°49'10"	259.72	N°1 MINTO 17 & 18 N°2 MINTO 15 & 16
TM. 1502	354°50'20"	284.13	
TM. 1503	2°53'35"	338.47	
TM. 1504	0°55'35"	441.78	N°1 MINTO 21 & 22 N°2 MINTO 19 & 20
C.L.S. POST 1505	101°54'40"	180.76	
TM. 1506	0°53'05"	264.15	
TM. 1507	1°24'45"	253.05	
TM. 1508	1°13'50"	220.76	
TM. 1509	354°31'50"	310.96	
TM. 1510	353°06'50"	102.12	
TM. 1511	353°35'05"	367.16	C.L.S. POST
TM. 1512	356°37'00"	375.79	C.L.S. POST
TM. 1513	356°30'00"	180.70	
TM. 1514	354°24'40"	411.13	N°1 MINTO 23 & 24 N°2 MINTO 21 & 22
TM. 1515	352°38'25"	244.97	
TM. 1516	354°17'20"	220.30	
TM. 1517	15°24'45"	153.94	
TM. 1451	88° 26'30"	238.09	
TM. 533	60°30'50"	176.51	S.E. COR. DEF. 16
TM. 534	242°36'10"	1278.11	
C.L.S. POST	242°16'30"	644.44	
TM. 1415	242°18'00"	617.52	S.W. COR. DEF. 16
TM. 1417	242°30'45"	264.59	
C.L.S. POST			N°1 MINTO 21 & 22 N°2 MINTO 19 & 20
C.L.S. POST 1478	89°48'05"	427.30	
TM. 1518	127°37'45"	260.62	
TM. 1519	92°43'05"	360.47	
TM. 1520	92°53'00"	476.42	
TM. 1521	90°16'30"	302.54	
TM. 1522	91°11'15"	249.95	
TM. 1523	90°50'20"	180.43	
JUR. 1524	2°30'35"	294.53	
TM. 1525	171°17'25"	198.30	
TM. 1526	3°17'05"	328.86	
TM. 1527	19°24'15"	169.14	
TM. 1528	356°56'40"	264.18	
TM. 1529	359°41'50"	416.81	N°1 MINTO 45 & 46
C.L.S. POST 1532	354°58'35"	189.52	N°2 MINTO 43 & 44
TM. 1534	5°13'35"	445.66	
TM. 1535	350°18'10"	468.85	
TM. 1536	6°37'00"	236.43	N°1 MINTO 43 & 44 N°2 MINTO 41 & 42
C.L.S. POST 1537	358°11'45"	243.73	
TM. 1538	2°17'34.35"	268.34	
TM. 1539	349°18'50"	186.53	
TM. 1540	6°35'00"	1178.17	
TM. 1008			

MINERAL CLAIM INDEX

LOT N°	CLAIM NAME	RECORD N°	LOCATION DATE	RECORDING DATE
93	MINTO 34	Y 61923	7th AUG. 1971	31st AUG. 1971
94	MINTO 32	Y 61931	7th AUG. 1971	31st AUG. 1971
96	MINTO 9	Y 61628	16th JULY 1971	9th AUG. 1971
97	MINTO 11	Y 61630	16th JULY 1971	9th AUG. 1971
98	MINTO 13	Y 61632	16th JULY 1971	9th AUG. 1971
99	MINTO 15	Y 61634	16th JULY 1971	9th AUG. 1971
100	MINTO 17	Y 61904	7th AUG. 1971	31st AUG. 1971
101	MINTO 20	Y 61629	16th JULY 1971	9th AUG. 1971
102	MINTO 18	Y 61631	16th JULY 1971	9 th AUG. 1971
103	MINTO 14	Y 61633	16 th JULY 1971	9th AUG. 1971
104	MINTO 16	Y 61635	16 th JULY 1971	9th AUG. 1971
105	MINTO 19	Y 61905	7th AUG. 1971	31st AUG. 1971
106	MINTO 70	Y 62301	4th SEPT. 1971	22nd SEPT 1971
107	MINTO 8	Y 61627	16 th JULY 1971	9th AUG. 1971
108	MINTO 6	Y 61625	16 th JULY 1971	9th AUG. 1971
109	MINTO 4	Y 61623	16 th JULY 1971	9th AUG. 1971
110	MINTO 2	Y 61621	16th JULY 1971	9th AUG. 1971
111	MINTO 36	Y 61909	7th AUG. 1971	31st AUG. 1971
112	MINTO 71	Y 62302	4th SEPT. 1971	22nd SEPT 1971
113	MINTO 7	Y 61626	16th JULY 1971	9th AUG. 1971
114	MINTO 5	Y 61624	16th JULY 1971	9th AUG. 1971
115	MINTO 3	Y 61622	16th JULY 1971	9th AUG. 1971
116	MINTO 1	Y 61620	16th JULY 1971	9th AUG. 1971
117	MINTO 35	Y 61909	7th AUG. 1971	31st AUG. 1971
123	MINTO 68	Y 62299	3rd SEPT. 1971	22nd SEPT. 1971
125	MINTO 66	Y 62297	3rd SEPT. 1971	22nd SEPT. 1971
121	MINTO 52	Y 61939	7th AUG. 1971	31st AUG. 1971
120	MINTO 50	Y 61937	7th AUG. 1971	31st AUG. 1971
119	MINTO 48	Y 61935	7th AUG. 1971	31st AUG. 1971
118	MINTO 46	Y 61951	7th AUG. 1971	31st AUG. 1971
124	MINTO 67	Y 62298	3rd SEPT. 1971	22nd SEPT. 1971
125	MINTO 65	Y 62296	3rd SEPT. 1971	22nd SEPT. 1971
126	MINTO 51	Y 61938	7th AUG. 1971	31st AUG. 1971
127	MINTO 49	Y 61936	7th AUG. 1971	31st AUG. 1971
128	MINTO 47	Y 61934	7th AUG. 1971	31st AUG. 1971
129	MINTO 45	Y 61930	7th AUG. 1971	31st AUG. 1971



LEGEND

C.L.S. 92 POST FOUND SHOWN THUS ●
C.L.S. 92 POST PLACED SHOWN THUS ○ ——— O.P. 1973 ———
TRAVERSE LINES AND WIRE SHOWN THUS ——— O.P. 1973 ———
B : DENOTES BEARING TREE ——— BEARINGS MAGNETIC
W.T. DENOTES WITNESS
L.P. DENOTES LOCATION POST
MINERAL CLAIMS DEALT WITH BY THIS PLAN ARE BORDERED THUS ———

BEARINGS ARE ASTRONOMIC AND ARE DERIVED FROM HUB 1000 (MINTO 9 AND 10) SHOWN AS 2°44'20" ON PLAN AND FIELD NOTES OF SURVEY OF LOTS 79 TO 93, GROUP 953, PLAN 7 KOEPKE SLS., 1973, RECORDED UNDER NUMBER 59454, C.L.S.R.

I, J.W.P. MATTHEWS, OF THE CITY OF VANCOUVER, DOMINION LAND SURVEYOR, MAKE OATH AND SAY THAT I HAVE IN MY OWN PROPER PERSON, ACCORDING TO LAW AND THE INSTRUCTIONS OF THE SURVEYOR GENERAL OF CANADA, LAND, PLANTED AND CORRECTLY EXECUTED THE SURVEY SHOWN BY THIS PLAN AND FIELD NOTES ; AND THAT THE SAID PLAN AND FIELD NOTES ARE CORRECT AND TRUE TO THE BEST OF MY KNOWLEDGE AND BELIEF. SO HELP ME GOD.

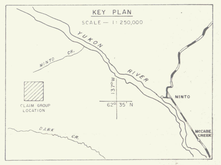
J.W.P. Matthews D.L.S.

SWORN BEFORE ME AT VANCOUVER, BRITISH COLUMBIA
THIS 28 DAY OF Oct 1974

A NOTARY PUBLIC AND FOR THE PROVINCE OF BRITISH COLUMBIA.

I HEREBY CERTIFY THAT I HAVE CAREFULLY EXAMINED THE GROUND INCLUDED IN THE LOT, 94 TO 129 INCLUSIVE, GROUP 953 MINERAL CLAIMS SURVEYED BY ME, AND HAVE, OTHERWISE MADE ALL REASONABLE INVESTIGATIONS IN MY POWER TO ASCERTAIN IF THERE WAS ANY OTHER EXISTING CLAIM CONFLICTING THEREWITH, AND I CERTIFY THAT I HAVE FOUND NO TRACE OR INDICATION AND HAVE NO KNOWLEDGE OR INFORMATION OF ANY SUCH CLAIM EXCEPT AS FOLLOWS : NONE

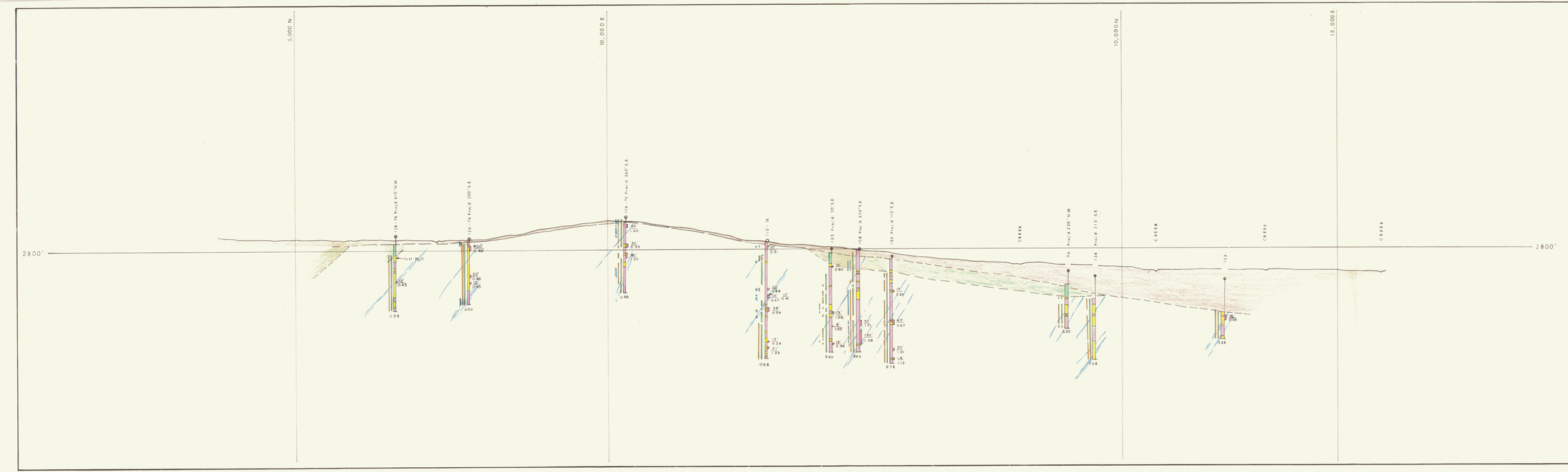
J.W.P. Matthews D.L.S.
THIS 7th DAY OF OCTOBER 1974.



Department of Energy, Mines and Resources
Ottawa 17, March 1976
Re Section 80 Yukon Quartz Mining Act
Approved
W. V. BLACKIE
Acting Surveyor General

NICKLEMANNEY ASSOCIATES
PROFESSIONAL LAND SURVEYORS
1200 WEST PENDER STREET
VANCOUVER 1, B.C.

JOB N°. 0.3871-1 DWG. 'A'



LEGEND

ROCK TYPE

- OVERBURDEN
- CONGLOMERATE &/or SEDIMENTS
- GRANITE (Granodiorite)
- GRANITE (Foliated)

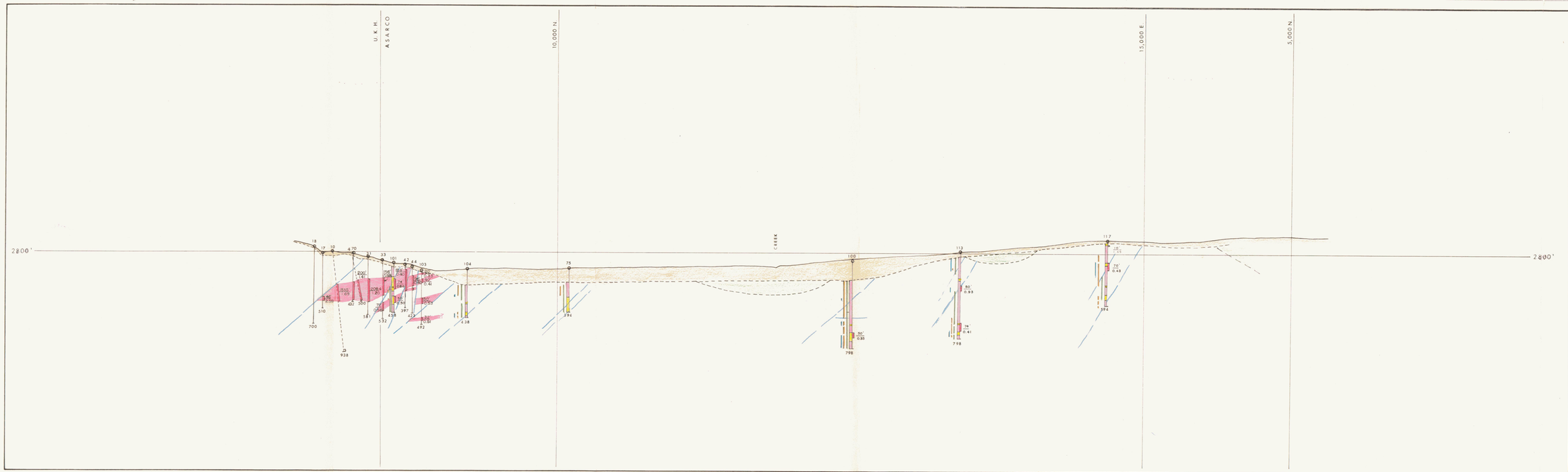
ALTERATION

- PROPYLITIC
- POTASSIC
- ARGILLIC

50.0' Intersection
1.71 % Cu

AMERICAN SMELTING AND REFINING Co.
VANCOUVER B.C.

MINTO PROJECT	SECTION N.48°E. LOOKING N.W.			
SCALE 1"=400'	DRAWN	DATE JAN/75	APPROVED	FILE No.


U.K.H.
ASARCO
10,000 N
CREEK
12,000 E
5,000 N
2800'
2800'
18
17
10
470
53
101
42
44
103
104
75
100
113
117
700
510
938
622
300
581
532
438
397
423
472
438
394
798
798
394
LEGEND
ROCK TYPE
OVERBURDEN
CONGLOMERATE &/or SEDIMENTS
GRANITE (Granodiorite)
GRANITE (Foliated)
ALTERATION
PROPYLITIC
POTASSIC
ARGILLIC
50.0'
1.71
Intersection
% Cu
AMERICAN SMELTING AND REFINING Co.
VANCOUVER B.C.
MINTO PROJECT
SECTION N.42°W
LOOKING N.E.
SCALE 1" = 400'
DRAWN
DATE JAN/75
APPROVED
FILE No.

SILVER STANDARD MINES LTD.

MINTO AREA, Y.T.

TRENCH SAMPLING PLAN (EAST HALF)
FIGURE 16

MAP SCALE
FEET 100 50 0 100 200 300 FEET

CONTOUR INTERVAL 20 FEET

LEGEND

- Copper ≥ 0·60%
- 0·40% ≤ Copper < 0·60%
- 0·10 % ≤ Copper < 0·40%
- Claim post (with airphoto control, approximated)
- Diamond drill hole — Vertical, depth; inclined (angle from horizontal, Depth) direction
- Approximate limit of muskeg
- Trench & survey station
- Trails
- Clearing

NOTE:-
HORIZONTAL AND VERTICAL CONTROL SUPPLIED BY WHITE, MOSFORD & IMPEY LTD.

SILVER STANDARD MINES LTD.

MINTO AREA, Y.T.

TRENCH SAMPLING PLAN (WEST HALF)
FIGURE 16

MAP SCALE
FEET 100 50 0 100 200 300 FEET

CONTOUR INTERVAL 20 FEET

NOTE:-
HORIZONTAL AND VERTICAL CONTROL SUPPLIED BY WHITE, HOSFORD & IMPEY LTD.

LEGEND

- Copper ≥ 0·60 %
- 0·40 % ≤ Copper < 0·60 %
- 0·10 % ≤ Copper < 0·40 %
- Claim post (with airphoto control, approximated)
- Diamond drill hole: Vertical, depth; inclined (angle from horizontal, Depth) direction
- Approximate limit of muskeg
- Trench & survey station
- Trails
- Clearing