Granisle Copper Limited

HISTORY

The earliest record of work on the copper mineralization of Copper Island is in the Annual Report to the B.C. Minister of Mines for the year 1913. Chas. Newman and H. J. McDonald were the discoverers and by that time two short tunnels, a shaft and several open cuts had been put in. The property was visited by N. W. Emmons, Provincial Mineralogist, who took several samples from the workings. Grades of around 1% copper were obtained with small values in gold and silver.

McDonald's cabin on Copper Island. McDonald was one of the two discoverers of the Granisle property.

The following years give scant information but in 1927 Douglas Lay visited the property and under the name Richmond Group describes the showings in the Report to the Minister. On his recommendation the property was bonded by C.M. & S. the following year.

In 1928 C.M. & S. carried out a program of trenching and drilling. This work was directed on the ground by H. C. Giegerich. Several long holes were drilled to test the extent of the mineralization. Further work was planned but did not develop, possibly due to the recession of 1929. The option was dropped and the property reverted to McDonald and Newman. Mr. Jim Cullinane, well known in B.C. diamond-drilling circles today, can relate some interesting anecdotes about his days on this drilling job and has given us the photo of McDonald's cabin on Copper Island, taken in 1928, which is shown herewith.

The property was examined by Dr. Victor Dolmage in 1943. At that time work had been done by E. E. Campbell and the prospect was described as the Newman property. On the basis of favorable geology and mineralogy, Dolmage recommended work in spite of the obvious low tenor of the ore. The hope was that higher-grade bands, which had not been intersected by the limited earlier drilling, might be found.

Soon after Dolmage's report, a small company was organized with work being directed in the field by B. I. Nesbitt. Four holes were drilled but when it was found that the average of almost 1700 feet of core, believed in the ore zone, only came to 0.60% copper, work was stopped.

In the following years the property was examined by several companies but no further work was carried out.

In August, 1955 the property was examined by Granby engineers. Before freeze-up additional claims had been staked and eight drill holes had been put down following a grid pattern on 200-foot centres. This work was continued as soon as winter relaxed, a larger drill being taken in over the ice in March. By summer's end a total of 49 holes had been drilled on the grid pattern and the remarkable continuity of values in copper had been demonstrated, extending far beyond the limits of previous drilling in a north-easterly direction.

In the next couple of years a drop in copper price discouraged work, but Granisle Copper Limited was formed and in 1959 further drilling was done to check continuity between the 200-foot grid holes, an additional 30 holes being driven. In 1963 planning had advanced to the stage of mill testing and surveys for suitable mill sites.

A feasibility study was completed in April, 1964, by the Granby staff, and using a copper price of 28.5c U.S., (a price at which copper had been stabilized for about two years), it appeared economically attractive to place the property into production. Arrangements were made for financing and the decision to go ahead was made in February, 1965. Design of the plant was started immediately, construction was carried out during 1965 and 1966, and production started in mid-November of 1966.

FINANCING

Granisle was financed by the sale of common stock and by a $3 million loan from a Canadian Bank, a $7½ million loan from four Japanese companies of the Sumitomo and Mitsubishi groups, and a $1 million loan from The Granby Mining Company Limited, with the loans to be repaid in that order from earnings. The entire output of concentrate will be sold to the Japanese companies for a period of ten years from the date of production.

A. J. McDougall

Angus J. McDougall, manager of Granisle Copper Limited, was born in Anyox, B.C., 42 years ago. He received his secondary schooling in Vancouver and, after three years' service in the Royal Canadian Air Force during World War II, he enrolled at the University of British Columbia from which he graduated as a bachelor of applied science in mining engineering in 1950.

Since graduation, Angus has had wide mining experience. He was employed by The Consolidated Mining and Smelting Company of Canada Limited as surveyor and miner; by Estella Mines Ltd. as mine engineer; by Britannia Mining and Smelting Co. Ltd. for five years successively as miner, contract engineer, assistant safety engineer, shift boss, and mine foreman; and by Denison Mines Limited as mine captain at Elliot Lake. He left Denison in 1961 to return to Britannia Beach as general superintendent of the operation then directed by the Howe Sound Company. He joined the Granby organization in 1962 as manager of Jedway Iron Ore Limited at Jedway on the Queen Charlotte Islands. He was transferred to Granisle as manager in 1965.

Mr. McDougall resides with Mrs. McDougall and their seven daughters at the new community of Granisle on the west bank of Babine Lake.

Geology of the Granisle Ore Zone

RECENT MAPPING

During the summer of 1965 a field party was assigned to the Babine area by the provincial government mines branch. Mr. N. C. Carter under the direction of Dr. Mike Carr visited Copper Island and mapped it with much of the adjoining territory. His report with accompanying maps give an excellent picture of the local geological setting of the property. It is to be found in the 1965 Report to the Minister of Mines and Petroleum Resources of B.C. The map of Copper Island accompanying Carter's report is reprinted herewith since it shows the most recent ideas of the local geology as Fig. 1.

In the summer of 1966, construction at the mine was approaching completion and the entire pit area was stripped to bedrock in preparation for mining. Advantage of this ideal situation was seized and a Granby crew mapped the exposed rock surface. This map is reproduced as Figure 2. It illustrates the detailed geology in the immediate vicinity of the ore.

REGIONAL GEOLOGY

The Granisle copper mine lies in a more or less central position in that great trough of mesozoic sedimentary rocks which occupies most of the interior of British Columbia. The regional north-westerly trend of this structure is represented at the property by major faulting. A poorly defined mass of red granitic rock lies about three miles south-east of the property. This is a member of the Topley intrusives of lower Jurassic age. The younger Omineca granodiorites are exposed about 20 miles away to the north-east in the core of a flanking mountain range. The Pinchi Fault lies 40 miles to the north-east marking the boundary of the basin. A second tectonic parameter of Granisle is a transverse uplift which has been called the Skeena Arch. It is marked by north-easterly trending fingers from the coast crystalline belt in the Terrace area and a large number of small stocks and bosses which extend across the sedimantary basin. This belt includes the many mines and prospects of the Terrace-Hazelton-Smithers district.

The island upon which the ore body occurs lies between two northwesterly-trending faults, spaced about 4000 feet

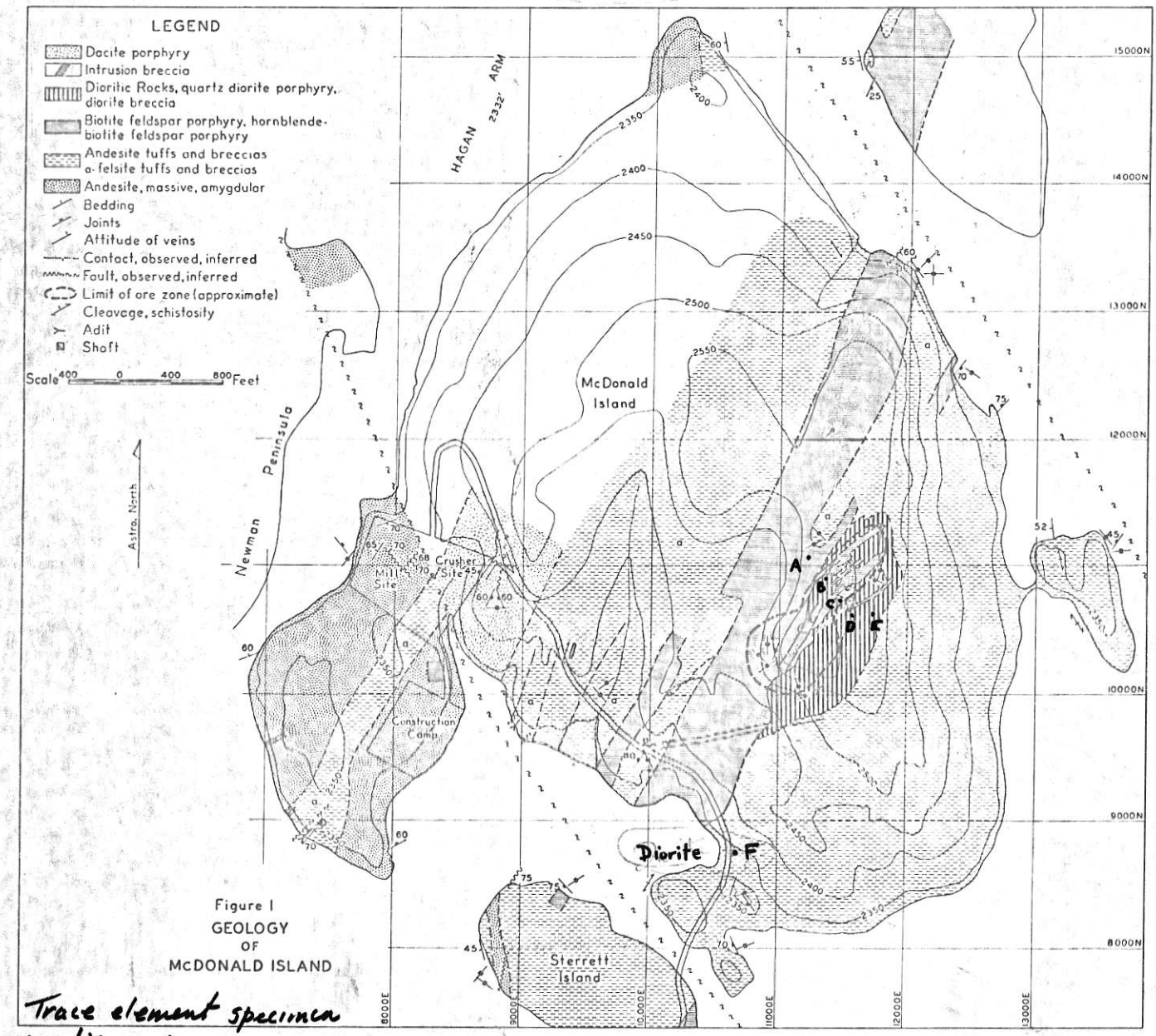

Figure I
GEOLOGY
OF
McDONALD ISLAND

Trace element specimen localities for Dr. J Wertz July 10/67.

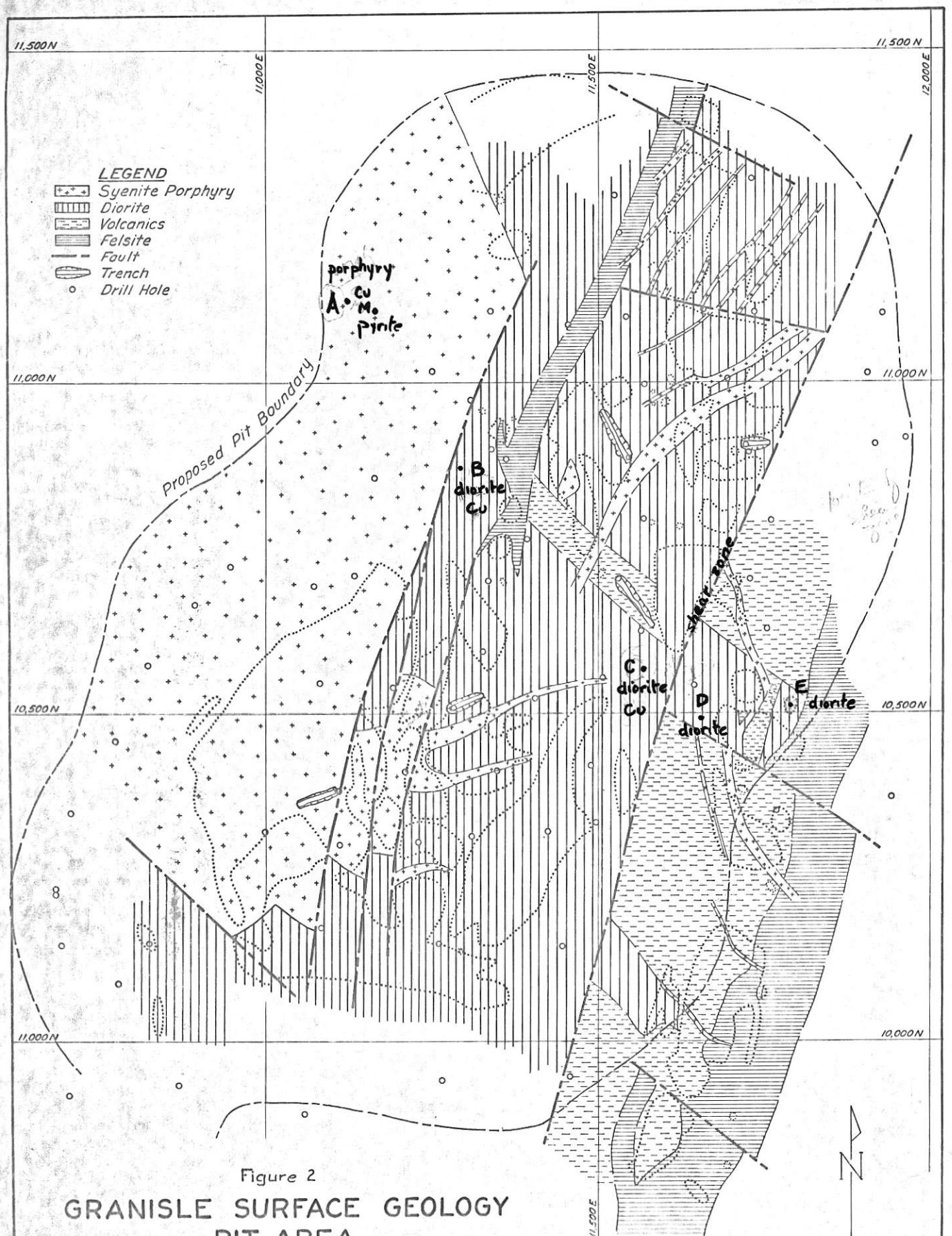

Figure 2

GRANISLE SURFACE GEOLOGY PIT AREA

Mapped August 1966, K.C.F.

0 50 100 200 300

Scale in feet

Trace element specimen localities for Dr. J. Wertz. July 10/67

apart. They have been mapped by the B.C. Department of Mines geologists and are proven to extend over at least 10 miles, reaching to the north-west across Newman Peninsula.

Correlations across the faults have not been made. The south-east segment which occurs on the western tip of Copper Island and most of Sterrett Island is largely stratified, being composed of thick bedded sediments and limey tuffs with some interbedded andesitic and felsitic flows. The central segment in which the ore body occurs is largely volcanic with thick bands of felsitic and andesitic flow material. The north east segment is not well known but thin bedded sandy and limey sediments occur in a creek exposure about a mile and a half north-east of the mine.

ROCK TYPES

Volcanic rocks are the oldest rocks mapped in the pit area. They occur in the eartern part of the map sheet. Andesitic types are generally fine-grained and fragmental texture is common. Felsitic types make well-defined contacts with the andesites and are massive fine-grained, light grey to pinkish in color. Their strike appears to be about N 25° E. No dips were determined.

They have been correlated with the Takla group of Upper Triassic system on the basis of composition. A system of andesine biotite porphyry intrusives is closely related to the ore occurrence. A large well-defined dyke with widths of from 400 to 600 feet and a strike of N 15° E crosses Copper Island between the two north-westerly-trending faults which bracket the island. About midway between the two faults there is a swell in the dyke due to a bulge on the east side to give the maximum width of 600 feet. This is the centre of a radial system of smaller dykes with widths of from one to 25 feet. This point is also the centre of alteration silicification and mineralization of the volcanics and the dykes. It corresponds with the knoll which is the highest point of the island and the outcropping of the ore zone.

A metamorphic rock called "diorite" at the mine has resulted from the alteration accompanying the porphyry intrusion. This rock extends over a zone about 400 feet wide along the large porphyry-dyke contact. It shows its fine-grained origin as a volcanic under the microscope but has been recrystallized with development of felspars a little more basic than the porphyry and with a mesh work of biotite which gives it a dark brown, silky appearance in the field. Relict fragmental texture and bands of unalterd volcanics occur within the "diorite". Bands of "diorite" with related copper mineralization extend to the east from the main diorite mass as fingers along smaller porphyry dykes. Only the andesitic volcanics appear to have been subject to the dioritization since it stops abruptly at felsite contacts.

STRUCTURE

At least two periods of faulting must be part of the geological history of the area to account for dyke intrusion and discontinuities in formations. The earlier faults follow a north-east direction and the latter, a north-west direction. On a regional scale there is evidence of large displacement on the north-westerly-trending faults since no definite continuations of the large porphyry dyke have been found beyond Copper Island.

Copper mineralization is closely related to a system of quartz-filled fractures. Widths vary from knife-edge widths to several inches but in most cases they are less than one-eighth inch wide. An average of over 50 measurements suggests that there are three principal directions. The most prominent direction is N 75° W in strike with a dip of about 80° NE. This direction accounts for about 60% of the fractures measured. A less prominent set striking N 10° E and dipping 80° SE accounts for 30%. A set of horizontal fractures account for 10% of readings but is probably much more important, being poorly exposed for measurement in surface rocks. These fractures are usually well-developed veinlets but

Open-pit mining by Granisle Copper Limited on Copper Island in Babine Lake. Equipment includes one Bucyrus Erie and one Japanese-built P&H shovel, Wabco end-dump trucks, and a Caterpillar D-8 tractor.

George Allen Aerial Photos Ltd.

K. C. Fahrni

Keith C. Fahrni, chief geologist of The Granby Mining Company Limited, was born May 3, 1914, in Gladstone, Manitoba, where he attended public school and high school. He enrolled at the University of Manitoba in engineering. After electing to specialize in mining engineering, which course was not available at Manitoba, he transferred to the University of British Columbia, from which he graduated as a bachelor of applied since in 1936.

For three years after graduation he worked in several southern British Columbia mining camps as miner and engineer. These included Bridge River, Hedley, and Britannia. In 1939, he returned to U.B.C. for a year of post-graduate study in geology and the following spring he joined the staff of The Consolidated Mining and Smelting Company of Canada Limited. He spent the next three years at the Con mine and on field work in the Yellowknife District of the Northwest Territories. This was followed by two years at the Sullivan mine at Kimberley.

Early in 1945, he left Cominco to become mine geologist at the Copper Mountain mine of The Granby Consolidated Mining, Smelting and Power Company Limited. He remained in that position until the closing of the Copper Mountain operation in 1957, when he moved to Vancouver as chief geologist of the company. He has been closely associated with the Granisle project since its inception.

ENDAKO MINES LTD. (N. P. L.)

PHONE: FRASER LAKE 261

ENDAKO, B.C. CANADA

13 July 1967.

MEMO TO: J. B. Wertz

FROM: K. M. Dawson

cc: H. J. Matheson
F. V. Hendershot
E. T. Kimura
A. D. Drummond

RE: Tour of Granisle - July 10, 1967

The geological staff at Endako were given a tour of Granisle on July 10. We collected the six enclosed specimens for your alteration study. I have plotted their locations on the geological maps published in the May 1967 "Western Miner", which is also enclosed. Specimens "A" to "E" bracket the ore zone, while specimen "F" is outside the mineralized area.

I have not yet completed the collection of an Endako suite of specimens for my trace element study with some duplicates for your alteration study. I will bring these in to the Vancouver office when I come down early in August.

K. M. Dawson,
Research Geologist.

KMD/dep

Encl.