QUEEN CHARLOTTES PROJECT. April - August, 1962 673295 Nov. 20, 1962 J. C. Stephen

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QUEEN CHARLOTTE ISLAND PROJECT.

April - August, 1962

INTRODUCTION:

A prospecting party was established on the Queen Charlotte Islands during the 1962 field season to investigate areas considered favourable for both iron and copper deposits. This included the portion of islands from Peel Inlet and Louise Island on the south, to Rennell Sound on the north, and covered the following areas in detail (see Fig. I).

- 1) Louise Island vicinity of the Iron Duke deposit;
- 2) Skidegate Channel;
- 2) Van Marbour to Rennell Sound;
- 4) Mosquito Lake;
- 5) Skidegate Lake;
- 6) Poel Inlet;
- 7) Gudal Bay.

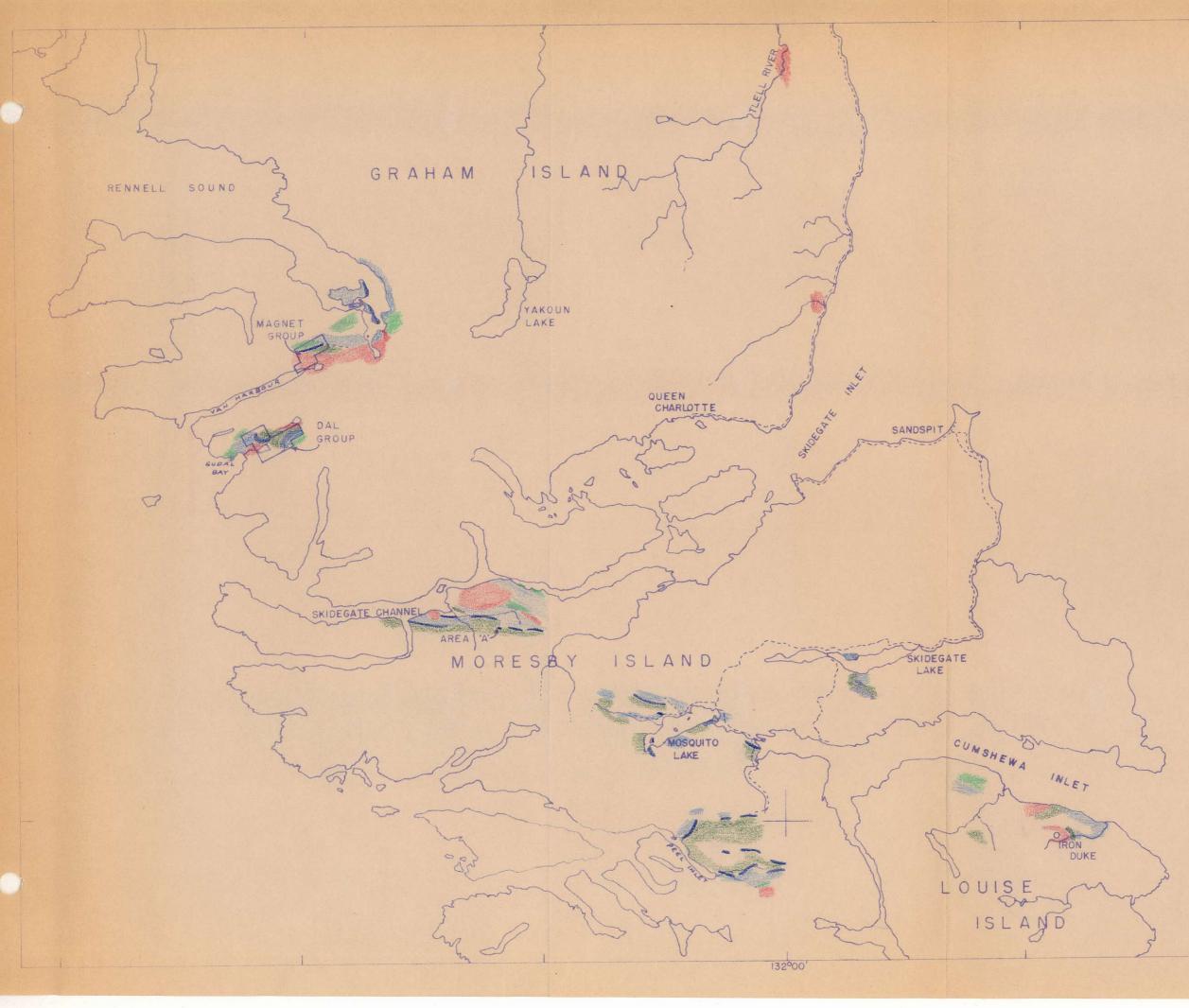
A search was also made in the Tiell River area of southeastern Graham Island for the source of reported molybdenite fleats, but with no success.

A two-man mapping and prospecting party started work on April 10, 1962. Changes in personnel and equipment occurred during the season mainly because of detailed exploration on the Magnet Group. Personnel returned from the Queen Charlotte Islands on August 27, 1962.

The main itoms of equipment used during the season vere:-

- Model 109 Land Rover used to travel these logging reads which were made available to us in the area. This was satisfactory in all respects.
- (2) Canova Inflatable Boat and 15 H.P. motor provided a means of moving camp by water and of prospecting shore lines where conditions were favourable. This beat was not highly regarded at first, probably because too much was expected of it, but, in general, it proved very useful. It can be taken down and transported easily in the Land Bover. In spite of some hard knocks no repairs of any consequence were requited during the season.

(3) Finnish Arvela Magnetometer - This pocket-sized instrument reads up to 60,000 gammas and was found convenient and adequate in prospecting for magnetite.



LEGEND

DIORITIC INTRUSIVES
YOUNGER VOLCANICS
BANDED SEDIMENTS
LIMESTONE
OLDER VOLCANICS

GENERAL GEOLOGY

53° 00'

KUNGA LIMESTONE AREAS

CENTRAL QUEEN CHARLOTTE IS. 1: 250,000 1962

FIGURE I

J.C.S. I

Sharpe SE -300 E.M. Unit. This unit was rented for use on the Magnet Group. It is convenient for following zones of sulphides where some indications have already been found. However range is very limited, and difficulty was experienced in getting the proper orientation between receiver and transmitter.

METHOD:

(4)

Preliminary, largely unpublished geology of the area was plotted on 1:50,000 scale topographic maps prior to the start of the field season. Economic deposits of magnetite and of copper on the west coast invariably occur in or close to the Upper Triassic limestone. Areas of this limestone were selected for examination and the seven areas listed above were prospected under this programme.

The two-man party was moved into the various areas by aircraft, chartered boat, inflatable rubber boat, or Land Rover, depending on conditions.

Examinations were made of the creek valleys for limestone, magnetite or other interesting float. At the same time notes were kept of the geology encountered and these notes were plotted on a second set of 1:50,000 maps. As limestone bands were outlined in detail the contact areas were examined more closely. In areas of overburden, magnetometer readings were taken at about 200 ft. intervals along traverses spaced approximately 1,000 ft. apart or, in some areas, along rather closely-spaced traverses parallel to the assumed limestone contacts. Periodic magnetometer readings were taken on all traverses, even over outcrop areas, in an attempt to detect completely hidden magnetic deposits.

A study was made of the Iron Duke area on Louise Island to determine the type and extent of the magnetite float fan in the vicinity of this body.

A geochemical kit for the rubeanic acid method of testing stream silts was used by the party in various areas in an attempt to locate indications of copper mineralization. Although no showings were located in this manner this was found useful as it provided confirmatory information in indicating the absence of mineralization. In using this method care must be taken to avoid vegetable matter in the samples and it was found that much more consistent results could be obtained when all samples of silt were dried before testing.

Aircraft reconnaissance was used to trace limestone belts and to find gossan areas. This was done in conjunction with moving and supplying the party and provided valuable information at little expense over that required in actually moving the search party from one area to another. Experience showed . that gossan areas observed from the air indicated areas worth further attention.

2.

SUMMARY AND CONCLUSIONS:

Two areas of interesting minoralization were discovered in the southwestern part of Graham Island. The Magnet Group of 11 claims and the Dal Group of 32 claims (see Fig I) were staked and adequately cover the potential zones. Both claim groups warrant further work.

The plan to prospect the southern and northern extremities of Graham and Moresby Islands respectively, was a good one, particularly in view of the fact that Dr. Bacon had access to unpublished geological data which strongly suggested this region to be a favourable area. With reference to the Queen Charlottes in general, however, and Moresby in particular, it is clear that a great deal of exploration has been carried out over the past few years and the chances now of finding another Tasu or Jedway are not too bright. In addition to standard prospecting procedure, extensive airborne magnetic work by several companies has greatly reduced the chances. In this regard the Jib Group on Burnaby Island staked by Dr. W. R. Bacon, assumes importance for the airborne anomaly there is of the same size and intensity as that obtained over the Jessie deposit at Jedway, four miles to the south.

RECOMMENDATIONS:

Work is recommended for both the Magnet and Dal groups which are four miles apart. The programme, to be efficient, would necessitate a helicopter and involve a minimum of a month's work.

<u>Magnet Group</u> - A vertical loop E. M. survey in the vicinity of the known showings.

Tranching on known showings of copper mineralization and on results of E.M. survey

Dal Group - Line cutting, followed by geological mapping and magnetometer work in region of present showings.

Detailed prospecting of the unexplored portion of the limestone contact area.

GENERAL GEOLOGY:

The deposits of iron and copper on the Queen Charlottes are associated with the Kunga limestone of Upper Triassic Age.

The Kunga formation is underlain by a thick sequence of generally featureless greenstones known as the Older Volcanics. In some areas evidence of anygdules and pillow.structures are found and thin beds of limestone may occur within these volcanics.

GENERAL GEOLOGY (cont'd)

Volcanics overlie the Kunga limestone. These rocks, termed the Younger Volcanics, are predominantly fragmental in contrast to the Older Volcanics.

In 1952 Dr. Bacon contradicted a generally accepted theory that the pyrometasomatic deposits of iron and coppy on the B. C. coadt were replacements of limestone. His work emphasized that many of these deposits were, in fact, replacements of the Older Volcanics, near contacts with the Upper Triassic limestone. Subsequent work showed that a minority of deposits occur near the base of the Younger Volcanics. The general effect of these important observations was to draw attention to the volcanic rocks bordering the limestone, rather than to the limestone itself.

The above observations, important as they are, nevertheless emphasized the importance of delineating the linestone belts. The base of the Kunga formation consists of 500 ft. of white to dark-bluish-black limestone which is generally massive. Above this massive limestone occurs a thicker sequence of well-bedded, black limestones. Overlying all, are beds of argillaceous limestone and argillite which, in places, attain a thickness of as much as 1,900 ft.

Dykes and plugs of granite intrude the rocks described above. They are generally grey, dioritic rocks of fairly fresh appearance. In some areas, such as Van Harbour (Magnet Group), the intrusive appears to have assimilated some of the volcanic rock, resulting in a hybrid rock of dark-green colour. Two facts of some importance economically are as follows:-

- 1) In the immediate vicinity of almost every orebody, and rarely elsewhere, dykes and sills of feldspar porphyry or quartz feldspar porphyry are abundant.
- 2) The limestone in the vicinity of mineralization found on the Queen Charlottes invariably exhibits a crumbly, sugary texture, a feature not noted where mineralization is absent.

The Tasu and Jedway deposits occur in the uppermost part of the Older Volcanics, i. e. near, or at the contact with Kunga limestone.

The Iron Duke deposit on Louise Inlet, as presently known, contains 525,000 tons of iron ore. It occurs within an anomalous area 600 ft. by 1,000 ft. Work in this vicinity indicated that float from this deposit is of two types:-

GENERAL GEOLOGY: (cont'd)

- Fresh, angular black magnetite fragments found on the hillside and in the stream beds to a distance of about 3,000 ft. downstream from the deposit;
- 2) Rounded, rusty or brown surfaced fragments originally deposited by early crosional agents on bedrock surfaces or in boulder beds near bedrock. These fleats are new being exposed and resorted and were found to a distance of 8,000 ft. downstream from the deposit.

PROSPECTING RESULTS:

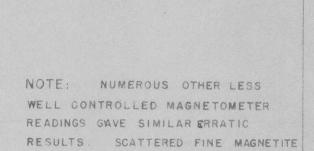
Interesting mineralization, in every case, was found by old-time prospecting methods, i. e. by finding floats downhill or mineral in place. Limestone floats which sometimes indicated previously unknown bands of limestone were found as much as one mile below their source.

One area of erratic high magnetic readings was found south of Skidegate Channel and is designated as Area "A" in Fig. I. Magnetemeter results of two traverses are shown in Fig. II. Although a little scattered fine magnetite was found, the area has been well prospected and nothing of commercial interest is indicated.

Two areas of more important mineralization were located and are described in detail below:-

<u>Magnet Group</u>. This is a group of 11 claims staked north of the head of Van Harbour (Fig. I) The claims cover a series of mineral showings which occur at an elevation of 2100 ft. overlooking the harbour. Detailed work was done on this group including geological mapping (Fig. III) magnetometer surveying (Fig.IV) and E. M. surveying (Fig. V). Figs. III, IV and V are included in the pocket at the back of this report.

Geological mapping indicates a band of Kunga limestone approximately 2400 ft. long. This band is terminated by steep cliffs at the southwest end and is obscured by overburden and possible faulting at the northeast end. Mineralization has been located within the Older Volcanics below the limestone over a length of approximately 1500 ft.



WAS FOUND IN VOLCANICS

7.8

6.7

6.4

7.2

6.7

6.3

6.95

5.2

10.3

5.3

5.6

5.3

7.6

7.0

5.0

10.3

6.3

6.5

6.7

66

6.4

6.3 5.8

6.0

5.6

5.5

5.0

7.7

9.4

7.8 5.2

3.4

9.2

6.3 5.5

5.3

10.4

4.5

5.0

A.5 5.2

5.2

6.0

5.8

5.8

60

5.6

5.7

4.9

6.3 5.9

6.1 6.3 6.0

6.5

10.5

5.0

54

MAGNETOMETER TRAVERSES AREA 'A' SKIDEGATE CHANNEL I" = 100' J.C.S.

Magnet Group (cont'd)

High grade copper float was found in a talus slope near the south-west end of the occurrence. A sample of this assayed 5.36% copper. Mineralization in place is poorly exposed. The magnetometer survey outlined the area of interest most efficiently. However magnetite lenses found are too small to be considered a possible iron ore body. The largest zone indicated would not exceed 400 ft. in length and 10 ft. average width. It appears to be steeply dipping and from the sharp magnetic anomaly is probably shallow.

E. M. surveying with the SE-300 was not found to be very satisfactory. Depth of penetration would probably be in the order of 50-60 ft. Results are very discontinuous and further complicated by the steep hillside. Use of a larger vertical loop unit would achieve considerably greater depth of penetration, and it is possible that better continuity might be indicated throwing a more favourable light on the occurrence. This work would make use of the grid lines already established.

The following is a detailed summary of results on the individual showings:

Showing I 5025N; 4975E. Fig. III

This is an occurrence of magnetite and a little chalcopyrite with minor malachite stain in fractured volcanics. A little rusty material occurs above the showing - the immediate area above is covered by overburden to the foot of the limestone cliff.

An E. M. setup on the showing gave a strong crossover at 100 ft. above the transmitter, apparently at the limestone-volcanic contact. No crossover was returned below the showing.

No trenching or blasting was done. The showing appears to be of small size with poor visible prospects of extensions.

Magnet Group (cont'd)

Showing I-A, 5050N; 4800E Fig. III

Trench No. 1 was dug in an area of very strong negative magnetic readings. The trench encountered rusty, altered, fractured rock, with up to 60% magnetite at the north end. North 5 ft. of trench estimated to average 25%+ magnetite, remaining 4 ft. to the south, much less. No contacts were reached.

A copper-bearing float was encountered in this trench leading to a search for more copper. This float is presumed to have come from just above the trench,

No. 2 trench is on an outcrop west of No. 1 trench. The north end of this trench starts at the limestone contact. From 0? to 9' copperbearing material - rusty fractured rock with considerable actinolite and very variable amounts of chalcopyrite was uncovered. The bedrock then dropped very steeply and the remaining 6 ft. of trench did not reach bedrock. Fairly strong negative magnetic readings were noted over this section of the trench. A copper-bearing float, about one foot in diameter, was cut through in the trench and grade was estimated at perhaps 3% copper. Similar material was found patchily near the limestone contact above.

Grade of the 9 ft. width might possibly reach 1% Copper, but the rusty broken nature of the rock and small amount of work done, make this guess hazardous. Considerable very fine mineralization was evident in some sections.

Trenches Nos. 1 and 2 appear to be parts of a single zone. Distance between the trenches is about 60 ft. The zone lines up with the E. M. crossover above No. 1 showing to the east, and with a small skarn zone some 50 ft. further west. Thus, a total length of up to 300 ft. might be inferred.

Magnet Group (cont'd)

Showing II. 4850N; 4700E. Fig. III

This showing was located in four outcrops over a length of 160 ft., and extended by magnetometer readings for an inferred length of 400 ft.

Outerop 1.	Line 48 E	0'-2' volcanics
		2*5* 1620% magnetite
		5'-13' rusty skarn (actinolite)
Outerop 2	50* West	0'-12' 20% magnetite in skarn
		No contacts uncovered.
Outerop 3	35* West	
	0*-11*	50% 'spotted magnetite - no contacts
Outerop 4	70' West	
	0*	dark massive volcanics
	21-41	skarn (actinolite)
	4*-5*	40% magnetite
	51-91	massive magnetite
	91-141	50% magnetite
		No upper contact.

Very minor amounts of chalcopyrite and magnetite are found in cliffs 250 ft. west of Outcrop 4 and approximately on strike. Erratic high magnetic readings were obtained throughout nearly all of this interval.

Showing II A. 5010N; 4450 E. Fig. III

An E. M. setup was made on some loose rusty material at the above location resulting in a crossover at 4930N; 4490E. This crossover however exhibits a rather flat indefinite profile.

A second setup was made on Outcrop No.4 of Showing II at 4865N; 4640E with readings to the west and north - strong 'right' angles were recorded above No. II Showing, which faded out to zero going uphill and east along the base line.

A third setup at 5000N; 4500E with readings along Lines 44E and 46E gave a crossover at 4960N; 4600E. Strong 'right' angles on Line 44E were recorded at 5125N, but no crossover was reached. On Line 46E the E.M. profile exhibits an extra curve on the approximate strike of Zone IA. The hillside is extremely steep.

Magnet Group (cont'd)

Showing No. III 4775N; 4200E. Fig. III

This is a rather isolated occurrence of magnetite with a little chalcopyrite some distance below the general level of most of the showings. It occurs on the cliff face and shows narrow widths of massive magnetite, but nothing of ore potential.

9.

Showing No. IIIA. 4850N; 4000E. Fig. III

This is a zone of crratic high magnetic readings and short E. M. anomalies.

A pit was dug at the above location where some of the strongest magnetic readings were recorded. A width of 12 ft. of massive magnetite was uncovered in contact with volcanics on both sides. Contacts are steep.

A short distance north of this magnetite an E. M. anomaly inferred to have a length of about 150 ft. was outlined. Three small pits were put down, each of which encountered barren volcanics. On the strike of the zone to the east, a rusty area is exposed on the cliff face some distance below the level surveyed.

Cause of the anomaly was not determined, but is almost certainly due to sulphide mineralization.

Showings on Cliff Faces: 5100N; 3700E Fig. III

E. M. readings in this area gave two weak crossovers south of the base line on the general strike of Showing IIIA and a strong crossover on Line 39E at 5085N. This last anomaly however did not give significant readings on either Line 38E or Line 40E.

A setup was made at the top of the cliff above the copper showing on the cliff face. No dip angles of any importance were obtained. This might be due to the limited range of this equipment.

An attempt was made to blast this showing off the cliff face. Some copper was observed while placing the charge. The blast was only partially successful, and although some copper was picked up in the valley later, it does not compare with the high grade floats. Grade might run 1 - 2% copper.

Magnet Cove (cont'd)

Showings on Cliff Faces (cont'd)

Two other blasts around the cliff rim dislodged some magnetic bearing material, but nothing of importance was uncovered.

While placing the charge on the copper-bearing face, extensions of the showing could be seen some 20-30 ft. below on other side , but there was no definite indication of any appreciable length. A downward extension could be tested for by drilling near the top of the talus slide. The some is in contact with limestone on the hanging wall side. Composition of the footwall is still in doubt.

Dal Group

This group of 32 claims was staked to cover the limestone-Older Volcanics contact area north of Gudal Bay (Fig. VI) The very favourable geology in this area including the presence of porphyry dykes and small mineralized showings, indicates that detailed mapping and magnetometer surveying could well find mineralization of importance.

This programme would require approximately eight miles of picket lines to provide a grid for geological mapping and magnetometer surveying in the vicinity of the showings. Upon completion of this work, the vertical loop E. M. used on the Magnet Group would be used here to check the main areas of interest. Since some of this area is deveid of timber, work should proceed relatively quickly.

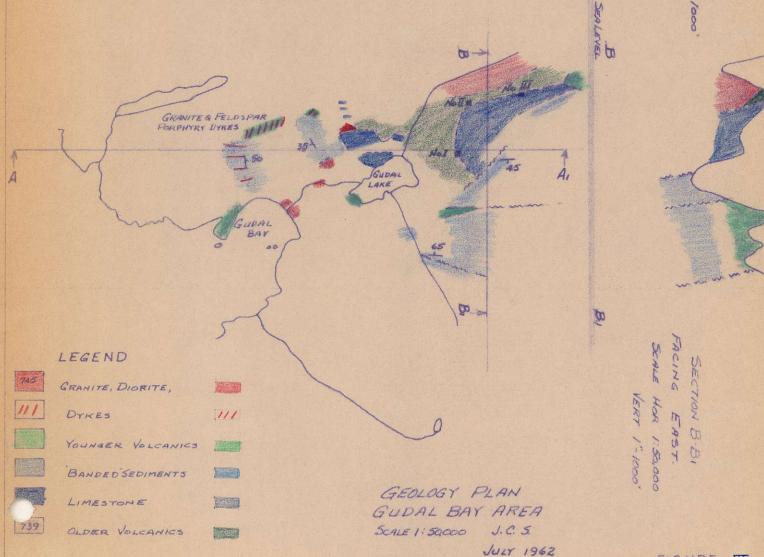
Both the Magnet Group and the Dal Group programmes would proceed simultaneously under the direction of one geologist.

The following indications of mineralization were found:-

Showing No. 1

An occurrence of pyrrhotite with some scattered magnetite and chalcopyrite occurs at the 980 ft. elevation (Fig. VI). On the showing very high magnetometer readings were obtained which fell off rapidly to the east. This mineralization occurs at the limestone-Older Volcanics contact.

SECTION A-AI FACING NORTH SCALE HOR 1: 50,000 VERT 1"-1000" AI

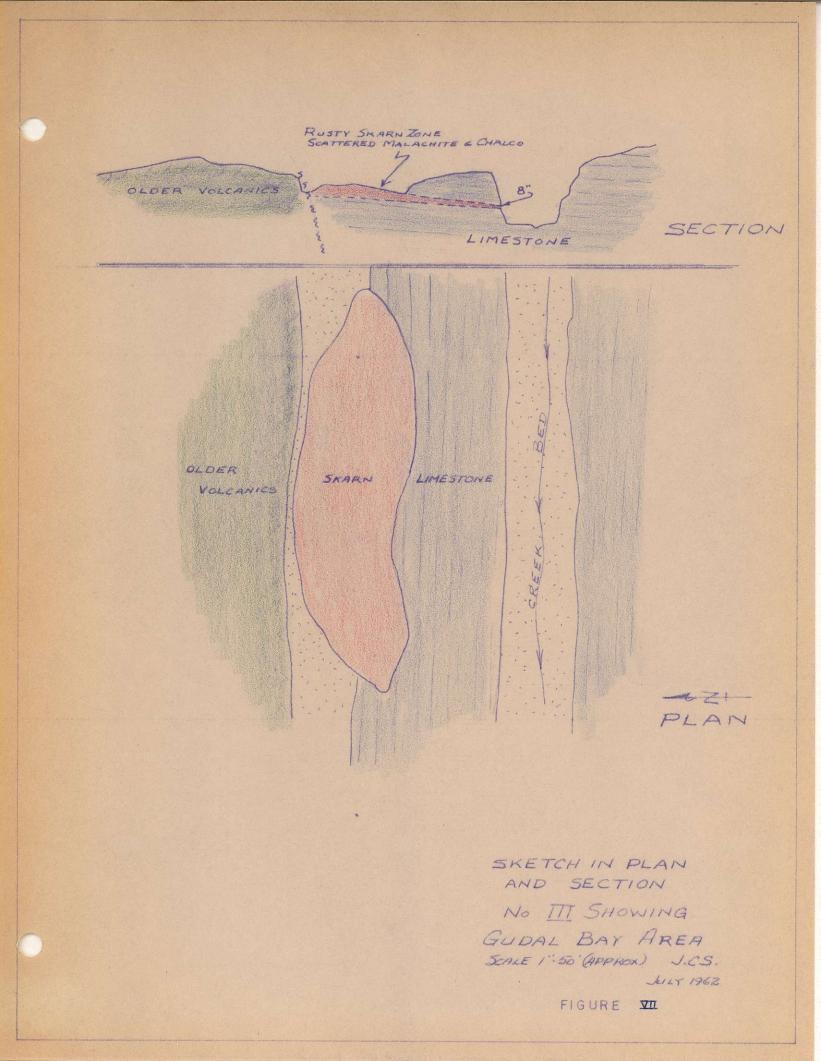


2000'

SEA LEVEL

FIGURE M

2000



Dal Group (cout'd)

Above, and to the east of the showing, lenses of volcanics appear in the limestone which may be areas of Older Volcanics showing through the limestone, or may be (at least in part) Younger Volcanics intrusives. Some indication of copper mineralization was located on one of these contacts.

The slopes are extremely steep, with areas of slash and deadfall. Showing No. II

At about 1300 ft. elevation on the limestone-Older Volcanics contact on the westerly slope of the mountain, the main creek issues from a series of fissures and caves in the limestone. Just west of the creek, a small draw follows the edge of the volcanic outerop. On the wall of volcanics at the bottom of the draw, an occurrence of magnetite with a little chalcopyrite was found. Somewhat anomalous magnetic readings were obtained in the area, but nothing to indicate a sizable body of magnetite.

Showing No. III (Fig. VII)

At the 2250 ft. elevation, on the limestons-Older Volcanics contect a rusty skarn is exposed over an area of approximately 200 ft. by 40 ft. with an indicated thickness in the order of 4 ft. Garnets are evident in a few places epidete is extremely common. Scattered malachite and chalcopyrite are found throughout. The original rock appears to have been a perphyritic volcanic sill. As indicated in the accompanying sketches, the skarn bed re-appears to the East as a thin sill in the limestone. Malachite was evident here, but very little chalcopyrite. It is thought that the limestone-volcanic contact has been faulted East side down. No extension was found in the velcanics. There is no appreciable magnetic anomaly associated with the showing.

Between Showings II and III, an area of albred volcanics shows considerable epidete, but no mineralization of consequence.

Below Showing No. II there are a number of zones or dykes of rusty volcanics containing scattered pyrrhotite. These dykes arethought to be related to the Younger Velcanics. Easty zones are numerous, but none of these examined proved of any interest.

The large rusty zones seen from the air in the area East of Gudal Lake appear to be rusty zones in banded sediments and Younger Volcanics. No mineralization of any interest was found.

Respectfully submitted, Stephen

Vancouver, B.C. November 20, 1962

LEGEND DYKES, PORPHYRITIC ANDESITE LIMESTONE, MINOR ARGILLITE VOLCANICS, INCLUDING SILLS AREA OF ANOMALOUS MAGNETOMETER READINGS -----MINERALIZATION MAGNETITE - Mag CHALCOPYRITE - CP

