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REPORT
ON
SARITA RIVER
and
TZARTUS ISLAND
MAGNETITE DEPOSITS

Alberni

MINING DIVISION
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Geologist

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SARITA RIVER AND TZARTUS ISLAND

MAGNETITE DEPOSITS

ALBERNI MINING DIVISION

B. C.

by

James J. McDougall

April 25th, 1957

R E P O R T

on

SARITA RIVER AND TZARTUS ISLAND MAGNETITE DEPOSITS

ALBERNI M. D., B.C.

Two neighbouring deposits of magnetite near Sarita River, which have been known for over 60 years, were examined by the writer during the first week in April. As these are both fully described in the literature (see 'references') a repetition here is not warranted. However, recent logging operations have greatly improved conditions of access and transport and a re-evaluation is necessary.

In general, these deposits are relatively small but should an iron and steel industry be established in British Columbia they could make important contributions.

We have been in touch with the Sarita deposit for some time, but as topographic maps published a few years ago indicated to us that the magnetite was on Indian Reserve we neglected to do anything until our policy was more firmly established. The present examination was carried out because it conveniently fitted in with that of Tzartus Island.

SARITA RIVER MAGNETITE

LOCATION AND ACCESS:

Sarita River enters Barkley Sound from the east about 32 miles southwest of Port Alberni, Vancouver Island, B. C. (See Map SR 1).

About 10 years ago McMillan and Bloedel established a 230 man logging camp about a mile south of the river mouth. It is now serviced twice daily by P.W.A., with float-equipped Norseman aircraft based at Port Alberni, and weekly by a small C.P.R. boat from Vancouver.

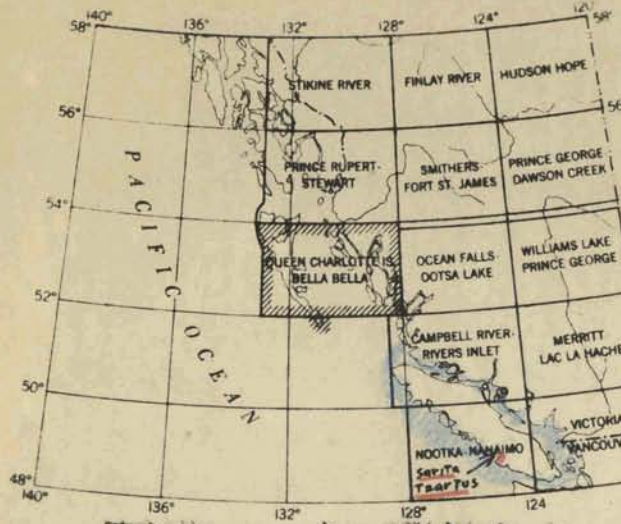
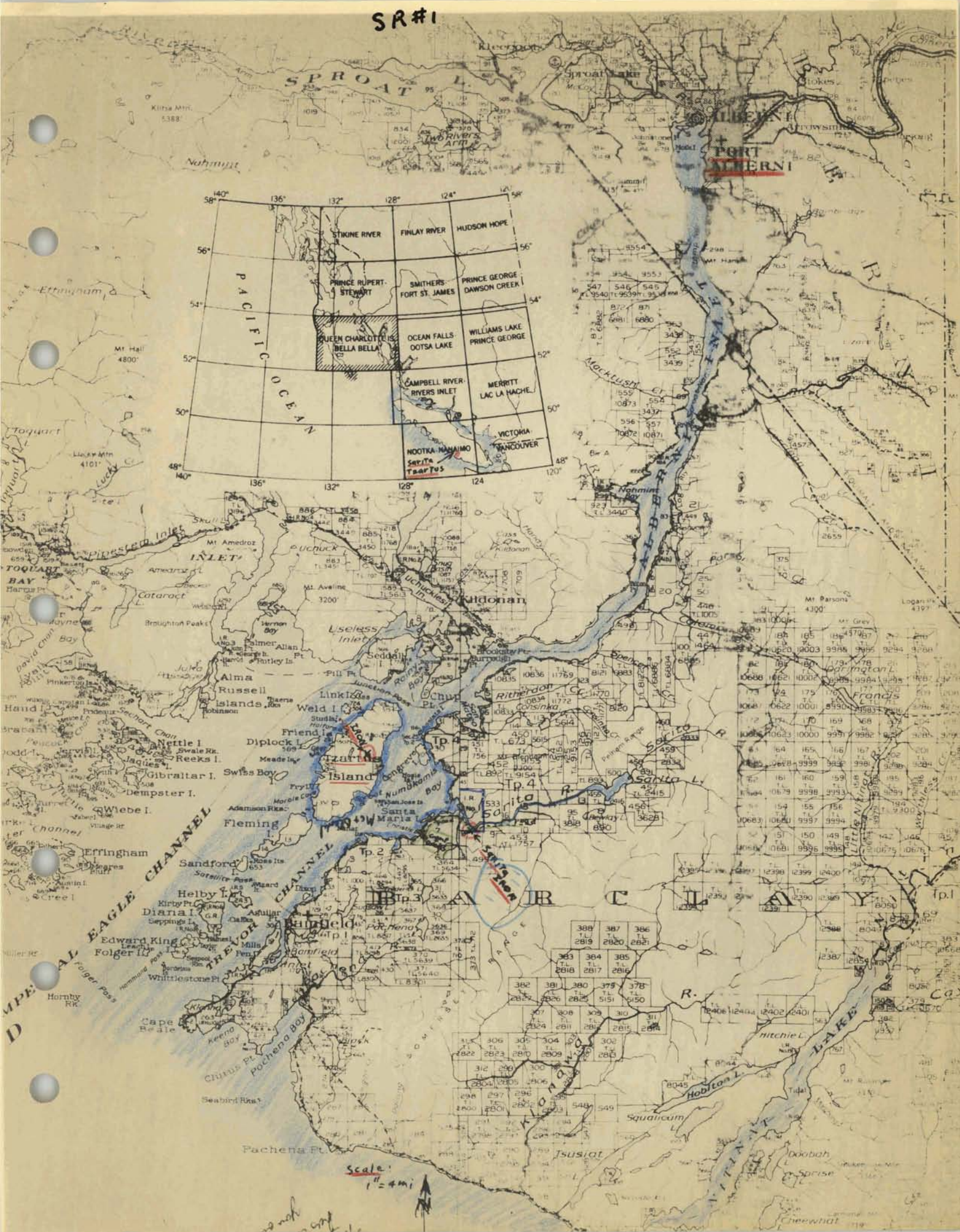
At least a dozen Indian families live on a large reserve centering around the lowlands of the Sarita.

The iron deposit now may be easily reached by following a good logging road for about 1-1/2 miles up the Sarita River to where a recently constructed short access road climbs the hill to the south. About 1/4 mile along the latter a short, westerly directed fire-break road, at elevation 125 ft., stops above and only 300 feet short of the main magnetite showing, and has actually run over and filled in an old open cut marking the eastern extension of the main ore-shoot (see Map SR 2).

PROPERTY AND OWNERSHIP:

Through up-to-date maps and information furnished by Mr. Lloyd, engineer at Sarita Camp, it is quite evident that, without exception, all deposits of interest previously described in the area occur within sub-lot(?) #18 which constitutes the southwest corner of Sarita Indian Reserve #1, Survey Lot #533. Old reports held that, although

SR#1



Scale:
1" = 4 mi

part of the magnetite occurred on the Reserve (this being later leased from the Indian Department) the main showings were on the Black Bear (lot 23) and the Union (Lot 54) Crown-granted mineral claims, which, along with five more adjoining, are presently controlled by a Mr. R.B.Wilson, Box 820, Victoria, B. C. As far as can be ascertained, no ore occurs within several hundred feet of any of these claims.

GENERAL GEOLOGY:

The rocks in the Sarita District consist of volcanics and sediments cut into several 2 mile-wide bands by granitic intrusives. These run westerly or north-westerly.

Clapp has placed the sediments (chiefly crystalline limestone) paralleling Sarita River in the Nitinat Formation of Jurassic or Triassic age. The Beale diorite, the intrusive of interest, is classed as Upper Jurassic or Lower Cretaceous. A large area of Vancouver Volcanics is present to the north. It is quite probable that the Nitinat Formation is the equivalent of the Quatsino Limestone which forms a strong belt farther up the Island and along which numerous magnetite showings occur.

Locally, the magnetite deposit occurs within a band of crystalline Nitinat limestone bounded to the south, and possibly underlain by the Beale hornblende or quartz diorite. Several exposures of fine-grained granitic rock were noticed to the north of this band. (At least

95% of the area is covered with light overburden and the local geology may be more complicated than indicated on Map SR 2).

The thickness of the limestone is unknown as structure is not apparent. However, the band is elongate in an east-west direction and reaches its greatest lateral development on the ridge north of the fire-break where the characteristic pitted surface can be traced across about 300 feet. More than one band may be present. Bedding structures were reported visible in only a few places and the dip is reported to be low or flat.

Diorite is well exposed on the Crown-granted claims to the south. As described in Iron Ores of Canada following examinations while the workings were still in good shape: "Apart from one or two small exposures near the bluff at the western end of the deposit, no diorite is exposed at the surface, whereas on the other hand, the inner 75 feet of the tunnel is in solid hornblende diorite. This fact, combined with the distribution of the two rocks to the east, leads to the inference that the ridge on which the deposit occurs is underlain by a boss of diorite whose contact with the limestone undulates about the plane lying at a shallow depth below the surface. Garnetized limestone and solid masses of brown garnet occur in some places near the intrusive contact."

The magnetite deposit is pyrometasomatic in origin and occurs as a replacement of probable impure limestone and possibly minor highly altered volcanic rock

near the diorite contact. Mineralization occurs erratically along this contact for at least 2500 feet easterly from the main workings which are located at the base of a small, steep bluff on the eastern side of a flat valley in which Frederick(?) Creek flows. At the eastern end of the zone the mineralization consists of typical "contact" pyrrhotite and pyrite showing varying amounts of chalcopyrite and a little magnetite. To the west, along the same general (but hidden) zone, and coincident with the greater development of limestone, massive magnetite relatively free of sulphides occurs. Here a drift was run along the limestone-magnetite contact exposed near the base of the bluff described. This is by far the best exposure in the area. At this point the magnetite body is at least 60 feet wide. It is bounded to the south by crystalline limestone which forms the remaining bluff in that direction for at least 200 feet. A mixture of skarn and minor altered dyke or volcanic rock is indicated to the north.

As several widely varying attitudes are present, due to the irregular replacement of the limestone, a general overall attitude is not apparent. The contact to the north appears to dip 40° to the south, and the south contact appears steep. In the first part of the drift, which follows the limestone footwall, the strike is southeast with a moderate to steep northeasterly dip. Near the end of the adit the diorite encountered overlays the magnetite with a reported dip to the southwest.

Beyond the bluff on strike to the west no

outcrop occurs for several hundred feet. This flat valley bottom is probably deeply drift filled and the dip needle gives no indication of magnetite underneath. The bluff described could easily represent a fault-line scarp.

Open cuts about 60 feet vertically above the drift expose at least two bands of magnetite and limestone which obviously occur as "prongs" from the main body below.

About 300 feet southeast of the portal, and cut by the firebreak road, about 60 feet of mixed magnetite and limestone occurs in an old open cut put in across the zone. The contact with the massive limestone to the north was reported to dip 65° southwesterly. No rock is exposed beyond the magnetite to the south. Because of constantly high dip needle readings, the writer feels that these showings are continuous with those of the bluff.

Magnetite has been picked up in open cuts for another 600 feet east of that described but these showings are now completely hidden. These were apparently not too impressive. The writer was able to pick up one fairly strong and one weak dip needle anomaly in this direction (see map).

DEVELOPMENT:

Early development began on a rust-stained bluff overlooking the Sarita River at the eastern end of the zone. Several adits, slightly less than 200 feet long, were driven into this bluff but work was abandoned when it appeared that the low grade highly siliceous and

sulphurous magnetite was of little value.

Exploration continued westward along a low, heavily wooded ridge and several cuts and short shafts were put in on massive copper-bearing pyrrhotite. Remnants of this work are visible where the access road cuts the nose of this ridge. This material does not appreciably effect the dip needle.

Good grade magnetite was reportedly picked up several hundred feet to the west and traced intermittently as far as the bluff by small cuts. As already mentioned these, with the exception of the cut near the end of the road at 125 ft. elevation, are now obscured.

The adit, collared at about 30 ft. elevation, has 295 feet of workings, plus a 10 foot winze. It was driven southeasterly in magnetite following the limestone contact for 111 feet before encountering diorite. A turn to the left at this point follows the magnetite for 76 ft. more to where the overlying diorite gradually cuts it out in the floor.

The Sarita deposit does not appear to have been examined in recent years and the logging company knew nothing of the westerly showings.

ASSAYS AND RESERVES:

Many assays have been made of the Sarita magnetite. Iron ranges from 52.4% to 64.3%, sulphur 4.85% to trace, silica 2.9 to 6.7, phosphorous 0.024 to trace, manganese 0.44 to trace, and titanium 0.05 to nil. An

average sample from 10 tons of material shipped assayed iron 52.4%, sulphur 0.2%, silica 4.6%, phosphorous trace, and titanium nil. A sample taken by the writer from the dump and walls of the drift assayed iron 54.9%, sulphur 0.25%, and copper 0.05%.

A sample of the better grade cupriferous pyrrhotite from the workings on the east end of the ridge assayed copper 2.35%, gold Tr. and silver 1.1 oz.

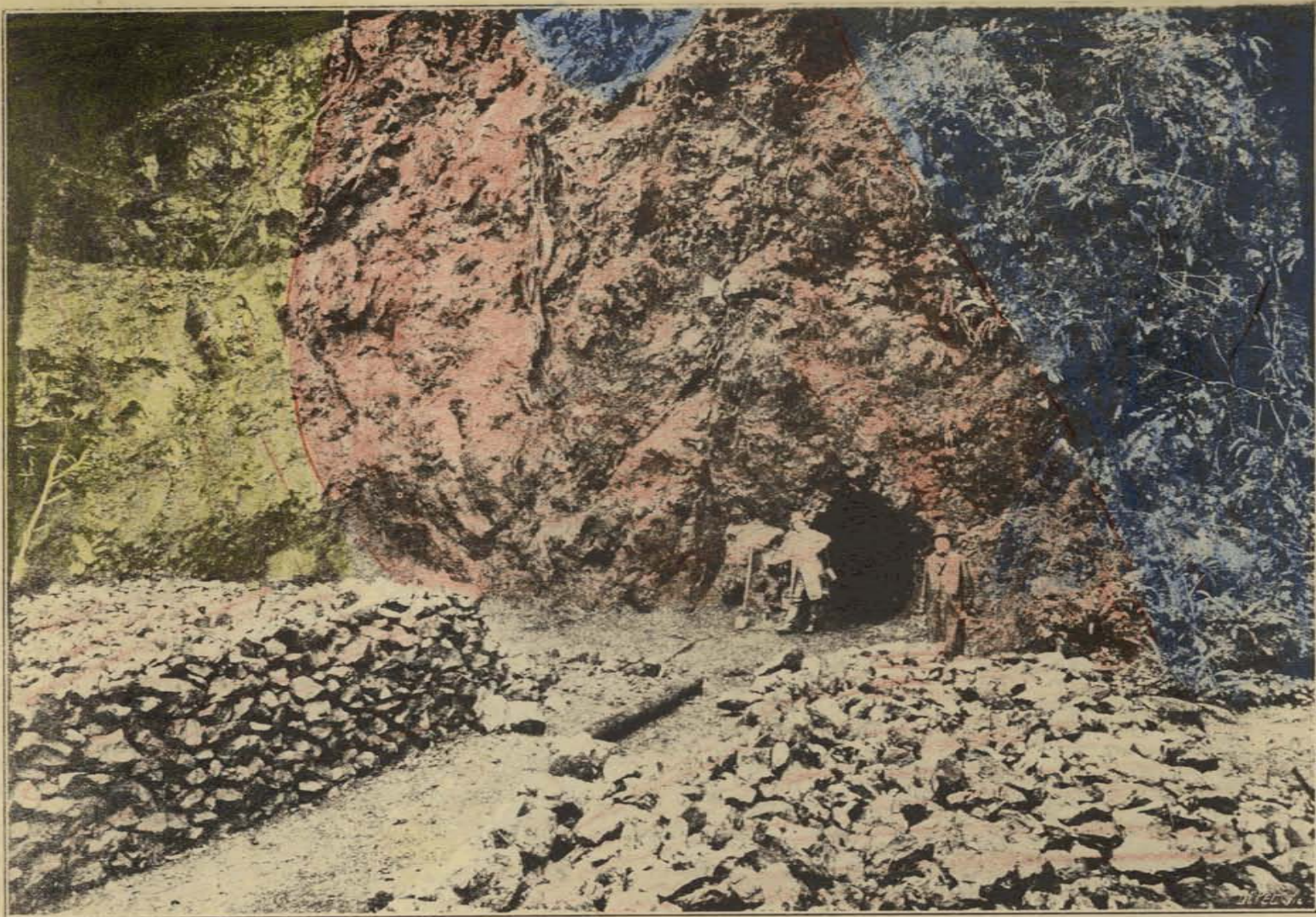
Due to the lack of vertical development of this erratic deposit, an accurate estimate of ore reserves is almost impossible.

Positive ore reserves are about 6000 tons, 500 of which are piled on the two ore dumps. Probably ore (above the drift level) has been estimated separately by two government engineers at 30,000 and 55,000 tons.

The writer believes that the bluff and open cut showings 300 feet to the east are connected. Should this be the case, at least 100,000 tons of possible ore is present to sea level. Considerable limestone inclusions could be included. Because of rapid mineralogical changes along strike, and the probably nearness of underlying diorite, the most liberal estimate of possible ore should not exceed 250,000 tons with present information.

CONCLUSIONS AND RECOMMENDATIONS:

The Sarita magnetite represents a small but exceptionally accessible deposit on which mining and shipping could begin almost at once with a minimum outlay of money.



EXPOSURE OF MAGNETITE ON BLUFF-SARITA IRON MINE-BARKLEY SOUND.

- Magnetite
- Limestone
- Stannite & fine grained intrusive

A 1/4 mile road should be built to join the bluff showing with the excellent gravelled logging road. By reimbursing the logging company for the use of their roads and constructing a barge loading ramp near their camp, a satisfactory arrangement for shipping could be made. This could probably be tied in with operations on Tzartus Island. The Sarita camp is now operating at about 1/2 strength, and a large fleet of privately owned heavy duty gravel trucks are working less than two days a week. They would welcome a short ore haul should logging conditions not improve in the future.

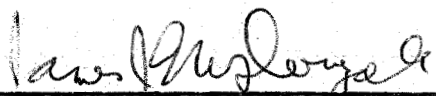
If we are interested in 30,000 - 100,000 tons of magnetite, an application should be made to the Department of Indian Affairs to lease a small part of the Reserve for exploration and possible mining purposes. The Indians would have nothing to lose by such an arrangement and can only gain by any royalty we would pay them. The logging company appears to have logged part of the Reserve and may have a similar leasing arrangement.

Exploration of the deposit by at least 1000 feet of short hole diamond drilling (packsack or X-ray) is essential before the proven ore reserves are increased. This could be easily accomplished. As there is a chance the ore could continue down the limestone-diorite contact additional drilling should be allowed for.

Several claims should be staked on open ground to the south and west should the company be interested in this deposit.

REFERENCES:

1. Iron Ores of Canada, Volume 1, pp. 191-198.
2. B.C. Minister of Mines Reports 1903, 1917.
3. Geology of Southern Vancouver Island, G.S.C. Mem. 13



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Geologist.




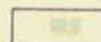

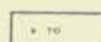
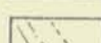
— MAP SR 2 —

SARITA RIVER IRON DEPOSITS

Base Map Copied From And With The Permission
Of Sarita Division Of McMillan and Bloedel Ltd

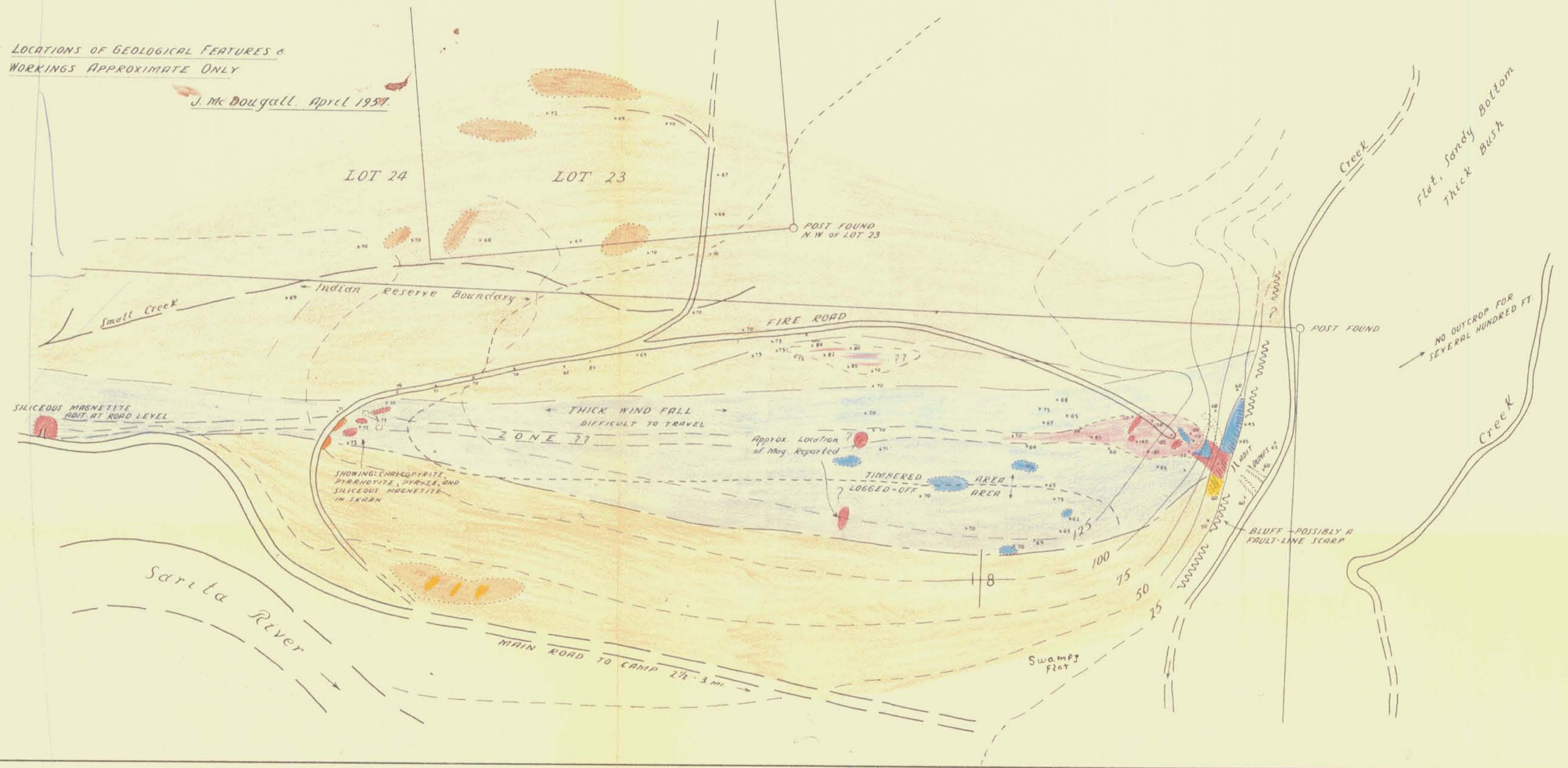
SCALE 1" = 200'

CONTOUR INTERVAL 25'

-  HORNBLLENDE QUARTZ-DIORITE OR RELATED INTRUSIVE
-  CRYSTALLINE LIMESTONE
-  SKARN
-  ALTERED DYKE OR VOLCANIC
-  MAGNETITE
-  DIP-NEEDLE READINGS - BACKGROUND 70°
-  GEOLOGICAL BOUNDARIES (DEFINED, ASSUMED, PROBABLE)

NOTE: LOCATIONS OF GEOLOGICAL FEATURES &
WORKINGS APPROXIMATE ONLY

J. Mc Dougall, April 1957



TZARTUS ISLAND MAGNETITE

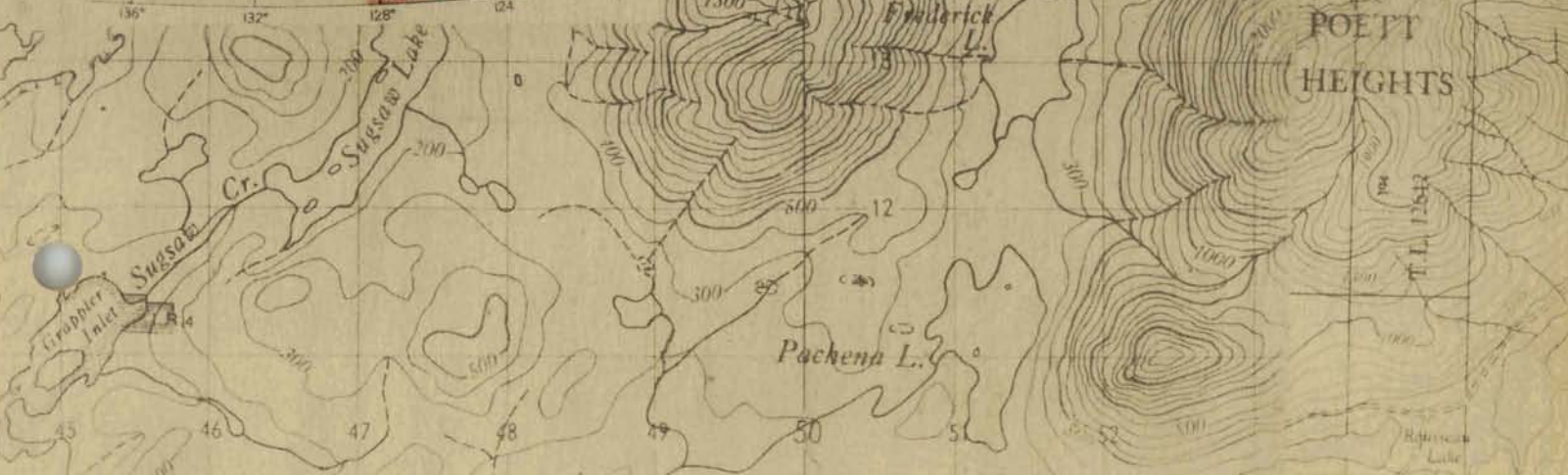
The magnetite deposits on Tzartus (formerly Copper) Island have been known for almost 70 years and examined frequently. Reports by government engineers (see References) are quite inclusive and repetition here is not warranted. During the present short examination special attention was paid the low grade zones lying between the better grade magnetite as mapped by the G. S. C., and to the possibility of proving ore solely by short hole drilling.

LOCATION AND ACCESS:

Tzartus Island, about five miles in length, is the largest Island in Barkley Sound, and is situated near the entrance to Alberni Inlet about 30 miles southwest of Port Alberni, Vancouver Island, B. C. The Island appears uninhabited but is only four miles west of the Sarita River Logging Camp operated by McMillan and Bloedel Ltd. (See Map TZ #1). This 230 man camp is serviced twice daily by float-equipped Norseman aircraft based at Port Alberni and weekly by a small C.P.R. steamship based at Vancouver.

Aircraft can land in a small bay in front of a good sand beach about one mile north of Sproat Bay on the east coast of the Island. From here the iron showing is only 1/2 mile to the northwest by a good but steep grade. The deposit occurs between 600 and 800 ft. elevation. As the highest point on the Island (881 ft.) is a small ridge composed largely of magnetite, the property is easy to find. No

T2 #1



trail exists but underbrush, except near the beach, is surprisingly light. Timber on the upper slopes is not heavy; this is probably the result of an old forest fire.

Water is scarce on the upper slopes although that in the old mine workings and small sloughs would be ample for a drilling program if the water was returned and re-used. Water could later be obtained from Holford Lake a mile to the west. This lake is 1/2 mile long and is at an elevation of 180 ft.

Only several small sections of the Island have been logged.

PROPERTY:

The magnetite showings are apparently well covered by a group of Crown-granted mineral claims, the present control of which is held by Mr. R. B. Wilson, Box 820, Victoria, B. C. These are the Mountain (L.28), Barclay (L.29), Clifton (L.33), Charmer (L.31), Pilot (L.34), Rainbow (L.30) and Sunbeam (L.32). The main magnetite showings are reported to be on the Mountain claim, although no corner posts were seen.

On the 28th of March of this year (1957) four claims were staked in the middle of the iron showings by Northwest Ventures Ltd., a small B. C. exploration company. The posts are obviously in the middle of the Crown-grants and it is doubtful if the Mining Recorder will allow them to be recorded.

DEVELOPMENT:

The lower deposit is developed chiefly by two open cuts and by one tunnel with an open cut approach (see Maps.

TZ #2 & 3). These are respectively 20, 70 and 140 feet in length, but as they all penetrate into the footwall disregarding the structure of the deposit they have not developed any noteworthy body of ore. Two shallow, water-filled shafts occur near the entrances to the open cuts.

Several small open cuts, pits, and shafts were observed on the summit of the hill but the amount of work was so limited that it was inconclusive.

GEOLOGY:

According to the G.S.C. - "On Copper Island are exposed a series of interbedded limestone, andesite, and andesitic tuff of the Vancouver Group, intruded by Beale Diorite, which is in turn cut by granodiorite. From Clifton Point northward for about one mile the andesite and tuff members, cut by sill-like masses of diorite, occur prominently with general northeasterly dips, beyond which limestone beds of varying thickness are interlayered with tuffaceous members. The southern and western parts of the Island are underlain principally by the two intrusive rocks above mentioned. Striking northwesterly from Clifton Point into the heart of the Island is a prominent contact between diorite and andesitic tuffs; and it is along this contact that the magnetite deposit is situated."

The tuffs are thin-bedded and can be seen in several instances to dip at low to moderate angles paralleling the slope of the hill. They are cut irregularly by dykes or apophyses of granitic rock confusing the overall

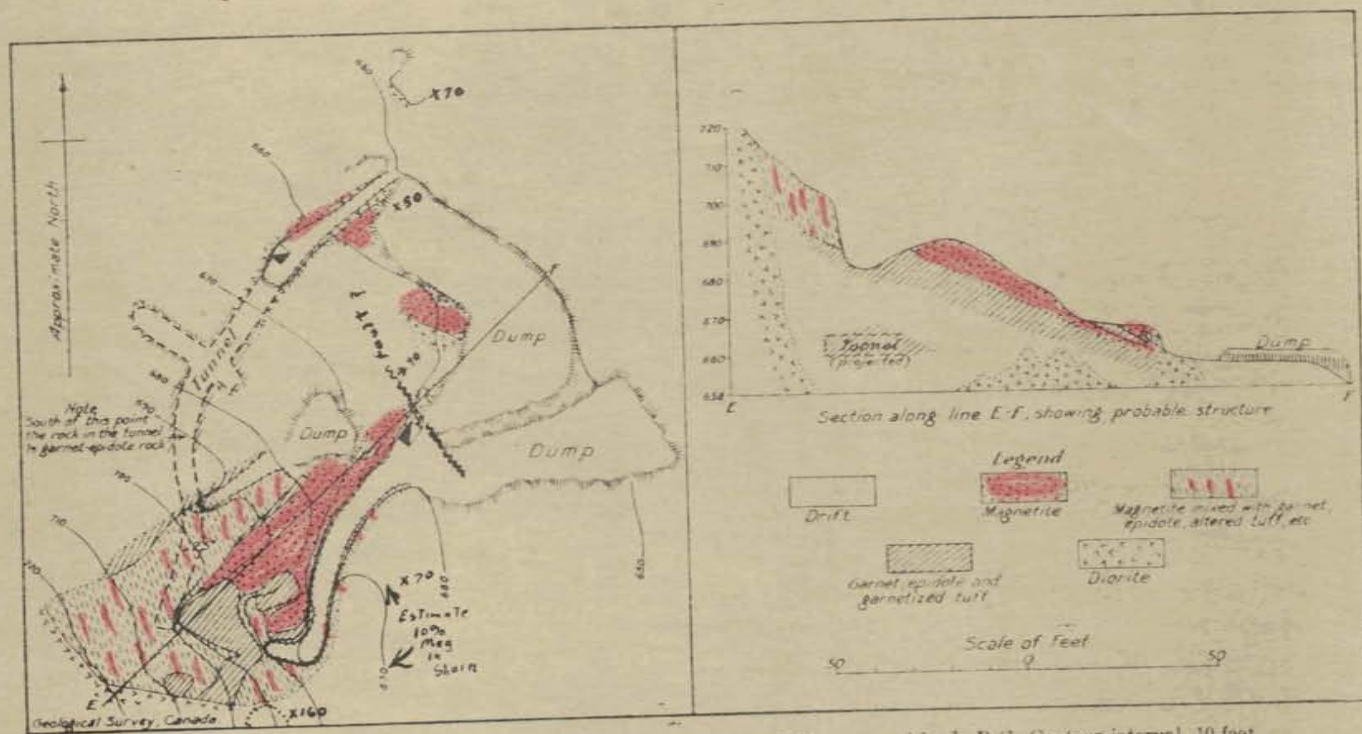


Figure 34. Principal magnetite bodies, Copper island, Barkley sound, Vancouver island, B.C. Contour interval, 10 feet.

T2 #3

picture. Several poorly defined dykes and sills of an intermediate to acidic nature were seen.

Signs of large scale faulting or shearing are lacking although common on a small scale. Near the largest open cut the low-dipping magnetite is in fault contact with the diorite to the northeast with the contact dipping 70° in that direction.

The magnetite occurs as a replacement of certain layers of the tuffs apparently near their contact with underlying diorite. The exact thickness of the magnetite zone is unknown and may vary widely but at no place where development has taken place is it shown to be more than 25 feet.

About 1/4 of the magnetite mapped is the massive variety showing little impurity. The remainder contains up to 60 or 70% by volume of unreplaced country rock in the form of altered tuffs or skarn. The sulphide content is generally low although slight pyrite and chalcopyrite occasionally occur as isolated grains.

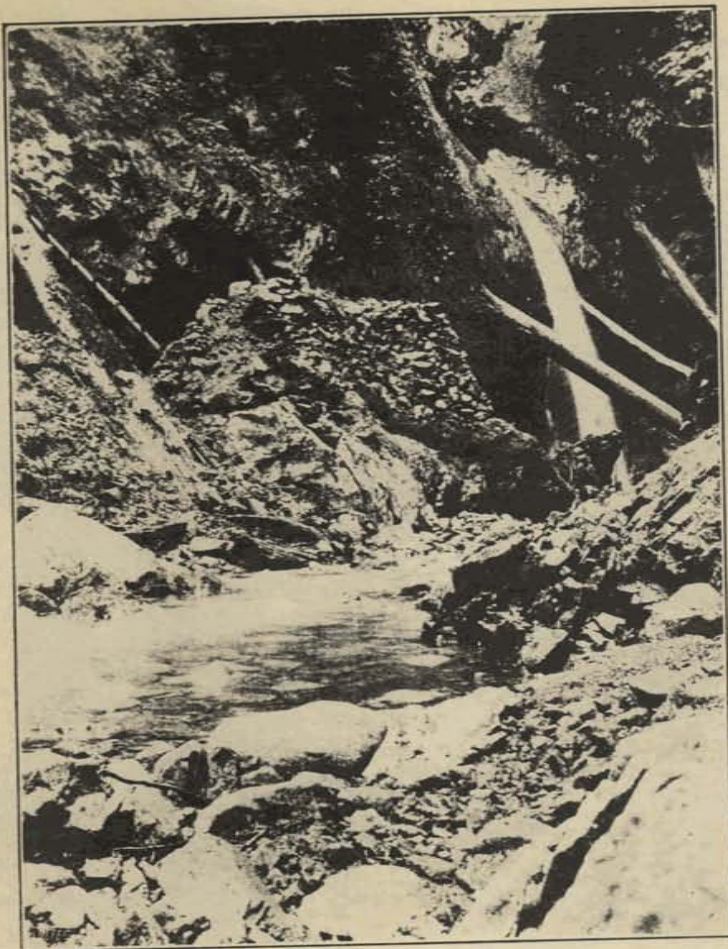
ASSAYS AND RESERVES:

A large number of samples taken of the deposit in the past assayed in the following ranges:

Iron 40 to 62%, Phosphorus nil to 0.098%,
Silica 6 to 22%, Sulphur 0.2 to 2.2%, Manganese tr. to
0.24%, and Titanium nil to trace.

Two surface samples taken by the writer from the upper and lower showings assayed respectively as follows:

Soluble Iron 49.0 & 55.8%, Sulphur 0.05 & 0.03%,



MAGNETITE EXPOSED BY BUGABOO CREEK TO DEPTH
OF 40 FEET.



OPEN CUT THROUGH MAGNETITE-IRON MINE,
COPPER ISLAND.

— Magnetite
— Volcanic, or granite

Faulted
off

Copper trace & trace, Phosphorous 0.09 & 0.12%, Titania 0.15 & 0.10%, and Silica 15.42 & 10.96.

The assays coincide essentially except that ours show a slightly higher phosphorous content. This is apparently due to better assay techniques at present. Some of the phosphorous may be present as apatite in the country rock.

It is impossible to give reliable estimates of probable or possible ore in this case as vertical development, particularly in the upper zone, is lacking. Outcrop and float are scattered through an area at least 600 feet square. Solid exposures as mapped indicate about 5300 tons per vertical foot of ore which should average 50 or 60% magnetite. An additional possible zone, partially indicated by float and erratic dip needle readings, could add 7500 tons per vertical foot of 30 to 50% magnetite. If the magnetite is assumed to have an average thickness of 20 feet (the greatest exposed over any distance so far) about 100,000 tons of probable and 150,000 tons of possible ore averaging about 50% magnetite could be present. Proven ore, including that on the dumps of the lower workings, is about 1500 tons.

CONCLUSIONS AND RECOMMENDATIONS

The Tzartus Island magnetite represents a small deposit, which, if tested, may show up 1/4 million tons of low grade magnetite which would require beneficiation before shipping. Any depth beyond the 20 feet suggested would increase the ore reserves considerably. Magnetometer explora-

tion would readily indicate similar but hidden deposits if they exist along the widespread contact zone. As the magnetite occupies a dip-slope position, it could be easily mined.

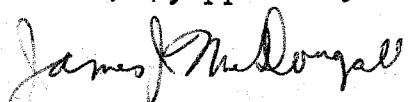
If we are interested in tonnages of this order which would be useful only to supplement larger production from elsewhere, a short hole packsack drilling program would be warranted. About 1000 feet of drilling is necessary. Water could be obtained from several small shafts scattered around the property and would be sufficient if some of the water was re-used.

As overburden is at least several feet deep on the hillside, an access road with several switchbacks could be easily constructed from the beach below if results warranted it. Equipment could probably be obtained from private contractors now working only part time at the Sarita Camp.

It should be noted that this magnetite has a higher phosphorous content than that usually found in coastal deposits although other objectional impurities are low.

REFERENCES:

1. Iron Ores of Canada, Col. 1, G.S.C. pp. 198-205.
2. B.C. Minister of Mines Reports 1903, pp. H217
1917, pp. K285


Jas. J. McDougall, Geologist.