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REPORT

ON

QUEEN CHARLOTTE ISLANDS BLACK SANDS

SKEENA

MINING DIVISION

F. T. Russell &
J. A. Robertson

~~ENGINEER~~

REPORT ON

QUEEN CHARLOTTE ISLAND BLACK SAND DEPOSITS

A report by F.T. Russell and J.A. Robertson* is enclosed. Their sampling technique was that used successfully by us on original evaluations of the similar but higher grade Klukwan alluvial black sand deposits.

Previous Work and Conclusions Reached

1. Clair Donaldson and Associates (1954) - "large tonnages will average 5% magnetite, and concentrations contain 10% TiO_2 as rutile."
2. Fred Hemsworth (1954) - estimates 5% magnetite in beach sands with 1% 'black sands' in the cliff deposits. TiO_2 (mainly ilmenite?) is reported to be 6% in the concentrates and vanadium about 1%.

Samples collected by Hemsworth were picked and only estimates made of the remaining material. Our lab results on these are enclosed.

Four samples collected by our prospectors gave unusually high gold values (in the order of $200/ cu. yd.) Flour gold is common in these sa nds but recovery has not proved economic. Considerable information regarding early gold placer has been published in the B.C. Mines Report, and in view

* St. Eugene prospectors

of this data we can not accept our high values as being representative. Our samples are no doubt of local highly concentrated sections but nevertheless the by-product recovery of fine gold would prove important if the black sands were otherwise worth extracting.

Samples on hand to date indicate a ilmenite to magnetite ratio of 1 to 2 or 2.5 to 1.*

Using as a basis our relatively large amount of experience in recent years on black sands in B.C. and Alaska, we did not feel justified in recommending further work on the Queen Charlotte sands. The overall mineable magnetite grade is only 1/20th of that which we have in large quantity near more suitable tidewater in S.E. Alaska but which itself has not yet been proved definitely economical.

Except for a slightly higher titanium content, the overall grade of the Rosepit sands is approximately that of other common coastal deposits. However, due to a peculiar combination of wind and sea, local, "short-lived" shallow concentrations covering a superficially large area are formed. How these could be economically mined between high tides and gales along a 30 mile coast which even the Haida Indians will not approach from the sea at any time poses a great problem.

It must be remembered that our prospecting was not exhaustive. However, we did check a thirty mile section surrounding the area of interest on three sides. The interior could conceivably contain large buried deposits of economic

* probably too low for an average

interest. If they were of sufficient grade to attract attention airborne magnetometer work would detect them as the overall magnetic background is hardly noticeable.

J. McDougall
St. Eugene Mining Corp.

Vancouver, B.C.
Jan. 21st, 1957.

REPORT ON

QUEEN CHARLOTTE ISLAND BLACK SANDS

SKEENA MINING DIVISION

BRITISH COLUMBIA

by

F.T. RUSSELL

Vancouver, B.C.

June 23rd, 1956.

REPORT ON

QUEEN CHARLOTTE ISLAND BLACK SANDS

SKEENA MINING DIVISION

REPORT ON

QUEEN CHARLOTTE ISLAND BLACK SANDS

Introduction

During March, 1956, the writer and J. Robertson spent 10 days examining the extensive black sand deposits occurring near the northeastern tip of the Queen Charlotte Islands. Beach and bank sands were checked along a 30 mile length of coastline. A large number of spot tests were made to determine the magnetite content, and several bulk samples collected.

Location and accessibility

The beach sands are in the Skeena Mining Division near the north end of Graham Island of the Queen Charlotte Group. The sand of interest is located on the north of Rose Point. (Refer to map enclosed with report.)

Rosepoint can be reached by chartering a plane at Queen Charlotte City and flying to Massett, or by road from Queen Charlotte City to Port Clements. A small passenger and freight boat travels from Clements to Massett twice a week. Union Steamships call on alternate weeks. The government has a weather station at Massett manned by the R.C.N. All hospital cases have to go to Queen Charlotte City. There is one hotel, two general stores, one cafe, a post office, gas station and garage. B.C. Airlines maintain radio communication.

A 16 mile road from Massett connects with Tow Hill, on the north coast, from where the beach may be travelled as far as Oeanda River, a distance of 25 miles.

The only jeep transportation available at Massett was supplied by Mr. Hagerman and his son, the rate being $15.00 per trip to any part of the beach near Rose Point. Mr. Hagerman is captain of a goverument fisheries vessel, and only very seldom at home. His son is attending school and only free on week ends. They will not rent the jeep to parties unfamiliar with the hazards of the beaches, mainly soft spots and creek crossings. All travelling has to be done below the high tide mark with its immense driftwood accumulations through which passage is almost impossible. Heavy rollers breaking on the beach are another problem. The population of Massett and district is approximately 600, mostly centering around the local crab cannery as well as other fishing and some logging.

Physical features and climate

The north east coast of Rose Point on Graham Island is largely a lowland muskeg within a moderately wet climate zone influenced by strong N.E. and S.E. gales.

The timber is small: spruce trees are plentiful, growing on higher ground. Streams in this area are discolored due to the peat accumulations, etc. through which they flow. The deer are abundant along the east coast, along with geese and ducks in the swampy areas. Razor clams and crabs are plentiful along the north and east beaches.

Extensive beach and bank sands occur. Along the whole east coast the sand bank is 35 to 40 ft. high and runs inland a distance of 50 to 500 ft. This bank is being continually built up

and torn down by wind action. In behind the sand banks the ground drops off into level or rolling ground containing small lakes and extensive swampy areas. Soil is either clay or peaty material.

History

Information from some of the older Indian residents who are of the Haida tribe, claim the population of the Queen Charlotte Islands was about 80,000 at the time when the Spanish ships were coming to the islands.

The Hudson Bay Company established a post on Graham Island near Massett, with the idea of settling the potential farmland between Rose Point and Tlell. Population on the island at this time was not enough to support this plan and outside markets were lacking. The plan collapsed and the company left the island without a real start having been made. The cattle left behind at this time were the ancestors of the wild cattle now present.

Parts of the Queen Charlotte beach sands have been worked from time to time for their gold content and were recently staked (1954) by parties interested in their magnetic iron and titanium content. These special Placer Leases were dropped without any amount of work being done. The map accompanying was traced from the 1954 government claim map. Much correspondence is in our files regarding past interest in the iron, titanium, uranium, etc. content of these sands. However as earlier work was based on small scale and local sampling, results will not be included here.

Regional Geology and description of beach sands

Approximately 800 square miles of the N.E. portion

of Graham Island is a lowland of stratified glacial drift which overlies practically unconsolidated tertiary sediments. Concentrations of black sands are being formed on the beaches at high tide mark along the driftwood line. The magnetite, etc. is derived from 25 to 40 ft. cliffs of stratified glacial drift against which the sea beats at times. Southeasterly gales play a large part in forming these concentrations on the beach, the dimensions of which are 1/4 inch to 12 inches thick, 10 ft. to 15 ft. wide, and 50 ft. to a mile long. Some concentration probably took place during the original deposition of the material by glacial rivers, or outwash plains. Later large areas may have been worked over by the sea when the sea level was higher than it is at present. Two distinct layers of sea shells show in the bank approximately 1 mile south of Oeanda River, the first layer 4 ft. above high tide and the other 2 ft. above that. Some of the sand banks are being reworked by the wind, forming dunes. The black sand layers in the cliffs most commonly are in the lower half, with barren sand layers, clay, and peat above. In some sections of the cliffs old river channel gravel can be seen. Banks a mile in length have been found to obtain little, if any, black sands. In many places along the east coast beach, layered clay is present 3 ft. below the sand surface. Large glacial boulders, similarly exposed, give the impression that black sand accumulations over large areas cannot exceed 10 ft. in depth.

Assay and Reserve

To eliminate collecting large samples, a large magnet and a graduated glass test tube were used to determine the

pounds per yard of magnetite. Three samples of natural black sand concentrations and one creek panning sample were brought out, but not yet analyzed.

Sample No. Q1 1 pan sample from a small creek 2 miles south of S.P.M. #42P

Sample No. Q2 Natural beach concentration 1 mile south of Oeanda River S.P.M.L. #41P

Sample No. Q3 Natural black sand concentration from bank three miles south of Rose Point tree line S.P.M.L. #44P

Sample No. Q4 Natural black sand beach concentration, one mile west of Rose Point tree line on the north beach S.P.M.L. #40P

Our method was to sample the cliffs, at 1/4 mile intervals, from their base up to but not including the peat on the top. A strong magnet and a 50 ML test tube were used to separate the magnetite and this was calculated in pounds per yard. The sampling was carried out to determine the best average grade possible over satisfactory widths. Wind-formed unstratified dunes were sampled separately.

The average magnetite content of several composite cliff samples, the locations of which are shown on the accompanying map, is as follows:-

No. 1 - Interval ---Clearwater Lake S.P.M.L. #42P, to the south end of S.P.M.L. #42P, a distance of 4 miles, is 12 pounds per yard.

No. 2 - Interval --- From the Oeanda River S.P.M.L. #41P south for 4 miles, the magnetite content of the cliff and beach drops off considerably. Only one section 200 ft. in

length contains visible magnetite, the rest being practically barren.

No. 3 - Interval —— From Clearwater Lake S.P.M.L. #43P, north to old mine cabins S.P.M.L. #44P, the average is 10 pounds per yard.

No. 4 - Interval —— From old mine cabins S.P.M.L. #44P, to the north end of S.P.M.L. #44P the content is 12 pounds* per yard.

*Max. approx .06 t/yd

On the north beach where cliffs are lacking, the only concentrations of black sand are at high water mark. These average 10 ft. in width, are 6 to 12 inches deep and are erratically distributed through about 4 miles. No average of the north beach was estimated as this small amount of black sand is not of interest. The amount of magnetite in the sand dunes, relative to that of the cliffs, is small and would not average over 7 pounds per yard.

Conclusions

It is of our opinion that the Queen Charlotte beach or banks could not be worked economically on a large scale due to the low average overall grade of magnetite, the great amount of buried logs and driftwood, the rough water, the strong winds, the lack of transportation, etc. The black sand concentrations on the beach could probably be worked on a small scale by high grading. This is not the case with the banks which would hold the only tonnage of interest but lack the grade.

Vancouver, B.C.
June 23rd, 1956.

F.T. Russell

REPORT ON

QUEEN CHARLOTTE ISLAND BLACK SANDS

SKEENA MINING DIVISION

BRITISH COLUMBIA

by

J.A. ROBERTSON

Vancouver, B.C.

June 29th, 1956.

REPORT ON

QUEEN CHARLOTTE ISLAND BLACK SANDS

On the N.E. coast of Graham Island 16 miles by road from Massett the sands extend from the river at Tow Hill on the north beach to the Tlell River on the East Coast approximately 40 miles.

From below high water there is concentrates of black sands caused by wave action depending on storms on a tide of the right height plus the proper riffles or barrier such as drift wood and logs in the proper position to the waves causing a natural riffle or trap.

In such places concentrates of almost pure black sand were noted up to 12" deep over an area of about 50 to 200 sq. ft.

In places, during dry weather and high winds, concentration takes place in amongst the drift wood, but this is only very thinly scattered on the surface. During these windy spells much sand has been blown up on the benches and now form sand dunes, some as high as 50 to 60 ft. and 200 to 300 ft. long, all of these carry small amounts of black sands.

The benches 0 to 40 ft. high appear to have flat lying bands of black sands in them, but on close examination of these bands this appearance is caused from thin flat laying bands of sand containing a small amount of clay which does not erode or blow away as readily as the sand itself. This ridge acts as a riffle which in turn holds some of the black sand that is either falling from above or blown up from below.

Samples were taken at intervals of 1/4 mile, using a 50 cc. glass vial and a strong magnet. Using this in water we

were able to get a good separation. Our average sample gave us less than 1/2 cc magnetic black sand, which amounts to about 10 - 15 lbs. per cu. yd.

J.A. Robertson

Vancouver, B.C.

June 29th, 1956.

Russell - ST. Eugene Sampling 1956

Quebec Metallurgical Industries Ltd.

OTTAWA RESEARCH LABORATORIES

1605

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REPORT OF CHEMICAL ANALYSIS

Engineer: C. Eggert. Date: June 8, 1956

Lab. No.	Material	Sample No.	Description	% Fe	% Nb	% TiO_2	oz/ton Au	%	%	%	%		
B 3761	1332	Q.1	Queen Charlotte	54.0	nd	12.8	3.08	Con.	45.0 gms = 3.= 1/gd. au		3000 #/yd.		
2	"	Q.2	"	40.8	nd	8.6	3.25				6000 #/yd.		
3	"	Q.3	"	19.8	nd	4.5	.235				6000 #/yd		
4	"	Q.4	"	22.5	nd	3.5	3.26				6000 #/yd		
		Mn and Zr are in the order of .1 by scanning											
		Reference your letter No. 1488											

DESCRIPTION OF SAMPLES OF
QUEEN CHARLOTTE ISLAND BLACK SANDS

Hemsworth Samples

Feb. 11, 1955

#1. 10 lbs. Black Sand from 3 mi S of Rose Spit. 2' black sand overlying gravel. 1 mi length, 15' wide at high tide level in amongst driftwood.

#2. 22 ozs Sand cliff sands same place as (#1). Very thing black sand bands, in yellow sands and huge tonnage available.

#3. 25 ozs /Cliff sand bank 20' high Oeander R. Freshwater only at Oeander R.

#4. 21 ozs Black Sand 2 mi N of Oeander R. 6" deep, 1 mi long, 10' wide next to high tide mark.

#5. 30 ozs panned concentrates same area as (#1); some light flakes of gold

PANNING AND MAGNETIC CONCENTRATION
(Values in % of total weight)

Panning plus Magnet Test.	Tails	Magnetite	Middling	No-Mag.
Sample 1.	22	11	56	11
2.	80	3	13	3
Magnet only				
1.		16	52	31
2		2.5	12	85
3		13	33	55
4		34	53	13
5		25	58	17

Mineralogy #1 Sample

22% Tails - 65% garnet, 25% hornblende
1% zircon 5% quartz, 4% epidote.

11% Magnetite

56% Magnetic middlings estimated to be 70% ilmenite.

11% Non-magnetic heavies (40% zircon, 25% garnet, 25% ilmenite? 5% epidote or monazite? Trace columbium.)

BLACK SANDS, QUEEN CHARLOTTE ISLAND, B.C.

On February 15, 1955, five small samples of beach sands from Queen Charlotte Island, B.C., were received from Alex Smith. These were given our Sample No. 1023. The weights of the samples were as follows:

No. 1	4300	grams
No. 2	560	"
No. 3	600	"
No. 4	500	"
No. 5	700	"

Mr. Smith reported that a semi-quantitative spectrographic analysis of a panned concentrate made from combined Samples 1 - 5 was as follows:

Silicon	20%
Boron	0.01
Manganese	0.50
Aluminium	2.5
Magnesium	1.25
Tin	0.01
Vanadium	0.10
Calcium	1.0
Chromium	0.06
Copper	0.003
Sodium	0.20
Titanium	15.0
Zirconium	1.0
Nickel	0.01
Strontium	0.02
Barium	0.003
Iron	Balance

Concentration tests were made to determine the composition and possible value of a magnetic concentrate consisting mainly of magnetite, and a non-magnetic or weakly magnetic gravity concentrate containing ilmenite, gold, and other heavy minerals.

Tests were made by tabling the sands and then passing the table concentrate through a low-intensity magnetic separator to give a highly magnetic concentrate and a non-magnetic fraction, called for convenience an ilmenite concentrate. Details of the five tests are attached. They show that the magnetic

Lab. Test 219-5 February 16, 1955.

Object - To make a concentrate containing gold from Queen Charlotte Island black sand No. 5, our sample No. 1023.

Procedure

1. Fed 700 grams of Queen Charlotte Island black sand No. 5 to a laboratory Wilfley table to give a table concentrate and a tailing.

2. Dried the table concentrate and fed it to a Ball-Norton magnetic separatorto give a magnetite concentrate and a tailing which was called an ilmenite concentrate.

3. Dried, weighed, and analyzed the products.

Results

Product	Percent Weight	oz./ton Au	Analysis % Fe	TiO_2	Cb
Magnetite concentrate	23.57	Trace	68.10	1.53	--
* Ilmenite concentrate	59.30	0.665	54.80	18.50	0.043
Tailing	17.13	0.150	34.70	7.40	--
Heads (calc.)	100.00	0.420	54.04	12.60	--

Percent Distribution

Au	Fe	TiO_2
Nil	29.70	2.86
93.88	60.13	87.07
6.12	10.17	10.07
100.00	100.00	100.00

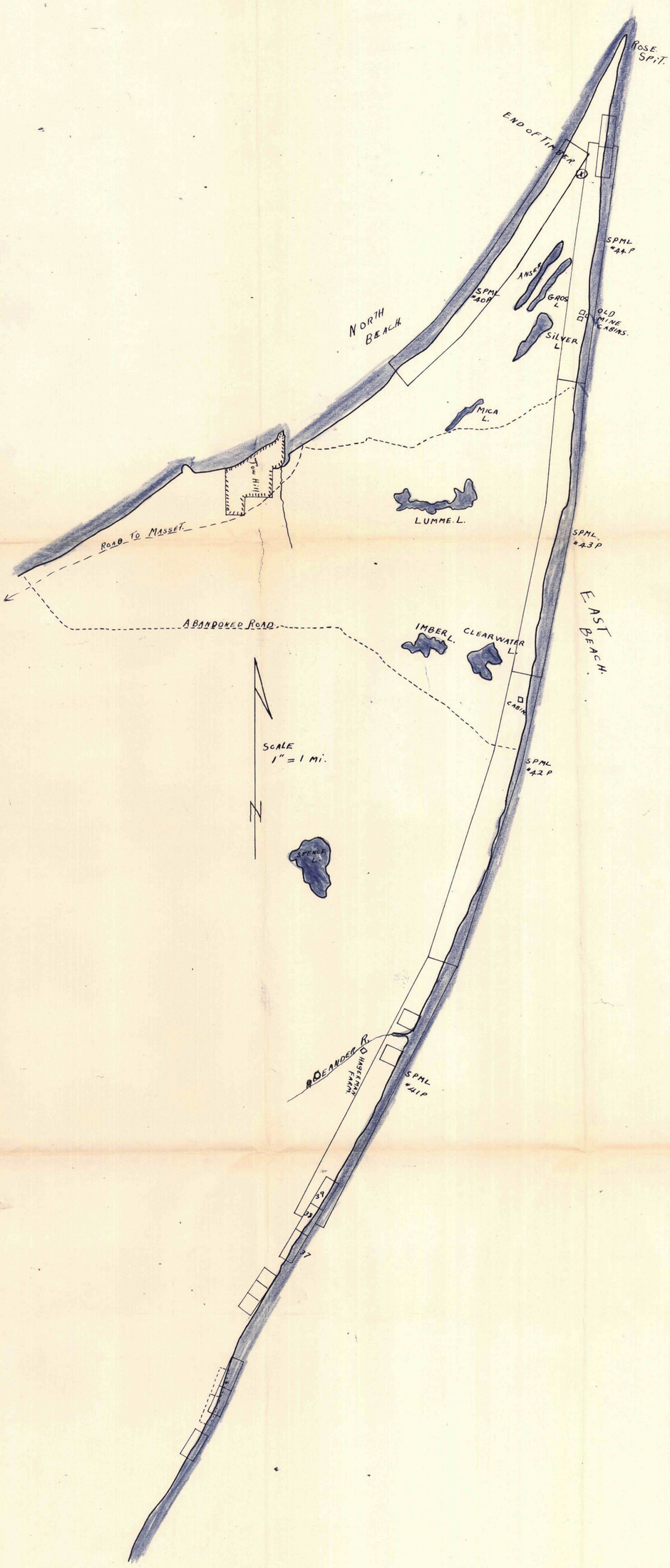
* not necessarily all ilmenite

concentrate contains about 70% iron, which is a very high grade iron ore. The ilmenite concentrate contains 90% or more of the gold with assays from 0.12 to 0.74 ounces per ton, and 15 to 18% TiO_2.

If the five samples represented a large amount of sand in a locality where low operating costs were possible, this would be an attractive prospect. Mr. Smith's report shows, however, that the bands of black sand are narrow and are interspersed with much thicker bands of barren sand, which reduces the average to an uneconomic level.

Ottawa, Canada,
May 6, 1955.

Quebec Metallurgical
Industries Ltd.



QUEEN CHARLOTTE ISLAND BEACH SANDS.

J.A.R + F.T.R.