

REPORT ON
SELWYN EXPLORATIONS LTD. (N.P.L.)
SHELL CREEK IRON DEPOSIT
YUKON TERRITORIES

BY

GORDON P.E. WHITE

OCTOBER 18, 1967.

GEOLOGICAL SURVEY
NOV 27 1968
Resident Geologist
Whitehorse, Y. T.

This report has been examined by
the Geological Evaluation Unit.
Approved as to technical worth by:

D. C. Furlan
RESIDENT GEOLOGIST

Approved as to cost in the amount
of: \$ 2720.31

P. G. Redden
RESIDENT MINING ENGINEER

Accepted as representation work
under Section 53(4) Yukon Quartz
Mining Act.

[Signature]
COMMISSIONER OF YUKON
This report has been examined by
the Geological Evaluation Unit.
Approved as to technical worth by:

[Signature]
COMMISSIONER OF YUKON

SUMMARY

Iron claims held by Selwyn Explorations Ltd. in the Yukon, cover a sedimentary, banded iron formation which has been traced for five and one half miles along strike. Preliminary assaying and beneficiation tests indicate a possible economic grade ore and concentrate.

A large open pit operation is considered feasible if 200 million tons of 30 - 35% Fe could be proven, and a graduated programme to explore this property is recommended.

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LOCATION MAP

SCALE 1" = 4 MILES

TO PROTECT OUR CLIENTS, THE PUBLIC AND OURSELVES, ALL REPORTS ARE SUBMITTED AS THE CONFIDENTIAL PROPERTY OF CLIENTS AND AUTHORIZATION FOR PUBLICATION OF STATEMENTS, CONCLUSIONS AND EXTRACTS FROM OUR REPORTS MUST RECEIVE OUR WRITTEN APPROVAL.

GORDON P. E. WHITE & ASSOCIATES LTD
CONSULTING GEOLOGISTS

INTRODUCTION

On October 4, 1967 a trip was made by helicopter to a group of iron claims held by Selwyn Explorations Ltd. (N.P.L.) in the Dawson Mining Division of the Yukon Territory.

The discovery of iron was first reported in this locality during 1956, and subsequent exploration work by private industry and Government surveys outlined a large sedimentary iron formation.

Reference has been made to information on this property filed by Asbestos Corporation (Explorations) Ltd. with the Mining Recorder in Dawson City.

LOCATION AND ACCESSIBILITY

The Shell claim group was staked by Selwyn Explorations, at a location approximately 45 miles north-west of Dawson and eight miles along Shell Creek from the north bank of the Yukon River. The claims are 14 miles distant from the Clinton Creek Asbestos Mine which lies to the south-west.

There is a heliport at the base camp, and surface access to the property would be possible by improving a 4 mile road along Forty Mile River from the Clinton Creek Mine road to the Yukon River. From this latter point, transportation would be by barge for 7

miles downstream on the Yukon River to the mouth of Shell Creek, where an 8 mile road should be constructed to the base camp.

TOPOGRAPHY AND VEGETATION

The claims cover a rolling, elongated dome-shaped hill which is the southern extremity of the Ogilvie Mountains. At Shell Creek, the Yukon River is around 1000 feet above sea level, while the claims are at an elevation of 2500 to 4000 feet. No topographic feature was observed that would hinder road construction or open pit mining.

Tree line varies from 3500 to 4000 feet above sea level, and there is ample timber below this elevation for mining or construction purposes.

CLIMATE

Winters are long and severe, with freeze-up on the Yukon River at Dawson occurring in late October or early November, while break-up is generally in May. Permafrost prevails on north-facing slopes and in sheltered areas.

PROPERTY

The property consists of 27 contiguous iron claims, each measuring 2640' by 2640'. Shell 1 to 11

inclusive were recorded at Dawson September 11, 1967, and Shell 12 - 27 inclusive on September 25, 1967.

HISTORY OF PROPERTY

Hans and Werner Krause reported this iron discovery in 1956 and their preliminary work showed 300 to 400 foot widths of iron formation east of Shell Creek, from which selected samples assayed as high as 48.7% Fe and 0.15% Ti.

The Krause claims were optioned in October 1957 and during the following field season, Asbestos Corporation established 47,600' of lines, 32 triangulation stations, did geological mapping and dip-needle surveying in addition to a programme of trenching and assaying. The results of their assays, filed with the Dawson Mining Recorder, have been tabulated and appended to this report. Asbestos Corporation reported no conclusions as to possible overall grade and tonnage and terminated their option, after which the Krause claims were allowed to lapse.

Reconnaissance mapping was carried out in this general area by the Geological Survey of Canada in 1961, and in 1966 a G.S.C. aeromagnetic sheet was published. Selwyn Explorations acquired the ground in September of 1967.

GENERAL GEOLOGY

Roddick and Green, G.S.C. Map 13, 1962, grouped this series of low grade metamorphosed sediments with possible minor volcanics, into a stratigraphic unit of Cambrian or Pre-Cambrian age. On the claims this sequence of bedded rocks is comprised of grey limestone, green chlorite schist, iron formation, phyllite and an epidote-chlorite rich rock, suggested by Asbestos Corporation to be volcanic in origin. The limestone beds are tentatively considered to be basal to this sequence, and lateral and vertical facies changes are evident by the thick interbeds of one rock type within the other in a given section.

Of lesser magnitude, interbeds of siltstone, quartzite, grit and greywacke are present, varying in thickness from thin beds to mere partings.

Asbestos Corporation mapped a small intrusive mass on Mount Simba, possibly of granodiorite composition.

STRUCTURAL GEOLOGY

Asbestos Corporation have mapped two limbs of a fold, interpreted as an anticline overturned to the north-east and plunging 10 degrees to 30 degrees south-east. Considerable drag folding has taken place on the crest (or trough) of the fold, as exhibited on the hillside

east of Shell Creek.

Interpretation of G.S.C. aeromagnetic map 4285 G recently published, suggests a shallow north-east dip on the south limb, a steeper south-west dip on the north limb, and a shallow dip south-east of the crumpled folds east of Shell Creek. Limited field examination of cleavage, jointing, grain gradation and casts in a section north-west of the camp area, suggests tops to the south on this south dipping north limb, which would suggest a syncline. However, detailed study would be required prior to arriving at any solution of the structure.

LITHOLOGY OF THE IRON FORMATION

In outcrops examined, the iron formation may best be described as a well bedded, banded iron formation, with $\frac{1}{4}$ inch to 2 inch cleanly washed, fine siltstones and quartzites interbedded, which comprise approximately thirty to thirty-five percent of the iron formation. The sharply contacted iron beds are chiefly composed of dense, black, fine grained magnetite, containing occasional octahedra of magnetite.

RESERVE POSSIBILITIES

The iron formation has been mapped by Asbestos Corporation over a strike length in excess of five miles,

and a G.S.C. aeromagnetic survey appears to confirm this lateral continuity of the banded iron formation. Asbestos Corporation report sections of iron formation 75 and 200 feet true width, separated by 300 feet of phyllite, and assays from trenches in the same area average 25% Fe. Earlier assays from the tightly folded section south-east of Shell Creek, indicated values in excess of 45% Fe.

With the qualification that detailed stratigraphic study with the aid of trenching, drilling and assaying is required to prove grade and tonnage, previous work has indicated possible tonnages well in excess of 200 million tons, which may average 30 - 35% Fe.

BENEFICIATION

To maintain a low unit shipping cost, it would be essential to produce a relatively pure iron oxide concentrate. Preliminary work by Britton Research has indicated a possible 63% Fe concentrate, at a fine grind using a Davis tube, from heads assaying 43.2% Fe. The minor constituent of the rock tested was argillaceous, and as most of the iron appears to be associated with siliceous beds, a better concentrate may be possible using a coarser grind. A total chemical analysis of the iron formation was not available, but this work is

currently under way.

TRANSPORTATION IN THE YUKON

At present, the Clinton Creek Asbestos and the Anvil base metal mines in the Yukon are preparing to go into production, and if the Shell Creek iron was proven to be economic, this deposit together with the above-mentioned asbestos and base metal mines, might provide sufficient justification for the capital expenditure required to construct a rail line to the coast. Crest Exploration, a subsidiary of Chevron Standard, is reported to have considered the possibility of shipping iron, in the form of slurry, through a pipeline to the coast, and the technological problems involved appear to have been solved.

A further consideration for the future is that iron, coal and limestone are all available in this immediate area, and the manufacture of pig iron in the Yukon is a distinct possibility.

CONCLUSIONS AND RECOMMENDATIONS

Reconnaissance field work by Government and private industry has outlined a banded iron formation of potentially large tonnage. In order to determine

whether the iron is present in economic grade, a two-stage programme of exploration is recommended.

Stage One would consist of stratigraphic and structural mapping, magnetometer surveying, trenching, assaying and bulk sampling, and roads, base camp, surveyed lines and contours would be necessary before commencing the mapping and geophysical programmes. Stage Two would include a drilling programme and a market and feasibility study, and the expenditures required to carry out this work would be as follows:

STAGE ONE

Roads 20 miles plus	\$12,000.00
Camp	5,000.00
Radio communications	2,000.00
Transport	4,000.00
River Barge	2,000.00
Surveying, lines, contours	8,000.00
Geological mapping	6,000.00
Magnetometer survey	4,000.00
Trenching, bulldozer	10,000.00
Sampling, testing	6,000.00
Engineering and contingencies	<u>10,000.00</u>
	<u>\$69,000.00</u>

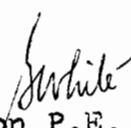

STAGE TWO

Diamond drilling 6000' @ \$15.	\$ 90,000.00
Market & feasibility study	6,000.00
Engineering & contingencies	<u>15,000.00</u>
	<u>\$111,000.00</u>
Total for the two stages	\$180,000.00

In the event that the results of Stage One and Two were favourable, considerably larger sums of money should be made available for preproduction expenses.

Respectfully submitted,

GORDON P.E. WHITE & ASSOCIATES LTD.

 
Gordon P.E. White, P. Eng.

I, GORDON PATRICK EARL WHITE, of the Municipality
of West Vancouver, in the Province of British Columbia,
HEREBY CERTIFY:

- 1) THAT I am a registered Professional Engineer
in the Province of British Columbia.
- 2) THAT I am a graduate of the University of New
Brunswick with a degree of Bachelor of Science
(1953)
- 3) THAT I am a Consulting Geologist, my residential
address is 2975 Altamont Crescent, West Vancouver
and my office is at 821 West Pender Street,
Vancouver, B.C.
- 4) THAT I have visited the property discussed in
this report on October 4, 1967.
- 5) THAT I have practised as a geologist for more
than 14 years, examining and reporting on pro-
perties and mines in North America and Africa.
- 6) THAT a Registered Engineer in the Province of
British Columbia, under my direction, on October
4, 1967, checked the staking of the claims and
the staking was in order.
- 7) THAT I have no interest, direct or indirect in
any company acquiring or intending to acquire
control, nor do I expect to have any interest
in Selwyn Explorations Ltd. (N.P.L.). Nor do
I have any interest in the claims, direct or
indirect, referred to in this report.

DATED AT West Vancouver this 18th day of October, 1967.

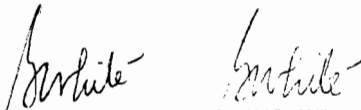

Gordon P.E. White, P. Eng.

TABLE 1

Results of 1958 trenching by Asbestos Corporation
(Explorations) Ltd. All sample numbers increase from South
to North.

<u>Trench No.</u>	<u>Sample No.</u>	<u>Width</u>	<u>% Fe</u>
1A			
	401	10'	25.0
	402	16'	26.2
	403	8'	28.0
	404	19'	14.4
	405	15'	12.0
	406	21'	7.3
	<u>401 - 406</u>	<u>89'</u>	
	407	20'	21.4
	408	22'	28.9
	409	21'	21.2
	410	14'	29.4
	411	9'	31.9
	412	19'	15.1
	413	14'	26.8
	414	18'	27.8
	<u>407 - 414</u>	<u>137'</u>	<u>24.6% average</u>
	415		
	416		

<u>Trench No.</u>	<u>Sample No.</u>	<u>Width</u>	<u>% Fe</u>
2	417	8'	17.4
	418	30'	31.6
<u>Trench No.</u>	<u>Sample No.</u>	<u>Width</u>	<u>% Fe</u>
3	424	13'	28.6
		4' Not sampled	
	425	14'	35.2
	426	10'	29.6
	<u>424-426</u>	<u>41'</u>	<u>28.3%</u>
<u>Trench No.</u>	<u>Sample No.</u>	<u>Width</u>	<u>% Fe</u>
4	436	36'	24.2
	437	18'	29.0
	438	17'	14.3
	439	33'	22.6
	440	21'	30.5
	441	22'	29.6
	<u>436-441</u>	<u>147'</u>	<u>25.0%</u>
	442	22'	10.7
443	14'	22.5	
<u>Trench No.</u>	<u>Sample No.</u>	<u>Width</u>	<u>% Fe</u>
5	430	36'	26.7
	431	32'	23.6
	432	31'	26.0
	433	17'	24.9
	<u>430-433</u>	<u>116'</u>	<u>25.5%</u>

<u>Trench No.</u>	<u>Sample No.</u>	<u>Width</u>	<u>% Fe</u>
5	433-434	26'	No sample, schist
	434	29'	26.5
	435	13'	24.9
	<u>433-435</u>	<u>184'</u>	<u>22%</u>

CONCENTRATION TESTS
ON A SAMPLE OF IRON ORE
submitted by
SELWYN EXPLORATIONS LTD.

Date: October 25, 1967

Project No: B161

Investigation by: John W. Britton, B.Sc., A.R.S.M., P. Eng.,
Consulting Metallurgist.

BRITTON RESEARCH LIMITED

105 KENNEDY STREET
VANCOUVER, B.C.

TEL 681

INTRODUCTION

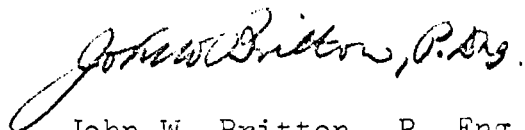
A 10 lb. sample of iron ore was received from Dr. Peter H. Sevensma, on behalf of Selwyn Explorations Ltd., 715-850 West Hastings Street, Vancouver 1, B.C., on September 21, 1967.

Dr. Sevensma requested us to carry out a magnetic separation test on the sample after grinding to approximately 85% minus 325 mesh.

SUMMARY

1. The sample as received assayed 43.2% total iron.
2. The whole of the sample was crushed to minus 10 mesh and a 2,000 gram sample was ground for 60 minutes in a ball mill at 65% solids. The product was treated in a Sala wet magnetic separator and the concentrate was retreated three times in the same machine. The tailings from the four stages were combined for assay. The final concentrate weighed 65.5% of the feed and assayed 59.4% Fe, 14.55% SiO₂, 0.01% S, 0.09% P, 0.21% TiO₂, 0.08% Mn, 0.91% MgO and a trace of silver. The iron recovery was 90.1%.
3. 86.2% of the concentrate was finer than 325 mesh; this fraction assayed 60.8% Fe.
4. Retreatment of the concentrate in a Davis tube tester increased the iron assay to 61.6%. The tailing from the Davis tube test contained a high proportion of gangue slimes.
5. In practice, stage grinding and separation would be used and it is expected that a higher grade of final concentrate would be produced. If necessary, the concentrate could be ground finer before the final stage of separation.

Respectfully submitted,
BRITTON RESEARCH LIMITED



John W. Britton, P. Eng.,
Consulting Metallurgist.

DETAILS OF TESTS

(a) Crushing

The whole of the sample was crushed to minus 10 mesh and riffled.

(b) Grinding

A 2000 gram sample of crushed ore was ground in a ball mill for 60 minutes at 65% solids.

(c) Magnetic separation

The ground ore was treated in a Sala wet magnetic separator and the concentrate was retreated 3 times in the same machine. The rougher and cleaner tailings were combined for assay. Results are shown in table 1.

The grade of concentrate, 59.4% Fe, was lower than desired. In order to determine whether additional magnetic separation steps would improve the grade, a Davis tube test was carried out on a sample of the concentrate. Results are shown in table 2.

Retreatment increased the grade to 61.6% Fe. Most of the improvement appeared to be due to the removal of gangue slimes but some low-grade middling particles were also removed.

A screen analysis of the original concentrate (see table 3) showed that 86.2% was finer than 325 mesh; this fraction assayed 60.8% Fe. The coarser fractions (+ 200 mesh and minus 200 plus 325 mesh) assayed only 47.7% and 51.1% Fe respectively. A Davis tube test on the minus 325 mesh fraction (see table 4) increased the grade to 63.2% Fe.

In practice, stage crushing, grinding and magnetic separation would be carried out. This would not only reduce the energy requirements considerably but would also improve the grade of the final concentrate, by eliminating gangue and low-grade middling particles earlier in the treatment. If necessary, the concentrate could be ground finer before the last stages of separation.

Table 1 - Magnetic separation results

#	Product	Weight %	Fe assay % *	Fe distribution %
1	Final concentrate	65.5	59.4	90.1
2	Combined tailings	34.5	12.4	9.9
3	Head (calculated)	100.0	43.2	100.0

* All iron assays shown in this report refer to total Fe.

Assay of final concentrate:

Iron (total)	(Fe)	% 59.4
Silica	(SiO ₂)	14.55
Sulphur	(S)	0.01
Phosphorus	(P)	0.09
Titanium	(TiO ₂)	0.21
Manganese	(Mn)	0.08
Magnesia	(MgO)	0.91
Silver	(Ag)	Trace

Table 2 - Davis tube test on concentrate

#	Product	Weight %	Fe assay % *	Fe distribution %
1	Concentrate	94.6	61.6	98.1
2	Tailing (calc.)	5.4	20.9	1.9
3	Head	100.0	59.4	100.0

Table 3 - Screen analysis of Sala concentrate

#	Fraction	Weight %	Fe assay %	Fe distribution %
1	Plus 200 mesh	3.4	47.7	2.7
2	- 200 + 325 mesh	10.4	51.1	9.0
3	Minus 325 mesh	86.2	60.8	88.3
4	Head (calc.)	100.0	59.3	100.0

Table 4 - Davis tube test on minus 325 mesh fraction

#	Product	Weight %	Fe assay %	Fe distribution %
1	Concentrate	94.3	63.2	98.0
2	Tailing (calc.)	5.7	21.1	2.0
3	Head	100.0	60.8	100.0

JWB/ih

BRITTON RESEARCH LIMITED

Consulting Metallurgists

1612 WEST THIRD AVENUE

VANCOUVER 9, B. C.

JOHN W. BRITTON, A.R.S.M., B.Sc., P.ENG.,
President

November 25, 1967

PHONE: 738-7195

Dr Peter H. Sevensma, P.Eng.,
Selwyn Explorations Limited,
715 - 850 West Hastings Street,
Vancouver 1, B.C.

Dear Peter,

Re: Concentration of iron ore

We enclose a copy of Coast Eldridge's assay report No. 38075, giving the silica, titanium and phosphorus assays on the Davis tube concentrate made from the minus 325 mesh fraction of the concentrate made in the Sala separator (see our report dated October 25, 1967).

As expected, the silica and phosphorus assays are lower than in the Sala concentrate, which assayed 14.55% silica, 0.09% phosphorus and 59.4% iron. The titanium assay (0.26%) is higher than in the Sala concentrate (0.21%), indicating that at least part of the titanium in the ore is intimately associated with magnetite.

Yours sincerely,

BRITTON RESEARCH LIMITED



John W. Britton, P.Eng.
Consulting Metallurgist

Enclosures (assay report
and invoice)

JWB/t

Dr P. H. Jamieson

Edwyn D. Hamilton



PHONE: 876-4111

CABLE ADDRESS "ELDRICO"

FILE NO. A.3-B.6-67-33075

DATE November 24, 1967

To:
Britton Research Ltd.,
1612 West Third Avenue
Vancouver, B.C.

Certificate of Assay
COAST ELDRIDGE
ENGINEERS & CHEMISTS LTD.
125 EAST 4TH AVE. VANCOUVER 10, CANADA

We Hereby Certify that the following are the results of assays made by us upon submitted Pulps samples

MARKED	GOLD		SILVER	Silica	Titanium	Phosphorus			
	OUNCES PER TON	VALUE PER TON	OUNCES PER TON	PER (SiO ₂) CENT.	PER (TiO ₂) CENT.	PER (P) CENT.	PER CENT.	PER CENT.	PER CENT.
Project B - 161 44032 Davis Tube Con - 325 Mesh		\$		10.21	0.26	0.06			

Gold calculated at \$.....per ounce

1/3p

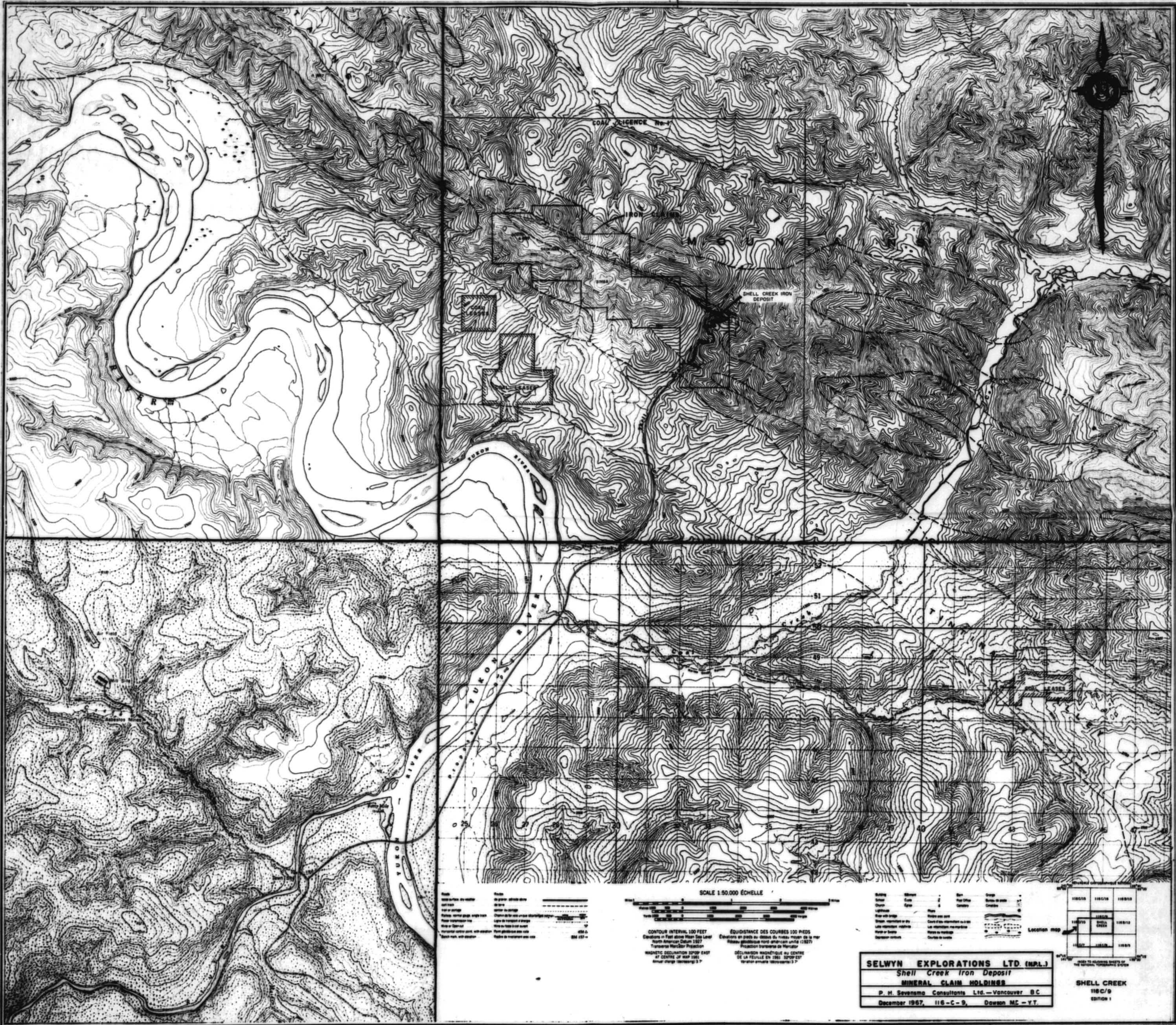
Note. Rejects retained one week.
Pulps retained one month.
Pulps and rejects may be stored for a maximum of one year by special arrangement.
Unless it is specifically stated otherwise, gold and silver values reported on these sheets have not been adjusted to compensate for losses and gains inherent in the fire assay process.

BRITTON RESEARCH LIMITED
1612 WEST THIRD AVENUE
VANCOUVER 9, B. C.

H. Shayer

Provincial Assayer

RECEIVED NOV 25 1967



COAL LICENCE No. 1

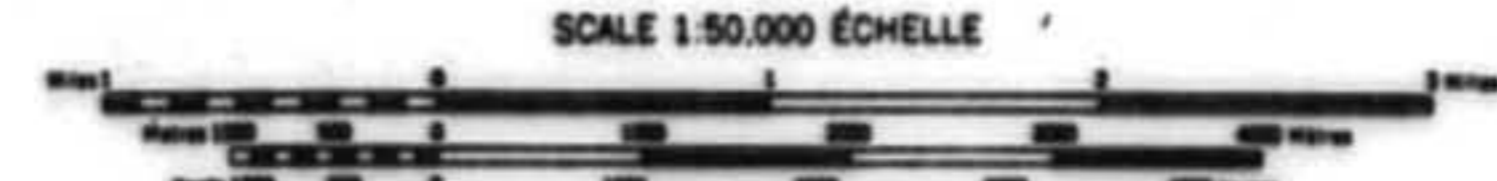
IRON

SHELL CREEK IRON DEPOSIT

YUKON RIVER

YUKON RIVER

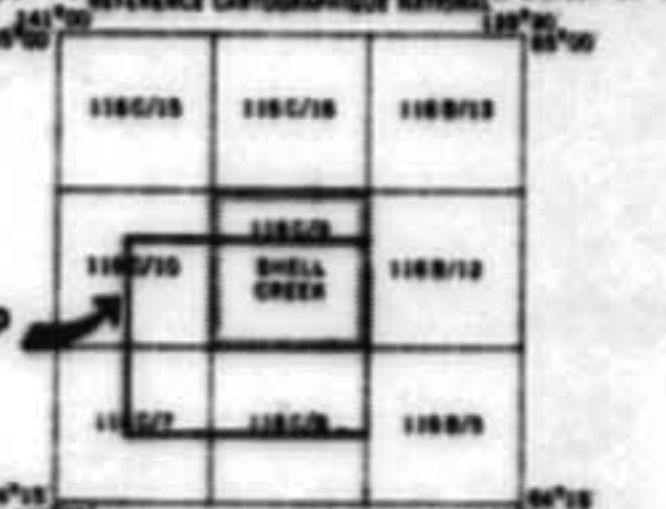
Scale and contour information in French and English.



CONTOUR INTERVAL 100 FEET
Elevations in Feet above Mean Sea Level
North American Datum 1927
Trompsdorff Mercator Projection
MAGNETIC DECLINATION 32°00' EAST
AT CENTRE OF MAP 1961
Annual change (1960-61) 3"

Scale and contour information in French and English.

SELWYN EXPLORATIONS LTD. (INCL.)
Shell Creek Iron Deposit
MINERAL CLAIM HOLDERS
P. H. Sevensma Consultants Ltd. - Vancouver B.C.
December 1967, 116-C-9, Dawson M.C. - Y.T.



SHELL CREEK
116C/9
EDITION 1