OTTAWA

June 18th, 1943.

REPORT

of the

ORE DRESSING AND METALLURGICAL LABORATORIES.

Investigation No. 1430.

Microscopic and Chemical Examination of Sphalerite from the Berens River Mines Limited, Favourable Lake, Ontario.



(Copy No.___.)

21430

ΑΨΑΤΤΟ

<u>R E P O R T</u>

of the

ORE DRESSING AND METALLURGICAL LABORATORIES.

Investigation No. 1430.

Microscopic and Chemical Examination of Sphalerite from the Berens River Mines Limited, Favourable Lake, Ontario.

Sample:

On May 29th, 1943, a small sample of sphalerite, designated as "Sample A", was received from the Berens River Mines Limited, Favourable Lake, Ontario, per Mr. W. R. Sutton, Geologist. This sample represented carefully hand-picked material.

Purpose of Investigation:

Mr. Sutton requested that the iron content of the sphalerite be determined, if possible, in order to determine the ultimate grade of zinc concentrate which it would be theoretically possible to make.

Microscopic Examination of Sphalerite:

Microscopic examination of polished sections of the sphalerite shows that it is coarsely crystalline and that it is deep red in colour in transmitted light; this colour indicates the presence of considerable iron. It is free from the tiny blebs and rods of chalcopyrite which are present in many sphalerites. Associated with the mineral as irregular patches and grains are chalcopyrite, galena, and pyrite.

A portion of Sample A was ground through 65 mesh and a sample of as pure sphalerite as possible was picked from this product under the binocular microscope. A polished section was prepared from this material and the remainder was sent to the Chemical Laboratory for determination of as many elements as possible on the small amount of material. The minerals were determined quantitatively under the microscope, as follows:

	Per cent by volume	Approximate per cent by weight	N
Sphalerite Pyrite Galena Chalcopyrite Gangue mater ials r	98,9 0,95 0,1 0,05 determined.	98,45 1.4 0.1 0.05	
not determine.		-	<u>م</u>
	 100,00	100.00	

Chemical analysis of the same sample gives the ', following:

		<u>Per cent</u>
Zinc	****	57,98
Iron		7.64
Al ₂ 03	****\$	0,36
******************* *****************		۲

6

- Page 3 -

Composition of the Sphalerite:

On the basis of the information above, the percentages of the various minerals were calculated as follows:

	-	Per cent
Sphalerite	ang t	97,52
Pyrite	÷	1,40
Galena	-	0,10
Chalcopyrite	μų.	0.05
Gangue (including 0.36 per cent Al203)	S S	0,93
Total -		100,00

It was calculated that the sphalerite consists of 86,54 per cent as ZnS and 10,98 per cent as FeS. The calculated composition of the pure sphalerite would therefore be as follows:

		Per	cent
Zinc Sulphur Iron	1 1 1	33	9,5 3,4 7,1
.Total		 100	0,0

CONCLUSION:

On the basis of microscopic and chemical investigation of the sample of sphalerite, it is calculated that the iron content is approximately 7.1 per cent. This does not take into consideration any iron which might be present in the gangue, but since only 0.93 per cent is available for gangue and 0.36 per cent of this is Al₂O₃ and most of the remainder probably silica, there must be only a very small quantity of - Page 4 -

(Conclusion, cont'd) -

iron in the gangue.

MHH: GHB.

While on the basis of this work it is theoretically possible to obtain a 59.5 per cent zinc concentrate, it would nevertheless be impossible to achieve this in practice. It must also be remembered that it is possible that the composition of the sphalerite itself may be somewhat variable through a deposit.

> 000000000000 000000 0

- Page 7 -

۲.j

(Test	NO.	4.	contid) =
	24~0	- 0	

and the second second

· · · ·	· · .	· · ·	i in the second se	Sec. 1	e e e e e e e e e e e e e e e e e e e	11.		• • • • •	
	aladowitay washqarintana	anness na muart friðanni, fri agar sinni. B	Weight,:	Ase	AYS .	an internet of the second	Di	stribu	tilon,
P	roduct		Weight; per	290	cent		i ()	per ce	ກະົ້
n ivi atta tek			per :	For X:		sereo.	i Fe	; Ni	:0720:
Magi Non Tabi	netic -mag. le con	conc. talling c. (cal.)	82.76 17.04 100.00	19. 1 0 3.52 51.71	0\58\ 0.099 0.50		3: 95,6): 4.4 L:100.0	4:96. 6:3. 0:100.	
olisiiska:	nite ane and stars	j Linas sector de la caracteria de la constanción Linas de la constanción de la constanción de la constanción de	anna han ann an ann an an ann an an an an an a	Shaansen harre surge	anan anan an	athininanan in than si	ารคำการระบบเราะ	nunn ann ann ann ann	o Nation Mary Constant April 19 and
*		•		1 at 1	· · · · · ·	der en s			
	tar Sjari Asij ⊂	Rat	io, of cond	oen trai	lon ai	fter ma	gnetic	· · · · · ·	·
		Ċ	oncentrati	lon of	table	concer	itrate	= 23	5,6:1.
2 -	• • •	· ,	e e este e			•••			
· ·		, , ,						,	
		Metal rec	voveries in	ı magne	stic co	moenti	ete, e	xpreas	led
Ê	 Ar a mar i ai	المناسب مستحلة الأسيم	and an an 13 Firm and	1				· · · · · ·	
111	cermș	o) the org	ginal feed	i conre	erre ar		e year		,
у У				* * , *		4	in a start in the start		н. Н
	• •		ి ్రాగా సంఘే 🤤					reent	0
÷ .		Nickel				=]3		10 · ·	· ·
	· ·	- OUVOID C	oxide - 3		-			1	
•	s:	• • • · · · · · ·	· .						•
		The folk	wing table	ၟႄႄ႞ၯၜႜ	ຸອຸ ເວນ	nparisc	on of r	eaults	۱.
ob t	പ്നരറ്	່ານ ທຸດຕາລະາ	le and tabl	à aoni	lantrod	han h		ana tar	1 69
	allion	DA IIISGING CT	to calles berry	ie com	2011 0 2 CL I	hand and a star of the		marer o 1.5.	ч 6
on	deslim	ed feed:	· · · · · · · · · · · · · · · · · · ·			ил. 	A. A. A.		
0 % (Pr. 1274)2547735724 #255 1218278743	95657-299855676980 Ø	Pona of A	oncentrate:	ergennen ergenen bereitet. G	и, тя сиёз 2014 и то 2 муля.	1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	141 FW-354755W WF-54251 +142512-1	an the second second second second	₹₽₽₩₽₩₩₩₽₩₩ ₽₩₽₩₽₩₽₩₽₩₽₩₽₽₩₽₽₩₽₽₩₽₽₩₽₽₩₽₽
	. ö u	from 100			isays,		Dist	ributi	.on,
Method		original		2		· · · · :	2		, •
	· · · · ·	Transien Commence	ייייייייייייייייייייייייייייייייייייי		eent?	i Natural States of the second	; per c	ent to)tal
		centrate	conc,	Fo	N1	crooz	;)Fo	Nl	Cro03
angentikan karangan di yerker	ener inzinaerandi 3	DRIVE CONTRACT OF CONTRACT	สมารามสมาริสารณ์และสาวม	I DARY LORDER TO CAR N	ALAN AND ALANA AND A	8	antinaninaning artist o o		ranasana karenasan
Magnetic		6 m c	;	, 		a 9 			1.01
Concentr Table con			s, ∝,	320°58.	;0°6%	ి ఓ.చరి	23,42;	9.84	4.84
tration				ō -		0	ē 5	d	
lowed by	mag			3.	-	5 2	~ a ¢, å	a	
concentr	ation:	4.23	1 ಸಮ 0 ಕ	:59,70	0.58	: 1.73	:36,69;	13,15	1.5 .70
12	0 0		0,87	13 52	0 096	17 50	1.71.	0.45	32 70
	, o	· · · · ·		ი კა და და და და და ი ი	300000	onal Oilutod o	6 0	ા પ્રાયક્ષ્ય છે.	a nor of a bat
The subscription of the set of th	100 10 10 10 10 10 10 10 10 10 10 10 10	an a	- 71 - Mile - Mali III - Alfred Charles - State - Stat	unnamena opt		ing intervention		A STATE OF THE OWNER	

. . 1

. (

• . .