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O T T A W A

November 17th, 1941.

R E P O R T

of the

ORE DRESSING AND METALLURGICAL LABORATORIES.

Investigation No. 1122.

Scheelite Ore from the Consolidated Nicola
Goldfields Limited,
Stump Lake Area, British Columbia.

BUREAU OF MINES
DIVISION OF METALLIC MINERALS
—
ORE DRESSING AND
METALLURGICAL LABORATORIES



CANADA
DEPARTMENT
OF
MINES AND RESOURCES
MINES AND GEOLOGY BRANCH

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Goldfields Limited,
Stump Lake Area, British Columbia.

Shipment:

A shipment of scheelite-bearing ore, net weight 36 pounds, was received from the Consolidated Nicola Goldfields Limited on October 16th, 1941. The property is located in the Stump Lake area, near Kamloops, British Columbia.

The shipment was submitted by the Honourable H. H. Stevens, President, Consolidated Nicola Goldfields Limited, 506 Dunsmuir Street, Vancouver, B. C.

Purpose of the Investigation:

The investigation was made to determine the grade of scheelite concentrate that could be recovered from ore represented by this shipment.

Character of the Ore:

The ore consisted of quartz gangue containing bands and patches of scheelite. The sulphide minerals were present as bands of varying thickness in some of the heavily mineralized portions of the sample; in part of the sample they were disseminated through the gangue.

No native gold was seen in the hand specimens.

Sampling and Analysis:

The ore was crushed minus 14 mesh and sampled by standard methods and was found to contain:

Tungsten trioxide (WO ₃)	-	3.69 per cent
Gold	-	0.30 oz./ton
Silver	-	1.78 "
Copper	-	0.25 per cent
Lead	-	0.74 "
Zinc	-	0.75 "
Arsenic	-	Nil.

Investigative Procedure:

The ore remaining after cutting out the sample was screened on the following standard Tyler screens: 35, 48, and 65 mesh.

The plus 35, 48 and 65 mesh products were tabled separately on a Wilfley table.

Each table product was examined microscopically under the ultra-violet light to determine the amount of free scheelite in the various sized particles.

This examination showed that plus 65 mesh products

(Investigative Procedure, cont'd) -

contained varying amounts of gangue and metallic minerals enclosed in or adhering to the particles of scheelite. A few plus 35 mesh particles of concentrate were pure scheelite. The examination indicated that a grind of minus 65 mesh would be required to produce a clean concentrate with a reasonable recovery.

The middling and tailing products from the plus 35, 48 and 65 mesh sizes were then reground to pass 65 mesh and added to the minus 65 mesh material from the original screening. This minus 65 mesh material was then tabled.

All of the table concentrates were combined, reground, and floated to remove sulphides. The table middling and tailing were sampled and assayed.

Results:

The tests indicate a recovery of 60.74 per cent of the WO_3 , in a concentrate containing over 70 per cent WO_3 .

Table Concentration.

Product	Weight, per cent	Assay, WO_3 , per cent	Distribution of WO_3 , per cent	Ratio of concentration
Feed	100.00	3.79	100.00	
Concentrate	6.45	38.07	64.85	15.5:1.
Middling	64.06	1.59	26.90	1.56:1.
Tailing	29.49	1.06	8.25	

Flotation of Table Concentrate.

Flot. feed	100.00	6.45	38.07	100.00	
Flot. conc.	52.52	3.39	4.59	6.34	29.5:1.
Flot. tailing	47.48	3.06	75.16	93.66	

Summary of the Test.

Feed	100.00	3.79	100.00	
WO_3 conc.	3.06	75.16	60.74	32.7:1.
Flot. conc.	3.39	4.59	4.11	29.5:1.
Table middling	64.06	1.59	26.90	1.56:1.
Table tailing	29.49	1.06	8.25	

Analysis of Tungsten Concentrate:

Tungsten trioxide (WO ₃)	-	75.16 per cent
Sulphur	-	Trace.
Lead	-	Nil.
Copper	-	"
Zinc	-	"
Tin	-	"
Molybdenum sulphide	-	"

Analysis of the Flotation Concentrate:

Tungsten trioxide (WO ₃)	-	4.59 per cent
Sulphur	-	20.91 "
Lead	-	16.07 "
Zinc	-	13.49 "

Conclusions:

In a continuously operated mill, the ore would be reduced to 14 or 20 mesh and classified into at least three products. These products then would be concentrated on separate tables, producing high-grade concentrates, middlings, and tailings. The middlings and tailings from the coarser sand tables would be reground to at least 60 mesh and reclassified. In this way the larger clean scheelite grains would be removed without being subjected to excessive grinding. The main tailing would consist of that from the table concentrating the fines.

As the ore contains a high percentage of sulphides, the table concentrates would be reground and floated to reduce the impurities to specification requirements. The flotation tailing then would constitute the finished scheelite concentrate.

The results obtained in this investigation show that a scheelite concentrate of over 70 per cent WO₃ can be obtained. The test work shows an actual recovery of 60.7 per

(Conclusions, cont'd) -

cent of the tungsten trioxide, 26.9 per cent of the values being in the middling products. In actual milling operations these middlings would be returned to the regrind circuit and a further recovery of the values obtained.

To obtain figures on the actual recovery that could be expected from continuous operation, at least three to five tons of ore would be required. Should the grade and character of the ore differ from the sample investigated, the grade of concentrate and percentage recovery also could be expected to vary from those shown in the body of this report.

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