

ALL OFFICIAL CORRESPONDENCE
SHOULD BE ADDRESSED TO THE DIRECTOR.
DIVISION OF ORE DRESSING AND
METALLURGY

G. C. MACKENZIE, B.SC., CHIEF OF DIVISION
W. B. TIMM, B.SC., 1ST ENGINEER
C. S. PARSONS, B.SC., 2ND ENGINEER
H. C. MABEE, B.SC., CHEMIST
R. J. TRAILL, ASST. CHEMIST
B. M. DERRY, MILLMAN



MINES BRANCH
EUGENE HAANEL, PH. D.
Director.

OTTAWA, January 9th., 1919.

Report of Ore Dressing and Metallurgical Laboratories.

Test No. 107

A shipment of scheelite ore was received on November 15th., 1918, from "The War Metals Products Company," Winnipeg, Manitoba.

This shipment was from the Falcon Lake District, and consisted of 90 bags, having the following weights, analysis, and content:-

Gross weight	7,996 pounds.
Net weight	7,953 "
Moisture - 0.40%	32 "
Net dry weight	7,921 "
Analysis: WO ₃	1.65 %
MoS ₂	0.10 %
Au	none.
Content: WO ₃	130.70 pounds.
MoS ₂	7.92 "

The mineral constituents of the ore were scheelite (calcium tungstate), molybdenite (molybdenum sulphide), and pyrite (iron sulphide). The rock constituents were a green colored mineral, probably olivine; a dark colored mineral, hornblende, and calcite.

Concentration

107

Concentration tests were conducted to recover the tungsten values in the form of scheelite concentrates. No attention was paid to the molybdenite, as it was present in such small quantities.

The ore was crushed to 20 mesh in a dry ball mill, and fed by a push feeder to a Wilfley concentrator, water being added below the feeder to obtain the required pulp density for the table. From the concentrator three products were made, a concentrate, middling and tailing, of the following weights, analyses and content:-

<u>Concentrates</u>	146 pounds.
Analysis, WO_3	70.90 %
Content, WO_3	103.51 pounds.
Percentage of WO_3 values	79.3 %.
 <u>Middlings</u>	 860 pounds.
Analysis, WO_3	2.90 %
Content, WO_3	24.94 pounds.
Percentage of WO_3 values	19.0 %
 <u>Tailing to waste</u>	 6,915 pounds.
Analysis, WO_3	0.04 %
Content, WO_3	2.76 pounds.
Percentage of WO_3 values	2.1 %

The middlings from the table were reground to 50 mesh and concentrated on the table. Two products were made in this case, a concentrate and tailing, of the following weights, analyses and content:

<u>Concentrates</u>	31 pounds.
Analysis, WO_3	69.34 %
Content, WO_3	21.50 pounds.
Percentage of WO_3 values	16.4 %

Tailings

Tailings to waste 829 pounds.
 Analysis, WO_3 0.35 %
 Content, WO_3 2.90 pounds.
 Percentage of WO_3 values 2.2 %.

Summary: The following is a summary of the results of the concentration of this shipment of scheelite ore:

	<u>Crude Ore.</u>	<u>Concentrates.</u>	<u>Tailings.</u>
Weights, lbs.....	7,921	177	7,744
Analysis, WO_3	1.65 %	70.63 %	0.073 %
Content, WO_3 , lbs.....	130.70	125.01	5.69
Percentage of WO_3 values .	100.0 %	95.7 %	4.3 %

Conclusions:- From the above test a high grade tungsten concentrate of grade 70.63% WO_3 was made, with a recovery of 95.7% of the tungsten values in the ore. These results are very satisfactory for a low grade ore, considering the comparatively coarse crushing necessary to obtain the separation. This is a very favorable point as it eliminates the slime loss due to fine crushing. A clean tailing can be discarded at 20 mesh, leaving a small percentage of middling product to be reground.

(Signed) W. B. Timm.