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O T T A W A

February 3rd, 1942.

R E P O R T

of the

ORE DRESSING AND METALLURGICAL LABORATORIES.

Investigation No. 1155.

Gravity Concentration of Chromite Ore
from H. Bruce Fletcher, Sherbrooke, Quebec.

(Copy No. 25.)

6pp.



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Shipment:

Thirty-nine bags of chrome ore, gross weight 2,730 pounds, were received on June 10th, 1941, from H. Bruce Fletcher, Sherbrooke, Quebec. This ore originated from Pit No. 4, Concession 12, Lot 7, Orford township, Sherbrooke district, Quebec.

The shipment was originally sent in to determine its suitability for air-table concentration. However, following the erection of a chromite concentrating mill at St. Cyr, Quebec, the shipment was tested by wet gravity methods to

(Shipment, cont'd) -

determine its response to the flow-sheet of the Chromite Limited mill at St. Cyr.

Prior to wet concentration, the sample had been dry-crushed and sized for air-table concentration. For wet concentration, the sized products were mixed and crushed to pass 14 mesh. The lot was then sampled. Analysis showed it to contain:

Chromic oxide (Cr_2O_3)	-	34.17 per cent.
Iron (Fe)	-	9.78 "
Ratio, Cr:Fe	=	2.39:1.

Experimental Investigation:

The ore at minus 14 mesh was fed at the rate of 960 pounds per hour to the flow-sheet adopted for the concentration of ore from Chromite Limited (See our Investigation No. 1051 - Concentration of Chromite from the Sterrett Property, St. Cyr, Richmond county, Quebec, dated July 15th, 1941).

The distribution to the various concentrating tables and the screen analyses of the table feeds are as follows:

<u>Feed Rates</u>		<u>Lb./hr.</u>
Mill feed	-	960
Butchart table feed	-	500
Deister " "	-	355
Wilfley " "	-	420
Pilot " "	-	265
Slime cone overflow	-	5.4
Middling thickener overflow	-	0.33
" " underflow	-	346.0

(Continued on next page)

(Experimental Investigation, cont'd) -

Screen Analyses, Weight, Per Cent.

Mesh	Feed	Butchart table feed	Deister table feed	Wilfley table feed	Pilot table feed	Middling thickener underflow	Tailing
+ 20	5.0	12.2	5.5			16.1	2.0
- 20+ 28	15.4	32.9	19.4			25.0	5.4
- 28+ 35	18.3	25.0	19.9		0.1	22.0	4.6
- 35+ 48	13.6	14.2	18.0	0.6	1.4	16.4	3.7
- 48+ 65	10.6	9.8	21.5	3.7	5.7	13.8	8.8
- 65+100	7.0	4.3	8.8	8.2	10.6	4.6	7.1
-100+150	7.3	1.5	5.3	16.4	17.5	1.5	15.4
-150+200	5.8)		1.1	18.6	17.1	0.4	13.1
-200	16.5)	0.1	0.4	52.5	47.6	0.2	39.9
	:100.0						

Samples taken during the run assayed as follows:

Product	A S S A Y S	
	Cr ₂ O ₃ , per cent	Fe, per cent
Feed	34.17	9.78
Butchart table feed	48.84	
" " concentrate	54.42	12.74
" " tailing	20.56	
Deister table feed	30.06	
" " concentrate	54.48	12.65
" " tailing	9.04	
Wilfley table feed	26.38	
" " concentrate	54.67	12.94
" " tailing	9.08	
Pilot table feed	35.51	
" " concentrate	53.25	12.45
Feed to regrind	22.29	
Slime cone overflow	14.24	
Middling thickener overflow	12.17	
Main tailing	8.35	

(Continued on next page)

(Experimental Investigation, cont'd) --

The concentrates recovered from the four tables were dried and sampled, mixed together, and re-sampled.

Results:

Product	Weight, pounds	A S S A Y S,	
		Per cent Cr ₂ O ₃	Per cent Fe
Butchart concentrate	477	55.66	11.34
Deister concentrate	309	55.45	11.39
Wilfley concentrate	211	55.04	12.20
Pilot concentrate	298	53.75	12.70
Middling	7	32.11	9.88
Tailing	1,223	8.35	-

The total weight of concentrate, 1,295 pounds, had the following analysis:

	Per cent
WO ₃	55.49
Fe	11.64
SiO ₂	2.30
S	0.02

Ratio, Cr:Fe = 3.26:1.

A compilation of the results of the test is as follows:

Product	Weight, pounds	A S S A Y S,		Pounds	Distribution of Cr ₂ O ₃ , per cent
		Per cent Cr ₂ O ₃	Per cent Fe		
Feed	2,525	34.17	9.78	862.7925	100.0
Concentrate	1,295	55.49	11.64	718.5955	87.3
Middling	7	32.11	9.88	2.2477	0.3
Tailing	1,223 [⊕]	8.35	-	102.1205	12.4

[⊕] Calculated.

Conclusions:

This ore, when milled in the concentrator of Chromite Limited, St. Cyr, Quebec, will produce a high-grade concentrate with a very favorable chromium-to-iron ratio.

As the sample on which the investigation was made was obtained from the No. 4 pit, the results shown above are applicable only to ore from that working. Should chrome-bearing material from other locations be mixed with ore from the No. 4 pit, the grade and character of the resulting concentrates cannot be relied on to correspond to those shown in this report.

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