

This document was produced
by scanning the original publication.

Ce document est le produit d'une
numérisation par balayage
de la publication originale.

Reports Section

**Declassified
Déclassifié**

CANADA

DEPARTMENT OF MINES AND TECHNICAL SURVEYS

OTTAWA

MINES BRANCH INVESTIGATION REPORT IR 58-7

MINERALOGICAL REPORT ON A BULK SAMPLE FROM REXSPAR
URANIUM AND METAL MINING CO. LTD., KAMLOOPS MINING DIVISION,
BIRCH ISLAND, B. C. -- REF. NO. 11 / 57-7

by

M. R. HUGHSON

RADIOACTIVITY DIVISION

Note: This report applies essentially to the samples received.
The report and related correspondence may not be used at
any time, in whole or in part, for publicity or advertising
purposes.

MINERALOGICAL REPORT ON A BULK SAMPLE FROM REXSPAR
URANIUM AND METAL MINING CO. LTD., KAMLOOPS MINING DIVISION,
BIRCH ISLAND, B.C. - - REF.NO.11/57-7

by

M.R. Hughson

Radioactivity Division

Abstract

The sample consists of a dark-coloured, fine-grained, siliceous rock rich in pyrite. The radioactivity is associated with rutile and appears to be chiefly uraninite in the A zone and uranothorite and/or thorite in the BD zone. There is little evidence of secondary uranium minerals.

Introduction

A 20,000 lb bulk sample, consisting of approximately equal amounts of ore from A zone and BD zone, was received from Rexspar Uranium and Metal Mining Co. Ltd., on November 12, 1957. It was reported to be from the company's property on Birch Island in the Kamloops Mining Division, British Columbia. The samples from the two zones, A and BD, were combined for uranium extraction tests. Chemical and radiometric assays of the combined sample, as compared with assays of earlier individual samples from the two zones (see Radioactivity Division report

SR-465/57), are as follows:

	11/57-7	9/56-6	
	A and BD	A	BD
	%	%	%
U ₃ O ₈ (chemical)	0.093	0.071	0.087
U ₃ O ₈ (radiometric)	0.099	0.067	0.094
ThO ₂ (chemical)	0.12	0.06	0.06
ThO ₂ (radiometric)	0.07	0.06	0.06
Probable secondary U ₃ O ₈	0.021	0.015	0.021
CO ₂ (evolution)	1.22	0.03	2.21
Ti	0.12		
V ₂ O ₅	<0.03		
S	11.75	13.81	9.55
F		7.31	2.29
P ₂ O ₅		3.89	4.0
Fe		12.4	12.6
S.G.	3.04	3.27	3.13

The mineralogical investigation was carried out to compare the present sample with the previous sample (Ref. No. 9/56-6) from Rexspar Uranium and Metal Mining Co. Ltd. reported on in SR-465/57. Selected hand specimens from the A and the BD zones were examined separately as well as a composite head sample of minus 10 mesh material.

Rock Composition

This rock is dark in colour, fine-grained and siliceous, and contains considerable pyrite. The mineral composition is shown in Table 1.

Table 1Gravity and Magnetic Separations of the Minus 100 Plus 150 Mesh Fraction

Specific Gravity	Wt %	Minerals
<2.80	19	Chiefly feldspar with minor quartz, phlogopite, fluorite, and jarosite.
2.80 to 3.86 non-magnetic at 0.7 amp	19	Chiefly sericite plus fluorite and and minor phlogopite.
2.80 to 3.86 magnetic at 0.7 amp	27	Chiefly phlogopite with minor jarosite, fluorite, sericite, magnesite, dolomite, and apatite.
>3.86	35	Chiefly pyrite with minor rutile, uranothorite, uraninite, chalcopyrite celestite, hatchettolite, ilmenite, and torbernite.

Table 1 shows that the rock consists essentially of mica and feldspar. Pyrite is very abundant and fluorite quite common. The most abundant of the minor minerals is rutile. The radioactive minerals will be discussed in the section on uranium mineralogy. Banding in some of the specimens is quite prominent.

Since the two zones were combined for the work on ore treatment they were examined separately only as hand specimens. Both pyrite and fluorite appear to be more common in the A zone.

Uranium Mineralogy

The radioactivity in the two zones A and BD is associated with rutile. Only occasional grains of uranothorite, speckled with pyrite and approximately 1/2 mm in diameter, are not directly associated with the rutile.

X-ray diffraction patterns show that in most cases the radioactive mineral associated with rutile in the A zone is uraninite. In some cases uranothorite is associated with rutile. The rutile-uraninite or rutile-uranothorite grains appear to be an even light grey in colour in polished section and usually occur as finely disseminated grains about $1/20$ mm in diameter or as aggregates of fine grains approximately 2 or 3 mm in the long direction. Occasional masses up to $1/2$ by 1 mm are present. One soft, yellow grain containing scattered grey specks gave an x-ray diffraction pattern of uraninite and thorogummite.

The radioactivity in the BD zone appears to be due to uranothorite and/or thorite associated with the rutile. In one case hatchettolite was the radioactive mineral occurring with the rutile. Since only one such grain was found this is believed to be an isolated occurrence. The occurrence of the radioactive minerals is similar to the A zone but the grains or aggregates of grains are not as large, more in the order of $1/4$ to $1/2$ mm. Uraninite was not identified in any of the x-ray diffraction patterns obtained from the BD zone.

Secondary radioactive minerals are rare, only a few scattered scales of emerald green torbernite being observed.

Conclusions

In conclusion, the present sample 11/57-7 appears to be quite similar to the previous sample 9/56-6, reported on in SR-465/57. The general composition of the rock is similar, chiefly mica and feldspar with considerable pyrite and fluorite. The radioactivity is finely disseminated

and is associated with rutile, uraninite being the dominant radioactive mineral in the A zone and uranothorite in the BD zone. As before, secondary radioactive minerals are scarce.

MRH/dm