UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY
WASHINGTON 25, D. C.

APR 3 1950

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AEC-367/0

Dr. Phillip L. Merritt, Assistant Manager
Raw Materials Operations
U. S. Atomic Energy Commission
P. O. Box 30, Ansonia Station
New York 23, New York

Dear Phil:

Transmitted herewith are copies 3 through 7 of Trace Elements Investigations Report 45, Part 1, "Radioactivity and mineralogy of concentrates from the placers of Julian, Moore, and Candle Creeks, and the Cripple Creek Mountains, Lower Yukon-Kuskokwim Highlands region, Alaska", by M. G. White and P. L. Killeen, February 1950.

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Sincerely yours,

W. H. Bradley
Chief Geologist

UNITED STATES DEPARTMENT OF THE INTERIOR

GEOLOGICAL SURVEY

SHORTER CONTRIBUTIONS TO ALASKAN TRACE ELEMENTS STUDIES FOR 1947

1950

Trace Elements Investigations Report 45

UNITED STATES DEPARTMENT OF THE INTERIOR

GEOLOGICAL SURVEY

RADIOACTIVITY AND MINERALOGY OF CONCENTRATES FROM THE PLACERS OF JULIAN, MOORE, AND CANDLE CREEKS, AND THE CRIPPLE CREEK MOUNTAINS, LOWER YUKON-KUSKOKWIM HIGHLANDS REGION, ALASKA

by

M. G. White and P. L. Killeen

February 1950

Trace Elements Investigations Report 45 - Part 1

USGS-TEI Rept. 45, Pt. 1
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RADIOACTIVITY AND MINERALOGY OF CONCENTRATES FROM THE PLACERS OF JULIAN, MOORE, AND CANDLE CREEKS, AND THE CRIPPLE CREEK MOUNTAINS, LOWER YUKON-KUSKOKWIM HIGHLANDS REGION, ALASKA

By M. G. White and P. L. Killeen

ABSTRACT

Radiometric and mineralogic study of 10 concentrate samples from the placers of Julian, Moore, and Candle Creeks, and the Cripple Creek Mountains, Lower Yukon-Kuskokwim Highlands region, Alaska, failed to reveal any significant amounts of uranium. Only the sample from Julian Creek shows an appreciable amount of radioactivity (0.03 percent equivalent uranium), but this is attributed entirely to thorium in monazite.

INTRODUCTION

In 1947 a trace elements reconnaissance party working in the vicinity of Flat in the Lower Yukon-Kuskokwim Highlands region, Alaska, collected samples of heavy sand, i.e., sluice-box concentrates, from some nearby placer gold-mining operations. The localities from which the concentrates were obtained were among those on which the Geological Survey had little or no information and from which it had no samples for preliminary trace elements studies. The results of radiometric and mineralogic data on the samples are given in table 1.

The localities, from which the samples came, (see fig. 1) are as follows:

1. Julian Creek, a tributary of the Middle Fork of the George River, 25 miles southeast of Flat.

2. Moore Creek, 30 miles east of Flat.

3. Candle Creek, 5 miles southwest of McGrath.

4. Cripple Creek Mountains, 35-40 miles northeast of Ophir.

The radiometric data on the heavier-than-bromoform fractions of the placer concentrates shown in table 1 were obtained from laboratory beta counts made by the authors.

LOCALITIES SAMPLED

Julian Creek

Julian Creek is an eastward-flowing tributary of the upper Middle Fork of the George River, which flows from the north into the Kuskokwim River at Georgetown. The mining operation, half a mile upstream from the mouth of the creek, is owned by Harry Steen and operated by Harry Steen and Sture Stenberg in partnership.

The creek's bedrock is sandstone and slate cut by a few narrow porphyritic granite dikes---all presumed to be of Upper Cretaceous age. Sandstone, slate, and porphyritic granite, therefore, make up the coarse material of the gravels. The sample, no. 1925, from this location is a representative one for all of the 1947 sluice-box cleanups.

Moore Creek

Moore Creek is a headwaters fork of the Takotna River, which enters the Kuskokwim River at McGrath. The mine in this locality is owned by Moore Creek Placers, a partnership operated by Elmer Keturi, one of the partners. The concentrate taken here, sample 1916, was from a pile of processed and discarded black sand that is representative of all the sluice-box cleanups at the mine. The gravel in the placer cut is comprised mainly of sandstone, shale, mafic igneous rocks, and some granitic rocks. The bedrock underneath the gravel is sandstone and shale of Cretaceous age.

Candle Creek

Candle Creek enters the Tataline River a few miles southwest of McGrath. The placer mine, a dredging operation owned by Strandberg and Sons, is about 4 miles below the head of the creek in Cretaceous sandstone and shale, just downstream from the contact of these rocks with a small quartz-monzonite body. Gold-quartz veins associated with the intrusive rock are apparently the source of some of the placer gold. Three sluice-box concentrates, samples 1917, 1918, and 1919, presumably represent three different localities on Candle Creek. In 1947, dredging had not yet been resumed after suspension during the war.

Cripple Creek Mountains

On the west side of the Cripple Creek Mountains concentrates were obtained from Cripple and Bear Creeks, headwater forks of Graham Creek, a tributary of Colorado Creek, which flows from the east into the Innoko River about 40 miles north of Ophir.

The upper workings on Cripple Creek, owned and operated by Strandberg and Sons, are at the head of the creek in Fox Gulch. Sample 1921 is representative of pre-1947 operations here, whereas sample 1922 is from the 1947 operations.

The lower workings on Cripple Creek and the Bear Creek workings are operated by Eric Hard. A sample was obtained from each of these two placer operations: sample 1920 from lower Cripple Creek; sample 1924 from Bear Creek. In addition, sample 1923 was taken from Hard's workings on a high bench between Cripple and Bear Creeks.

The bedrock in the lower Cripple Creek workings is a serpentinized greenstone, and in the upper workings it is sandstone and slate of presumed Upper Cretaceous age. The coarse material of the creek gravels consists largely of chert, greenstone, andesite, and basalt porphyry. A smaller proportion of sandstone, slate, and granitic rocks is present also.

CONCLUSION

The information obtained during this investigation indicates that none of the placer deposits at the localities examined contain a significant amount of radioactive materials.

Table 1

Data on concentrates from the placers of Julian, Moore, and Candle Creeks and the Cripple Creek Mountains, Lower Yukon-Kuskokwim Highlands region, Alaska

Location	Alaska Placer File no.	Collector	Percent equivalent uranium in heavier-than-bromoform fraction	Mineralogy of heavier-than-bromoform fraction
Moore Creek	1916	M. G. White	.001	80% chromite in octahedrons* 3% zircon 15% rock-forming minerals Trace of cinnabar, scheelite, pyrite
Candle Creek	1917 and 1919	M. G. White	.003	90% spinel 3% zircon 2% cinnabar, scheelite, monazite(?) 5% rock-forming minerals

Table 1

Data on concentrates from the placers of Julian, Moore, and Candle Creeks, and the Cripple Creek Mountains, Lower Yukon-Kuskokwim Highlands region, Alaska

Location	Alaska Placer File no.	Collector	Percent equivalent uranium in heavier-than-bromoform fraction	Mineralogy of heavier-than-bromoform fraction
Candle Creek (cont.)	1918	M. G. White	.001	65% rock-forming minerals 30% garnet and spinel 3% olivine Trace of zircon
Cripple Creek Mountains	1920	P. L. Killeen	.000	Mostly rock-forming minerals with large grains of zircon.
	1921		.002	
	1922		.001	
	1923		.001	
	1924		.001	
Julian Creek	1925	P. L. Killeen	.03	80% pyrite 10% rock-forming minerals 5% garnet 5% monazite

*45% Cr_2O_3 by spectrographic analysis