THE GEOLOGICAL SURVEY OF WYOMING
Gary B. Glass, State Geologist

MINERAL REPORT 87-1

THE BONNEVILLE PEGMATITE CLAIMS, COPPER MOUNTAIN, FREMONT COUNTY, WYOMING

by

Ray E. Harris

Laramie, Wyoming
1987

The Bonneville pegmatite claims,

Copper Mountain, Fremont County, Wyoming

The Bonneville Pegmatite claims are located over a group of northeast-southwest trending pegmatites located in sections 21, 22, 27, and 28, T.40N., R.93W., Fremont County, Wyoming (map attached). These claims are located on the U.S. Geological Survey Birdseye Pass and Guffy Peak 7½-minute topographic Quadrangles. Access to the claims is via a graded dirt road that leaves U.S. Highway 20 3½ miles north of its junction with the paved road to Bonneville. Follow the graded dirt road east and northeast from U.S. Highway 20 about 9½ miles to the intersection of another graded dirt road that parallels a set of power lines. Follow that road one mile east, then one mile north along an ungraded dirt trail to the spring in the center of section 28, then east ½ mile on an intersecting ungraded road to the base of the Bonneville #1 pegmatite. Direct access to the Bonneville Claims from the south through the Quien Sabe Ranch is prohibited by the ranch owner as of this date. Four-wheel drive is advisable, though two-wheel drive high clearance vehicles can get to the area in dry weather.

The first mining in this area took place in 1906, when some muscovite was removed from several pegmatites. Beginning in 1910, and continuing intermittently to 1940, small amounts of feldspar, beryl, mica, lepidolite, and tantalite have been removed (McLaughlin, 1940). In 1969 and 1970 the Wyospar Division, Northwestern Feldspar Corporation, produced feldspar from the area, and developed the Quien Sabe underground feldspar mine located ½ mile northeast of the Bonneville Claims. In 1972, Modern Mining and Milling began to produce feldspar from the area. Prior to 1980, the claims were known as the Whippet

Prospects. In 1980 and 1981 Concepts West, Incorporated, reported feldspar production from the Bonneville #1 Mine (now the pit on the Bonneville #1 claim). The claim names were changed to the Bonneville claims by the present owner in 1981. Two hundred tons of feldspar were produced in 1980, and ninety tons were produced in 1981 (Wyoming State Inspector of Mines 1969-1982 annual reports). No feldspar has been produced since 1981.

Eight claims (Bonneville 1-8) make up the present claim group. The pegmatites on the Bonneville Claims 1, 2, 7, and 8 were examined for this report in October, 1986. The pegmatites on Bonneville Claims 3, 4, 5, and 6 were not visited, but are reported by the claim owner to be similar to the pegmatites examined. These claims are located on a series of approximately N60° east-trending quartz-microcline-muscovite pegmatites intruded concordantly into regionally metamorphosed schists, phyllite and gneisses of Precambrian age. Precambrian granite occurs in small areas. Some of the pegmatites extend for more than 1,000 feet along strike and may be more than 150 feet wide. They form a group of subparallel bodies extending from the west-center of section 28 to the center of section 22. The pegmatites are well-exposed, as is the country rock in the area of the Bonneville Claims. The pegmatites in this area are also described in McLaughlin (1940) and Hanley and others (1950), but the maps in those publications do not agree, nor do they agree with observations made for this report. Hanley and others (1950), McLaughlin (1940) and Hausel and others (1984) describe the geology of the country rocks in the area.

The Bonneville #1 claim is developed by a bulldozed pit in a large pegmatite (about 50 feet in width) located just north of the center of section 28, at the end of a graded access road. Beryl and tantalum minerals are being hand-cobbed from the rock after blasting and dozing, and small amounts of beryl have been

shipped in the past two or three years to the Brush-Wellman beryllium recovery plant in Delta, Utah. Beryl crystals several feet in diameter and length occur here. These beryls are light green to yellowish green and contain scattered muscovite flakes. With the exception of their size, they are not valuable as specimens since they are opaque and easily fractured, but are valuable as an ore of beryllium. Columbite-tantalite crystals (mineralogy determined by x-ray diffraction, and ARC emission spectrometry - see attached laboratory report 850826) up to four inches by four inches by one inch in size have been found in this pegmatite. Pyrochlore-microlite and tapiolite have also been identified in this pegmatite (see attached laboratory report 861010). The pegmatite in the pit contains an ellipitcal area of beryl crystals in a quartz-feldspar matrix, surrounded by a tantalum-beryl zone in a feldspar matrix which is in turn surrounded by the quartz-feldspar-muscovite mineralogy of the main body of the pegmatite. The elliptical body that contains the beryl crystals is not in the center of the pegmatite. Tantalum minerals occur in other elliptical and tabular areas in the pegmatite body. Hanley and others (1950) report that columbite (containing 48 percent Ta_2O_5 and 34 percent Nb_2O_5) is also present in a pegmatite at this locality. McLaughlin (1940) reports that columbite, cleavelandite and tourmaline are present in a pegmatite at this locality.

The pegmatite that is found on Bonneville Claims 1 and 2 was examined along strike to the northeast for about 500 feet. Smaller pods containing beryl and tabular tantalum-rich zones are present, and lithium-bearing minerals (lepidolite and possibly petalite) were noted. These occur in irregular pods, three to four inches in which diameter contain 1/4 inch by 1/4 inch lepidolite flakes. The dike thins to the northeast, pinching out in one place. This pegmatite continues beyond the pinchout to the top of the ridge in the NE1/4 of section 28.

The Bonneville Claim 7 is located in the SW1/4NW1/4 section 27 on the north-facing slope of a ridge, near the ridge crest and adjacent to a prominent gap. The pegmatite exposed on this claim is a quartz-microcline-muscovite body about 20 feet wide. The length of this pegmatite was not determined, but it is shown by McLaughlin (1940) to extend only 50 feet along strike. No tantalum bearing minerals or beryl were observed; however, clear rose quartz is found in a three by six inch pod in this pegmatite. The extent of the rose quartz at depth is not known.

Bonneville Claim 8 is located in the SW1/4SW1/4 section 22, and just within the NW1/4NW1/4 of section 27. The pegmatite on this claim varies in width from a wedge edge to 20 feet. It contains pods and tabular zones parallel to its length that contain abundant petalite, aquamarine beryl, tapiolite, tantalite-columbite, and pyrochlore-microlite (see attached laboratory report 861010). A conspicuous tabular zone three feet in width extending along strike for 50 feet or more consists of 20 percent tapiolite (identified by x-ray diffraction, see attached laboratory report 861010) with pyrochlore-microlite reaction rims. Aquamarine beryl encased in white quartz and feldspar forms a zone measuring about ten feet by ten feet in another part of the pegmatite. The beryl crystals are up to six inches long and 3/4 inch in diameter. They are difficult to remove from the other pegmatite minerals. Currently they are being hand-cobbed for sale as mineral specimens. The tapiolite crystals would also make excellent specimens for collectors due to their size (up to 1/2 inch in length) and well-developed crystal forms, as would the large petalite (four inches by three inches by one inch) and (one inch by 1 inch by 1/2 inch) fan-shaped tantalite-columbite crystals.

The size of the tantalum, columbium, beryl, lithium, and other resources in the pegmatites in this area is not known. The occurrences are irregular

within each pegmatite, although very high grade pockets are present. Any exploration program should encompass all of the related pegmatite bodies in the area. All of the mineral resources present in the pegmatites, including tantalum, columbium, feldspar, beryl, lithium, and quartz, should be considered when evaluating the pegmatites for development. A detailed mapping program is also needed. The use of air photographs on which the pegmatites should stand out since they are white and the country rock is dark colored may expedite mapping.

References

Hanley, J.B., Heinrich, E.W., and Page, L.R., 1950, Pegmatite investigations in Colorado, Wyoming and Utah: U.S. Geological Survey Professional Paper 227, 125 p.

McLaughlin, T.G., 1940, Pegmatite dikes of the Bridger Mountains, Wyoming: American Mineralogist, v. 25, p. 46-68.

Hausel, W.D., Graff, P.J., and Albert, K.G., 1984, Economic geology of the Copper Mountain supracrustal belt, Owl Creek Mountains, Fremont County, Wyoming: Geological Survey of Wyoming Report of Investigations 28, 33 p.

Wyoming State Inspector of Mines, 1964-1982, Annual reports: Office of the State Inspector of Mines, Rock Springs, Wyoming.

50 Years of Service to Wyoming

THE GEOLOGICAL SURVEY OF WYOMING
UNIVERSITY OF WYOMING
BOX 3008, UNIVERSITY STATION
LARAMIE, WYOMING 82071
(307) 742-2054 (307) 721-3920 (307) 766-2286

LABORATORY REPORT

Client Sample No.:

WGS Sample No.: 850826

Client: Ray Harris

Sample Description:

dense, tabular habit, dull grey-black to brown-black, non-magnetic with some muscovite (?)

Analyses Requested:

id mineral

Methods & Results:

XRD: Columbite-Tantalite (position in series indeterminate by XRD)
+minor muscovite
+minor quartz

ARC EMISSION SPEC: qualitative

element	intensity
Nb	VS
Ta	S
Fe	S
Al	S
Mn	S
Mg	M
Si	S
Cu ?	M

VS = very strong
S = strong
M = moderate
W = weak

EDXRF, qualitative:

element	intensity
Ta	VS
Nb	S
Fe	VS
Mn	S
Si	W
Ca	W
Ti	W

SPECIFIC GRAVITY = 6.24

Analyst: Jay Roberts Date February 4, 1987

small sample retained in permanent lab referance, remainder to REH

WGS Sample No.: 850826

50 Years of Service to Wyoming

THE GEOLOGICAL SURVEY OF WYOMING
UNIVERSITY OF WYOMING
BOX 3008, UNIVERSITY STATION
LARAMIE, WYOMING 82071
(307) 742-2054 (307) 721-3920 (307) 766-2286

LABORATORY REPORT

Client Sample No.: Bonneville

WGS Sample No.: 861010

Client: Ray Harris

Sample Description:

A: Bonneville 8C, chalky, white, tabular
B: Bonneville 8B, split wedge x1, dull brown-black
C1: Bonneville 8A, Black, orthorhombic(?) x1
C2: Bonneville 8A, dull brown to black where fresh
C3: Bonneville 8A, v. soft, friable brown weathered residue scraped from cavity
C4: Bonneville 8A, dull black, red-brn streak
D1: Bonneville #1, tabular black grain
D2: Bonneville #1, shallow sample of brown coating on dull brown grain
(sample locations noted on rocks)

Analyses Requested: mineral id

Methods & Results:

X-ray diffraction:

A = Petalite, $LiAlSi_4O10$ + trace quartz

B-D2, Relative Diffraction Intensity:

Sample #	Pyrochlore/ Microlite	Tapiolite	Columbite/ Tantalite	Unknown*
B	11	0	100	7
C1	25	100	0	33
C2	45	100	0(?)	3
C4	7	100	0	6
D1	16	100	0	trace
D2	100	69	0	trace

C3 = plagioclase + quartz + trace pyrochlore (?)

* Unknown = possible plagioclase, lepidolite and/or muscovite contamination of sample from host rock. Possible Betafite.

Analyst: Jay Roberts Date: October 21, 1986

Excess Sample: X returned __discarded __store 90 days, discard __store permanent

WGS Sample No.: 861010 Bonneville

Bonneville #5
Bonneville #7
Bonneville #3
Bonneville #1
Bonneville #2
Stardust Tungsten Mine
Comet Tungsten Mine
Meeks Ranch
Quien Sabe Ranch
Hoodoo
Dry Creek
West Fork
Tough Creek
Tough
Mine
Spring
BM 5950
BM 5904
BM 5938
19
20
21
22
23
24
25
26
27
28
29
30
31
32
33
34
35
36
1
2
3
4
5
6
R. 94 W.
R. 93 W.
R. 93 W.
12 MI. TO U.S. 20
WYOMING
710 000 FEET
57'30"
SCALE 1:24 000
1 MILE
1 KILOMETER
4000 5000 6000 7000 FEET
ROAD CLASSIFICATION
Heavy-duty
Medium-duty
4 LANE | 6 LANE
Light-duty
Unimproved dirt
U. S. Route
State Route
INTERIOR—GEOLOGICAL SURVEY, WASHINGTON, D. C.
BIRDSEYE PASS, WYO.
N4322.5—W10800/7.5
1951
AMS 4370 I NE—SERIES V874
Mapped, edited, and published by the Geological Survey
as part of the Department of the Interior program
for the development of the Missouri River Basin
Control by USGS and USC&GS
Topography from aerial photographs by multiplex methods
Aerial photographs taken 1949. Field check 1952
Polyconic projection. 1927 North American datum
10,000-foot grid based on Wyoming coordinate system,
West central zone
All mines on this map are inactive
1000-meter Universal Transverse Mercator grid ticks,
Zone 13, shown in blue
UTM GRID AND 1952 MAGNETIC NORTH
DECLINATION AT CENTER OF SHEET
CONTOUR INTERVAL 20 FEET
DATUM IS MEAN SEA LEVEL
THIS MAP COMPLIES WITH NATIONAL MAP ACCURACY STANDARDS
FOR SALE BY U. S. GEOLOGICAL SURVEY, DENVER, COLORADO 80225, OR WASHINGTON, D. C. 20242
A FOLDER DESCRIBING TOPOGRAPHIC MAPS AND SYMBOLS IS AVAILABLE ON REQUEST

Location Map
Bonneville Claims MR-87-1