

**GEOLOGICAL SURVEY OF WYOMING  
MINERAL REPORT 91-1**

**Sheep Mountain Copper Mine, Medicine Bow Mountains,  
Wyoming**

by

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Senior Economic Geologist  
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1991

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On May 20, 1991, I examined a historic mine on Sheep Mountain at the request of Fred Gray with the University of Wyoming Agriculture Department. Access to the mine was gained from the Owen Creek road running along the southern flank of Sheep Mountain between Highway 11 and 230. From Owen Creek, a trail runs north into Sheep Mountain (Figure 1), where it connects with the main Sheep Mountain Trail nearly 3 miles from the road. A short distance east of the trail intersection, the remnants of an overgrown trail run directly east for nearly a mile before reaching the historic mine at the eastern edge of Sheep Mountain. The old trail is difficult to see and is easily overlooked which probably explains why no modern reports exist on this particular mine. Since the name of the mine is unknown, for simplicity, the mine will be referred to as the Sheep Mountain mine.

Prior to reaching the Sheep Mountain mine, a couple of prospects were seen along the trail. In the NW/4 sec. 27, T.14N., R.77W., a prospect pit was observed on a southeasterly trending fault in the Fence Creek valley. A short distance east of that prospect at the confluence of two unnamed intermittent drainages, is a shaft with a small dump and a decaying cabin. Neither of these were investigated. A third prospect was found along the trail in the SE/4 sec. 21, T.14N., R.77W. This pit is located in pink sericitized granite (Figure 1). The remains of a decaying cabin lie over the prospect pit. Very little evidence of mineralization was found here with the exception of minor malachite stains on the granite. The early prospectors probably recognized the copper stains but gave up after finding very little evidence of mineralization below the surface.

The Sheep Mountain mine lies to the north of these prospects and is well hidden in a forested area at the headwaters of two unnamed drainages. One drainage runs west into Fence Creek, the other drains east down a steep canyon into the Laramie Basin. The mine is at the saddle between the two drainages.

The shaft lies on the south side of the saddle, and the property includes the remains of three mine support buildings. Since the mine portal was caved, it was not possible to determine the extent of the mine workings; however, based on the size of the the mine dump the shaft could be a few hundred feet deep with several hundred feet of drifts. In all probability some ore had been shipped from the mine.

The following mineralized and ore specimens were collected from the mine dump:

SPM1-91: A pink, hypidiomorphic granular granite with phenocrysts of orthoclase, albite(?), and quartz enclosed by a fine-grained mesh of biotite. Grains of non-fluorescent purple fluorite occur in the biotite mesh and possibly replace some biotite. Traces of malachite stain some of the biotite and feldspar grains.

SPM2-91: Malachite-stained quartz with silver-gray metallic oxide. The metallic oxide was analyzed by XRD with a best matches to ilsemannite ( $\text{MoO}_3 \cdot x\text{H}_2\text{O}$ ) and litharge ( $\text{PbO}$ ). Being that molybdenite was found in another sample on this mine dump, it is assumed the mineral is ilsemannite.

SPM3-91: A black massive malachite-stained rock with minor quartz. The black mass consists of fine-grained biotite and very fine-grained material identified by XRD as berthierine (a variety of the chlorite group mineral-chamosite). Another sample in this group contained fracture filling ilsemennite(?) in malachite-stained quartz.

SPM4-91: A group of fractured quartz vein ore specimens filled with malachite-stained chalcopyrite, chalcocite, and bornite. One disseminated grain of a bright, silver-metallic, greasy mineral was confirmed by XRD as molybdenite.

SPM5-91: Quartz with fractures filled with malachite-stained bornite.

SPM6-91: Quartz breccia in a matrix of malachite-stained chalcopyrite and chalcocite.

SPM7-91: Quartz with fractures filled by malachite-stained chalcopyrite with biotite, minor cuprite and traces of copper sulfate (?).

SPM8-91: Gray malachite-stained fractured quartz with fracture filling silver-gray ilsemannite.

Five samples were assayed with the following results:

<u>Sample #</u>	<u>Au (ppb)</u>	<u>Ag(ppm)</u>	<u>Cu(%)</u>	<u>Pb(ppm)</u>	<u>Zn(ppm)</u>	<u>Mo(ppm)</u>
SPM3-91	52	16.3	>2.0	192	<1	870
SPM4-91	6	5.0	>2.0	672	60	99
SPM5-91	10	23.2	>2.0	47	<1	114
SPM6-91	40	26.8	>2.0	--	--	--
SPM7-91	13	23.8	>2.0	83	<1	--

These assays confirm the presence of relatively high grade fracture-filling copper ore with some molybdenum and anomalous silver. Unfortunately, the gold content is low. But based on the mineral assemblage, this deposit may be worthy of further investigation as a possible Laramide mineralization event.



THE GEOLOGICAL SURVEY OF WYOMING

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LABORATORY REPORT

GSW Lab. #: 910524

Client: Dan Hausel

Client Sample #: SPM2-91 SPM3-91 SPM4-91 F.Sander

Sample Description: Rock

Analysis Requested: SPM2-91: XRD for possible Chalcocite; SPM3-91 XRD for Tourmaline;
SPM4-91: XRD for Molybdenite; F.Sander: XRD for Argentite

Methods & Results:
SPM2-91: Negative for Chalcocite - Best matches found are:
Ilsemanite (Mo3O8·xH2O)
Litharge (PbO) - minor quartz also indicated.
SPM3-91: Berthierine (100 rel. intensity) - (FeAl)3(SiAl)2O5(OH)4
Chlorite also indicated by computer and by matching peaks
(neither is real definitive as certain peaks are
missing but the most intense peaks are present for the
two minerals named).
SPM4-91: Molybdenite (good match)

Analyst: Robert W. Sengary Date: June 20, 1991

Excess Sample: xx returned \_\_\_ discarded \_\_\_ store months & discard \_\_\_ store perm.

GSW Lab. #: 910524 1-4

