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RECONNAISSANCE OF BASIN-BOULDER-CLANCEY AREA, JEFFERSON COUNTY, MONTANA

By
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Division of Raw Materials
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Technical Information Service, Oak Ridge, Tennessee

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ILLUSTRATION

RECONNAISSANCE OF BASIN-BOULDER-CLANCEY AREA, JEFFERSON COUNTY, MONTANA

By Millard L. Reyner, Geologist

Introduction

During the spring and summer of 1950 a radiometric reconnaissance of mineral deposits in the Basin-Boulder-Clancey area of Montana was carried out by the author. About 30 mines and prospects were visited, including several where slight radioactivity had been reported, and several which have a record of silver-lead production. Below are summarized the observations at those deposits which appeared to possess a sufficiently significant degree of radioactivity to warrant further consideration. The Enterprise mine is the subject of a forthcoming separate report and is therefore omitted here.

Alice claim

The Alice claim, in Sec. 8, T. 6 N., R. 4 W., is owned by the Elkhorn Mining Co., Boulder, Mont., through a recent purchase. Development consists of an inaccessible 25-foot shaft on a shear zone bearing N. 40° E. and dipping steeply to the north, in quartz monzonite. The shear zone is 1 to 2 feet wide, mineralized mainly by quartz with minor sulfides. The small pile of ore in the bin was only slightly radioactive -- about twice background. Near the collar, the vein showed insignificant radioactivity.

Beavertown Ranch

Beavertown Ranch is owned by Edwin Erickson, Jefferson City, Mont. Silver ore was found in Sec. 24, T. 7 N., R. 4 W. on the ranch about five years ago by Bob Erickson who removed about 20 sacks of ore from a trench 30 feet long and 2 feet deep. He says the ore ran 140 oz. in silver and that the vein is 6 to 8 inches wide. The overburden has caved into the trench and no vein was observed.

Vein material in the ore sacks consists of vuggy quartz stained grayish green. The most radioactive piece showed 10 to 15 times background, and contained some green and yellow secondary uranium minerals.

Bullion mine

This property is located in Sec. 13, T. 7 N., R. 6 W., or about 7 miles north of Basin on the northwest side of Jack Mt. A 200-ton concentrator and smelter was built on the property prior to 1913 but it is now dismantled. The vein is a hydrothermal fissure filling and replacement lode along an easterly trending shear zone in quartz monzonite which has been cut by a few aplite bodies. Vein material consists of galena, sphalerite, pyrite, arsenopyrite, tetrahedrite, some chalcopyrite, white crystalline quartz, gray flinty quartz, and fairly abundant tourmaline.

The mine has been developed by several adits and small

shafts, totaling several thousand feet. Most of the mine dumps were examined as well as the material around the old mill and smelter. Several pieces of radioactive material were found on the dump by the first adit above the main haulage level, evidently the last material taken from this adit. The next dump above this one showed some activity in material beside a shaft. The dumps at the main haulage level showed little or no activity. The radioactive material is mostly black coatings on, and black seams in, pieces of material high in arsenopyrite and pyrite. Some of this black material is sooty. Several pieces showed radioactivity 50 to 100 times background

Carbonate claim

The Carbonate claim, in Sec. 9, T. 6 N., R. 4 W., is owned by Wade V. Lewis and Sanford Davis, Boulder, through location in 1949. There are three small pits on the claim, but no vein was exposed at the time of examination due to caving of the pits. The country rock is quartz monzonite.

One-half of one dump gave radioactivity of two to three times background. A few small pieces of vein quartz stained with limonite were observed on the dump, but no uranium minerals.

Comstock group

One of the seven claims in this group, in Secs. 10 and 15, T. 6 N., R. 5 W., is owned by W. F. Meaney, of Great Falls, and is leased to Waldemar Sandquist and George Mayer, of Basin,

and Paul K. Williams, of Helena, which three own the other six claims of the group. Development includes several short adits, trenches, and open-cuts.

A brief radiometric examination of the upper dumps, open-cuts, and adits was made. Radioactivity of 10 times background was observed from some pieces of ore containing oxidized lead minerals, oxidized copper minerals and galena. One ore shoot underground, about 15 feet long and 8 to 10 inches wide, of high-grade silver ore gave 5 times background radioactivity. The open-cut on the top of the hill, which is said to have yielded a little high-grade uranium ore, gave radioactivity of 10 times background in a few spots. The bottom of the cut was not clear of loose rock, and it is possible that more of the high-grade lies under this loose rock. Slight radioactivity is measurable for a length of a few hundred feet along one east-trending structure.

Gold Point claim

The Gold Point claim, in Sec. 8, T. 6 N., R. 4 W., is owned by Sanford Davis, Boulder, Mont., who located it two years ago with permission of the previous owner. The vein strikes east and dips about 80° N. in the upper tunnel, which has been caved by stoping from below. It is said to range from a few inches to 2 feet wide. Development consists of two adits on the vein, both of which are caved. The lower drift is about 80 feet below the upper drift and enters 300 feet east; it has been stoped to surface for about 300 feet. The lower drift is said to be about 350 feet, the upper drift

about 50 feet long. The property has been worked intermittently on a small scale since 1900, a few small shipments of lead ore having been made to East Helena.

The vein contains mainly white quartz with associated galena, pyrite, and chalcopyrite, and their oxidation products -- cerussite, limonite, and chrysocolla. Ore sorted out in the bin at the lower adit showed radioactivity of 5 to 7 times background; one waste dump by this adit gave the same radioactivity. Pieces containing mostly galena seemed to have very little radioactivity, while pieces of vuggy quartz with spots of chrysocolla showed about 5 times background. The radioactivity is probably all due to secondary uranium minerals. Radioactivity of about 5 times background was noted in some galena-quartz ore beside a 15-foot shaft about 1500 feet to the west of the workings.

Hinman group

The Hinman claims, 2½ to 3 miles west of Clancey, in Secs. 5 and 6, T. 8 N., R. 3 W., are owned by Wayne Hinman, Clancey, Mont. This group consists of four unpatented claims -- the West End, '49'er, King Solomon, and Blue Monday. They are developed by numerous small pits and a few short tunnels, the longest of which is 30 ft. The country rock is quartz monzonite intruded by an elongated body of aplite. No veins were observed, but several silicified and breccia zones up to 2 ft. wide were seen.

One silicified zone consisting mainly of bluish quartz was observed on the '49'er claim at the discovery cut and in the

face of a tunnel about 15 ft. below the cut. It is 2 ft. wide and indicates 0.10% e U_3O_8. The strike of the zone is N. 60° E. and it dips 57° S. A grab sample from a dump beside a small pit 300 ft. west of this tunnel ran 0.4% eU, and green crystals of metatorbernite were identified in this material. Several other radioactive spots on these claims were noted by Sunshine Mining Co., Kellogg, Idaho, who had a lease and option on the property in 1949.

Josephine mine

Josephine mine, 15 miles north of Basin, Mont., in Sec. 25, T. 8 N., R 6 W., is owned by Seven Consolidated Gold Mines, Inc., 405 N. 149th St., Seattle, Wash. The deposit was discovered in 1887 and last worked to the 300-foot level in 1893. Near-surface operations have been carried on by lessees intermittently since that time. The mine is developed by a 400-foot shaft with three levels totaling over 1000 feet, and an adit 250 feet long with a winze down 180 feet. The vein strikes east and is almost vertical.

The shaft was inaccessible and snow prevented any surface reconnaissance at the first visit. William McLean, mine manager, gave the following information: "The vein is up to 32 inches wide, in aplite. Ore was shipped for gold-silver-lead content. Wet assays for uranium on pieces of ore from the 300-foot level showed

0.88%, 0.96%, 1.20% U_3O_8, and a picked specimen gave 7.0% U_3O_8."

A sample of two pieces of ore collected by the writer from a small pile in the hoist room ran 0.11% eU. These two pieces consisted of quartz, pyrite, sphalerite, chalcopyrite, arsenopyrite, and green silicates. Mr. McLean also stated that radioactivity was observed on the claim 1500 feet west of the shaft.

The 300-foot level is developed by a 60-foot crosscut southwest from the shaft to the vein. The vein has been drifted on and stoped to the west for about 150 feet but a cave has blocked the drift at 40 feet. To the east, a drift has been driven 300 feet and the first 130 feet is stoped both above and below the level. The vein, which strikes easterly, dips 75° to 80° north, and is all in aplite. The vein is predominatly quartz with auriferous pyrite, galena, sphalerite, chalcopyrite, and arsenopyrite. Some of the quartz has a reddish jaspery appearance.

A radiometric survey was made of the dumps, ore bin, and accessible portions of the 300-foot level. Several pieces of ore in the bin from the 300-foot level gave a radioactivity of 20 times normal background. On the 300-foot level the most radioactive area appeared to be in a stope 130 feet east of the crosscut to the shaft. The stope is about 30 feet long, 20 feet high, and 2 to 4 feet wide. The radioactivity in the stope is twice background and in some places against the walls it goes up to 10 times background.

King Solomon mine

King Solomon mine, owned by the Monarch Mining & Milling Co., c/o Cordelia N. Moreland, 1030 E. Ocean Boulevard, Long Beach 2, California, and not identical with the King Solomon claim in the Hinman group, above, is in Sec. 6, T. 8 N.,R.3 W. It was located in 1889 and worked intermittently for about 25 years through an inclined shaft. The vein consists of a wide shear zone trending westerly, parallel to a dacite dike, and containing narrow slabs of high-grade ore. The country rock is quartz monzonite cut by dikes of aplite and dacite. The vein material is chalcedonic quartz, sphalerite, galena, with some pyrite and tetrahedrite.

A few pieces of rock on the dump showed slight radioactivity, and one piece of vein quartz with a light brown coating gave 6 times background on the coated side. Pieces of ore had insignificant radioactivity.

Liverpool mine

This mine is in Sec. 33, T. 9 N., R. 3 W., and on the north side of Lump Gulch 2 miles north of Clancey. It is owned by Mr. Ora Guffey, c/o Mutual Coal Co., Helena, Mont. The mine is developed by four shafts, the deepest of which is said to be 750 feet. It has produced over $1,000,000, mostly in silver.

The vein appears to be a fissure filling and replacement

lode along an east trending, steeply dipping shear zone in altered quartz mozonite. The vein matter carried galena, sphalerite, pyrite, arsenopyrite, tetrahedrite, ruby silver(?), white quartz, brown jaspery quartz, and pink magnesite. Several pieces of radioactive material were found on the dumps. The highest activity was about 40 times background, several pieces reading 15 to 20 times background. The radioactive material consists of black seams and coatings, some of which are sooty, as well as some black slickensided surfaces.

Lone Eagle mine

The Lone Eagle mine in Sec. 25, T. 8 N., R. 5 W., near the head of Quartz creek, and about 5 miles nearly due east of the Josephine mine, is owned by Dave Nieminen of Wickes, and Maurice Nelligan and A. H. Eiselein of Boulder. It was located prior to 1900 and annual assessment work was kept up for many years until the original locator died. The present owners located the property two years ago. Development consists of a 300-foot crosscut, the last 100 feet of which is full of water behind caved ground. Two drifts were started from the crosscut but they are caved.

Approximately 10 tons of vein material are in the bin, several pieces of which show radioactivity of 20 to 30 times background. The vein material consists of white and gray quartz, silicified wall rock, pyrite, and minor chalcopyrite, sphalerite, and galena. This vein material is very similar to that of the Josephine

mine. The country rock is quartz monzonite intrude by aplite, and the two caved drifts are both in aplite. The vein which produced the ore in the bin was not seen underground, so this ore is presumed to have come from one of the caved drifts.

Meadow mine

The Meadow mine, 2 miles north of Clancey, in Sec. 34, T. 9 N., R. 3 W., is owned by the N. and N. Mining Co., P. O. Box 1069, Helena, Mont. The deposit was discovered two years ago when Winston Bros. unearthed vein material during dredging operations. Shaft sinking was started in 1949. Total development consists of a 90-ft. inclined shaft (80°) with a drift 50 ft. long at the bottom and a 20-ft. drift 25 ft. below collar. The country rock is quartz monzonite with a "dacite dike" on hanging wall. The vein strikes east and dips 80° south. It varies in width from 18 in. down to 6 inches and consists of white quartz, with associated galena, sphalerite, pyrite, tetrahedrite, ruby silver, and brown opal. Approximate assays, according to Al Nugent, who is half owner, are 4% Pb, 8 to 9% Zn, and over 200 oz. Ag.

At the time of examination, radioactivity in the west end of the bottom level was twice background, and in the east end just a little over background. Pieces of sulfide ore showed no noticeable increase, but pieces containing brown opal gave 4 to 5 times background and indicated 0.06% eU.

Mountain Queen and Jack mines

These mines are located in Sec. 27, T. 4 N., R. 5 W.,

about 12 miles east of Trask, and at the head of Hay canyon in Jefferson County. The Mountain Queen is owned by E. J. Freudenstein, 411 S. Dakota St., Butte, Mont., and the Jack is leased by Walter Cowley, 400 S. Washington St., Butte, Mont. The two claims lie on the same vein, which can be traced for over 4000 feet on the surface. Development consists of several small adits and shafts. The present owners are dewatering a shaft on the Mountain Queen claim with the intention of driving a drift westward underneath the old workings. This shaft is said to contain some galena ore which is slightly radioactive.

The vein strikes east and is nearly vertical. It consists of quartz, limonite, pyromorphite, cerussite, and carries minor metatorbernite. Several of the dumps were examined, as well as pieces of vein material from dumps 2000 feet to the east and 2000 feet to the west of the shaft that is being dewatered. Most of the material gave a radioactivity of two to three times background, the most active piece about eight times background.

Nickelodeon claim

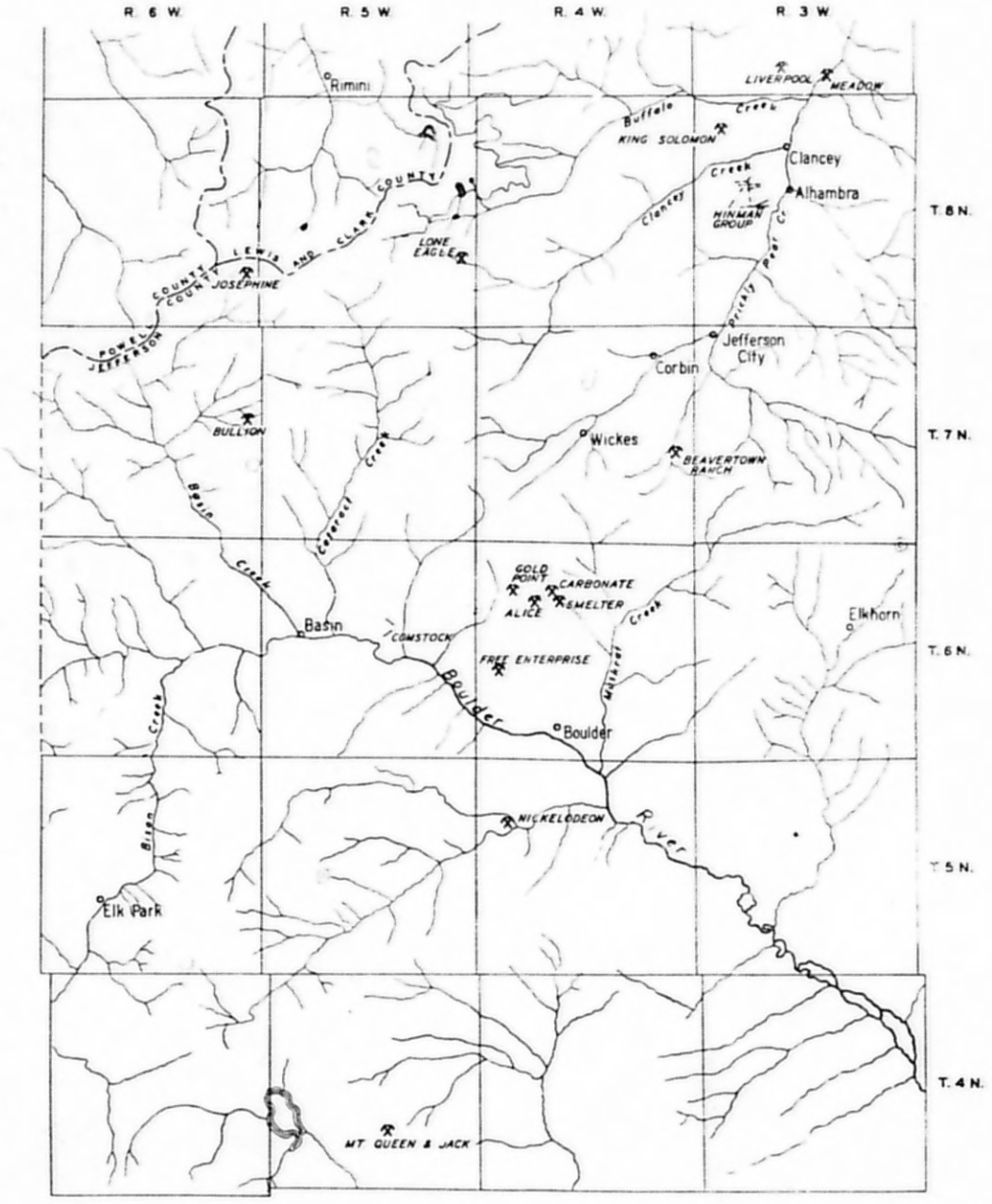
The Nickelodeon, in Sec. 7, T. 5 N., R. 4 W., 3-1/2 miles south of Boulder, is owned through location by Sanford Davis, Boulder, Mont. It is developed by a 20-foot shaft, several small cuts, and a 270-foot crosscut tunnel. The shaft is on a $2\frac{1}{2}$-foot vein which strikes N. 78° E. and dips 80° to 85° N. The country rock is granite intruded by aplite. The vein contains chiefly

quartz, with associated chrysocolla, tenorite, chalcopyrite, pyrite, molybdenite, scheelite(?), and silver.

Radioactivity of the ore is 5 to 10 times background, and radioactivity in the crosscut tunnel is fairly consistently 2 to 3 times background. A prospect about 1/4 mile to the east contains similar vein material with similar radioactivity.

Smelter claim

This property, in Sec. 9, T. 6 N., R. 4 W., owned by Wade V. Lewis and Sanford Davis, both of Boulder, Mont., was located by the former in 1949. It is developed by three small pits on a 6 to 8-in. vein striking N. 60° E. and dipping steeply to the north. The vein consists of highly leached vuggy quartz with spots of galena and cerussite, stained with limonite. Country rock is quartz monzonite. No uranium minerals were found, but radioactivity of pieces of vein material on the dump was two to three times background.



INDEX MAP OF NORTHERN BOULDER BATHOLITH AREA, MONTANA
SHOWING MINES AND PROSPECTS EXAMINED FOR RADIOACTIVITY
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MILES
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PLATE I

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