

REPORT OF THE STATE GEOLOGIST ON THE AREA  
NORTHEAST OF BONNEVILLE, FREMONT COUNTY,  
WYOMING, ON POSSIBLE MERCURY AND GOLD DEPOSITS.

On Thursday, September first, 1927, State Geologist, John G. Marzel, accompanied by Deputy Geologist C. S. Dietz and State Oil and Gas Inspector Frank B. Taylor, journeyed from Casper to Bonneville and thence to the area about eight miles northeast of that town where the Golden Dome Mining Co. and other prospecting firms are reported to have discovered a deposit of mercury and gold. The day was bright and sunny, warm with a light breeze and the roads dry. The State officials were accompanied on this trip by Charles B. Stafford of the Casper Chamber of Commerce, George Lilly of the Golden Dome Mining Co. and Roy C. Smith. Arriving on the ground the party met with R. E. Steffen, Lewis Funk and F. L. Hill who are prospecting or mining in the area.

Topography

This area lies on the south side of the Copper Mountains, a part of the Big Horn system and the stratification is a monocline rising to the north. It is comprised of the different geological horizons from recent and Tertiary overlays on the surface to the lower period strata which come to the surface as one nears the granite uplift of the mountains themselves. The claims supposed to contain mercury and gold are in the Tertiary strata and are composed in the main of loosely cemented gravels with clays and some shales. There is no indication of volcanic action in the area examined.

This area presents a somewhat broken plain left by the prehistoric erosion

and is cut by a small stream known as Dry Creek flowing from the mountains into Badwater Creek. The plant of the Golden Dome Mining Co. is located upon this stream. The operation carried on here consisted of shoveling this Tertiary gravel into sluices where it was washed by water pumped from the bed of the creek by means of a centrifugal pump and gasoline engine, and the concentrates were caught in specially constructed iron basins lined with copper plates where the mercury was amalgamated.

### Geology

All local ground examined consists of a deep sand and gravel deposit of Tertiary and recent age, derived from the older formations of granites and other Archean rocks which are exposed a few miles north of this area in the central core of the Copper Mountains. It may be stated here, that in California and elsewhere, mercury is generally found in ore called cinnabar.

### Market Quotations

In recent months, the price of mercury has hovered either a few cents above or below one dollar per pound. For all purposes of this report, this quotation will be considered as the average value of this metal. Translated into simple terms, one dollar mercury ore is rock that contains one pound of metallic mercury in each short ton of 2,000 pounds.

### Sampling

For most of the tests, a miners gold pan that measured twelve inches in diameter and two inches in depth was used. By filling this pan about three-fourths full, or to a depth of one and a half inches, the weight of the average sample was  $12\frac{1}{2}$  pounds or 200 ounces. Obviously, if the gravel carried the  $1/2,000$  proportion

before mentioned, a recovery of one-tenth ounce of mercury would have been obtained from the various 200 ounce samples tested.

One-tenth of an ounce of mercury equals the magnitude of a large pea and from the ten panning tests made by the various members of the inspecting party, it is evident that the total 125 pounds or 2,000 ounces tested should have yielded a recovery of no less than one ounce of mercury in the event that the samples carried a value of one dollar to the ton.

In the actual results obtained from these tests, made by both the prospectors and the State officials in the party, nine pans showed not the slightest trace of the metal and in only one pan was a color obtained. Unfortunately, that color was so microscopically faint that the dirt and gravel panned could not be credited with carrying more than two cents to the ton in mercury value. Because the material from which the faint showing came was a doubtful origin and being of exceedingly limited volume, no further tests were made of this material.

In conducting this investigation, it is noted here that the investigators were allowed to select their samples at will and these samples were therefore taken from the more likely appearing points along the workings. No showings were obtained from samples taken from the strata of gravels in place.

One panning was made by the State Geologist personally but in no instance was it deemed necessary for the State Geologist to have a recheck made of the results obtained by the assistants as the results were clearly defined.

In conclusion, the State Geologist wishes to state that he is keenly disappointed in regard to the findings in this area. Careful tests were made at

various levels and points and in the different so-called pay-streaks. All of the prospectors appeared to be intelligent and well informed mining and mineral men, but their failure to bring forth any visible values in the tests made during the day was so disappointing that the State Geologist is at a total loss to offer any helpful advice of encouragement in respect to the project.

September 1st, 1927.

Bonneville Mercury - Sec. 12, Twp. 39, Range 93

At the "deep pit" which goes to a depth of 68' according to the report of Mr. Grayson, G. W., the average of 14 (?) samples indicated 1 lb., 8.48 oz. of Hg. (see Grayson report, p. 12). As far down as could be seen, the pit was in gravel - Wind River fm. according to the State Geol. Map.

The gravel consists of diorite, granite, and several metamorphic rocks, such as schist gneiss and quartzite.

Another pit in Sec. 14.

About a mile or two N. of the first pit Mr. Stafford says is alum and sulphur, probably indicating some hot-spring activity. *See J. D. L. notes + analyses*

Another pit in Sec. 24. Another in Sec. 12. *analyses for oil, etc. + photos*

Apparently the Hg in the pits and dumps is leached by weathering because a year after the original samples were assayed, the Hg content decreased considerably.

This appears to be a case of careful trenching and pitting.

(Writer visited the area with John Hanley, Chas. Stafford, and Mr. Royce.)

*Report by Art Hagner? 1940's  
I have no idea when the Grayson  
report is, or that by Stafford. Perhaps  
the latter could be in Cheyenne in  
the files of the War Production Board  
or a similar one that Stafford headed  
during WW II.  
J. D. L.*