UNITED STATES DEPARTMENT OF THE INTERIOR
Harold L. Ickes, Secretary

GEOLOGICAL SURVEY
W. C. Mendenhall, Director

Bulletin 870

GEOLOGY AND ORE DEPOSITS OF THE BAYARD AREA, CENTRAL MINING DISTRICT, NEW MEXICO

BY

SAMUEL G. LASKY

Prepared in cooperation with the
STATE BUREAU OF MINES AND MINERAL RESOURCES
NEW MEXICO SCHOOL OF MINES

UNITED STATES
GOVERNMENT PRINTING OFFICE
WASHINGTON : 1936

For sale by the Superintendent of Documents, Washington, D. C. - - - - - - Price 80 cents

Vein minerals of the Bayard area, listed by metals and origin—Continued

ORE MINERALS—continued

- Copper—Continued.
  - Supergene—Continued.
    - Covellite.
    - Cuprite.
    - Cuprodescloizite.
    - Malachite.
- Lead:
  - Hypogene: Galena.
  - Supergene:
    - Anglesite.
    - Cerusite.
    - Cuprodescloizite.
    - Endlichite.
    - Plumbojarosite.
    - Pyromorphite.
    - Wulfenite.
- Zinc:
  - Hypogene: Sphalerite.
  - Supergene:
    - Calamine.
    - Cuprodescloizite.
    - Goslarite.
- Zinc—Continued.
  - Supergene—Continued.
    - Smithsonite.
    - Willemite.
- Iron:
  - Hypogene:
    - Magnetite.
    - Pyrite.
    - Specularite.
  - Supergene:
    - Goethite.
    - Jarosite.
- Manganese:
  - Hypogene: Manganiferous calcite.
  - Supergene:
    - Psilomelane.
    - Pyrolusite.
    - Wad.
- Vanadium:
  - Supergene:
    - Cuprodescloizite.
    - Endlichite.

GANGUE MINERALS

- Oxides:
  - Hypogene: Quartz.
  - Supergene:
    - Chalcedony.
    - Quartz.
- Carbonates:
  - Hypogene: Calcite.
  - Supergene: Calcite.
- Silicates:
  - Hypogene:
    - Beidellite.
    - Sericite.
  - Supergene:
    - Beidellite.
    - Halloysite.
    - Kaolinite.
- Sulphates:
  - Hypogene: Barite.
  - Supergene: Gypsum.

GOLD

The gold content of the hypogene ores is insignificant. It ranges from a trace to about 0.05 ounce to the ton and is generally too low for smelter payment. The supergene ores carry somewhat more gold, though still, as a rule, in meager quantities. At some places in the western part of the district, where the veins carry a variable amount of manganiferous carbonate, the gold content in the oxidized ores is appreciable, shipments of lead carbonate ores from the Three Brothers and Silver King mines having contained as much as 0.42 ounce to the ton. On the St. Helena and Eighty-eight claims, near the town of Central, the veins carry very little besides quartz

and pyrite and have been worked for their gold content. The ore from the St. Helena is said to have averaged about 0.75 ounce to the ton in gold and that from the Eighty-eight much more, but only a few tons of such a grade was mined. The gold recovered by amalgamation from the Eighty-eight vein ranged from 0.5965 to 0.6655 fine. It is reported that a shipment of ore from the Owl mine, in Gold Gulch, yielded $7,800, chiefly in gold; the assays shown on an assay map of the mine, however, do not bear out this report but indicate instead that the gold content was as meager there as elsewhere in the area.

Fine gold has been panned from otherwise nearly barren, gougy veins on the Gold Spot and Lost Mine claims; the gold there lies in clayey pockets and in stringers of altered black calcite and manganese oxides. The fineness of this gold averages about 0.760. On the Gulch vein along the highway to the west, adjacent to the St. Helena, gold was panned from large pockets of sooty manganese oxides associated with considerable black and brown calcite.

Placer gold derived from the veins is widely distributed. Most of it is fine and angular, but nuggets as large as a small lima bean have been found. The placer gold is about 0.705 fine.

SILVER MINERALS

HYPOGENE MINERALS

All the primary ores carry several ounces of silver to the ton, associated with the base-metal sulphides, though the silver content varies considerably from place to place in the district. No assays of pure mineral specimens are available to show the silver content of the different base-metal sulphides, but detailed assay records of ore and of concentrates from the Ground Hog mine make it possible to obtain this information mathematically. A description of the computations has been published elsewhere and need not be repeated here.[37] According to these computations and to the interpretations placed upon them, about half the silver content of the mixed-sulphide ore in the main shoot of the Ground Hog mine has been contributed by submicroscopic supergene silver minerals locked up in a chalcocitic tarnish on the chalcopyrite and sphalerite. In this tarnished ore, which contains an average of 10 ounces of silver to the ton, the galena yields 1 ounce of silver for each 50 pounds of lead (34.6 ounces of silver to the ton of galena) and contributes 35 percent of the silver in the ore; the tarnished chalcopyrite yields 1 ounce of silver for each 22 pounds of copper (31.4 ounces to the ton of chalcopyrite) and contributes 47 percent of the silver in the

[37] Lasky, S. G., Distribution of silver in base-metal ores: Am. Inst. Min. Met. Eng. Tech. Pub. 557, 1934.

A 15-ton lot of sorted ore, which was shipped to Germany, consisted of two-thirds of the highest grade and one-third of the second-class vanadium ores and assayed 9.16-percent vanadium pentoxide. * * * The ore was evidently satisfactory, as requests for regular shipments were made.

The "needlelike" and "asbestoslike" lead vanadates mentioned by Larsh are the endlichite described in this report. The hard massive ore has been described by Hess [48] as follows:

Specimens of the ore sent to the United States Geological Survey are yellow with green blotches and are peculiarly massive. In microscopic section the rock is seen to be made up of vanadinite crystals in quartz, which apparently replaces a brecciated porphyritic rock. The green color is probably due to descloizite.

Hess' description suggests that the material is the same as that described in this report as pyromorphite, the lead chlorophosphate, which locally is intimately associated with the vanadium minerals. Chemical tests on samples collected by me show the presence of phosphate, chloride, and lead but no arsenic nor vanadium.

GOLD PLACER DEPOSITS

Every arroyo, no matter how small, in the prevolcanic rocks contains placer gold, and even the small rain channels on the slopes below the veins yield colors. A map of the placer ground would be essentially a map of the drainage pattern of the nonvolcanic area, but the most productive areas have been south of the Copper Glance vein, the down-slope side of the Owl-Dutch Uncle-Tin Box-Lost Mine vein linkage, and the vicinity of the veins along the highway into Central at the western edge of the area mapped. The gold was unquestionably derived from the veins and not from the country rock, as some residents of the area believe. In panning up an arroyo the miners find that the gold content gradually increases to the point where the arroyo crosses a vein, then abruptly drops, to increase again until another vein is crossed. Many veins too small to be shown on the map have yielded gold according to this test.

Each panful of gravel yields a few colors, and occasionally a nugget as large as a small lima bean is found. The particles are rough and irregular and could not have been transported far. The fineness of the gold is about 0.705.

HISTORY AND PRODUCTION

In the early days of mining in the Central district attention was directed chiefly to the copper deposits at Santa Rita, which, as then recognized, consisted of shallow vein deposits and veinlike lenses of comparatively high-grade ore. Everywhere copper seemed to be the

[48] Hess, F. L., Mineral Resources U. S., 1911, pt. 1, p. 950, 1912.