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Zinc Nevada
Combined Metals
Pioche Nevada.

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Visited this on October 29, 1941, with Paul Gemmill, super at Black Prince Mining Co. Ore bodies are typical limestone replacements and mineralization is confined to one favorable bed. Ore thickness varies from 10 to 60 feet. Ore lies horizontally. Complicated block faulting hinders efficient mining. Mineralization consists of pyrite, sphalerite and galena. The two properties are 1.5 miles apart, and mineralization will probably be continuous for that distance. Heads from the Combined Metals operation were running about 8% Zn, 4% Pb, and 2 ounces silver. Black Prince development ore was running 14%ZN,4%Pb and 2 ounces silver. Seperation is made

X- Re

175

ITEM 77

Report

COMBINED METALS OPERATION

(Lincoln County, Nevada)

INTRODUCTION

Through the courtesy of Paul and David Gemmill, who were introduced by Col. J. G. Scrugham, congressman from Nevada, the writer had the opportunity of visiting the operation of the Combined Metals Reduction Company and the Black Prince Consolidated on October 29, 1941. Mr. R. L. Dean, mine superintendent of Combined Metals, was particularly anxious that any representative of the Freeport Sulphur Company be shown anything and everything. Mr. Dean had visited the Grande Ecaille property several years ago and apparently had not forgotten the courtesies extended to him at that time.

CONCLUSIONS

A visit to the Pioche district illustrates the possibilities that can lie dormant in a supposedly worked-out ghost camp. The odds are naturally against all ghost camps reacting so favorably to new geologic interpretation, but at least here is one area where new ideas successfully revived a district. The lesson of Pioche well warrants future study of other like western possibilities.

LOCATION

Pioche lies in Lincoln county, southeastern Nevada. Paved highways connect Pioche with Ely, 108 miles north, and with Las Vegas, 195 miles south.

HISTORY

Mineralization was discovered in 1862. In 1869, the Meadow Valley Mining Company and the Raymond & Ely Mining Company began producing, and between 1869 and 1875 production, which was confined to the mining of rich fissures, amounted to $16,000,000, as reported by F. C. Lincoln in "Mining Districts and Mineral Resources of Nevada." Lower ore value and adverse water conditions with depth caused a decline in operations after 1875. With the exception of a brief revival in 1890, production was small until 1905. At that time, the district was extended by the discovery of the Prince Consolidated. The main reason for the 1905 revival was the completion of the Caliente & Pioche branch connecting the area with transcontinental railroad facilities. Production from 1905 to 1912 totaled $9,739,322. Values were in gold, silver, copper, lead and zinc.

The Prince Consolidated had been the first to show the possibilities of bedding replacement in the district. This interested Combined Metals. Their interest dates from about 1921. Extensive churn drilling indicated an extensive favorable bed replaced by a complex galena-sphalerite mineralization below the horizon which had been worked in the oxide zone by the Prince Consolidated. This relatively new horizon, plus the Snyder's ability to conquer the flotation coupled with the advent of cheap Boulder Dam power in 1937, are the factors behind the successful revival of the Pioche district. In 1940, the total production for this area was listed at $42,000,000.

GEOLOGY

The ore deposits in the district are divided into (1) fissure veins in the basal Cambrian quartzite (which has a thickness of 1,500 feet), and, to a minor degree, in the limestone and shale; (2) contact veins associated with intrusive dikes; (3) bedded replacement deposits in the limestones and shales. As mentioned above, early day mining was confined to the first type: Meadow Valley and Raymond & Ely mining silver chloride, lead carbonates with a little gold and occasional sulphides from fissures.

Whereas three types of limestone replacements were described for the original era of replacement mining, the large manganese-iron-silver and lead bed at the Prince Consolidated was of major importance in 1923. The bed of the Combined Metals was just under development at that time and little was known of its importance. Since 1923, Combined Metals has developed this favorable bed through two shafts (the No. 1 and the Castleton) 8,200 feet apart. This same favorable bed is also being developed at the Prince Consolidated, 7,000 feet to the south of the Castleton shaft. It is impossible to specifically state that this mineralization is continuous for 15,000 feet, but even with the to be expected gaps, a portion of the 15,000 plus development possibilities to the south of the Prince shaft suggests large reserves.

Ore occurs in a limestone bed with mineralization scattered over a 450-foot width in an east-west direction. The writer was led to believe that this replacement band had a north-south trend and that the total bed thickness was about 40 feet. The entire thickness is not ore. The lime bed underlies impervious shale. At the base of the lime is a shaley phase. Replacement occurs on the upper margin of the shaley phase and at the base of this phase, where it lies in contact with quartzite. Total mineralization thickness sometimes equals 60 feet. Values occur as lead, zinc and silver, occurring as galena and sphalerite associated with rhodochrosite and calcite. Mining difficulties, which might be anticipated with two flat-lying replacement horizons separated by a barren shale zone, are further complicated by block faulting. An original trough-like distribution in section, the result of folding, has been further accentuated by this post-mineral structure. Details of this complicated picture could not be acquired in the brief time available for map study. Suffice it to say that from a mining standpoint, an understanding of block faulting in the Pioche district is as important as the interpretation of favorable horizons.

MINING METHODS

There was no opportunity to visit the actual mining operation. John B. Huttl, in the November, 1941, Engineering & Mining Journal, describes it in brief as follows: "Exploitation of blocked-out ore is effected by room and pillar methods, similar to those employed in coal mines with the exception that no standard room and pillar dimensions can be laid out owing to the faulting. Pillars are mined on retreat. Under normal conditions, exploitation of the bed proceeds in two operations. The upper bed is mined first and the ground subsequently allowed to cave, followed by removal of the footwall bed . . . About 12% of the material broken in the stopes is moved to transfer points by mechanical scrapers, the remainder by wheelbarrows and one-ton end-dump cars.

ORE VALUES

It has been reported that past shipments from the Combined Metals' operation have averaged 0.035 ounces of gold, 6.56 ounces of silver, 6.25% lead, and

16.1% zinc. Feed to mill at the time of inspection amounted to 4% lead, 8% zinc and 2.5 ounces of silver from the Castleton shaft, and 1% lead, 14% zinc, and about 2 ounces of silver from the Prince Consolidated.

TREATMENT METHODS

Combined Metals placed a new 500-ton mill into operation in September, 1941. It is located at the Castleton shaft, but is designed to handle ores from both the Castleton and Prince Consolidated. Whereas the mill is arranged to handle 500 tons per 24 hours, there is sufficient room for enlargement. The crushing section, with a capacity of 70 tons per hour, completes all preparatory crushing on one shift. Gyratory coarse and fine crushers break the ore down to -3/8-inch size. Four 500-ton storage bins hold the crushed material prior to grinding. A ball mill in closed circuit with an Akins classifier completes the fine grinding. Gravity flow carries the material to pulp tanks for feed to flotation cells.

Spahlerite and pyrite are first depressed and galena floated off in a series of cells. Tails from the lead circuit are then pumped back to the zinc pulp tank where pyrite is depressed and sphalerite activated. The latter is then floated off as a zinc concentrate. Both concentrates are then elevated and passed on to Eimco filters from where, devoid of moisture, they go directly to cars for shipment. The fines, not reclaimed, are returned to thickeners, which in turn sends the thickened concentrate back to the filter for treatment.

OWNERSHIP

The Combined Metals is reputedly a subsidiary of National Lead. The Snyder interests of Salt Lake City are interested in Combined Metals to an unknown extent. Besides the Pioche property, a successful operation at Haley, Idaho, and a mill at Bauer, Utah, represent a portion of their western organization.

The Prince Consolidated is divided as follows:

800,000 shares: International Mining & Smelting Co. (Anaconda)
800,000 shares: Combined Metals
800,000 shares: Gemmill Brothers (whose family held property for years)
200,000 shares: Outstanding

Probably on the strength of Combined Metals success in the district, American Metal Company is doing some exploratory work in the area.

D. L. Evans

Reno, Nevada
December 3, 1941

cc-Mr. McIver
Mr. Shirley
Mr. Gentry
Mr. Lundy
Mr. Lee

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