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Item 24

PIOCHE DISTRICT

LOCATION

The Pioche district is centered around the Pioche Hills, or Ely Range, which forms a low, northwest-trending arc extending to the east from the more prominent Bristol-Highland range. The hills form a general dividing line between Meadow Valley to the south and Lake Valley to the north. The mines of the district are located in T1N, R67E south of the present town of Pioche. The district was first know as the Meadow Valley district as the original settlement and milling center was near Panaca to the south in Meadow Valley. Later, the district was named the Ely district after one of the early mine owners. The present district name, Pioche, is sometimes extended to include the Highland district to the west but this report will use the Pioche name to cover only those mines in the Pioche Hills.

HISTORY

Silver ore from Pioche was shown to William Hamblin, a Mormon missionary, by Indians in 1863. The Indian name for silver ore was "panacare", a name Hamblin slightly transformed to "Panacher" and applied to claims he staked on the silver croppings. With a little more adjustment, the name became "Panaca" and is still in use for the small Mormon farming town in Meadow Valley. Hamblin and others organized the Meadow Valley mining district in March, 1864 but little mining was done until 1868 when San Francisco financier F. L. A. Pioche entered the district and formed the Meadow Valley Mining Co. In 1869, W. H. Raymond and John Ely came to the area and formed the Raymond and Ely Mining Co., and the first major mining period in the district began. The first ores mined were high-grade silver chloride-cerrusite ores from narrow fissure veins on Treasure Hill slightly southeast of Pioche. These ores contained considerable gold and were treated by stamp mills at Bullionville, near Panaca in Meadow Valley and in Dry Valley. This first period of production peaked in 1873 and was over by 1879. About $21 million, nearly all in silver, was produced during the short time period. Two later periods of production followed. Between 1912 and 1920, low-grade manganese-silver fluxing ores were produced from mines on the west side of the district and, between 1934 and 1953, large bedded replacement ores containing zinc-lead-silver were mined, also from the west side of the district. Total district production is recorded at $133 million but this figure may contain some production from nearby districts. At the present time (1984), none of the mines in the Pioche district are active. Some ores from outside the district are reportedly being treated at the mill immediately northeast of Pioche, but the efforts are very small-scale. Exploration has been done near Caselton for the past few years and several major mining companies continue to show interest there. Exploration results and future plans for the area are, however, unknown.

GEOLOGIC SETTING

The Pioche Hills (Pioche district) are composed of complexly faulted Lower and Middle Cambrian rocks which have been intruded by a few porphyry dikes and

sills. In general, the eastern part of the district is underlain by Cambrian Prospect Mountain Quartzite which served as host to the narrow, high-grade silver fissure deposits mined early in the district's history. The western part of the district is underlain by quartzite as well as the overlying Pioche Shale, Lyndon Limestone, Chisholm Shale, and Highland Peak Formation. The south-eastern portion of the Pioche Hills, beyond the mining area, is covered by Tertiary volcanic rocks.

The Pioche Shale served as host horizon for the large bedded replacement ore bodies and the Lyndon Limestone and Highland Peak Formation were the host rocks for the low-grade manganese-silver fluxing ores mined during the later mining periods of the district.

Regionally, the Pioche Hills, and the adjacent Highland and Bristol ranges, are part of a north-south elongated outcrop of mainly Cambrian rocks which appear to embay or are covered by volcanic rocks of the large Mount Wilson and Caliente caldron complexes which are centered to the east and south. Westgate and Knopf (1932) and Tschanz and Pampeyan (1970) consider the Pioche Hills to be a window in a regional thrust plate of Upper Cambrian rocks that overrode older Cambrian rocks and Tertiary volcanic rocks. They presume the thrust underlies Cambrian rocks on the west side of the Highland range and on Arizona Peak. A megabreccia composed of blocks of Cambrian rocks and volcanic rocks is known, from drill hole data, to surround the productive portion of the district. Tschanz and Pampeyan (1970) believe the megabreccia to be the result of gravity sliding. Gemmill (1968) discounts entirely the thrust concept and attributes all of the former thrust fault relationships to more simple gravity sliding. It would be interesting to investigate the possibility that the megabreccia could be related to the large volcanic centers which almost totally encircle the district.

ORE DEPOSITS

Three important types of orebodies have been mined within the Pioche district; high-grade fissure vein occurrences of silver in quartzite on Treasure Hill, low-grade manganese-silver replacement bodies from limestones on the west side of the Pioche Hills, and zinc-lead-silver bedded replacement bodies from limestones within the Pioche Shale (largely from the "CM" limestone bed).

The fissure deposits were mainly in three nearly east-west trending fissures, the Raymond and Ely which split into the Meadow Valley and Burke veins, and the Yuba Dike. Oxidized silver ore shoots in the fissures extended for several thousand feet along strike and they were locally mined to a depth of 1200 feet. The richer fissure ore contained 75 to 150 ounces of silver to the ton, mainly as silver chloride. Lead, as cerrusite, was present in amounts ranging from 11 to 20 percent.

The low-grade silver-bearing, manganese fluxing ores came from the Prince and Virginia Louise mines on the western slope of the Pioche Hills, south of Caselton. Between 1915 and 1927, these mines produced about 1,100,000 tons of manganese fluxing ore which contained an average of 2.7 ounces silver, 3 percent lead, and 3.5 percent zinc along with 31.5 percent iron and 12.5 percent manganese. This material was sent to lead smelters in the Salt Lake Valley, Utah.

The bedded replacement deposits in the Pioche Shale, the largest orebodies both in size and total value mines at Pioche, occur principally in the Combined Metals Member and Susan Duster bed of the Pioche Shale. The bedded ore was mined from "channels", ore zones roughly aligned along an east-west trend across the district. The main channel, the Castelton, is mineralized for some 9000 feet through the district. It has produced about 3,250,000 tons of ore containing 0.044 ounces gold, 4.86 ounces silver, 4.48 percent lead and 11.96 percent zinc per ton. Minerals in the sulfide portions of this material are sphalerite, galena, pyrite, and manganoan siderite.

Gemmill, 1968, notes that there seems to be no direct relationship between mineralization in fissures in quartzite and mineralization in the C.M. bed of the Pioche Shale. The "Greenwood fissure", important as a feeder structure in the Castelton replacement ore channel, is not mineralized where it is seen in Prospect Mountain Quartzite. The Raymond and Ely fissure, where projected to intersect Pioche Shale, does not form replacement ore.

GEOCHEMICAL RELATIONSHIPS

Ore samples from the Pioche district displayed fairly consistent relationships. Silver was reported present in all, but was highest in samples form fissure-vein occurrences. Manganese, lead and zinc values were highest in ores from the replacement deposits. Arsenic was anomalous in all samples, antimony anomalous in most. Only a few samples showed detectable gold. Low tin values and scattered tungsten values were reported. No molybdenum was reported from any samples, and the barium values appear to be lower than those found in many other nearby districts.

COMMENTS

The Pioche district is the largest mining district, in production, in Lincoln County and, in all of eastern Nevada, is second only to the Robinson district to the north in White Pine County. Several detailed studies have been made of Pioche district geology and of geology of major Pioche mining properties. These studies should be referred to for more detailed information on the area. One point that has not been stressed in earlier work, however, is the coincidence between the Pioche district and the volcanic structures in this part of eastern Nevada. There is no reason to infer that the massive bedded ores at Pioche are in any way related to late vulcanism, but some features noted during our field examinations could point to the presence of late-stage, low-temperature mineralization which in fact could be related to volcanic activity. Open-space fillings of silica were noted at several properties, as was crystalline jarosite, and quartzite breccia cemented with opaline silica was reported from the Wide Awake mine southeast of Pioche. Although not visited during our examination, Knopf (Westgatre and Knopf, 1932, p. 51) reported the presence of a considerable mass of opal north of the Ely Valley mine and related it to a hot spring origin resulting from Tertiary volcanic activity.

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