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GEOLOGY OF THE PINTADA MINE

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INTRODUCTION

The Pintada mine is a sandstone copper deposit with the mineralization occurring in the Grayburg-Queen Formation of Permian age. The mine is located approximately 14 miles east of Santa Rosa, New Mexico, near the bottom of Pintada Canyon. The open pit and mill are located in the NW¼ Section 14, T. 8 N., R. 19 E.

The topography of the mine area is one of low, rolling hills. Rocks of Triassic age cap mesas surrounding the mine. The elevation ranges from 4,990 feet on the floor of Pintada Canyon to 5,350 feet at the rim of the mesa. Drainage for the area flows in an easterly direction through the Rio Agua Negra, eventually emptying into the Pecos River south of Santa Rosa. Rainfall is sparse and generally less than 13 inches per year.

The chief industry of the area is cattle ranching. From time to time minor amounts of mining have been carried on at the Pintada mine and Stauber mine for copper.

Only limited geologic investigations have been carried out on the Pintada mine. The only written report known to the authors of this area is by Soule' (1956). R. J. Holmquist, U.S. Bureau of Mines Engineer, examined the property in 1943 but did not publish his findings.

STRATIGRAPHY

The Permian San Andres limestone is the oldest rock which crops out in Pintada Canyon near the Pintada mine. Only the upper part of the formation is exposed in Pintada Creek bed and there it consists of light- to dark-gray, thin- to thick-bedded, micrite. In the mine area its contact with the overlying Grayburg-Queen Formation is obscured by valley fill and float.

The 280-300-foot thick Permian which overlies the San Andres and is overlain by the Santa Rosa Formation (Triassic) has been the subject of a nomenclatorial problem. Read and Hayes (1958) concluded that of the three names which had been given to this unit, Bernal, Chalk Bluff, and Whitehorse, Chalk Bluff should be used for the interbedded gypsum, sandstone, siltstone, mudstone and shale. In 1965 Dane and Bachman mapped this unit as the Artesia Group undivided and recently Kelley (personal commun., 1972) conducted a regional study of the Permian in eastern New Mexico and believes that this Permian unit should be called the Grayburg-Queen Formation. It is not within the scope of this paper to deal with this nomenclatorial problem and thus this unit will be referred to as the Grayburg-Queen throughout this report.

The Grayburg-Queen in the mine area can be divided into three mappable units at a scale of 1:24,000. It must be kept in mind that the authors have studied the Grayburg-Queen only in the vicinity of the mine and do not intend to indicate that these divisions can be recognized regionally. The three units are described in ascending order below.

The basal 60-75 foot thick "gypsiferous" unit consists of white to gray, massive, gypsum and is in gradational contact with the overlying "lower sandstone" unit. The gypsum forms the valley floor along much of Pintada Canyon.

The "lower sandstone" unit contains the copper mineralization near the Pintada mine and consists predominantly of gray to dark-gray, very fine to fine-grained, well-sorted, quartzose sandstone up to 9 feet thick interbedded with gray to light-gray, reddish-brown, siltstone, mudstone, and shale. Minor gypsum up to 4 feet thick is present and secondary gypsum commonly occurs filling fractures throughout this unit. The "lower sandstone" is 60-75 feet thick and is in gradational contact with the overlying "upper sandstone" unit.

The "upper sandstone" unit is 150-170 feet thick and is unconformably overlain by the Santa Rosa Formation. It consists of red to red-brown, very fine to fine-grained, thin- to thin-bedded sandstone interbedded with red to reddish-brown siltstone, mudstone, and shale all of which contain discontinuous light-gray zones. The "upper sandstone" is a slope former and the contact between the "upper and lower sandstone" units can be placed at the highest occurrence of continuous gray sandstone which is characteristic of the "lower sandstone."

The Santa Rosa sandstone (Triassic) is the youngest unit in the mine area and caps the mesa surrounding the Pintada Canyon. It consists of light-gray to reddish-brown, crossbedded sandstone and mudstone with local conglomerate near the base and is 70-80 feet thick.

STRUCTURE

The Permian and Triassic beds in the mine area are flat lying with minor folds, wavy bedding, and small gravity faults which have formed from collapse due to the ground-water solution of gypsum in the "gypsiferous" unit of the Grayburg-Queen. The mineralized beds of the "lower sandstone" in the open pit at the mine are dipping 4° north-northwest.

HISTORY OF PRODUCTION

Residents of the area tell of Indians using copper-stained rocks as ornaments in the 1890's. However, the first active interest in the area, that is known to the authors, began in 1939. In October 1939, Mr. William L. Hammer patented the Pintada Lode # 1-4. These claims lie in the NW¼ sec. 14, T. 8 N., R. 19 E. These claims were amended slightly in 1943 and constitute the mine area today. Only small-scale operations

were conducted by Hammer at this time (Roberts, 1971, personal commun.).

Drunzer and Casner operated the Pintada property next but little is known of their mining activities outside of the fact that they did ship limited amounts of ore to El Paso. The major period of production came in 1970 and was conducted by Mr. Robert E. Roberts. Mr. Roberts purchased the original patented claims and carried out a limited exploratory drilling program. Based on this drilling program, Roberts constructed a small flotation mill and developed the open pit as it exists today. The pit is approximately 50 feet wide by 250 feet long and 30 feet deep. Records show that Roberts produced and shipped over 41,600 pounds of copper concentrate to El Paso for smelting. The operation was closed, according to Roberts, in late 1970 due to inadequate equipment and mining methods. No production has been recorded since this date.

MINERALIZATION

The copper mineralization found at the Pintada mine occurs in a quartz arenite, light gray-medium bluish gray (N7-5B 5/1), fine-grained to very fine grained, subgrounded to subangular, moderate to well-sorted, 90-95% quartz, 1-3% feldspar, with minor pyrite, carbonaceous material, and kaolin. Where pyrite is present and the rock has been subjected to oxidation, limonite is produced giving the rock a grayish orange (10 yr 7/4) appearance. Chalcocite is the dominant copper mineral with minor amounts of copper carbonates present in the area of the pit.

A typical screen analysis of random samples taken from the mine area shows the following copper distribution:

Mesh	Percentage of Total Copper
+100	26.71
+150	9.58
−100	63.71

The same sample when subjected to a spectrographic analysis provided the breakdown of elements shown below:

Less than 0.01%–	Mo, B, Ni, V, Co, Zn, Au
0.01 – 0.10%–	Mn, St, Ba, Pb, Zr, Cr, Ag
0.10 – 1.00%–	Na, K, Ti
1.00 – 10.0%–	Fe, Al, Ca, Mg
Greater than 10.0%–	Cu, Si

Five individual, mineralized sands are present at the mill and open pit. The sands are separated by silt or shale layers. Small, secondary gypsum veinlets sporadically cut each of the sand units. The sand units are most commonly homogeneous in appearance, however, faint, low-angle crossbedding may be observed in some areas.

The overall section present at the Pintada mine from the San Andres to the Santa Rosa represents a regressive sequence. In the horizon of interest at the Pintada mine, the copper mineralization is found in association with finely disseminated organic material. In some cases, this organic material shows signs of reworking by burrowing organisms. No fossils have been found. The organic material is not visible in outcrop in all areas surrounding the mine. Very fine grained euhedral pyrite is commonly associated with the organic material. The pyrite occurs as single, euhedral cubes and in clusters. It is similar to that described by Love (1962) in the Permian Kuperschiefer. A reducing environment was present in the mineralized zones at the time of deposition.

REFERENCES

Dane, C. H. and G. O. Bachman, 1965 Geologic map of New Mexico; U.S. Geol. Survey, scale: 1:500,000.

Love, L. G., 1962, Biogenic primary sulfide of the Permian Kuperschiefer and marl slate; Econ. Geology, v. 57, p. 350-366.

Read, C. B., 1958, Panel discussion of Bernal-Whitehorse-Chalk Bluff nomenclatorial problem: *in* New Mexico Geol. Soc., Nineth Field Conference. Black Mesa Basin, p. 204.

Soule', J. H., 1956, Reconnaissance of the "Red Bed" copper deposits in New Mexico: U.S. Bur. Mines, Inf. Circ. 7740, p. 29-30.