

Geology of the Pintada Mine

Clint L. Sandusky and William H. Kaufman, 1972, pp. 176-177

in:
East-Central New Mexico, Kelley, V. C.; Trauger, F. D.; [eds.], New Mexico Geological Society 23rd Annual Fall Field Conference Guidebook, 236 p.

This is one of many related papers that were included in the 1972 NMGS Fall Field Conference Guidebook.

Annual NMGS Fall Field Conference Guidebooks

Every fall since 1950, the New Mexico Geological Society (NMGS) has held an annual Fall Field Conference that explores some region of New Mexico (or surrounding states). Always well attended, these conferences provide a guidebook to participants. Besides detailed road logs, the guidebooks contain many well written, edited, and peer-reviewed geoscience papers. These books have set the national standard for geologic guidebooks and are an essential geologic reference for anyone working in or around New Mexico.

Free Downloads

NMGS has decided to make peer-reviewed papers from our Fall Field Conference guidebooks available for free download. Non-members will have access to guidebook papers two years after publication. Members have access to all papers. This is in keeping with our mission of promoting interest, research, and cooperation regarding geology in New Mexico. However, guidebook sales represent a significant proportion of our operating budget. Therefore, only research papers are available for download. Road logs, mini-papers, maps, stratigraphic charts, and other selected content are available only in the printed guidebooks.

Copyright Information

Publications of the New Mexico Geological Society, printed and electronic, are protected by the copyright laws of the United States. No material from the NMGS website, or printed and electronic publications, may be reprinted or redistributed without NMGS permission. Contact us for permission to reprint portions of any of our publications.

One printed copy of any materials from the NMGS website or our print and electronic publications may be made for individual use without our permission. Teachers and students may make unlimited copies for educational use. Any other use of these materials requires explicit permission.
This page is intentionally left blank to maintain order of facing pages.
GEOLOGY OF THE PINTADA MINE

by

CLINT L. SANDUSKY

and

WILLIAM H. KAUFMAN

Frontier Resources Inc.

Albuquerque

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 NW\text{\textdegree} sec. 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 of red 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 gyspum 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 NW\text{\textdegree} 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
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, subrounded 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:

<table>
<thead>
<tr>
<th>Mesh</th>
<th>Percentage of Total Copper</th>
</tr>
</thead>
<tbody>
<tr>
<td>+100</td>
<td>26.71</td>
</tr>
<tr>
<td>+150</td>
<td>9.58</td>
</tr>
<tr>
<td>-100</td>
<td>63.71</td>
</tr>
</tbody>
</table>

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, Sr, 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


