Terrenates manganese district, Chihuahua, Mexico

McAnulty, W. N., Sr., 1969, pp. 207-208

in:

The Border Region (Chihuahua, Mexico, & USA), Cordoba, D. A.; Wengerd, S. A.; Shomaker, J. W.; [eds.], New Mexico Geological Society 20th Annual Fall Field Conference Guidebook, 228 p.

This page is intentionally left blank to maintain order of facing pages.

TERRENATES MANGANESE DISTRICT CHIHUAHUA, MEXICO

by

W. N. MCANULTY, SR.

Department of Geology, University of Texas at El Paso

ABSTRACT

Commercial deposits of psilomelane-type manganese ore occur in fissure veins cutting andesitic and rhyolitic flows and tuffs of Tertiary (?) age in the Terrenates district in north-central Chihuahua, Mexico. More than 75,000 tons of medium-to high-grade manganese ore has been produced from several small mines in the Terrenates district. Possible reserves of ore containing more than 35 percent of $Mn0_2$ are estimated to be 500,000 tons.

RESUMEN

Los yacimientos comerciales de minerales de manganeso de tipo psilomelano, se presentan en vetas de fisura, que cortan derrames andesiticos y rioliticos asi como tubas de edad terciaria (?), en el distrito de Terrenates de la region nor-central de Chihuahua, Mexico. Más de 75,000 toneladas de mineral de manganeso, de mediano a alto grado, han lido producidas por varias minas pequenas en este distrito. Posibles reservas del mineral estimadas en 500,000 toneladas podrian contener más del 35% de $Mn0_2$.

INTRODUCTION

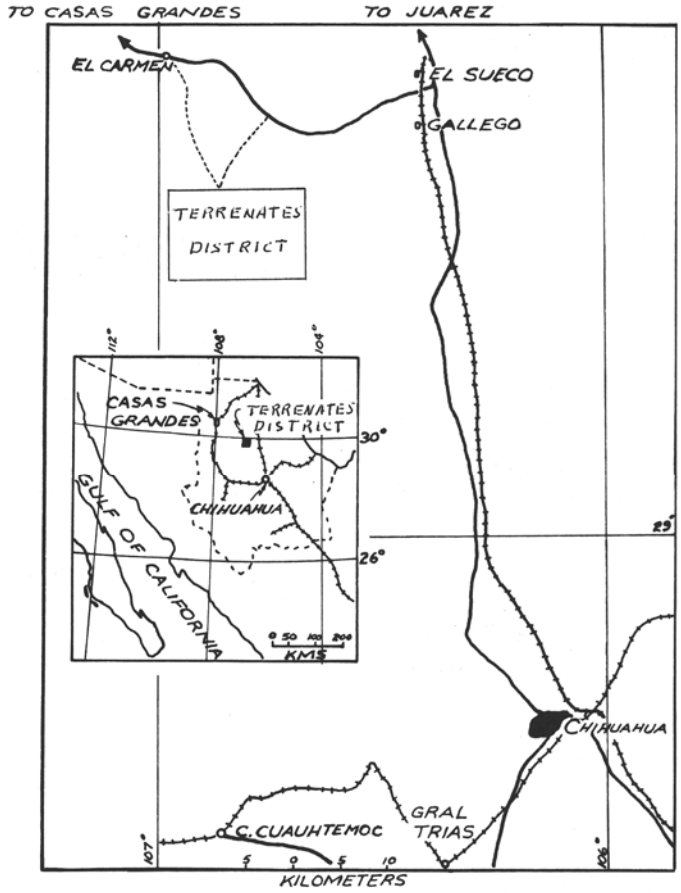
More than 75,000 tons of medium- to high-grade manganese ore have been produced from fissure vein deposits of hydrothermal origin in andesitic and rhyolitic flows and tuffs of Tertiary (?) age in the Terrenates district in north-central Chihuahua. The manganese-bearing veins occur in an area approximately five kilometers wide and 15 kilometers long. The district may be reached by travelling 25 miles west from El Sueco on the Casas Grandes Highway and thence 15 miles southward on a dirt road. Many of the mine workers live in a small village known as Campo Grande, in the southern part of the district. Several small mines have been developed, the most important of which are: La Venganza, Ocateca, and Atravisada.

GEOLOGY

Manganese mineralization in the Terrenates district occurs in fissure veins developed along faults and fractures cutting gently tilted, light-colored andesitic and rhyolitic flows and tuffs of Tertiary (?) age. Most of the faults strike northwestward and dip between 45 and 90 degrees.

The principal manganese minerals are cryptomelane $K\ (Mn^{+4,}\ Mn^{+z}\ )_8 0_{16}$ and psilomelane $BaMn_9 0_{16}(OH)_4$. The cryptomelane-psilomelane ratio varies considerably from place to place. Thallium in amounts ranging from 350 to 850 ppm is present in the ores. Gangue minerals include quartz, calcite, and hematite. Unreplaced fault breccia constitutes a significant part of the total gangue.

The vein deposits pinch and swell, with widths ranging from three to fifteen feet. The larger deposits average about 5 feet in width. Many of the veins are persistent along the



INDEX MAP
Terrenates Manganese District, Chihuahua, Mexico

strike; several are traceable on the surface for more than 1,000 feet. Most of the ore produced has been mined within 100 feet of the surface, but a shaft on one of the larger deposits is still in ore at a depth of 320 feet.

The ore grade varies from one deposit to another, both vertically and horizontally. Some zones contain ore with as much as 70% $Mn0_2$, whereas in others the $Mn0_2$ content is less than 35 percent. Ore bodies in the Ocateca mine consist of about 25 percent manganese, 25 percent calcite, and 50 percent unreplaced fault breccia. The manganese minerals occur principally in fractures and spaces between the larger breccia clasts, but some of the fault breccia has been replaced by the ore minerals.

MINING

Mining was started in the Terrenates district in 1944 but there was very little production until 1953. During 1953-54, the period of greatest activity, the reported production was 45,000 metric tons containing 38 percent Mn and 20 percent $Si0_2$; and 25,000 tons containing 43 percent Mn and 8 percent Si02.

The high-grade ore is selectively mined and hand-sorted for shipping. Lower-grade material is crushed and up-graded in crude, hand-operated jigs. Initially, the mining was from open pits, but most of the higher-grade ore near the surface was soon mined out and underground workings were developed. A large tonnage of mill-grade ore near the surface was by-passed. The largest mine employed about 70 workers during the peak period in 1953-54. The ore is hauled in trucks to Estacion Gallegos, a distance of about 45 miles, for shipment by rail.

RESERVES

Several veins known to contain good manganese ore have not been explored and veins on which mines are located have not been drilled for the purpose of determining reserves. Therefore, data are not available for a rigid classification of reserves. A reasonable estimate of possible reserves is 500,000 tons of ore containing more than 35% $Mn0_2$ and at least that amount of lower-grade ore. A large tonnage of milling-grade ore is available in dumps.

ACKNOWLEDGMENTS

Much of the information in this paper was obtained from a report prepared for the Dow Chemical Company in 1960 by D. R. Atkinson and J. M. Rasberry, who were at that time members of a group working under the writer's supervision. The writer is also indebted to Salvador Jimenez V. for information published in his paper entitled "Yacimientos de Manganeso Comprendidos Dentro de la Region de Terrenates, Chihuahua," Symposium Sobre Yacimientos de Manganeso, XX Congreso GeolOgico Internacional, Tomo III, 1956, p. 151-155.