MINERALOGY OF THE COALINGA ASBESTOS DEPOSIT

by

F. A. MUMPTON and C. S. THOMPSON

Research and Development Department
Mining and Metals Division
Union Carbide Corporation
Niagara Falls, New York

I N T R O D U C T I O N

Even the most casual visitor has little difficulty in realizing why the New Idria serpentinite body remained unrecognized for over one hundred years as one of the world's largest deposits of short-fiber asbestos. Despite its enormous size, and its high-grade nature - over 50% recoverable fiber is present in most of the deposit - the physical appearance of this body is totally unlike that of almost any other known asbestos deposit in the world. Whereas most asbestos deposits contain chrysotile in the form of cross-fiber veinlets within a massive serpentinite host-rock, such veins are essentially absent from the New Idria body. Here, the great bulk of the ore consists of soft, powdery, pellet-like agglomerates of matted, friable chrysotile, surrounding fragments and blocks of serpentinite rock. It is this highly sheared and pulverized nature which has led to the recent exploitation of

the New Idria asbestos ore, since mining can be accomplished with ease by low-cost, open-pit methods, and high purity asbestos products can easily be prepared by separating the powdery chrysotile from the hard, dense serpentinite rock.

Although small asbestos bodies had been reported to be present in certain areas of the New Idria body, it was not until late in 1957 that serious consideration was given to this deposit. At this time, J. H. Bright of Union Carbide Corporation's Exploration Department examined a number of asbestos claims within the body, about 35 miles northwest of Coalinga, California. He noted that, although cross-fiber veins were absent from this ore, the entire southeastern third of the serpentinite consisted of tough, leathery sheets, intermixed with soft, friable agglomerates of powdery asbestos. He reported that the ore extended several tens of feet beneath the surface and appeared reasonably uniform over a fifteen square mile area.

Early reports indicated that the New Idria asbestos ore was either mountain leather or antigorite, neither of which was useful in asbestos applications, and although the California Division of Mines reported a deposit of "chrysotile" in the Condor Pit area of the mass (Anonymous, 1957), it was not until the middle of 1959 that the asbestos industry was generally aware that chrysotile was the major constituent of the ore. This identification led to further speculation that important commercial uses might be found for

this unusual asbestos ore, and touched off a minor "asbestos boom" in the area. By late 1959, the town of Coalinga had become the center for asbestos exploration activities, and the asbestos occurrences of the New Idria serpentinite became known as the Coalinga asbestos deposits. During this period, several large mining companies were attracted to the area and were successful in acquiring the mining rights to several hundred claims covering the entire southeastern third of this body. (See also, Munro and Reim, 1962; Merritt, 1962, Rice, 1963)

Subsequent laboratory studies by several of these companies showed that the Coalinga ore contained between 50 and 75% chrysotile, in contrast with Canadian-type ores which contain only about 5-10% usable asbestos. The Coalinga ore was comparable with Grade-7 Canadian fiber, and thus, appeared potentially useful in such products as wallboard, asbestos cement, shingles and floor tile. At the present time, three major companies are conducting mining and milling operations on this ore, including Union Carbide Corporation, Atlas Corporation, and Coalinga Asbestos Company, a joint venture between Johns-Manville Corporation and Kern County Land Company. The latter two process the ore at their mine sites by standard dry-lifting techniques, while Union Carbide hauls the ore sixty miles to King City, California, for wet processing. In addition to the conventional uses for asbestos mentioned above, the wet processed products have proved applicable to an entirely new