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The Mucanha Vuzi coal deposit, Mozambique

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The Mucanha Vuzi coal deposit is located in the Tete Province of northwest Mozambique, on the northern shore of the Cahora Basa dam, 240 km from the Moatize coal mine. The deposit was first explored in its central portion (the Bohodzi block) in the 1980s by a consortium led by the Brazilian state-owned company CPRM [1]. From 2008 to 2012 Vale undertook a comprehensive exploration program at Mucanha Vuzi including an airborne geophysical survey, geological mapping and a reverse circulation and diamond drilling campaign, accompanied by detailed coal quality analyses.

Mucanha Vuzi is part of the extensive E-W trending Permo-Triassic Chicôa-Mecúcoè coal sub-basin, which forms part of a sequence of sub-basins that extend for approximately 400 km to the east along the Mid-Zambezi valley to the Malawi border [2]. Coal resources in these sub-basins are hosted in remnants of the Permian Ecca Group of the Karoo Supergroup [3]. Together, these sub-basins constitute one of the largest underdeveloped coal provinces in the world.

The exploration work performed by Vale allowed for a significant extension of the coal sequence to the east of the Bohodzi block for a total E-W strike of 26 km. These areas which had not been previously explored were denominated the Grande Mucanha and Mucanha Oeste blocks. Along this trend, the beds dip at an average of 8° to the south. Major NW-SE trending normal faults are the main structural feature observed in the area and mark the limits between the three blocks, as well as the outer limits of the Bohodzi and Mucanha Oeste blocks.

The coal bearing sequence at Mucanha Vuzi is correlated to the Moatize Formation. It is composed of an alternation of sandstones, mudstones, carbonaceous shales and coal seams deposited in a lower fluvial environment, transitioning to an upper fluvial and lacustrine environment [4]. To the north of the Grande Mucanha and Mucanha West blocks the Moatize Formation rests on the Dwyka Group, which in turn unconformably overlies crystalline basement rocks. In other parts of the deposit it is at fault contact with sediments of the Matinde Formation and basement leucogranites [4].

The Mucanha-Vuzi coal deposit is characterized by a discrete number of coal seams, ranging from 0.5 m to 8.5 m in thickness, separated by inter-burden units of thickness generally significantly exceeding that of the individual coal seams. Thirty two coal seams have been identified and grouped into 8 major seams. The coal is classified as a high ash, high volatile, bituminous coal with estimated raw quality averages of 1.47% moisture, 42% ash, 21% VM, 36% fixed carbon and 1,03% S (air dried basis). Vitrinite

content is high and reflectance ranges from 1.0 to 1.1%. Washability tests demonstrate that a coking coal product can be obtained but yields are low and the ash content of product is elevated and expected to exceed generally accepted market levels [4].

References:

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