

## **KINGRI AND TOI NALA (GHOZE GHAR-SAVI RAGHA) COALFIELDS OF MUSAKHEL DISTRICT, BALOCHISTAN, PAKISTAN: FORESIGHT STRATEGY**

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### **Abstract**

The different coalfields of Musakhel District are located in the northeastern part of Balochistan Province and also Sulaiman foldbelt. Kingri-Aram-Gharwandi Coalfields (Latest Cretaceous coal) have been found in the Vitakri Formation of Nath Ghar and Sumat Ghar in the south (Kingri coalfield), Nishpa, Tor Sari, Aram and Shiren in the central part (Aram coalfield) and Manhi area like Surbol and Nath locality and Khagoon areas in the north (Alu Khan Kach/Gharwandi coalfield) and Indur Pur and Sarin Lahar in the east. There are two main coal horizons (coeval to dinosaur red mud beds) each capped by sandstone units. Each horizon shows lenticular and discontinuous lignitic and muddy coalseams with low heating value. In Kingri mine thin seam of metallic coal/graphitic coal is also observed. In Gharwandi (Nath) area and also northeastern Sumat Ghar the laterite and high sulphur is also associated with coalseams. Estimated reserves of lignitic and muddy coal of Musakhel district are about 81million ton/mt with breakup as measured 3.9mt, indicated 7.8mt, inferred 35mt and hypothetical 34.3mt. Estimation of reserves is purely tentative based on only outcrop because no exploratory holes have been drilled. Here mining is not successful due to need of metallic coal by mine owners which is found negligible. In Multan a drill hole by oil company show 3m coal may belongs to Latest Cretaceous Vitakri or Early Paleocene Hangu or Eocene Domanda coal which reveals extension of coal under Punjab plain.

Kingri-Shikar-Tor Shah Coalfields (Early Eocene coal) is found in Toi Formation exposed in the vicinity of metallised road from Kingri to Kot Khan Mohd-Musakhel. These coal seams started in Shikar area (about 5km NE of Kingri town) are extending toward NE direction in the Gidar Shikai, Chamoz, Tor Shah, etc. This coal is exposed on the eastern limb of anticline. This anticline is followed in the west by Tor Shah syncline and in the east by Gandhera syncline. There are 5 main seams, each showing 1 foot thick carbonaceous shale with minor metallic coal. Coal quality seems like Chamalang and Toi Nala (Dewal-Ghoze Ghar-Savi Ragha) coal. The tentative reserve of this coal is 1mt but of thin coal seam. This Toi coal seems to be promising for drillings.

Toi Nala (Dewal-Ghoze Ghar-Savi Ragha) Coalfield is found in Early Eocene Toi Formation of Drug Tehsil region (District Musakhel), exposures starting from south are Dewal, Ghoze Ghar, Miana, Tabai Khah, Takai and Alambadai (Savi Ragha). The coal is also exposed in Toi Nala at Plawan/Betar. There are 3 main coalseams with 5 minor coalseams hosted by shale and sandstone, capped and roofed by sandstone/limestone beds dipping (20<sup>0</sup>-35<sup>0</sup>) eastward. Toi Formation is about 30m thick in Alam Badai. Lower coal seam is about 1 foot thick, the middle and upper coal seams each about 9 inches or slightly less than 1 foot thick. Total estimated coal reserves of Toi Nala coalfield are 15.4mt with breakup as measured 1.2mt (upto 0.4km depth), indicated 2.4mt (from 0.4km depth to 1.2km depth), inferred 10.8mt (from 1.2km depth to 4.8km depth) and hypothetical 1mt (beyond 4.8km depth) but not verified by drilling. Coal quality is better than Chamalang's coal. This coalfield seems to be significant for development to start mining. Toi Nala coalfield is found in the eastern continuation of Chamalang coalfields in the Sulaiman (Middle Indus) Basin and its development will be another good addition to the coal fields of Balochistan.