

Lithofacies, petrographic and geochemical analyses of Cretaceous Lumshiwal Formation, Surghar Range, Pakistan

Muhammad Waseem Khan¹ and Shahid Ghazi²

¹Atomic Energy Minerals Centre, Lahore,

²Institute of Geology, University of the Punjab

geo_waseem2005@yahoo.com

Abstract

The present study deals with the lithofacies, petrographic and geochemical analyses of Lumshiwal Formation in three sections (Baroch Nala, Karandi and Chichali Pass sections) of the Surghar Range. The thicknesses of the Formation at the study area are 158m, 190m and 38m respectively, indicating thinning behavior towards the East direction in East-West segment of Surghar Range due to lack of subsidence or due to tectonic activity. It is predominantly fine to medium grained, medium to coarse grained at some parts, mostly unfossiliferous. Belemnites fossils have been observed at lower most parts of the Formation. It has lower contact transitional with Chichali Formation of the Cretaceous age and unconformably overlain by Hangu Formation of Paleocene age.

Based on field studies three lithofacies are identified. These three lithofacies assemblages from top to bottom are designated as “A” (combination of mudstone, carbonaceous shale, and coal beds), and two types of sandstone lithofacies “B” and “C”. Lithofacie B comprised of medium to coarse grained and current bedded sandstone. Lithofacie C comprised of variegated color sandstone horizon, medium to fine grained.

Sandstones of Lumshiwal Formation fall into Sub Arkose to Arkose arenites on the basis of modal composition; few samples are classified as Lithic Arkose. Geochemical studies show generally high percentage of silica due to ample silicate minerals confirmed by petrographic and X-Ray diffraction analyses.

The Formation is rich in carbonaceous matter, radioactive at some parts in three sections. Coal partings have also been observed in different parts of the Formation. The Formation is generally porous and permeable and show potential hydrocarbon reservoir behavior.