

## **The microfacies analysis and impact of diagenesis on the reservoir quality of the Sakesar Limestone, Nilawahan Gorge, central Salt Range, Pakistan**

**Muhammad Ishaq<sup>1</sup>; Irfan U. Jan<sup>1</sup>; Muhammad Hanif<sup>1</sup>; Muhammad Awais<sup>1,2</sup>; Hafiz Shahid Hussain<sup>1</sup>; Irshad Ahmad<sup>1</sup> and Naveed Akhtar<sup>1</sup>**

*<sup>1</sup>National Centre of Excellence in Geology, University of Peshawar*

*<sup>2</sup>Department of Geology, University of Swabi, Swabi  
geoishaq88@gmail.com*

### **Abstract**

The visual estimation ratio technique of allochemical constituents and micrite of the 75 m-thick section of Sakesar Limestone at the Nilawahan Gorge, central Salt Range helped in recognizing five microfacies types, i.e. 1) Larger benthic foraminiferal wackestone, 2) Foraminiferal-algal rich wackestone-packstone, 3) Milliolidal-algal rich wackestone-packstone, 4) Larger benthic foraminiferal packstone, and 5) Alveolina-algal rich packstone, giving rise to foraminiferal-algal dominated proximal inner ramp to distal middle ramp lagoonal setting.

The diagenetic fabric of the formation has been elucidated and on that basis paragenetic sequence has been established. These diagenetic events have manifested that the Sakesar Limestone has practiced marine, meteoric and burial diagenesis. The porosity types recognized consisted of intraparticle, intercrystalline, moldic and fracture porosity. The fractures and dissolution have enhanced the reservoir quality of the Sakesar Limestone, making it a prolific hydrocarbon pool while cementation, neomorphism and stylolitization seem to have destroyed its reservoir quality.