

Water quality in Derajat Leghari, Dera Ghazi Khan

Aqeel Goher¹, Mohammed Ashraf² and Mohammed Arshad Khan²

¹Bahria University, Islamabad

²Azad Jammu & Kashmir University, Muzaffarabad

Geological and hydrogeological studies were carried out in about 1,113 square kilometers area of Derajat Leghari, Dera Ghazi Khan. These include study of various lithostratigraphic units exposed in the mountainous region, determination of chemical quality of surface and groundwater of the area, and its use for drinking purpose.

Lithostratigraphic units, which range in age from Cretaceous to Recent, have been described. The Cretaceous to Miocene age rocks are of marine environment, whereas the Siwaliks and post-Siwaliks are of continental origin. The stratigraphic succession of the area consists of Moghalkot Formation (Paleocene), and Ghazij, Laki and Kirthar Formations of Eocene age. The Nari Formation is of Oligocene-Miocene age and the Siwaliks of Pliocene – Pleistocene age, whereas the alluvium is of Recent age. The rock units described here are from Ghazij Formation to Recent alluvium. These consist of both clastic and non-clastic sediments. About 41 water samples were collected from different localities. The surface water flow through different rocks ultimately reaches the piedmont planes in the region. A hydrogeological map is prepared taking into consideration the fresh and saline zone which changes with depth of the water table. The effect of geology on ground and surface water has been recorded.

The pH value for ground and surface water ranges from 7.3 to 8.3. The calcium concentration varies between 0.4 and 17.9 m meq/l, magnesium is up to 23.0 meq/l, and sodium with potassium ranges from 1.3 to 32.5 meq/l. These values reveal that they are higher as per international drinking water standards. The carbonates and bicarbonates increase the alkalinity of drinking water in the area. Their concentration ranges from 2.6 to 17.8 meq/l. The sulphates are 0.2 to 46.4 meq/l, whereas chlorides are within international standards. The dissolved constituents range from 216 to 3600 ppm. The study shows that the water in sandy aquifer better qualifies for drinking purpose as compared to that from the silt – clay zones.