The Tefenni (Burdur) plain is located in the southwest of Turkey and is semi-closed basin. Groundwater is densely used as drinking, irrigation and domestic water in the Tefenni plain. Hydrogeochemical processes controlling groundwater chemistry and geochemical assessment of groundwater were investigated in the Tefenni (Burdur/Turkey) plain. The conceptual hydrogeological model of the plain was prepared for qualitative description of the underground geology and interpretation of hydrogeochemical processes of the study area. In this study, groundwater samples for two seasons were analyzed and major ion chemistry of groundwater was researched to understand the groundwater geochemistry. Two major hydrochemical facies (Ca-Mg-HCO$_3$ and Mg-Ca-HCO$_3$) were determined in the area. Mg, Na, SO$_4$ and Cl- concentrations of water samples increased seasonally related to ion change of minerals in rocks by rainwater in wet season. Various graphical plots and multivariate statistical analysis (Pearson correlation analysis) were used for identifying the occurrence of different geochemical processes. Carbonate weathering in dry season and silicate weathering in wet season were the major hydrogeochemical processes in the study area. In addition, ion exchange and reverse ion exchange were two possible processes of water–rock interaction in the basin. The mechanism controlling groundwater chemistry at the Tefenni plain is originally regulated by the geogenic process rather than anthropogenic activities.