

Soil erosion and land subsidence effects in the vicinity of power transport lines in Eshtehard Plain using sedimentology and Geoelectric studies

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Abstract

Soil erosion and land subsidence in Iran have become known and important issues. Recently, the vital arteries of urban and interurban areas include the nation's power line face with secondary effects of soil erosion and land subsidence. In this research, the place of power line and different upstream marls (M1, M2, M3 units) from Eshtehard to Bouin-Zahra area were studied from a sedimentology erodibility and geoelectric point of view. In the laboratory, granulation, calcimetry, electrical conductivity, Aterberg limits, type and the amount of different elements and clay minerals were determined. The types of erosion include surface, furrow, stream, and trench erosion on the Upper Red Formation deposits and Quaternary sediments. The results show that the area is covered by highly erodible marl and contains abundant non-cohesive silt particles, alkali cations, and soluble anions. A silty layer about one-meter-thick is located on the surface substrate consisting of dense clay and on the clayey sand layer and due to high erosion, they cause large tunnels and gullies that go towards the electric towers. The clay mineral of this layer is montmorillonite with highly sensitive to soil erosion factors. Geoelectric studies show this layer as well as sandy layers deposited in 45m and more depths. The main reason for the general subsidence of this region can be considered as water extraction for the steel industry in the Eshtehard region, which has been used as a driving force to create cracks and erosive cracks in the soil.

Keywords: *Sediment, Erosion, Vital arteries, Geoelectric, Eshtehard*