

Swab gas is that gas produced by a formation due to underbalance caused by the upward movement of the drillstring. This may be accompanied by pump shutdown (e.g. during connections and trips) or not. There are two types of swabbing, one being the piston type (some part of the drill string acting as a plunger in the borehole) and the other being the frictional type (friction between moving drill string and annular mud inducing a slight lifting force in annular mud column).

Trip gas is produced gas caused by the loss of annular pressure drop during pump shutdown by swabbing the entire hole (influenced by the speed of tripping out the drill string), lowering of hydrostatic head (if the hole is not kept full), and the period of non-drilling operations while making a trip. It also is a measure of the degree of static balance in the borehole, but its utility is less because time interval is a significant factor in round trips when compared to connections.

3. Cuttings Analysis

(a) Shale Density

The compaction of sediments through applied overburden pressure and diagenetic process is largely a function of dewatering. The exclusion of water with compaction will result in a decrease in primary porosity and an increase in bulk density, generally with depth. With normal compaction, bulk density typically ranges from 1.7 to 2.7 gm/cc and shows a steady rate of increase with depth. Anomalies from this normal compaction trend may be due to mineralogy, e.g. siderite, dolomite, and calcitic shales exhibit higher than normal values. Sandy, silty shales and soft wet clays will produce further variations.

Geopressure in homogeneous claystone/shale sections is indicated by a constant or decrease in density with depth reflecting a higher than normal porosity and fluid content. "Cap rocks" of higher than normal density may be present above this zone of geopressure.