

Regional Low Gravity Anomalies Influencing High Concentrations of Heavy Minerals on Placer Deposits

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Abstract : Regions of low gravity and gravity anomalies both influence heavy mineral concentrations on placer deposits. Economically imported heavy minerals are likely to have higher levels of deposition in low gravity regions of placer deposits. This can be found in coastal regions of Southern Asia, particularly in Sri Lanka and Peninsula India and areas located in the lowest gravity region of the world. The area about 70 kilometers of the east coast of Sri Lanka is covered by a high percentage of ilmenite deposits, and the southwest coast of the island consists of Monazite placer deposit. These deposits are one of the largest placer deposits in the world. In India, the heavy mineral industry has a good market. On the other hand, based on the coastal placer deposits recorded, the high gravity region located around Papua New Guinea, has no such heavy mineral deposits. In low gravity regions, with the help of other depositional environmental factors, the grains have more time and space to float in the sea, this helps bring high concentrations of heavy mineral deposits to the coast. The effect of low and high gravity can be demonstrated by using heavy mineral separation devices. The Wilfley heavy mineral separating table is one of these; it is extensively used in industries and in laboratories for heavy mineral separation. The horizontally oscillating Wilfley table helps to separate heavy and light mineral grains into different fractions, with the use of water. In this experiment, the low and high angle of the Wilfley table are representing low and high gravity respectively. A sample mixture of grain size $<0.85\text{ mm}>$ of heavy and light mineral grains has been used for this experiment. The high and low angle of the table was 6° and 2° respectively for this experiment. The separated fractions from the table are again separated into heavy and light minerals, with the use of heavy liquid, which consists of a specific gravity of 2.85. The fractions of separated heavy and light minerals have been used for drawing the two-dimensional graphs. The graphs show that the low gravity stage has a high percentage of heavy minerals collected in the upper area of the table than in the high gravity stage. The results of the experiment can be used for the comparison of regional low gravity and high gravity levels of heavy minerals. If there are any heavy mineral deposits in the high gravity regions, these deposits will take place far away from the coast, within the continental shelf.

Keywords : anomaly, gravity, influence, mineral

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