

## ABSTRACT

*Mount Seulawah Agam is one of the geothermal areas in Aceh Province controlled by volcanic activity and geological structures. This study aims to identify gravity anomaly patterns, analyze their relationship with geological structures, and model the subsurface structure using 2D inversion. The data used in this study consist of GGMPlus satellite gravity data and ERTM2160 elevation data with a total of 14,042 points. Data processing was carried out through Bouguer correction and terrain correction to obtain the complete Bouguer anomaly (CBA), followed by regional and residual anomaly separation using the upward continuation method up to an elevation of 7000 m. The average rock density was determined using the Parasnis method, resulting in a value of 2.66 g/cm<sup>3</sup>. The results show that the CBA values range from 28.33 mGal to 43.47 mGal, while the residual anomaly values range from -5.73 mGal to 4.10 mGal. The low residual anomaly zone is dominantly distributed in the central to southern part of the study area and is located close to the Mount Seulawah Agam body, geothermal manifestations, and fault zones. The overlay with the regional geological map indicates that this zone coincides with the Qvtl and QTvt units. The 2D inversion modeling along profile A–A' shows a density range of 1.65–2.93 g/cm<sup>3</sup>, whereas profile B–B' shows a density range of 1.91–2.95 g/cm<sup>3</sup>. The low-density zones in both profiles may indicate the influence of less compact lahar deposits, fractures, hydrothermal alteration, or geothermal fluid occurrence.*

**Keyword :** gravity anomaly, GGMPlus, Mount Seulawah Agam, 2D inversion, geothermal.