A 3D gravity model of the Copper Flat Mine was performed as part of the exploration of new resources in the mine. The project is located in the Las Animas Mining District in Sierra County, New Mexico. The mine has been producing ore since 1877, currently is owned by the New Mexico Copper Corporation, who plans to bringing the closed copper mine back into production, with innovation and a sustainable approach to mining development. The project is located on the eastern side of the Arizona-Sonora-New Mexico porphyry copper belt of Cretaceous age. Copper Flat is predominantly a Cretaceous age stratovolcano composed mostly of quartz monzonite. The quartz monzonite was intruded by a block of andesite alter which a series of latite dikes creating veining along the topography where the majority of the deposit. The Copper Flat deposit is mineralized along a breccia pipe where the breccia is the result of auto-brecciation due to the pore pressure. There have been a number of geophysical studies conducted at the site. The most recent survey was a gravity profile on the area. The purpose of the new study is the reinterpretation of the IP Survey and emphasizes the practical use of the gravity geophysical method in evaluating the validity of the previous survey results. The primary method used to identify the deposit is gravity in which, four Talwani models were created in order to created a 3D model of the ore body. The Talwani models have numerical integration approaches that were used to divide every model into polygons. The profiles were sectioned into polygons; each polygon was assigning a specific density depending on the body being drawn. The calculation of the polygons used an exact formula instead of the numerical integration of the profile made with a Talwani approach. A least-squared comparison between the calculated and observed gravity is used to determine the best fitting gravity vectors and the best susceptibility for the assemblage of polygonal prisms. The survey is expected to identify the geophysical anomalies found at the Copper Flat deposit in order to identify the alteration that surrounds that part of the ore body. The understanding of the anomalies, needs to be reevaluated in order to have a sharper model of Copper Flat, and to understand the relations of the different structures that shaped this copper porphyry deposit.