MINING VOIDS DETECTION USING SEISMIC LAND STREAMER DATA AT THE TRI-STATE MINING DISTRICT IN NORTHEAST OKLAHOMA

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We acquired five seismic reflections lines at the Tri-State Mining District in northeast Oklahoma using the seismic land streamer to detect unmapped mining voids. Detecting subsurface voids is always required to reduce risks to both property and human life. This study was conducted at the Tar Creek Superfund Site characterized by hazardous toxic levels of zinc, cadmium, and lead in mine waste, soil, air, and water. Despite recent improvements in subsurface void detection using geophysics, hazardous conditions can limit the applications of many geophysical methods in void detection. This study tested the effectiveness of the seismic reflection data acquired by land streamer in void detection. The acquired seismic data were analyzed as P-wave reflection, refraction, and multichannel analysis of surface wave to generate multiple images of the subsurface and maximize the chance of detecting voids. The results showed that the seismic land streamer data have successfully detected multiple mining voids along the acquired profiles. This study demonstrated that a seismic land streamer is an effective tool for acquiring suitable data to detect subsurface voids.