REFRACTION MICROTREMOR FOR DELINEATION OF LAYERS AND LENSES, AND ASSESSING LIQUEFACTION POTENTIAL WITHIN AN ALLUVIAL SETTING – MOROBE PROVINCE, PAPUA NEW GUINEA

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Refraction Microtremor (ReMi) is a relatively new method in the geophysics industry. ReMi provides high resolution seismic shear wave velocity models up to 200m depth and as such has the potential of being an efficient method for assessing the soil liquefaction potential in seismically active regions.

This paper presents a geophysical investigation carried out as part of a geotechnical feasibility study for a proposed Tailings Storage Facility (TSF) in the Morobe Province of Papua New Guinea. The primary objective of the investigation was to use geophysical methods to obtain subsurface parameters to assess the liquefaction potential within an interbedded and lensed clay/gravel alluvial setting. ReMi together with down hole and cross hole seismic methods were used to generate shear wave velocity information of multiple layers with depth, and in particular to define seismic velocity inversions.

ReMi data was acquired using two array setups specifically targeting the top 100m of subsurface material and the top 50m of subsurface material at increased layer resolution. The data was inverted to produce shear wave velocity soundings which were correlated with the cross hole and down hole seismic methods, and with borehole Standard Penetration Tests (SPT). The soundings were compiled to generate high resolution shear wave velocity sections, analysis of which proved pertinent in defining the interconnectivity of the lensed clay/gravel and shear wave velocity variations for the calculation of liquefaction potential thresholds.

Key words: Ambient seismic, refraction micro tremor, ReMi, Papua New Guinea, soil liquefaction