

## ABSTRACT

The research is done in Inul East Pit, PT. Kaltim Prima Coal, Kutai Timur District. PT. Kaltim Prima Coal have to diverse river where is in the middle of Inul East Pit mine plan, so PT. Kaltim Prima Coal can mine this area. This river diversion must be done in good effect to environment with reducing overburden excavation as much as possible to avoid TSS environmental issue and acid water because planning area is the only one of Inul East hauling road to dumping area or coal stockpile.

Choosing Jacking Force Microtunneling method to diverse Pinang River is the best way from environmental aspect and tunnel operational safety. Jacking force calculation currently only calculated using one layer of soil/rock, it can cause error calculation when applied on area which its rockmass has two or more layers of rocks.

Jacking force value to push MTBM and concrete pipe into the ground is calculated in two methods, they are software model in 255 m along tunnel plan alignment and manual calculation based on Jacking Force Ultimate Assosiation Method (2012). Manual jacking force calculation using one layer assumption will cause the difference value of 4005.38 kN compared by jacking force based on finite element model

Keywords : Concrete Pipe, *Jacking Force*, *Microtunneling*