

Fault Structure Effect in Sidoarjo Mud Volcano (Lusi)

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Abstract

On May 29, 2006, hot mud began erupting unexpectedly on Siring Village and its surrounding, District of Porong, Sidoarjo, East Java, Indonesia (named LuSi) has inundated an area in excess of more than 700 Ha. This phenomenon show the hot mudflow in Sidoarjo shows that the mud broached from a layer below the surface that is quite thick and contain clay (shale) that has a higher pressure due to hydrostatical pressure (overpressure), a very plastic characteristics and it might be in mobile condition. On the surface, the mud is a mixture of fluid and solid elements in the form of salty water, sand, gas as well as steam that reach 100 degrees Celsius. This hot mud can spew out to the surface through weak zone or cracks that happened because of new fault from drilling activity.

The goal is to know the geology condition of research area that consist of lithology forming, geological structure, the fault orientation, fault type, location, pattern of straightness and direction of the bubble and the emergence of crack, but it also determines who has a zone of high risk levels rise mudflow, water and gas in the research area.

The method which is used in this research is analyzing the condition of geology and geomorphology. The parameters that is used as base analyze is sub surface data in form of seismic, well geoseismic, gravity, Very Low Frequency (VLF) and Ground Penetrating Radar (GPR), while surface data in the form of data map of spreading pattern of bubbles, map of spreading cracks, and also geomorphology map of Porong and its surroundings.

Result from this analysis is area of Porong-Sidoarjo represent plain with very thick sediment with its compiler lithology is pebbles, granules, sand, mud and clay. Spreading of natural bubbles is make-up of the amount along with increasing it wide of area where having phenomenon degradation of land and crack that happened in research area. Pursuant to surface and sub surface data analysis got result there was fault structure which has South West- North East direction at the location of mud Sidoarjo blast with 2 kilometers wide dimension. This fault structure is known as Watukosek fault which have influence to hot mud blast appearance because functioning as its exit media of mud from the earth. Fluid mass in the form of mud which appears to the surface through cavities fall and crack alongside weak zone of Watukosek fault. Pursuant to the mentioned, hence suggested the existence of furthermore interpretation of geohazard study especially for the microzonation of area affect disaster on the future at weak zone fault area so that able to know the area where is can get more hard damage effect of influence of mud blast.

Keywords : Mud of Sidoarjo, Watukosek Fault, Media of Mud Spreading, Geohazard.