



Determination of the contaminated area after the blowouts in Alasehir (Manisa/Turkey) Geothermal Area using geophysical methods

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Western Turkey is one of the most spectacular regions of widespread active continental extension in the world. The most prominent structures of this region are E–W trending Gediz and Büyük Menderes Grabens. Geothermal activity around city of Manisa in Gediz Graben has been investigated by many researchers and many drillings has been opened in order to produce electricity and heating purposes. In the middle of May, 2012, a geothermal blowout occurred 150 m away from the deep drilling, at the depth of 1100 m, in Alkan village of Alasehir resort in city of Manisa. After that, 5 big blowouts happened at the same area and hot water had been diverted to Alkan stream for almost 4 months. In this study, it was intended to determine contaminated area by using magnetic susceptibility measurements for the surface and VLF-R method for underground layers. Magnetic observations were carried out by using Bartington MS2E system and VLF-R by Scintrex ENVI-VLF. It is observed that magnetic susceptibility values vary between 90-160 cgs in the center of the blowout and 30-80 cgs 50 m around of it. All of the susceptibility values were mapped and contaminated areas was clearly defined on the surface using 246 data points. Besides, VLF-R studies were carried out along 21 profiles each of a length of 170 m at three different frequencies with a line and station spacing of 5 m. Laterally constrained two layer inversion was applied to each station and in addition to the inversion of all profiles for each frequency, all lines were stacked within a precise resistivity interval and 2-D maps of the contaminated zones were obtained.