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Mineralogical and geotechnical characterization of a large earthflow in weathered structurally complex terrains of the Molise region, Italy

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Molise, the smallest region of southern Italy, has a territory which is extensively affected by landslides and erosional processes due to diffuse presence of structurally complex formations. These, consisting of alternating lithologies dominated by clayey materials, are severely tectonized and intensely involved in weathering processes. The result is an overall poor to very poor quality of the physico-mechanical properties that favours an high susceptibility to landslides. One of the largest active mass movements affects the municipality of Agnone, a town situated in the Isernia province. The landslide, an initial roto-translational slide evolving in an elongated earth flow, was firstly re-activated in January 2003 by intense rainstorms, causing serious damage to rural buildings and the local road network, along with the cautional evacuation of 15 families from their houses. Further stages of re-activations were registered in the time span 2003-2005, and since then it has been continuously moving. The present paper highlights the role played by weathering in the phases of reactivation of this complex landslide. Geologic field investigations, combined with the outcomes from several phases of in situ surveys and monitoring, and laboratory (geotechnical and mineralogical) tests, allowed to collect a good amount of data on the materials involved in landsliding. In particular, the laboratory tests carried out on selected samples from the boreholes, provided the information necessary to distinguish three main grades of weathering in the local stratigraphy, and to correlate these grades to the more likely

sliding surfaces. At present (winter 2006-07) the landside is intermittently moving, and has recently shown evidence of a retrogressing distribution of activity. Prolongation of the monitoring, both at the surface and at depth, will likely provide further useful data to better comprehend the landslide kinematics, and relate it to the weathered layers in the stratigraphic sequence.