



## **Examples of geomorphic reclamation on mined lands in Spain by using the GeoFluv method**

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This paper describes seven examples of geomorphic reclamation on mined lands of Spain, as solutions for complex environmental problems, by using the GeoFluv method through the Natural Regrade software (Carlson). Of these seven examples, four of them have been partially or totally constructed. Each of them has its own particularities and contributions, becoming innovative geomorphic solutions to existing environmental (ecological, social and economic) problems. The Quebraderos de la Serrana example (Toledo province) allowed a local company to get permission for slate quarrying in a highly ecologically vulnerable area; before that, the permission for extracting rocks had been rejected with a conventional reclamation approach. The Somolinos case is, to this date, the most complete geomorphic reclamation in Spain, and the first one in Europe to have been built by using the GeoFluv method. This restoration has healed a degraded area of about six hectares at the outskirts of the Somolinos hamlet, in a valuable rural landscape of the Guadalajara province. The Arlanza example (Leon province) shows a design which proposes to restore the hydrological connectivity of a coal mine dump which blocked a valley. The Machorro and María Jose examples (Guadalajara province) are allowing kaolin mining to be compatible with the preservation of protected areas at the edge of the Upper Tagus Natural Park (UTNP), in highly vulnerable conditions for water erosion. The Campredó case (Tarragona province) shows an agreement between a mining company, the academia, and the Catalanian Agency of Water, to combine a high standard of geomorphic reclamation with solving problems caused by flooding downstream of a clay mining area. Finally, the Nuria example is also located at the UTNP area; the goals here are to stabilize a large landslide in a waste dump and to minimize the risk of occurrence of flash floods from mining ponds. Additional information on these examples and about the state of art of the Geomorphic Reclamation practice in Spain can be found at <http://www.restauraciongeomorfologica.es>.