

## Integrated Water Basin Management Including a Large Pit Lake and a Water Supply Reservoir: The Mero-Barcés Basin

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Water resource managers attempt to minimize conflicts among users, preserve the environment as much as possible, and satisfy user necessities at a minimum cost. Several European directives indirectly address mine restoration policies, with a goal of minimizing negative impacts and adding social and environmental value where possible. Water management must consider water sources, ecological flows, flood control, and variability in the demands for urban, industrial, and agricultural uses. In the context of the present study, the city of A Coruña is located in Galicia (NW Spain). The water supply system for this city and surrounding municipalities (~400.000 inhabitants) is based on the Abegondo-Cecebre reservoir. In cases when precipitation is scarce (e.g. no rain for more than seven consecutive months) and there is a seasonal increase in demand significantly stress the supply system so that, as occurred in 2010, shortages and water supply restrictions need to be considered. This is a clear indication of that, at present, the Abegondo-Cecebre reservoir has not enough capacity to cope with a scenario of increasing water demand (due to the vegetative and seasonal increase of population) and hydric stress likely connected with the widely acknowledged climate change. In the present context of monetary resources scarcity and society concern with respect large new public work projects, the construction of a new dam is challenging. However the opportunity provided by the recent flooding of the Meirama open pit (a large mine void that has been forced-flooded for its reclamation and it is located in the headwaters of one of the rivers draining towards the Abegondo-Cecebre reservoir) proves to be a significant new asset that will help to improve the future water management scenarios under the acknowledged uncertain conditions. In this study we have studied in detail the hydrochemistry of the affected systems (lake, river and reservoir) in order to make clear whether or not the use of lake water is acceptable from different points of view (water quality, legal constrains, etc.). Our results indicate that the joint use of the lake/reservoir system is feasible. Based on this and other complementary study, the basin water authorities has developed a project by which a 2.1 km uptake tunnel will be excavated in the next years to drain water from the lake towards the Barcés river and complement the water supply necessities of the Abegondo-Cecebre reservoir in case of hydric emergencies.