Impacts of a Long-terme Shutting Down on the Aquifer Recharge Management: Case of the Aquifer Recharge System of Geneva – Switzerland

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ABSTRACT

The drinking water supply for the Geneva area comes partly from a large trans-boundary aquifer called "Genevois aquifer". An artificial recharge (A.R.) system was established in 1980 to recharge water from one of the main river crossing Geneva (the Arve river) into the "Genevois aquifer" in order to maintain the groundwater level and to enable continued use of the groundwater (cf. ISAR 4, Adelaïde 2002 *). During the 25 years of exploitation, the A.R. system of Geneva, which includes a treatment plant and infiltration by underground drains in a spreading area, has brought over 225 M m3 of treated water into the "Genevois aquifer". The A.R. system also brought positive results to the global quality of water resource, especially its hardness and nitrate contents.

The building of a new dam in the Arve River started in September 2005 on the site where the water-intake structure for the A.R. system is located. In order to take advantage of this work to displace and improve the water-catchment, it has been necessary to shut down the A.R. plant for 15 months.

This project had an important impact on the A.R. and drinking water supply management. In order to minimize the impacts of pumping on the water level and to prepare the "Genevois aquifer" to be used without A.R. during the 15 month period, it has been necessary to plan groundwater management more than a year in advance. The main fear was to face another scorching summer in 2006, as was the case in 2003, and to have the sole service of aquifer without the assistance provided by A.R. As it is described in this paper, July 2006 was the hottest month in the meteorological history of Switzerland and the total pumping during this month has almost reached the draw-off recorded in 2003. This paper describes management strategy to lead groundwater supply to a good balance between pumping and recharging, before, during and after the work time frame in order to maintain an optimal drinking water supply management in the Geneva area. The impact on the quality of water and its variations during this period are also analyzed.

* The aquifer recharge system of Geneva, Switzerland: a 20 year successful experience. G. de los Cobos in Management of Aquifer Recharge for sustainability - Peter J. Dillon, Balkema Publishers 2002