

Potential Impacts of Rock Mining from a Karstic Aquifer on a nearby Wellfield Abstract n°1788

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Water to the city of Miami and other communities in Miami-Dade County, Florida, USA is supplied by several wellfields, including the Northwest Wellfield. The water is produced from the Biscayne Aquifer, a karstic limestone. This limestone is also the source of rock aggregate for construction and is extensively mined in the vicinity of this wellfield. Mining of the rock occurs below the water table and man-made lakes, hydraulically connected to the aquifer, remain at the completion of mining+ because of the abundance of such lakes, the area is called the Lake Belt Area. Depth of mining is controlled by regulations based on travel-time distances from the wellfield. There were, however, concerns that these regulations were not adequate for protecting the wellfield from pathogens and other contaminants that could enter the aquifer through the mining lakes. To address these concerns, several tracer tests were conducted in the vicinity of the wellfield by County and Federal agencies. Previous evaluations of these test data compared travel velocities without considering the relative position of the test location with respect to the wellfield. This presentation summarizes the results of an analysis of these test data using a simple model that considers test location, and presents an evaluation of the adequacy of the existing mining regulations with respect to the test results. It is concluded that travel-time distances specified in the regulations were flawed because their calculation did not correctly consider the pathways between the lakes and the wellfield, ignored the effects of regional gradients, and used data that were not consistent with the results of tracer tests.

