CLEAN-WATER ALTERNATIVES TO ARSENIC NATURALLY POLLUTED GROUNDWATER IN A SEMI-ARID ZONE OF MÉXICO

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Arsenic-related health effects have been observed in the population of Zimapán, Mexico. Zimapán is a low income community with nearly 9000 inhabitans located in the central part of México. Groundwater is the only drinking water source at Zimapán. Natural and anthropogenic pollution sources have been found to release arsenic into the aquifer system. Hyperkeratosis, hypopigmentation and hyperpigmentation have been related with the continuous consumption of water containing more than 0.3 mg/L of arsenic. Groundwater exploitation alternatives have ben proven to be limited for the solution of the problem. The more productive wells drilled in the limestone aquifer are also the most polluted by natural causes. Good quality groundwater is found in the volcanic aquifer which, on the other hand, has a low productivity. Various alternatives have been proposed to supply Zimapán inhabitants with clean water. The most polluted well (1.0 mg/l of As) was closed in early 1996. Groundwater treatment procedures requiring low investment and straitghtforward operation have been tested. A potable water treatment plant based on floculation with ferric sulfate and filtration has just started to operate. Water from one of the most polluted (0.5 mg/L of As) and also more productive wells will be treated by this plant. One of the limestones rock formations has been proven to eliminate a high proportion of the arsenic through agitation with the polluted water. This last procedure could be applied as an in-house method to reduce As in the water coming from one contaminated well (0.7 mg/L of As) still in operation. In developing and semi-arid countries, a unique solution to As-polluted water seems difficult. Different measures must be stablished to solve the As-related health problem.