

عنوان مقاله:

Application of in situ permeable reactive barrier technology for the remediation of nitrate contaminated groundwater

محل انتشار:

چهارمین کنفرانس بین المللی نوآوری های اخیر در شیمی و مهندسی شیمی (سال: 1396)

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خلاصه مقاله:

Groundwater is one of the most available resources in Iran and other parts of the world. Nitrate contamination of groundwater resources due to consumption and improper management of nitrogenous fertilizers, is one of the important environmental and agricultural problems in present. Removing nitrates from contaminated water is one of the most important environmental issues. Denitrification methods of groundwater are divided into two general categories: In-Situ and Ex-Situ. In-Situ methods, treatment pollution in the site (eg, aquifer) and Ex-Situ methods extract pollution from the site and perform filtration out of site (eg the earth surface). Pumping and feeding system is one of the most common methods of treating Ex-Situ. In this system, after pumping water from wells, water filtered by using methods such as reverse osmosis and electro dialysis, and then injected through well into the groundwater. But this process requires sophisticated equipment, skilled operators and high energy consumption, which lead to an expensive treatment process. But In-Situ remediation methods are more economical compared to Ex-Situ methods and do not have the In-Situ methods problems. So the extension of groundwater nitrate pollution and expensive Ex-Situ method, lead to more tendency for using of In-Situ methods. Permeable reactive barrier (PRB) is one of the best technologies of In-Situ remediation technique. The general concept of this technology, is putting the permeable barrier in the direction of ground water that contaminated with nitrate. So the mass of contaminants passes under the influence of natural hydraulic gradient, and permeable barrier can treatment it. For building permeable barrier, a trench drill deep enough underground and then fill with reactive materials. During passing of water from the Permeable reactive barrier (PRB), contamination reacts with the material located within the barriers and purified water comes out the other side of the barrier. In this study, the Permeable reactive barrier (PRB) technology for groundwater denitrification is discussed. This study included introduction of groundwater pollution sources, technology PRB, how do groundwater in situ denitrification, and reviewing the studies in the field of PRB, design and installation of the PRB, advantages and limitations of the PRB.

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