

Biodiversity - 2014: Ground water and surface water utilization via bank infiltration method: A case study along the riverbank of Langat River, Selangor

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Abstract

This study was initiated thanks to potential public water system shortage within the Klang Valley within the near future resulted in inadequate volume of raw water sources. Bank infiltration (BI) is seen together of the solutions in providing the specified volume of raw water. Groundwater and surface water utilisation via BI technique provide improvement on quality and quantity for both surface water and groundwater. BI offers an honest practice to treat and protect the surface water as well as groundwater. The practice uses the bed of a reservoir, lake or river and an adjacent sand and gravel aquifer as natural filter and this technology are often applied on to the existing surface water reservoirs, streams, lakes and rivers, and now it's often a guiding think about the hydrogeological investigation of latest source supplies. BI is that the influx of river water to the aquifer induced by a hydraulic gradient. Pumping wells located on the banks at a particular distance from the river creates a pressure head difference between the river and aquifer, which induces the water from the river to flow downward through the aquifer. By applying this system of beverage extraction, two different water resources are used simultaneously. On the one hand, surface water from the river moves towards the well and groundwater of the encompassing aquifer is utilised. Currently BI study isn't well studied and documented in Malaysia. The development is deterred by big project like inter basins water

transfer. As more rivers are becoming polluted, more BI scheme might be developed within the near future. In view of the requirements emphasizing on raw water abstraction, the BI study in riverbank of Langat River is administered as a pilot program to develop a far better understanding of the potential and sustainable source of water abstraction, and can provide an honest platform to introduce this system in Malaysia. Areas along Langat River were chosen thanks to the high water demand within the area for public water system and groundwater is perceived together of the source with very high potential to be developed as supplementary source to meet the demand. The objective of this study is to work out the effectiveness of BI and improving the standard of river water, and to work out the effective rate of water abstraction from the alluvial aquifer. Fifty (50) monitoring wells and 4 test wells were constructed at the Jenderam Hilir and Sungai Serai village located at the riverbank of the Langat Rivers. From the boreholes within the study area, it are often deciphered that this area is rich in soil which may be a good potential as an aquifer and filter materials. Resistivity surveys were also conducted to improve the understanding of the subsurface soil stratification. In order to determine the potential of those locations for water source abstraction, pumping tests are administered. Water samplings during the 72 hours pumping tests show that test wells were ready to produce better quality and quantity of water with very low drawdown from the first static water level in the pumping wells.

The distance between the river and therefore the test wells depends considerably on hydrogeological characteristics of the study area. In the study area the space between the river and therefore the test wells is a smaller amount than 35 m. Water quality analyses was administered during the pumping test and therefore the results shows a decreasing trends in some parameters in BI method which were very high within the Langat river. Initial results from this study, has shown the light at the end of the tunnel. Riverbank of Langat Rivers in Selangor has great potential for riverbank/bed filtration for water resource abstraction. The players in beverage industry should start the utilisation of this BI technique as a replacement technology of using natural filtration system. The study on the effectiveness of BI may be a proactive effort of NAHRIM to enhance surface water quality as a source for domestic water during a modern urbanised area and conjunctively utilised with groundwater.

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