

Capture Zone of a Well Field in an Aquifer Bounded by Two Parallel Streams

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Abstract : In this paper, the velocity potential and stream function of capture zone for a well field in an aquifer bounded by two parallel streams with or without a uniform regional flow of any directions are presented. The well field includes any number of extraction or injection wells or a combination of both types with any pumping rates. To delineate the capture envelope, the potential and streamlines equations are derived by conformal mapping method. This method can help us to release constrains of other methods. The equations can be applied as useful tools to design in-situ groundwater remediation systems, to evaluate the surface–subsurface water interaction and to manage the water resources.

Keywords : complex potential, conformal mapping, image well theory, Laplace's equation, superposition principle

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