

A numerical solution to model the flow of fluorescein tracer in a fractured, high temperature geothermal system is presented. This study was carried out in Olkaria, Kenya. Results show that correcting for fluorescein decay at elevated temperatures can be used to yield reservoir hydro-geologic parameters and improve the methods of evaluating effects of injected fluids on reservoir temperature. The hydro-geologic parameters for this study are better than those obtained by other methods. This outcome was obtained by solving the material, tracer and energy balance equations that were fully discretized using integral finite difference and solved by Gauss–Seidel recursive methods. A computer code in C++ had to be written to perform the simulations. Porosity and permeability were seen to range between 11 and 16% and 1.8–2.6 Darcy respectively. Reservoir pore volume along well OW-12 and OW-19 flow path was approximately 17–26 million litres whilst recharge rate was 7 kg/s. This proves that computational methods such as those considered here can be used for industrial application. Furthermore, fluorescein being cheap and benign to environment can be made applicable in high temperature geothermal systems.