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## Use of Class II Injection Wells to Dispose of Desalination Residual Fluids in Texas

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### ABSTRACT

Desalination of brackish water (TDS < 10,000 mg/L) using reverse osmosis will be used to meet future drinking water needs in Texas. The residual fluids from the desalination process require safe disposal because of their high salinity and, in some, cases, concentrated organics. Over 75,000 active Class II Injection wells in Texas are designated for either enhanced oil recovery (EOR) or fluid disposal. Of these, over 21,000 are disposal wells. Class II wells currently can only accept liquid oil and gas exploration and production wastes. Concerns over injection of fluids are primarily risks of seismic activity and/or aquifer contamination. The disposal wells are generally shallower than the oil & gas reservoirs, well above the crystalline basement, so seismic risks, although still present, are minimal. During this Texas Water Development Board funded project on delineating buffer distances for Class II injection wells from designated Brackish Groundwater Production Zones (BGPZ) in Texas aquifers, we plotted locations of Class II wells in Texas and analyzed three analytical and one numerical model to predict the migration of injectate in order to generate scientifically defensible buffer distances. We find the Bear and Jacobs (1965) analytical model the most appropriate. Comparison with numerical modeling results that incorporated fluid density effects and well partial penetration indicated that in most cases this analytical model yields very similar results, which are acceptable for defining the buffer distances for BGPZ designation. Class II EOR wells could also be used to dispose of desalination residual fluids; abandoned EOR wells in depressurized petroleum reservoirs offer a promising option for safe fluid disposal.

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## NOTES

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