

Geochemical assessment of mixing advanced treated wastewater and groundwater in the Harmony Grove Basin, Southern California

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The Harmony Grove basin aquifer is located in San Diego California. This location is being sought after by the Rincon del Diablo Municipal Water District for storage of advanced treated wastewater (ATW). After storage, pumping of groundwater is proposed for potable reuse. The project consultant sampled and analyzed groundwater chemical concentrations from five wells in the project area (AECOM 2010). From this, three representative wells of the region were chosen (Wells B,C,E) and compared against a hypothetical ATW comprised of data from the Monterey Regional Water Pollution Control Agency (MRWPCA) and the North City Water Reclamation Plant (NCWRP). Monitoring data was analyzed with a geochemical program, PHREEQC, which is designed to perform a wide variety of low temperature aqueous geochemical calculations. The focus of this study is on chemical ion speciation, mineral saturation index, redox and batch mixing. Potential changes in aquifer geochemistry from mixing with ATW are assessed by the modeling. The lack of accurate redox monitoring data was identified due to these parameters being analyzed in the laboratory. Further work should involve field measurement of redox and other parameters which can change after exposure to the atmosphere (pH, redox, dissolved oxygen, alkalinity).