

**A COMPARISON OF RECENT SEISMIC EVENTS  
PROXIMATE TO UNDERGROUND INJECTION WELLS**

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Large volumes of flowback and produced water generated from hydraulic fracturing and oil & gas production activities have led to increased wastewater disposal through underground injection wells. Increased disposal volumes and more injection wells may affect the likelihood of injecting wastewater near unmapped faults. Some have suggested that recently felt seismic events may be associated with underground injection wells in Arkansas (Horton, 2012), Ohio (Kim, 2013), Texas (Frohlich et al., 2011), and Oklahoma (Keranen, 2013). However, in some cases, such as in Oklahoma, there is a lack of consensus as to whether the earthquakes were the result of injection wells or natural processes (e.g., Oklahoma Geological Survey, 2013). Moreover, it is unclear why earthquakes have occurred near some injection wells but not others, with apparently similar geology, target reservoirs, and injection rates (e.g., Frohlich, 2012). This paper provides a comparison between several case studies of seismicity proximate to underground injection wells and the mechanisms that control the interactions between injection wells and faults. This work will provide a framework to help inform stakeholders about the processes that control induced seismicity and their relation to wastewater disposal wells.