

**Understanding the Birds Nest Aquifer in Uintah County, Utah:
A Potential Source for Large-Scale Saline Water Disposal**

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Saline water disposal is the single most pressing issue with regard to increasing petroleum production in the Uinta Basin of Utah, primarily from Uintah and Duchesne Counties. Conventional oil and gas fields in the basin provide 67% of Utah's total crude oil production and 71% of Utah's total natural gas, the latter of which has increased 175% in the past 10 years. As petroleum production increased, so has saline water production, creating an increasing need for economic and environmentally responsible disposal plans. Current water-disposal wells are near capacity and permitting for new wells is being delayed because of a lack of technical data regarding potential disposal aquifers and questions concerning contamination of freshwater sources. Many Uinta Basin operators claim that crude oil and natural gas production cannot reach its full potential until a suitable, long-term saline water disposal solution is developed.

The Birds Nest aquifer is one potential disposal zone for the large volumes of saline water produced by Uintah County natural gas companies. This poorly understood aquifer, ranging from slightly saline to briny, was formed from the dissolution of saline minerals within the upper Green River Formation's Parachute Creek Member, roughly 300 ft above the oil shale-rich Mahogany zone. Preliminary research indicates that water movement through the Birds Nest aquifer might be controlled by northwest-trending fractures and impermeable gilsonite veins, creating similarly trending aquifer compartments. The Utah Geological Survey is currently studying these compartmentalized zones of dissolution and water flow, as well as overall aquifer characteristics, in order to create an effective saline water disposal plan for the Birds Nest aquifer that ensures protection of fresh or nearly-fresh groundwater resources.